Exeter River Geomorphic Assessment and Watershed-based Plan

Appendix A through F

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Prepared by:
Bear Creek Environmental, LLC.
297 East Bear Swamp Road
Middlesex, VT 05602

and

Fitzgerald Environmental Associates, LLC.
316 River Road
Colchester, VT 05446

Prepared under contract to:
New Hampshire Department of Environmental Services

and

Town of Exeter

Appendix A

Phase 2 Stream Geomorphic Assessment Data

Fordway Brook

Phase 2 Stream Geomorphic

Assessment Data

Fordway Brook Subwatershed - Reach/Segment Cross-Reference Table		
Reach/ Segment ID	**Town**	**Segment Location**
FW01-A	Raymond	Segment starts at confluence with Upper Exeter and continues 305 feet upstream to start of wetland
FW01-B	Raymond	Segment starts upstream of Rt 102 bridge at wetland and continues to tributary entering in wetland
FW02	Raymond	Segment starts upstream of tributary entering in wetland and continues to until wetland ends and stream channel begins
FW03	Raymond	West of Aggregate Industries
FW04	Raymond	Segment is wetland and starts upstream of stream channel reach near Aggregate Industries
FW05	Raymond	Segment is wetland/pond and is in vicinity of Fordway Brook Road, although only a trail and footbridge access pond
FW06	Raymond	Segment is wetland and is located between pond/wetland and channel downstream of Old Bye Road
FW07-A	Raymond	Downstream of Lane Road crossing, below plane bed segment, upstream of large wetland
FW07-B	Raymond	Downstream of Lane Road crossing, planebed segment
FW07-C	Raymond	Downstream of Lane Road crossing, below entrenched segment
FW07-D	Raymond	Downstream of Lane Road crossing, until stream becomes less entrenched
FW08	Raymond	Huge wetland reach upstream of Lane Road culvert
FW09	Raymond	Near Old Bye Road crossing
FW10-A	Raymond	Downstream of Lane Road crossing and wetlands, near cul de sacs off of Old Bye Road
FW10-B	Raymond	Wetland area downstream of Lane Road crossing
FW10-C	Raymond	Upstream of Lane Road crossing. Influenced by wetlands upstream and downstream
FW10-D	Raymond	Huge wetland segment east of Old Chester Road in Raymond
FW10-E	Raymond	Downstream of Old Chester Road crossing, influenced channel with wetlands upstream and downstream
FW10-F	Raymond	Wetland segment upstream of Old Chester Road crossing in Raymond
FW11-A	Raymond	Wetland area downstream of Shattagee Road crossing
FW11-B	Raymond	Segment of stream channel between wetlands in vicinity of Shattagee Road crossing
FW11-C	Raymond	Wetland area upstream of Shattagee Road crossing continues to beyond power lines
FW12-A	Raymond	Off of trail accessed by power lines off Shattagee Road (very remote)
FW12-B	Raymond	Off of trail accessed by power lines off Shattagee Road, upstream of short segment with channel
FW13	Candia	Near Crowley Road crossing
FW14	Candia	Upstream of Crowley Road

Phase 2 Reach Summary Statistics for Fordway Brook																			
Reach/ Segment	Watershed Area (mi^2)	Phase 1 Confinement	Reference Channel Width (ft)	Channel Dimensions			Channel & Floodplain Ratios			Reference Stream Type	Existing Stream Type	Dominant Bed Substrate	Bedform	Sinuosity	RGA* Rating	RHA* Rating	Reach Sensitivity	CEM†	CEM† Stage
				Width (ft)	Mean Depth (ft)	Area (ft^2)	Width to Depth	Entrench-ment	Incision										
FW01-A[A]	10.0	Broad	38.5	39.0	--	--	--	--	--	C	C	Gravel	Plane Bed	low	Fair	Fair	Very High	--	--
FW01-B	10.0	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FW02	9.9	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FW03	6.9	Very Broad	32.1	28.7	1.7	48.2	17.1	4.3	1.0	Cb	Cb	Cobble	Riffle-Pool	low	Good	Good	Moderate	F	I
FW04	6.8	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FW05	6.6	Wetland/Pond	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FW06	6.2	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FW07-A	5.8	Broad	29.4	25.0	1.3	31.3	20.0	6.7	1.0	C	C	Cobble	Riffle-Pool	moderate	Good	Good	Moderate	F	I
FW07-B	5.8	Broad	29.4	22.8	1.4	31.2	16.6	2.4	1.0	Cb	Cb	Cobble	Plane Bed	low	Reference	Good	Moderate	F	I
FW07-C	5.8	Broad	29.4	51.7	1.0	53.8	49.7	1.9	1.0	C	D	Gravel	Riffle-Pool	low	Fair	Good	Extreme	D	IId
FW07-D	5.8	Broad	29.4	19.5	1.2	23.8	16.0	1.7	1.0	Bc	Bc	Gravel	Riffle-Pool	low	Good	Fair	Moderate	F	I
FW08	5.6	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FW09	4.6	Broad	26.4	21.5	1.1	22.8	20.3	6.0	1.0	C	C	Gravel	Riffle-Pool	moderate	Fair	Fair	Very High	D	IId
FW10-A	4.3	Very Broad	25.5	24.2	1.0	24.7	23.7	5.2	1.0	C	C	Gravel	Riffle-Pool	moderate	Fair	Fair	Very High	D	IId
FW10-B	4.3	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FW10-C[A]	4.3	Very Broad	25.5	18.0	--	--	--	--	--	E	E	Sand	Dune-Ripple	low	Good	Fair	High	--	--
FW10-D	4.3	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FW10-E[A]	4.3	Very Broad	25.5	13.0	--	--	--	--	--	E	E	Sand	Dune-Ripple	low	Reference	Good	High	--	--
FW10-F	4.3	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FW11-A	3.3	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FW11-B	3.3	Very Broad	22.3	10.5	1.3	13.3	8.3	1.8	2.2	C	Bc	Gravel	Riffle-Pool	low	Fair	Fair	Very High	F	II
FW11-C	3.3	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FW12-A	0.9	Very Broad	11.5	16.5	1.3	20.8	13.1	13.3	1.0	C	C	Gravel	Riffle-Pool	moderate	Good	Good	High	F	I
FW12-B	0.9	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FW13	0.8	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FW14[A]	0.4	Very Broad	7.8	--	--	--	--	--	--	E	E	Sand	Riffle-Pool	moderate	Reference	Reference	High	--	--

[A] Administrative judgment used for determining stream type, RGA, and RHA condition for impounded segments and segments not assessed for other reasons
* RGA = Rapid Geomorphic Assessment, RHA = Rapid Habitat Assessment
† CEM = Channel Evolution Model

Summary of the Rapid Habitat Assessment (RHA) Values for Fordway Brook, NH														
Reach Point ID	Bedform	Woody Debris Cover	Bed Substrate Cover	Scour and Depositional Features	Channel Morphology	Hydrologic Characteristics	Connectivity	River Banks		Riparian Area		Total Score	Percentage**	Habitat Condition
								Left Bank	Right Bank	Left Corridor	Right Corridor			
FW3-0	Riffle-pool	11	18	17	14	13	14	8	9	7	10	121	76%	Good
FW7-A	Riffle-pool	8	17	8	17	12	13	8	8	10	10	111	69%	Good
FW7-B	Plane Bed	8	18	8	17	12	12	8	8	10	10	111	69%	Good
FW7-C	Riffle-pool	14	14	13	7	8	13	8	8	9	10	104	65%	Good
FW7-D	Riffle-pool	5	12	13	14	8	11	8	8	7	9	95	59%	Fair
FW9-0	Riffle-pool	13	13	8	14	8	13	8	8	8	8	101	63%	Fair
FW10-A	Riffle-pool	13	13	11	16	5	13	9	6	9	7	102	64%	Fair
FW11-B	Riffle-pool	15	13	12	8	10	13	7	8	6	7	99	62%	Fair
FW12-A	Riffle-pool	12	16	12	17	14	8	7	7	9	9	111	69%	Good
Total Possible Score		**20**	**20**	**20**	**20**	**20**	**20**	**10**	**10**	**10**	**10**	**160**	**100%**	**Reference**

** Percentages are calculated from a reference RHA score of 160

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW01	Segment:	A	Completion Date:	3-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	O	Rain:	Yes
Segment Length (ft):	305	Segment Location:	Segment starts at confluence with Upper Exeter and continues 305 feet upstream to start of wetland.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One Side	Both Sides
Berms	33	0
height (ft)	Unknown	
Roads	0	0
height (ft)		
Railroads	0	0
height		
Improved Paths	0	0
height (ft)		
Development	38	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Hilly
Continuous	Never	Never
W/in 1 bankfull	Never	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		200
Width Determination		Measured
Confinement Type		Narrow
Rock Gorge?		No
Human Caused Change?		Yes

Step 2. Stream Channel

2.1 Bankfull Width (ft)	39
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		NA
2.10 Riffle Type		NA
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt/Clay Present	NA	
Embedded (channel)	NA	%
Embedded (margin)	NA	%
LWD (#)	3	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Plane Bed	
Field Measured Slope:		
2.15 Reference Stream Type		
C, Gravel, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks		
Typical Bank Slope	Steep	

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)		
Revetment Type	Multiple	Multiple
Revetment Length (ft)	73	23

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	30	0	10	90
R Trees (%)	50	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	60	0	10	90
R Shrub/Sapling (%)	60	0	10	90

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	90	5	10	85
R Herbs (%)	90	0	0	100

Bank Canopy	Left	Right
Canopy %	51-75	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer		
Buffer Width (ft)	Left	Right
Dominant	0-25	51-100
Sub-dominant	None	None
Length <25 ft	302	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	10	0	0	100
R Trees (%)	70	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	0	0	0	0
R Shrub/Sapling (%)	35	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	90	0	90	10
R Herbs (%)	50	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Residential	Forest
Sub-dominant	None	Residential
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts			
	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	Straightening	
Length (ft)	194	
5.5 Dredging	None	
Bridge and Culvert Survey	Yes	

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW01	Segment:	A	Completion Date:	3-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	O	Rain:	Yes
Segment Length (ft):	305	Segment Location:	Segment starts at confluence with Upper Exeter and continues 305 feet upstream to start of wetland.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	13.9	Yes	Yes	Yes	Yes

Problems: DA, SA

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type	Confined Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0

Total Score: 0

Geomorphic Rating: 0

Channel Evolution Model 0

Channel Evolution Stage 0

Geomorphic Condition 0

Stream Sensitivity 0

Channel Adjustment Processes Narrative

Notes:

Reason not assessed is other: segment influence byUpper Exeter River. The segment is too short for the habitat assessment to be of value. Old dam in reach according to dam layer. Little remnants of dam. Significant human-caused change in valley confinement. Bridge span at lower end of reach is much narrower than the bankfull width.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW01	Segment:	B	Completion Date:	3-Aug-08
Organization:	BCE	Observers:	CS, MN, LM	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	1535	Segment Location:	Segment starts upstream of Rt 102 bridge at wetland and continues to tributary entering in wetland.				

Step 1. Valley and Floodplain

1.1 Segmentation:		PS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Never	Never
W/in 1 bankfull	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		441
Width Determination		Estimated
Confinement Type		NA
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		NA
2.10 Riffle Type		NA
2.11 Riffle Step Spacing (ft)		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt/Clay Present	NA	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
LWD (#)	NA	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	NA	
Bed Material:	NA	
Subclass Slope:	NA	
Bed Form:	NA	
Field Measured Slope:		
2.15 Reference Stream Type		
Wetland		

Step 3. Riparian Features

3.1 Stream Banks	
Typical Bank Slope	Shallow

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt	Silt
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)		
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	50	50
R Trees (%)	80	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	80	0	30	70
R Shrub/Sapling (%)	80	0	30	70

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	10	0	0	100
R Herbs (%)	10	0	0	100

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width (ft)	Left	Right
Dominant	>150	>150
Sub-dominant	None	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	50	50
R Trees (%)	80	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	0	100
R Shrub/Sapling (%)	10	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	10	0	0	100
R Herbs (%)	10	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	2
Affected Length (ft)	Unknown

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW01	Segment:	B	Completion Date:	3-Aug-08
Organization:	BCE	Observers:	CS, MN, LM	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	1535	Segment Location:	Segment starts upstream of Rt 102 bridge at wetland and continues to tributary entering in wetland.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0

Total Score:	0
Geomorphic Rating:	0
Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Wetland segment is not impacted and in reference condition.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW02	Segment:	None	Completion Date:	3-Aug-08
Organization:	BCE	Observers:	CS, MN, LM	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	4166	Segment Location:	Segment starts upstream of tributary entering in wetland and continues to until wetland ends and stream channel begins.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*				*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right
1.1 Segmentation:		None	2.6 Width/Depth Ratio			NA	*Bank Texture*	Left		Right		*Corridor Land Use*		
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio			NA	Upper					Dominant	Forest	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio			NA	Material Type	Sand		Sand		Sub-dominant	None	None
Length (ft)	One	Both	*Human Elevated Incision			NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0
Berms	0	0	2.9 Sinuosity			NA	Lower					Height (ft)		
height (ft)			2.10 Riffle Type			NA	Material Type	Silt		Silt		Gullies (number)	0	0
Roads	0	0	2.11 Riffle Step Spacing (ft)			NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)		
height (ft)			2.12 Substrate Composition				*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**		
Railroads	0	0	Bedrock	NA	%		Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive	
height (ft)			Boulder	NA	%		Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive	
Improved Paths	0	0	Cobble	NA	%		Revetment Type	None		None		4.3 Flow Status	Average	
height (ft)			Coarse Gravel	NA	%		Revetment Length (ft)	0		0		4.4 # of Debris Jams	0	
Development	0	0	Fine Gravel	NA	%		*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None	
1.4 Adjacent Side	Left	Right	Sand	NA	%		**L** Trees (%)	50	0	20	80	4.6 Up/Downstream Flow Reg	None	
Hillside Slope	Hilly	Hilly					**R** Trees (%)	50	0	20	80	4.7 Stormwater Inputs		
Continuous	Never	Never	Silt/Clay Present	NA				% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%		**L** Shrub/Sapling (%)	80	0	100	0	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%		**R** Shrub/Sapling (%)	80	0	100	0	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA				% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	2		
Valley Width (ft)		1224					**L** Herbs (%)	100	0	70	30	Affected Length (ft)	Unknown		
Width Determination		Estimated	2.13 Average Largest Particle				**R** Herbs (%)	100	0	70	30	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		NA	Bed	NA	inches		*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches		Canopy %	51-75		51-75			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%		Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type				3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA			Buffer Width (ft)	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA			Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA			Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA			Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:				Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type				L Trees (%)	50	0	30	70		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		Wetland				R Trees (%)	80	0	30	70		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**					% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks				**L** Shrub/Sapling (%)	80	0	30	70	5.5 Straightening	None		
			Typical Bank Slope	Shallow			**R** Shrub/Sapling (%)	80	0	30	70	Length (ft)			
								% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8							L Herbs (%)	40	0	0	100				
Channel Constrictions on Sheet 2 of this workbook.							R Herbs (%)	40	0	0	100	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW02	Segment:	None	Completion Date:	3-Aug-08
Organization:	BCE	Observers:	CS, MN, LM	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	4166	Segment Location:	Segment starts upstream of tributary entering in wetland and continues to until wetland ends and stream channel begins.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0

Total Score:	0
Geomorphic Rating:	0
Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Wetland segment is not impacted and in reference condition. Saw 2 beaver dens. Landowner has photos of great wildlife in segment (northern water snakes).

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW03	Segment:	None	Completion Date:	4-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	707	Segment Location:	Adjacent to Aggregate Industries				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Hilly
Continuous	Never	Never
W/in 1 bankfull	Never	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		402
Width Determination		Measured
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		Yes

Step 2. Stream Channel

2.1 Bankfull Width (ft)	28.7
2.1a Wetted Width (ft)	12.5
2.1b Ratio (wetted/bkfl)	0.44
2.2 Max Depth (ft)	3.1
2.3 Mean Depth (ft)	1.7
2.4 Floodprone Width (ft)	123.7
2.5 RAF	3.1
*Human Elevated FP	

Step 2. (Cont'd)

2.6 Width/Depth Ratio		17.1
2.7 Entrenchment Ratio		4.3
2.8 Incision Ratio		1.0
*Human Elevated Incision		0.0
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing (ft)		104
2.12 Substrate Composition		
Bedrock	0	%
Boulder	32	%
Cobble	37	%
Coarse Gravel	12	%
Fine Gravel	7	%
Sand	12	%
Silt/Clay Present	No	
Embedded (chan)	0	%
Embedded (marg)	5	%
LWD (#)	12	
2.13 Average Largest Particle		
Bed	8	inches
Bar	3.8	inches
2.13a % Subs. Exp.	15	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Cobble	
Subclass Slope:	b	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
Cb, Cobble, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks		
Typical Bank Slope	Steep	

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Boulder/Cobble	Boulder/Cobble
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)		
Revetment Type	Multiple	Multiple
Revetment Length (ft)	55	55

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	60	40
R Trees (%)	80	0	60	40

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	25	0	0	100
R Shrub/Sapling (%)	25	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	70	0	0	100
R Herbs (%)	70	0	0	100

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer

Buffer Width (ft)	Left	Right
Dominant	>150	>150
Sub-dominant	26-50	None
Length <25 ft		

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	90		70	30
R Trees (%)	90		70	30

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	30			100
R Shrub/Sapling (%)	30			100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	30			100
R Herbs (%)	30			100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Industrial	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	1	0	2
	Diagonal	Delta	Island
	1	0	0

5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
1	0	No

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	Straightening	
Length (ft)	55	
5.5 Dredging	None	
Bridge and Culvert Survey	Yes	

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW03	Segment:	None	Completion Date:	4-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	707	Segment Location:	Adjacent to Aggregate Industries				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Other	5.7	Yes	Yes	Yes	Yes
Problems:	SB				
Old abutment	19	Yes	Yes	Yes	Yes
Problems:	SA				
Old abutment	12	Yes	Yes	Yes	Yes
Problems:	DA, SA, SB				

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	17	None	No
7.2 Channel Aggradation	13	None	No
7.3 Widening Channel	17		No
7.4 Change in Planform	13		No

Total Score: 60

Geomorphic Rating: 0.75

Channel Evolution Model F

Channel Evolution Stage I

Geomorphic Condition Good (0.65-0.84)

Stream Sensitivity Moderate

Channel Adjustment Processes Narrative

Minor aggradation and planform adjustment - Most issues in this reach related to old abutments and d

Notes:

Dark water and substrate; lots of FPOM, Fe & Mn staining on rocks. Good moss cover on near banks. In channel moss cover is moderate --- stable flow regime. Aggregate Industries plans to mine across the river and will build bridge across channel for access (20 year plan) per Dennis Lydon (Project Manager).

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW04	Segment:	None	Completion Date:	4-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	1467	Segment Location:	Segment is wetland and starts upstream of stream channel reach near Aggregate Industries.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*				*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right
1.1 Segmentation:		None	2.6 Width/Depth Ratio			NA	*Bank Texture*	Left		Right		*Corridor Land Use*		
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio			NA	Upper					Dominant	Forest	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio			NA	Material Type	Sand		Sand		Sub-dominant	None	None
Length (ft)	One	Both	*Human Elevated Incision			NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0
Berms	0	0	2.9 Sinuosity			NA	Lower					Height (ft)		
height (ft)			2.10 Riffle Type			NA	Material Type	Silt		Silt		Gullies (number)	0	0
Roads	0	0	2.11 Riffle Step Spacing (ft)			NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)		
height (ft)			2.12 Substrate Composition				*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**		
Railroads	0	0	Bedrock	NA	%		Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive	
height (ft)			Boulder	NA	%		Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive	
Improved Paths	0	0	Cobble	NA	%		Revetment Type	None		None		4.3 Flow Status	Average	
height (ft)			Coarse Gravel	NA	%		Revetment Length (ft)	0		0		4.4 # of Debris Jams	0	
Development	0	0	Fine Gravel	NA	%		*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None	
1.4 Adjacent Side	Left	Right	Sand	NA	%		**L** Trees (%)	90	0	80	20	4.6 Up/Downstream Flow Reg	None	
Hillside Slope	Steep	Hilly					**R** Trees (%)	90	0	80	20	4.7 Stormwater Inputs		
Continuous	Never	Never	Silt/Clay Present	NA				% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%		**L** Shrub/Sapling (%)	80	0	90	10	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%		**R** Shrub/Sapling (%)	80	0	90	10	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA				% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	1		
Valley Width (ft)		562					**L** Herbs (%)	100	0	50	50	Affected Length (ft)	Unknown		
Width Determination		Estimated	2.13 Average Largest Particle				**R** Herbs (%)	100	0	50	50	**Step 5. Channel Bed & Planform Changes**		
Confinement Type		NA	Bed	NA	inches		*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches		Canopy %	76-100		76-100			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%		Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type				3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA			Buffer Width (ft)	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA			Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA			Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA			Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:				Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type				L Trees (%)	90	0	20	80		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		Wetland				R Trees (%)	90	0	20	80		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**					% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks				**L** Shrub/Sapling (%)	20	0	0	100	5.5 Straightening	None		
			Typical Bank Slope	Shallow			**R** Shrub/Sapling (%)	20	0	0	100	Length (ft)			
								% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8							L Herbs (%)	30	0	0	100				
Channel Constrictions on Sheet 2 of this workbook.							**R** Herbs (%)	30	0	0	100	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW04	Segment:	None	Completion Date:	4-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	1467	Segment Location:	Segment is wetland and starts upstream of stream channel reach near Aggregate Industries.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0

Total Score: 0

Geomorphic Rating: 0

Channel Evolution Model 0

Channel Evolution Stage 0

Geomorphic Condition 0

Stream Sensitivity 0

Channel Adjustment Processes Narrative

Notes:

Wetland segment is not impacted and in reference condition. Saw 1 beaver dam at lowest end of reach. Wetland is approximately 400 feet wide.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW05	Segment:	None	Completion Date:	4-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	3983	Segment Location:	Segment is wetland/pond and is in vicinity of Fordway Brook Road, although only a trail and footbridge access pond.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		None	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		*Corridor Land Use*			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest	
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	None	None	
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0	
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)			
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)	0	0	
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive		
height (ft)			Boulder	NA	%	Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive		
Improved Paths	0	0	Cobble	NA	%	Revetment Type	None		None		4.3 Flow Status	Average		
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)	0		0		4.4 # of Debris Jams	0		
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None		
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	90	0	50	50	4.6 Up/Downstream Flow Reg	None		
Hillside Slope	Very Steep	Very Steep				**R** Trees (%)	90	0	50	50	4.7 Stormwater Inputs			
Continuous	Never	Never	Silt/Clay Present	NA			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	80	0	90	10	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	80	0	90	10	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	1		
Valley Width (ft)		632				**L** Herbs (%)	80	0	70	30	Affected Length (ft)	Unknown		
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	80	0	70	30	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		NA	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	76-100		76-100			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width (ft)	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:			Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	100	0	90	10		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		Wetland			R Trees (%)	100	0	90	10		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks			**L** Shrub/Sapling (%)	20	0	0	100	5.5 Straightening	None		
			Typical Bank Slope	Moderate		**R** Shrub/Sapling (%)	20	0	0	100	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	10	0	0	100				
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	10	0	0	100	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW05	Segment:	None	Completion Date:	4-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	3983	Segment Location:	Segment is wetland/pond and is in vicinity of Fordway Brook Road, although only a trail and footbridge access pond.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0

Total Score:	0
Geomorphic Rating:	0
Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Wetland segment is not impacted and in reference condition. Saw 1 beaver dam just upstream of wooden foot bridge. Very wide buffer on both sides, pond is relatively inaccessible.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW06	Segment:	None	Completion Date:	4-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	2201	Segment Location:	Segment is wetland and is located between pond/wetland and channel downstream of Old Bye Road.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*				*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		None	2.6 Width/Depth Ratio			NA	*Bank Texture*	Left		Right		*Corridor Land Use*			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio			NA	Upper					Dominant	Forest	Forest	
1.3 Corridor Encroachments:			2.8 Incision Ratio			NA	Material Type	Sand		Sand		Sub-dominant	None	None	
Length (ft)	One	Both	*Human Elevated Incision			NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0	
Berms	0	0	2.9 Sinuosity			NA	Lower					Height (ft)			
height (ft)			2.10 Riffle Type			NA	Material Type	Silt		Silt		Gullies (number)	0	0	
Roads	0	0	2.11 Riffle Step Spacing (ft)			NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)			2.12 Substrate Composition				*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	NA	%		Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive		
height (ft)			Boulder	NA	%		Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive		
Improved Paths	0	0	Cobble	NA	%		Revetment Type	None		None		4.3 Flow Status	Average		
height (ft)			Coarse Gravel	NA	%		Revetment Length (ft)	0		0		4.4 # of Debris Jams	0		
Development	0	0	Fine Gravel	NA	%		*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None		
1.4 Adjacent Side	Left	Right	Sand	NA	%		**L** Trees (%)	90	0	80	20	4.6 Up/Downstream Flow Reg	None		
Hillside Slope	Steep	Steep					**R** Trees (%)	90	0	80	20	4.7 Stormwater Inputs			
Continuous	Never	Never	Silt/Clay Present	NA				% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%		**L** Shrub/Sapling (%)	100	0	90	10	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%		**R** Shrub/Sapling (%)	100	0	90	10	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA				% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	1		
Valley Width (ft)		722					**L** Herbs (%)	100	0	80	20	Affected Length (ft)	Unknown		
Width Determination		Estimated	2.13 Average Largest Particle				**R** Herbs (%)	100	0	80	20	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		NA	Bed	NA	inches		*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches		Canopy %	76-100		76-100			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%		Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type				3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA			Buffer Width (ft)	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA			Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA			Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA			Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:				Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type				L Trees (%)	100	0	80	20		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		Wetland				R Trees (%)	100	0	80	20		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**					% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks				**L** Shrub/Sapling (%)	10	0	0	100	5.5 Straightening	None		
			Typical Bank Slope	Shallow			**R** Shrub/Sapling (%)	10	0	0	100	Length (ft)			
								% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8							L Herbs (%)	10	0	0	100				
Channel Constrictions on Sheet 2 of this workbook.							R Herbs (%)	10	0	0	100	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW06	Segment:	None	Completion Date:	4-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	2201	Segment Location:	Segment is wetland and is located between pond/wetland and channel downstream of Old Bye Road.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0

Total Score:	0
Geomorphic Rating:	0
Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Wetland segment is not impacted and in reference condition. Saw 1 beaver dam at upstream end of reach. Wide buffers both sides.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW07	Segment:	A	Completion Date:	18-Jul-08
Organization:	BCE	Observers:	CS, MN, SS, LL	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	665	Segment Location:	In Raymond, downstream of Lane Road crossing, below plane bed segment, upstream of large wetland.				

Step 1. Valley and Floodplain

1.1 Segmentation:		PS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		231
Width Determination		Measured
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	25
2.1a Wetted Width (ft)	10.7
2.1b Ratio (wetted/bkfl)	0.43
2.2 Max Depth (ft)	2.1
2.3 Mean Depth (ft)	1.3
2.4 Floodprone Width (ft)	168
2.5 RAF	2.1
*Human Elevated FP	

Step 2. (Cont'd)

2.6 Width/Depth Ratio		20.0
2.7 Entrenchment Ratio		6.7
2.8 Incision Ratio		1.0
*Human Elevated Incision		0.0
2.9 Sinuosity		Mod (1.2-1.5)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing (ft)		69
2.12 Substrate Composition		
Bedrock	0	%
Boulder	10	%
Cobble	50	%
Coarse Gravel	24	%
Fine Gravel	5	%
Sand	11	%
Silt/Clay Present	No	
Embedded (chan)	12	%
Embedded (marg)	16	%
LWD (#)	4	
2.13 Average Largest Particle		
Bed	7.5	inches
Bar	4.5	inches
2.13a % Subs. Exp.	30	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Cobble	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
C, Cobble, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	60	0
Erosion Height (ft)	3	
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	90	10
R Trees (%)	80	0	90	10

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	0	100
R Shrub/Sapling (%)	10	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	50	0	0	100
R Herbs (%)	50	0	0	100

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer

Buffer Width (ft)	Left	Right
Dominant	>150	>150
Sub-dominant	None	None
Length <25 ft		

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	90	0	90	10
R Trees (%)	90	0	90	10

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	20	0	0	100
R Shrub/Sapling (%)	20	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	30	0	0	100
R Herbs (%)	30	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	None
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	5
	Diagonal	Delta	Island
	2	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

	# SRs	# HCs	Trib Rejuv.
	3	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW07	Segment:	A	Completion Date:	18-Jul-08
Organization:	BCE	Observers:	CS, MN, SS, LL	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	665	Segment Location:	In Raymond, downstream of Lane Road crossing, below plane bed segment, upstream of large wetland.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	19	None	No
7.2 Channel Aggradation	14	None	No
7.3 Widening Channel	16		No
7.4 Change in Planform	14		No

Total Score: 63

Geomorphic Rating: 0.79

Channel Evolution Model F

Channel Evolution Stage I

Geomorphic Condition Good (0.65-0.84)

Stream Sensitivity Moderate

Channel Adjustment Processes Narrative

Minor aggradation and planform adjustment.

Notes:

Black rocks with Fe and Mn staining. Segmented due to lower slope, greater sinuousity, smaller substrate size and change in bedform. Segment has good floodplain access.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Phase 2 Segment Summary (pa Exeter River Watershed

Stream:	Fordway Brook	Reach #:	FW07	Segment:	B	Completion Date:	17-Jul-08
Organization:	BCE	Observers:	CS, MN, SS, LL	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	484	Segment Location:	In Raymond, downstream of Lane Road crossing, planebed segment.				

Step 1. Valley and Floodplain

1.1 Segmentation:		PS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Very Steep
Continuous	Never	Sometimes
W/in 1 bankfull	Never	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		205
Width Determination		Estimated
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	22.8
2.1a Wetted Width (ft)	9.7
2.1b Ratio (wetted/bkfl)	0.43
2.2 Max Depth (ft)	2.2
2.3 Mean Depth (ft)	1.4
2.4 Floodprone Width (ft)	54.9
2.5 RAF	2.2
*Human Elevated FP	

Step 2. (Cont'd)

2.6 Width/Depth Ratio		16.6
2.7 Entrenchment Ratio		2.4
2.8 Incision Ratio		1.0
*Human Elevated Incision		0.0
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Not Applicable
2.11 Riffle Step Spacing (ft)		NA
2.12 Substrate Composition		
Bedrock	0	%
Boulder	32	%
Cobble	40	%
Coarse Gravel	7	%
Fine Gravel	15	%
Sand	6	%
Silt/Clay Present	No	
Embedded (chan)	11	%
Embedded (marg)	27	%
LWD (#)	2	
2.13 Average Largest Particle		
Bed	9	inches
Bar	5.6	inches
2.13a % Subs. Exp.	30	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Cobble	
Subclass Slope:	b	
Bed Form:	Plane Bed	
Field Measured Slope:		3%
2.15 Reference Stream Type		
Cb, Cobble, Plane Bed		

Step 3. Riparian Features

3.1 Stream Banks	
Typical Bank Slope	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Boulder/Cobble	Boulder/Cobble
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	10
Erosion Height (ft)		3
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	40	60
R Trees (%)	80	0	40	60

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	0	100
R Shrub/Sapling (%)	20	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	60	0	0	100
R Herbs (%)	60	0	0	100

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer		
Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	None	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	50	50
R Trees (%)	80	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	50	0	0	100
R Shrub/Sapling (%)	50	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	30	0	0	100
R Herbs (%)	30	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	
Height (ft)		
Gullies (number)	0	
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	None
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	
Field Ditch 0	Road Ditch 0
Urban Storm Pipe 0	Tile Drain 0
Overland Flow 0	Other 0
4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	2
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening None	
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW07	Segment:	B	Completion Date:	17-Jul-08
Organization:	BCE	Observers:	CS, MN, SS, LL	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	484	Segment Location:	In Raymond, downstream of Lane Road crossing, planebed segment.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Plane bed

	Score	STD	Historic
7.1 Channel Degradation	19	None	No
7.2 Channel Aggradation	18	None	No
7.3 Widening Channel	18		No
7.4 Change in Planform	20		No

Total Score: 75

Geomorphic Rating: 0.94

Channel Evolution Model F

Channel Evolution Stage I

Geomorphic Condition Reference (0.85-1.0)

Stream Sensitivity Moderate

Channel Adjustment Processes Narrative

Very stable, no major processes.

Notes:

Very stable segment, plane bed by reference. Large bed material, good floodplain access.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW07	Segment:	C	Completion Date:	17-Jul-08
Organization:	BCE	Observers:	CS, MN, SS, LL	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	498	Segment Location:	In Raymond, downstream of Lane Road crossing, below entrenched segment.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Very Steep
Continuous	Sometimes	Never
W/in 1 bankfull	Sometimes	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		192
Width Determination		Measured
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	51.7
2.1a Wetted Width (ft)	18.1
2.1b Ratio (wetted/bkfl)	0.35
2.2 Max Depth (ft)	2.0
2.3 Mean Depth (ft)	1.0
2.4 Floodprone Width (ft)	98.2
2.5 RAF	2.0
*Human Elevated FP	

Step 2. (Cont'd)

2.6 Width/Depth Ratio		49.7
2.7 Entrenchment Ratio		1.9
2.8 Incision Ratio		1.0
*Human Elevated Incision		0.0
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing (ft)		75
2.12 Substrate Composition		
Bedrock	0	%
Boulder	17	%
Cobble	27	%
Coarse Gravel	24	%
Fine Gravel	14	%
Sand	18	%
Silt/Clay Present	Yes	
Embedded (chan)	25	%
Embedded (marg)	38	%
LWD (#)	5	
2.13 Average Largest Particle		
Bed	6.5	inches
Bar	3.5	inches
2.13a % Subs. Exp.	70	%
2.14 Stream Type		
Stream Type:	D	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
C, Gravel, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks		
Typical Bank Slope	Steep	

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)		
Revetment Type	Hard Bank	Hard Bank
Revetment Length (ft)	70	70

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	30	70
R Trees (%)	80	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	0	100
R Shrub/Sapling (%)	30	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	60	0	0	100
R Herbs (%)	50	0	0	100

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	51-100	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	90	0	30	70
R Trees (%)	90	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	20	0	0	100
R Shrub/Sapling (%)	20	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	30	0	0	100
R Herbs (%)	30	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	None
4.2 Adjacent Wetlands	None
4.3 Flow Status	Base
4.4 # of Debris Jams	1
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	
Field Ditch 0	Road Ditch 0
Urban Storm Pipe 0	Tile Drain 0
Overland Flow 0	Other 0
4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	2	1	2
	Diagonal	Delta	Island
	0	0	1

5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts	# SRs	# HCs	Trib Rejuv.
	3	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	Straightening
Length (ft)	91
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW07	Segment:	C	Completion Date:	17-Jul-08
Organization:	BCE	Observers:	CS, MN, SS, LL	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	498	Segment Location:	In Raymond, downstream of Lane Road crossing, below entrenched segment.				

1.6 Grade Controls — Present

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS
Ledge	below abut	1.1	0.4	Yes	No

4.8 Channel Constrictions — Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Old abutme	16	Yes	No	Yes	Yes

Problems: DA, DB, SB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type: Unconfined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	4	C to D	Yes
7.3 Widening Channel	8		No
7.4 Change in Planform	8		No

Total Score: 36

Geomorphic Rating: 0.45

Channel Evolution Model: D

Channel Evolution Stage: II d

Geomorphic Condition: Fair (0.35-0.64)

Stream Sensitivity: Extreme

Channel Adjustment Processes Narrative

Extreme aggradation, major widening and planform adjustment.

Notes:

Historic abutment or mill dam appears to be impacting channel morphology both upstream and downstream of structure. Channel is extremely wide with lots of exposed substrate. Stream type departure from aggradation.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW07	Segment:	D	Completion Date:	17-Jul-08
Organization:	BCE	Observers:	CS, MN, SS	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	390	Segment Location:	In Raymond, downstream of Lane Road crossing, until stream becomes less entrenched.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		CD	2.6 Width/Depth Ratio		16.0	*Bank Texture*	Left		Right		*Corridor Land Use*			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		1.7	Upper					Dominant	Forest	Forest	
1.3 Corridor Encroachments:			2.8 Incision Ratio		1.0	Material Type	Sand		Sand		Sub-dominant	Residential	None	
Length (ft)	One	Both	*Human Elevated Incision		0.0	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0	
Berms	0	0	2.9 Sinuosity		Low (<1.2)	Lower					Height (ft)			
height (ft)			2.10 Riffle Type		Complete	Material Type	Sand		Sand		Gullies (number)	0	0	
Roads	229	0	2.11 Riffle Step Spacing (ft)		68	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)	Unknown		2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)			22		4.1 Springs/ Seeps	Minimum		
height (ft)			Boulder	2	%	Erosion Height (ft)			3		4.2 Adjacent Wetlands	None		
Improved Paths	0	0	Cobble	32	%	Revetment Type	Rip-rap		Rip-rap		4.3 Flow Status	Base		
height (ft)			Coarse Gravel	43	%	Revetment Length (ft)	45		40		4.4 # of Debris Jams	0		
Development	146	0	Fine Gravel	12	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None		
1.4 Adjacent Side	Left	Right	Sand	12	%	**L** Trees (%)	90	0	90	10	4.6 Up/Downstream Flow Reg	None		
Hillside Slope	Very Steep	Very Steep				**R** Trees (%)	90	0	90	10	4.7 Stormwater Inputs			
Continuous	Sometimes	Never	Silt/Clay Present	No			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	2
W/in 1 bankfull	Sometimes	Sometimes	Embedded (chan)	27	%	**L** Shrub/Sapling (%)	10	0	0	100	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	36	%	**R** Shrub/Sapling (%)	10	0	0	100	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	1			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	0		
Valley Width (ft)		185				**L** Herbs (%)	20	0	0	100	Affected Length (ft)			
Width Determination		Measured	2.13 Average Largest Particle			**R** Herbs (%)	20	0	0	100	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Broad	Bed	9.5	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	4	inches	Canopy %	76-100		76-100			0	0	5
Human Caused Change?		Yes	2.13a % Subs. Exp.	40	%	Mid-channel canopy	Closed					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	19.5		Stream Type:	B		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	9.5		Bed Material:	Gravel		Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	0.49		Subclass Slope:	c		Sub-dominant	26-50		None			Braiding		
2.2 Max Depth (ft)	1.8		Bed Form:	Riffle-Pool		Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	1.2		Field Measured Slope:			Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	34		2.15 Reference Stream Type			L Trees (%)	90	0	90	10		# SRs	# HCs	Trib Rejuv.
2.5 RAF	1.8		Bc, Gravel, Riffle-Pool			R Trees (%)	90	0	90	10		0	0	No
*Human Elevated FP			**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks			**L** Shrub/Sapling (%)	20	0	0	100	5.5 Straightening	None		
			Typical Bank Slope	Steep		**R** Shrub/Sapling (%)	20	0	0	100	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	5	0	0	100				
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	5	0	0	100	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cu

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW07	Segment:	D	Completion Date:	17-Jul-08
Organization:	BCE	Observers:	CS, MN, SS	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	390	Segment Location:	In Raymond, downstream of Lane Road crossing, until stream becomes less entrenched.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	9.7	Yes	Yes	Yes	Yes

Problems: DB, SB, Alignment

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	18	None	No
7.2 Channel Aggradation	12	None	No
7.3 Widening Channel	16		No
7.4 Change in Planform	13		No

Total Score: 59

Geomorphic Rating: 0.74

Channel Evolution Model F

Channel Evolution Stage I

Geomorphic Condition Good (0.65-0.84)

Stream Sensitivity Moderate

Channel Adjustment Processes Narrative

Minor aggradation and planform adjustment.

Notes:

So much FPOM in segment, coated most of the substrate and it was difficult to see in the water column. Black substrate (Fe, Mn) from extensive wetland above. Large side bar below Lane Road culvert with evidence of a lot of road material washing into the stream (chunks of asphalt found on bars well downstream of the structure).

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW08	Segment:	None	Completion Date:	17-Jul-08
Organization:	BCE	Observers:	CS, MN, SS	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	5283	Segment Location:	Huge wetland reach upstream of Lane Road culvert.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*				*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		None	2.6 Width/Depth Ratio			NA	*Bank Texture*	Left		Right		*Corridor Land Use*			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio			NA	Upper					Dominant	Shrub/Sapling	Shrub/Sapling	
1.3 Corridor Encroachments:			2.8 Incision Ratio			NA	Material Type	Silt		Silt		Sub-dominant	None	None	
Length (ft)	One	Both	*Human Elevated Incision			NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0	
Berms	0	0	2.9 Sinuosity			NA	Lower					Height (ft)			
height (ft)			2.10 Riffle Type			NA	Material Type	Silt		Silt		Gullies (number)	0	0	
Roads	0	0	2.11 Riffle Step Spacing (ft)			NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)			2.12 Substrate Composition				*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	NA	%		Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive		
height (ft)			Boulder	NA	%		Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive		
Improved Paths	0	0	Cobble	NA	%		Revetment Type	None		None		4.3 Flow Status	Base		
height (ft)			Coarse Gravel	NA	%		Revetment Length (ft)	0		0		4.4 # of Debris Jams	0		
Development	0	0	Fine Gravel	NA	%		*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None		
1.4 Adjacent Side	Left	Right	Sand	NA	%		**L** Trees (%)	5	0	0	100	4.6 Up/Downstream Flow Reg	None		
Hillside Slope	Steep	Steep					**R** Trees (%)	5	0	0	100	4.7 Stormwater Inputs			
Continuous	Never	Never	Silt/Clay Present	Yes				% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%		L Shrub/Sapling (%)	100	0	90	10	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%		R Shrub/Sapling (%)	100	0	90	10	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA				% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	1		
Valley Width (ft)		549					**L** Herbs (%)	75	0	10	90	Affected Length (ft)	>250		
Width Determination		Measured	2.13 Average Largest Particle				**R** Herbs (%)	75	0	10	90	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		NA	Bed	NA	inches		*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches		Canopy %	51-75		51-75			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%		Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type				3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA			Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA			Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA			Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA			Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:				Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type				L Trees (%)	20	0	30	70		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		Wetland				R Trees (%)	20	0	30	70		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**					% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks				L Shrub/Sapling (%)	85	0	90	10	5.5 Straightening	None		
			Typical Bank Slope	Shallow			R Shrub/Sapling (%)	85	0	90	10	Length (ft)			
								% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8							L Herbs (%)	70	0	10	90				
Channel Constrictions on Sheet 2 of this workbook.							R Herbs (%)	70	0	10	90	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cu

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW08	Segment:	None	Completion Date:	17-Jul-08
Organization:	BCE	Observers:	CS, MN, SS	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	5283	Segment Location:	Huge wetland reach upstream of Lane Road culvert.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Reach is all wetland, largely unimpacted and inaccessible. Reference condition.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW09	Segment:	None	Completion Date:	15-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	2675	Segment Location:	Raymond near Old Bye Road crossing.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		None	2.6 Width/Depth Ratio		20.3	*Bank Texture*	Left		Right		*Corridor Land Use*			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		6.0	Upper					Dominant	Forest	Forest	
1.3 Corridor Encroachments:			2.8 Incision Ratio		1.0	Material Type	Sand		Sand		Sub-dominant	Residential	Residential	
Length (ft)	One	Both	*Human Elevated Incision		0.0	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	23	
Berms	0	0	2.9 Sinuosity		Mod (1.2-1.5)	Lower					Height (ft)		12	
height (ft)			2.10 Riffle Type		Sedimented	Material Type	Gravel		Gravel		Gullies (number)	0	0	
Roads	0	0	2.11 Riffle Step Spacing (ft)		128	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	262		117		4.1 Springs/ Seeps	Minimum		
height (ft)			Boulder	1	%	Erosion Height (ft)	6		5		4.2 Adjacent Wetlands	Minimum		
Improved Paths	0	0	Cobble	28	%	Revetment Type	Multiple		Multiple		4.3 Flow Status	Base		
height (ft)			Coarse Gravel	44	%	Revetment Length (ft)	137		199		4.4 # of Debris Jams	1		
Development	0	0	Fine Gravel	19	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None		
1.4 Adjacent Side	Left	Right	Sand	8	%	**L** Trees (%)	70	0	10	90	4.6 Up/Downstream Flow Reg	None		
Hillside Slope	Very Steep	Very Steep				**R** Trees (%)	70	0	10	90	4.7 Stormwater Inputs			
Continuous	Sometimes	Sometimes	Silt/Clay Present	No			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	2
W/in 1 bankfull	Sometimes	Sometimes	Embedded (chan)	25	%	L Shrub/Sapling (%)	30	0	5	95	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	40	%	R Shrub/Sapling (%)	30	0	5	95	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	31			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	1		
Valley Width (ft)		235				**L** Herbs (%)	100	0	10	90	Affected Length (ft)	75		
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	100	0	10	90	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Broad	Bed	6	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	5	inches	Canopy %	76-100		76-100			2	2	22
Human Caused Change?		Yes	2.13a % Subs. Exp.	40	%	Mid-channel canopy	Closed					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						8	1	0
2.1 Bankfull Width (ft)	21.5		Stream Type:	C		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	9		Bed Material:	Gravel		Dominant	>150		>150			13	0	1
2.1b Ratio (wetted/bkfl)	0.42		Subclass Slope:	None		Sub-dominant	51-100		51-100			Braiding		
2.2 Max Depth (ft)	1.6		Bed Form:	Riffle-Pool		Length <25 ft	64		161			0		
2.3 Mean Depth (ft)	1.1		Field Measured Slope:			Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	129		2.15 Reference Stream Type			L Trees (%)	85	0	10	90		# SRs	# HCs	Trib Rejuv.
2.5 RAF	1.6		C, Gravel, Riffle-Pool			R Trees (%)	85	0	10	90		8	0	No
*Human Elevated FP			**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks			L Shrub/Sapling (%)	40	0	0	100	5.5 Straightening	None		
			Typical Bank Slope	Steep		R Shrub/Sapling (%)	40	0	0	100	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	90	0	10	90				
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	90	0	10	90	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW09	Segment:	None	Completion Date:	15-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	2675	Segment Location:	Raymond near Old Bye Road crossing.				

1.6 Grade Controls — Present

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS
Ledge	DS end	0.4	0.1	Yes	No
Ledge	below culv	0.7	0.2	Yes	No

4.8 Channel Constrictions — Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	12	Yes	Yes	Yes	Yes
Problems: DA, DB, SA, A					
Old abutment	14	Yes	No	Yes	Yes
Problems: DA, SA					
Other	12	Yes	No	Yes	Yes
Problems: DS, SB Note: other= boulder piles in channel.					

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	17	None	No
7.2 Channel Aggradation	6	None	No
7.3 Widening Channel	14		No
7.4 Change in Planform	6		No
Total Score:	43		
Geomorphic Rating:	0.54		

Channel Evolution Model	D
Channel Evolution Stage	II d
Geomorphic Condition	Fair (0.35-0.64)
Stream Sensitivity	Very High

Channel Adjustment Processes Narrative

Minor widening, major aggradatiuon and planform adjustment. Did not have split flow but there were many flood chutes present.

Notes:

Recommend removing old abutment (or old dam?) to provide floodplain access at least on one side. Right bank would need to remove some large trees. Abutment is 7 feet high. Would be difficult to get equipment to location. Extreme planform adjustment at lower end of reach with multiple flood chutes. Old Bye Road culvert alignment and span causing extreme localized geomorphic instability. At upper end of reach pools were limited.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW10	Segment:	A	Completion Date:	16-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	482	Segment Location:	Raymond, downstream of Lane Road crossing and wetlands, near cul de sacs off of Old Bye Road				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		PS	2.6 Width/Depth Ratio		23.7	*Bank Texture*	Left	Right			*Corridor Land Use*			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		5.2	Upper					Dominant	Forest	Forest	
1.3 Corridor Encroachments:			2.8 Incision Ratio		1.0	Material Type	Sand	Sand			Sub-dominant	None	Residential	
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive	Non-cohesive			Mass Failures (ft)	0	0	
Berms	0	0	2.9 Sinuosity		Mod (1.2-1.5)	Lower					Height (ft)			
height (ft)			2.10 Riffle Type		Sedimented	Material Type	Gravel	Gravel			Gullies (number)	0	0	
Roads	0	0	2.11 Riffle Step Spacing (ft)		155	Consistency	Non-cohesive	Non-cohesive			Height (ft)			
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left	Right			**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	29	38			4.1 Springs/ Seeps	Minimum		
height (ft)			Boulder	1	%	Erosion Height (ft)	2	2			4.2 Adjacent Wetlands	None		
Improved Paths	0	0	Cobble	41	%	Revetment Type	None	None			4.3 Flow Status	Base		
height (ft)			Coarse Gravel	35	%	Revetment Length (ft)					4.4 # of Debris Jams	1		
Development	0	0	Fine Gravel	10	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None		
1.4 Adjacent Side	Left	Right	Sand	13	%	**L** Trees (%)	80	0	0	100	4.6 Up/Downstream Flow Reg	None		
Hillside Slope	Steep	Steep				**R** Trees (%)	80	0	0	100	4.7 Stormwater Inputs			
Continuous	Never	Never	Silt/Clay Present	No			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Sometimes	Embedded (chan)	20	%	**L** Shrub/Sapling (%)	20	0	0	100	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	40	%	**R** Shrub/Sapling (%)	20	0	0	100	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	11			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	0		
Valley Width (ft)		450				**L** Herbs (%)	80	0	10	90	Affected Length (ft)			
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	80	0	10	90	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Very Broad	Bed	Unknown	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	76-100		76-100			0	1	4
Human Caused Change?		No	2.13a % Subs. Exp.	65	%	Mid-channel canopy	Closed					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						2	0	1
2.1 Bankfull Width (ft)	24.2		Stream Type:	C		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	3.2		Bed Material:	Gravel		Dominant	>150		>150			2	0	0
2.1b Ratio (wetted/bkfl)	0.13		Subclass Slope:	None		Sub-dominant	26-50		None			Braiding		
2.2 Max Depth (ft)	1.6		Bed Form:	Riffle-Pool		Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	1.0		Field Measured Slope:			Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	125.2		2.15 Reference Stream Type			L Trees (%)	80	0	10	90		# SRs	# HCs	Trib Rejuv.
2.5 RAF	1.6		C, Gravel, Riffle-Pool			R Trees (%)	80	0	10	90		2	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			Stream Ford
			3.1 Stream Banks			**L** Shrub/Sapling (%)	20	0	0	100	5.5 Straightening	None		
			Typical Bank Slope	Steep		**R** Shrub/Sapling (%)	20	0	0	100	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	20	0	0	100				
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	20	0	0	100	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cu

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW10	Segment:	A	Completion Date:	16-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	482	Segment Location:	Raymond, downstream of Lane Road crossing and wetlands, near cul de sacs off of Old Bye Road				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	18	None	No
7.2 Channel Aggradation	9	None	No
7.3 Widening Channel	17		No
7.4 Change in Planform	7		No

Total Score: 51

Geomorphic Rating: 0.64

Channel Evolution Model D

Channel Evolution Stage II d

Geomorphic Condition Fair (0.35-0.64)

Stream Sensitivity Very High

Channel Adjustment Processes Narrative

Major aggradation and planform adjustment multiple diagonal bars and large island.

Notes:

An old washed out culvert is sitting in channel on one side of island (see photo log). It's not a constriction as flow can move on either side of the structure. Two diagonal bars and one small point bar were in the reach, point bar was mostly sand while diagonal bar was coarse gravel to sand. Could not find suitable bar to measure ALP.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW10	Segment:	B	Completion Date:	16-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	1027	Segment Location:	Raymond wetland area downstream of Lane Road crossing.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right		
1.1 Segmentation:		PS	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		*Corridor Land Use*				
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest		
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	Residential	None		
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0		
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)				
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)	0	0		
Roads	204	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)				
height (ft)	Unknown		2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**				
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	33		0		4.1 Springs/ Seeps	Extensive			
height (ft)			Boulder	NA	%	Erosion Height (ft)	2		0		4.2 Adjacent Wetlands	Extensive			
Improved Paths	0	0	Cobble	NA	%	Revetment Type	Rip-rap		Rip-rap		4.3 Flow Status	Base			
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)	24		25		4.4 # of Debris Jams	1			
Development	541	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None			
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	90	0	60	40	4.6 Up/Downstream Flow Reg	None			
Hillside Slope	Very Steep	Steep				**R** Trees (%)	90	0	60	40	4.7 Stormwater Inputs				
Continuous	Never	Never	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0	
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%	L Shrub/Sapling (%)	90	0	50	50	Urban Storm Pipe	0	Tile Drain	0	
Texture	NE	NE	Embedded (marg)	NA	%	R Shrub/Sapling (%)	90	0	50	50	Overland Flow	0	Other	0	
1.5 Valley Features			LWD (%)	NA			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	0			
Valley Width (ft)		650				**L** Herbs (%)	80	0	30	70	Affected Length (ft)				
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	80	0	30	70	**Step 5. Channel Bed & Planform Changes**				
Confinement Type		NA	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side	
Rock Gorge?		No	Bar	NA	inches	Canopy %	76-100		76-100			0	0	0	
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island	
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0	
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion	
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>150		>150			0	0	0	
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	51-100		None			Braiding			
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	0		0			0			
2.3 Mean Depth (ft)	NA		Field Measured Slope:			Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts				
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	90	0	60	40		# SRs	# HCs	Trib Rejuv.	
2.5 RAF	NA		Wetland			R Trees (%)	90	0	60	40		0	0	No	
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:				
			3.1 Stream Banks			L Shrub/Sapling (%)	70	0	10	90	5.5 Straightening	Straightening			
			Typical Bank Slope	Shallow		R Shrub/Sapling (%)	70	0	10	90	Length (ft)	64			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None			
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	50	0	0	100					
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	50	0	0	100	Bridge and Culvert Survey	Yes			

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW10	Segment:	B	Completion Date:	16-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	1027	Segment Location:	Raymond wetland area downstream of Lane Road crossing.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	9.5	Yes	Yes	Yes	Yes

Problems: DB, SB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0

Total Score: 0

Geomorphic Rating: 0

Channel Evolution Model 0

Channel Evolution Stage 0

Geomorphic Condition 0

Stream Sensitivity 0

Channel Adjustment Processes Narrative

Notes:

Segment is a wetland (210 feet across). Wetland is mostly undisturbed and is in reference condition. Lane Road crossing is a double culvert (4.5 feet wide and 5 feet wide).

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW10	Segment:	C	Completion Date:	16-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	I	Rain:	No
Segment Length (ft):	489	Segment Location:	Raymond upstream of Lane Road crossing. Influenced by wetlands upstream and downstream.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*				*Step 3. (Cont'd)*					3.3 Riparian Corridor		Left	Right
1.1 Segmentation:		PS	2.6 Width/Depth Ratio			NA	*Bank Texture*	Left		Right		*Corridor Land Use*			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio			NA	Upper					Dominant		Residential	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio			NA	Material Type	Sand		Sand		Sub-dominant		Forest	Residential
Length (ft)	One	Both	*Human Elevated Incision			NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)		0	0
Berms	0	0	2.9 Sinuosity			NA	Lower					Height (ft)			
height (ft)			2.10 Riffle Type			NA	Material Type	Silt		Silt		Gullies (number)		0	0
Roads	358	0	2.11 Riffle Step Spacing (ft)			NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)			2.12 Substrate Composition				*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	NA	%		Erosion Length (ft)	0		23		4.1 Springs/ Seeps		Minimum	
height (ft)			Boulder	NA	%		Erosion Height (ft)			3		4.2 Adjacent Wetlands		Minimum	
Improved Paths	0	0	Cobble	NA	%		Revetment Type	Rip-rap		None		4.3 Flow Status		Base	
height (ft)			Coarse Gravel	NA	%		Revetment Length (ft)	234				4.4 # of Debris Jams		0	
Development	445	0	Fine Gravel	NA	%		*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type		None	
1.4 Adjacent Side	Left	Right	Sand	NA	%		**L** Trees (%)	70	0	30	70	4.6 Up/Downstream Flow Reg		None	
Hillside Slope	Very Steep	Steep					**R** Trees (%)	90	0	30	70	4.7 Stormwater Inputs			
Continuous	Never	Never	Silt/Clay Present	Yes				% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%		**L** Shrub/Sapling (%)	60	0	30	70	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%		**R** Shrub/Sapling (%)	60	0	30	70	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA				% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		1	
Valley Width (ft)		450					**L** Herbs (%)	70	0	20	80	Affected Length (ft)		upstream segment	
Width Determination		Estimated	2.13 Average Largest Particle				**R** Herbs (%)	70	0	20	80	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Very Broad	Bed	NA	inches		*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches		Canopy %	51-75		76-100			0	0	0
Human Caused Change?		Yes	2.13a % Subs. Exp.	NA	%		Mid-channel canopy	Closed					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type				3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	E			Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	Sand			Dominant	26-50		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	None			Sub-dominant	None		51-100			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	Dune-Ripple			Length <25 ft						0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:				Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type				L Trees (%)	90	0	30	70		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		E, Sand, Dune-Ripple				R Trees (%)	90	0	30	70		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**					% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			
			3.1 Stream Banks				**L** Shrub/Sapling (%)	70	0	5	95	5.5 Straightening	Straightening		
			Typical Bank Slope	Steep			**R** Shrub/Sapling (%)	60	0	5	95	Length (ft)	482		
								% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None	
Note: General comments, Step 1.6 Grade Controls and Step 4.8							L Herbs (%)	70	0	10	90				
Channel Constrictions on Sheet 2 of this workbook.							R Herbs (%)	70	0	10	90	Bridge and Culvert Survey		Yes	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW10	Segment:	C	Completion Date:	16-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	I	Rain:	No
Segment Length (ft):	489	Segment Location:	Raymond upstream of Lane Road crossing. Influenced by wetlands upstream and downstream.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Some nice undercuts in segment, historic rip rap. One pool for entire segment. Channelized. Good geomorphic condition, fair habitat (not diverse). Channel width is 15-20 feet.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW10	Segment:	D	Completion Date:	16-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	2734	Segment Location:	Huge wetland segment east of Old Chester Road in Raymond.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*				*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right
1.1 Segmentation:		PS	2.6 Width/Depth Ratio			NA	*Bank Texture*	Left		Right		*Corridor Land Use*		
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio			NA	Upper					Dominant	Forest	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio			NA	Material Type	Silt		Silt		Sub-dominant	Residential	None
Length (ft)	One	Both	*Human Elevated Incision			NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0
Berms	0	0	2.9 Sinuosity			NA	Lower					Height (ft)		
height (ft)			2.10 Riffle Type			NA	Material Type	Silt		Silt		Gullies (number)	0	0
Roads	0	0	2.11 Riffle Step Spacing (ft)			NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)		
height (ft)			2.12 Substrate Composition				*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**		
Railroads	0	0	Bedrock	NA	%		Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive	
height (ft)			Boulder	NA	%		Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive	
Improved Paths	0	0	Cobble	NA	%		Revetment Type	Rip-rap		None		4.3 Flow Status	Base	
height (ft)			Coarse Gravel	NA	%		Revetment Length (ft)	26				4.4 # of Debris Jams	0	
Development	0	0	Fine Gravel	NA	%		*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None	
1.4 Adjacent Side	Left	Right	Sand	NA	%		**L** Trees (%)	10	0	0	100	4.6 Up/Downstream Flow Reg	None	
Hillside Slope	Steep	Hilly					**R** Trees (%)	10	0	0	100	4.7 Stormwater Inputs		
Continuous	Never	Never	Silt/Clay Present	Yes				% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%		**L** Shrub/Sapling (%)	20	0	90	10	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%		**R** Shrub/Sapling (%)	20	0	90	10	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA				% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	1		
Valley Width (ft)		525					**L** Herbs (%)	100	0	90	10	Affected Length (ft)	500		
Width Determination		Estimated	2.13 Average Largest Particle				**R** Herbs (%)	100	0	90	10	**Step 5. Channel Bed & Planform Changes**		
Confinement Type		NA	Bed	NA	inches		*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches		Canopy %	1-25		1-25			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%		Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type				3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA			Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA			Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA			Sub-dominant	101-150		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA			Length <25 ft						0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:				Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type				L Trees (%)	90	0	20	80		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		Wetland				R Trees (%)	90	0	20	80		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**					% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks				**L** Shrub/Sapling (%)	60	0	50	50	5.5 Straightening	None		
			Typical Bank Slope	Shallow			**R** Shrub/Sapling (%)	60	0	50	50	Length (ft)			
								% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8							L Herbs (%)	70	0	30	70				
Channel Constrictions on Sheet 2 of this workbook.							R Herbs (%)	70	0	30	70	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW10	Segment:	D	Completion Date:	16-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	2734	Segment Location:	Huge wetland segment east of Old Chester Road in Raymond.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Segment is in reference condition, partially on conserved land. Can't see left buffer very well from right side of wetland to characterize vegetation of width. Low tree cover and bank canopy is natural due to flooding, not due to a problem within the segment.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW10	Segment:	E	Completion Date:	16-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	I	Rain:	No
Segment Length (ft):	1096	Segment Location:	Downstream of Old Chester Road crossing, influenced channel with wetlands upstream and downstream.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*				*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right
1.1 Segmentation:		PS	2.6 Width/Depth Ratio			NA	*Bank Texture*	Left		Right		*Corridor Land Use*		
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio			NA	Upper					Dominant	Forest	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio			NA	Material Type	Silt		Silt		Sub-dominant	None	None
Length (ft)	One	Both	*Human Elevated Incision			NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0
Berms	0	0	2.9 Sinuosity			NA	Lower					Height (ft)		
height (ft)			2.10 Riffle Type			NA	Material Type	Silt		Silt		Gullies (number)	0	0
Roads	0	0	2.11 Riffle Step Spacing (ft)			NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)		
height (ft)			2.12 Substrate Composition				*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**		
Railroads	0	0	Bedrock	NA	%		Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive	
height (ft)			Boulder	NA	%		Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive	
Improved Paths	0	0	Cobble	NA	%		Revetment Type	None		None		4.3 Flow Status	Base	
height (ft)			Coarse Gravel	NA	%		Revetment Length (ft)					4.4 # of Debris Jams	3	
Development	0	0	Fine Gravel	NA	%		*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None	
1.4 Adjacent Side	Left	Right	Sand	NA	%		**L** Trees (%)	50	0	20	80	4.6 Up/Downstream Flow Reg		
Hillside Slope	Hilly	Steep					**R** Trees (%)	50	0	30	70	4.7 Stormwater Inputs		
Continuous	Never	Never	Silt/Clay Present	Yes				% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	1
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%		**L** Shrub/Sapling (%)	50	0	80	20	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%		**R** Shrub/Sapling (%)	50	0	80	20	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA				% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	0		
Valley Width (ft)		500					**L** Herbs (%)	100	0	10	90	Affected Length (ft)			
Width Determination		Estimated	2.13 Average Largest Particle				**R** Herbs (%)	100	0	10	90	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Very Broad	Bed	NA	inches		*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches		Canopy %	51-75		51-75			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%		Mid-channel canopy	Closed					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type				3.2 Riparian Buffer						1	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	E			Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	Sand			Dominant	>150		>150			1	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	None			Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	Dune-Ripple			Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:				Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type				L Trees (%)	80	0	30	70		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		E, Sand, Dune-Ripple				R Trees (%)	80	0	30	70		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**					% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks				**L** Shrub/Sapling (%)	30	0	10	90	5.5 Straightening	None		
			Typical Bank Slope	Moderate			**R** Shrub/Sapling (%)	90	0	15	85	Length (ft)			
								% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8							L Herbs (%)	60	0	0	100				
Channel Constrictions on Sheet 2 of this workbook.							R Herbs (%)	60	0	0	100	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW10	Segment:	E	Completion Date:	16-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	I	Rain:	No
Segment Length (ft):	1096	Segment Location:	Downstream of Old Chester Road crossing, influenced channel with wetlands upstream and downstream.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	5	Yes	Yes	Yes	Yes

Problems: DB, SB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Wetted width is 13 feet, influenced "channel" is 1-2 feet deep on average. Segment has good habitat (great for frogs), is in reference condition and on conserved land. Double culverts under Old Chester Road (2.5 feet wide each). Road gravel washing into stream resulting in large diagonal bar of road material just downstream of crossing.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW10	Segment:	F	Completion Date:	16-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	333	Segment Location:	Wetland segment upstream of Old Chester Road crossing in Raymond.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*				*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right
1.1 Segmentation:		PS	2.6 Width/Depth Ratio			NA	*Bank Texture*	Left		Right		*Corridor Land Use*		
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio			NA	Upper					Dominant	Forest	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio			NA	Material Type	Sand		Sand		Sub-dominant	None	None
Length (ft)	One	Both	*Human Elevated Incision			NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0
Berms	0	0	2.9 Sinuosity			NA	Lower					Height (ft)		
height (ft)			2.10 Riffle Type			NA	Material Type	Silt		Silt		Gullies (number)	0	0
Roads	0	0	2.11 Riffle Step Spacing (ft)			NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)		
height (ft)			2.12 Substrate Composition				*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**		
Railroads	0	0	Bedrock	NA	%		Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive	
height (ft)			Boulder	NA	%		Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive	
Improved Paths	0	0	Cobble	NA	%		Revetment Type	None		None		4.3 Flow Status	Base	
height (ft)			Coarse Gravel	NA	%		Revetment Length (ft)					4.4 # of Debris Jams	0	
Development	0	0	Fine Gravel	NA	%		*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None	
1.4 Adjacent Side	Left	Right	Sand	NA	%		**L** Trees (%)	60	0	10	90	4.6 Up/Downstream Flow Reg	None	
Hillside Slope	Hilly	Hilly					**R** Trees (%)	10	0	10	90	4.7 Stormwater Inputs		
Continuous	Never	Never	Silt/Clay Present	Yes				% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%		**L** Shrub/Sapling (%)	50	0	50	50	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%		**R** Shrub/Sapling (%)	70	0	50	50	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA				% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		1	
Valley Width (ft)		725					**L** Herbs (%)	80	0	50	50	Affected Length (ft)		250	
Width Determination		Estimated	2.13 Average Largest Particle				**R** Herbs (%)	90	0	50	50	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		NA	Bed	NA	inches		*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches		Canopy %	51-75		76-100			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%		Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type				3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA			Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA			Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA			Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA			Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:				Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type				L Trees (%)	90	0	10	90		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		Wetland				R Trees (%)	60	0	10	90		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**					% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks				**L** Shrub/Sapling (%)	30	0	10	90	5.5 Straightening	None		
			Typical Bank Slope	Shallow			**R** Shrub/Sapling (%)	50	0	10	90	Length (ft)			
								% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None	
Note: General comments, Step 1.6 Grade Controls and Step 4.8							L Herbs (%)	90	0	10	90				
Channel Constrictions on Sheet 2 of this workbook.							R Herbs (%)	90	0	20	80	Bridge and Culvert Survey		Yes	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW10	Segment:	F	Completion Date:	16-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	333	Segment Location:	Wetland segment upstream of Old Chester Road crossing in Raymond.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Segment is wetland on conserved land. Lots of wildlife. Segment is generally unimpacted (dirt road downstream of segment break) and in reference condition.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW11	Segment:	A	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	2084	Segment Location:	Raymond wetland area downstream of Shattagee Road crossing.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*				*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right
1.1 Segmentation:		PS	2.6 Width/Depth Ratio			NA	*Bank Texture*	Left		Right		*Corridor Land Use*		
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio			NA	Upper					Dominant	Shrub/Sapling	Shrub/Sapling
1.3 Corridor Encroachments:			2.8 Incision Ratio			NA	Material Type	Gravel		Gravel		Sub-dominant	None	None
Length (ft)	One	Both	*Human Elevated Incision			NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0
Berms	0	0	2.9 Sinuosity			NA	Lower					Height (ft)		
height (ft)			2.10 Riffle Type			NA	Material Type	Silt		Silt		Gullies (number)	0	0
Roads	0	0	2.11 Riffle Step Spacing (ft)			NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)		
height (ft)			2.12 Substrate Composition				*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**		
Railroads	0	0	Bedrock	NA	%		Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive	
height (ft)			Boulder	NA	%		Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive	
Improved Paths	0	0	Cobble	NA	%		Revetment Type	None		None		4.3 Flow Status	Base	
height (ft)			Coarse Gravel	NA	%		Revetment Length (ft)					4.4 # of Debris Jams	0	
Development	0	0	Fine Gravel	NA	%		*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None	
1.4 Adjacent Side	Left	Right	Sand	NA	%		**L** Trees (%)	40	0	10	90	4.6 Up/Downstream Flow Reg	None	
Hillside Slope	Steep	Steep					**R** Trees (%)	40	0	10	90	4.7 Stormwater Inputs		
Continuous	Never	Never	Silt/Clay Present	Yes				% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%		**L** Shrub/Sapling (%)	80	0	10	90	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%		**R** Shrub/Sapling (%)	40	0	10	90	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA				% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	0		
Valley Width (ft)		700					**L** Herbs (%)	100	0	30	70	Affected Length (ft)			
Width Determination		Estimated	2.13 Average Largest Particle				**R** Herbs (%)	100	0	30	70	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		NA	Bed	NA	inches		*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches		Canopy %	51-75		51-75			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%		Mid-channel canopy	Closed					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type				3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA			Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA			Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA			Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA			Length <25 ft						0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:				Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type				L Trees (%)	50	0	10	90		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		Wetland				R Trees (%)	50	0	10	90		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**					% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks				**L** Shrub/Sapling (%)	60	0	10	90	5.5 Straightening	None		
			Typical Bank Slope	Shallow			**R** Shrub/Sapling (%)	60	0	10	90	Length (ft)			
								% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8							L Herbs (%)	80	0	20	80				
Channel Constrictions on Sheet 2 of this workbook.							R Herbs (%)	80	0	20	80	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW11	Segment:	A	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	2084	Segment Location:	Raymond wetland area downstream of Shattagee Road crossing.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

D channel in good condition wetland complex. Lots of beaver activity, could be heard diving in water. Downstream end of segment was conserved land (wetland), saw a northern water snake on bank.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW11	Segment:	B	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	646	Segment Location:	Raymond segment of stream channel between wetlands in vicinity of Shattagee Road crossing.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*				3.3 Riparian Corridor	Left	Right
1.1 Segmentation:		PS	2.6 Width/Depth Ratio		8.3	*Bank Texture*	Left	Right		*Corridor Land Use*		
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		1.8	Upper				Dominant	Forest	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio		2.2	Material Type	Sand	Sand		Sub-dominant	Residential	Residential
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive	Non-cohesive		Mass Failures (ft)	0	0
Berms	0	0	2.9 Sinuosity		Low (<1.2)	Lower				Height (ft)		
height (ft)			2.10 Riffle Type		Complete	Material Type	Sand	Sand		Gullies (number)	0	0
Roads	0	0	2.11 Riffle Step Spacing (ft)		115	Consistency	Non-cohesive	Non-cohesive		Height (ft)		
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left	Right		**Step 4. Flow & Flow Modifiers**		
Railroads	0	0	Bedrock	8	%	Erosion Length (ft)	74	0		4.1 Springs/ Seeps	Present	
height (ft)			Boulder	3	%	Erosion Height (ft)	4			4.2 Adjacent Wetlands	Present	
Improved Paths	0	0	Cobble	28	%	Revetment Type	Multiple	Multiple		4.3 Flow Status	Base	
height (ft)			Coarse Gravel	30	%	Revetment Length (ft)	139	114		4.4 # of Debris Jams	3	
Development	141	0	Fine Gravel	18	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None
1.4 Adjacent Side	Left	Right	Sand	13	%	**L** Trees (%)	60	0	10	90	4.6 Up/Downstream Flow Reg	None
Hillside Slope	Steep	Steep				**R** Trees (%)	60	0	10	90	4.7 Stormwater Inputs	
Continuous	Never	Never	Silt/Clay Present	No			% Cover	Invasive	WADs	Saplings	Field Ditch	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	30	%	**L** Shrub/Sapling (%)	40	0	10	90	Urban Storm Pipe 0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	40	%	**R** Shrub/Sapling (%)	50	0	10	90	Overland Flow 0	Other	0
1.5 Valley Features			LWD (#)	19			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	0	
Valley Width (ft)		730				**L** Herbs (%)	50	0	5	95	Affected Length (ft)		
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	50	0	5	95	**Step 5. Channel Bed & Planform Changes**		
Confinement Type		Very Broad	Bed	6	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	3	inches	Canopy %	76-100		76-100			1	1	4
Human Caused Change?		Yes	2.13a % Subs. Exp.	40	%	Mid-channel canopy	Closed					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	10.5		Stream Type:	B		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	4.5		Bed Material:	Gravel		Dominant	>150		>150			1	0	0
2.1b Ratio (wetted/bkfl)	0.43		Subclass Slope:	c		Sub-dominant	26-50		51-100			Braiding		
2.2 Max Depth (ft)	1.8		Bed Form:	Riffle-Pool		Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	1.3		Field Measured Slope:			Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	18.9		2.15 Reference Stream Type			L Trees (%)	80	0	10	90		# SRs	# HCs	Trib Rejuv.
2.5 RAF	4.0		C, Gravel, Riffle-Pool			R Trees (%)	80	0	10	90		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks			**L** Shrub/Sapling (%)	35	0	10	90	5.5 Straightening	Straightening		
			Typical Bank Slope	Steep		**R** Shrub/Sapling (%)	36	0	10	90	Length (ft)	289		
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	40	0	10	90				
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	40	0	10	90	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW11	Segment:	B	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	646	Segment Location:	Raymond segment of stream channel between wetlands in vicinity of Shattagee Road crossing.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	4.8	Yes	Yes	Yes	Yes
Problems: DA, SB					
Old abutme	13.5	Yes	No	Yes	Yes
Problems: None					

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	5	C to B	Yes
7.2 Channel Aggradation	14	None	No
7.3 Widening Channel	17		No
7.4 Change in Planform	9		No

Total Score: 45

Geomorphic Rating: 0.56

Channel Evolution Model F

Channel Evolution Stage II

Geomorphic Condition Fair (0.35-0.64)

Stream Sensitivity Very High

Channel Adjustment Processes Narrative

Extreme historic degradation due to encroachments, minor aggradation, major planform adjustment occurring at lower end of segment.

Notes:

Historic straightening associated with old abutment, rip rap and road encroachment. Better floodplain access at lower end of reach. Extensive wetlands both upstream and downstream of reach.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW11	Segment:	C	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	3310	Segment Location:	Raymond wetland area upstream of Shattagee Road crossing continues to beyond power lines.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*				*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right
1.1 Segmentation:		PS	2.6 Width/Depth Ratio			NA	*Bank Texture*	Left		Right		*Corridor Land Use*		
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio			NA	Upper					Dominant	Forest	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio			NA	Material Type	Sand		Sand		Sub-dominant	Shrub/Sapling	Shrub/Sapling
Length (ft)	One	Both	*Human Elevated Incision			NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0
Berms	0	0	2.9 Sinuosity			NA	Lower					Height (ft)		
height (ft)			2.10 Riffle Type			NA	Material Type	Silt		Silt		Gullies (number)	0	0
Roads	0	0	2.11 Riffle Step Spacing (ft)			NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)		
height (ft)			2.12 Substrate Composition				*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**		
Railroads	0	0	Bedrock	NA	%		Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Present	
height			Boulder	NA	%		Erosion Height (ft)					4.2 Adjacent Wetlands	Present	
Improved Paths	0	0	Cobble	NA	%		Revetment Type	None		None		4.3 Flow Status	Base	
height (ft)			Coarse Gravel	NA	%		Revetment Length (ft)					4.4 # of Debris Jams	0	
Development	0	0	Fine Gravel	NA	%		*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None	
1.4 Adjacent Side	Left	Right	Sand	NA	%		**L** Trees (%)	80	0	80	20	4.6 Up/Downstream Flow Reg	None	
Hillside Slope	Very Steep	Steep					**R** Trees (%)	80	0	80	20	4.7 Stormwater Inputs		
Continuous	Never	Never	Silt/Clay Present	Yes				% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%		**L** Shrub/Sapling (%)	30	0	50	50	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%		**R** Shrub/Sapling (%)	30	0	50	50	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA				% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	1		
Valley Width (ft)		850					**L** Herbs (%)	90	0	70	30	Affected Length (ft)	>250		
Width Determination		Estimated	2.13 Average Largest Particle				**R** Herbs (%)	90	0	70	30	**Step 5. Channel Bed & Planform Changes**		
Confinement Type		NA	Bed	NA	inches		*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches		Canopy %	76-100		76-100			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%		Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type				3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA			Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA			Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA			Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA			Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:				Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type				L Trees (%)	90	0	100	0		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		*(if different from P1)*	Wetland			R Trees (%)	90	0	100	0		0	0	0
*Human Elevated FP	NA		**Step 3. Riparian Features**					% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks				**L** Shrub/Sapling (%)	10	0	0	100	5.5 Straightening	None		
			Typical Bank Slope	Shallow			**R** Shrub/Sapling (%)	10	0	0	100	Length (ft)			
								% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8							L Herbs (%)	10	0	0	100				
Channel Constrictions on Sheet 2 of this workbook.							R Herbs (%)	10	0	0	100	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW11	Segment:	C	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	3310	Segment Location:	Raymond wetland area upstream of Shattagee Road crossing continues to beyond power lines.				

1.6 Grade Controls — None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions — None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Huge wetland complex with large beaver ponds. Power lines cut through segment, ATV trail runs along small part of segment (still wetland) and large trees are not present near power lines.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW12	Segment:	A	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	660	Segment Location:	Raymond, off of trail accessed by power lines off Shattagee Road (very remote).				

Step 1. Valley and Floodplain

1.1 Segmentation:		PS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Steep
Continuous	Never	Never
W/in 1 bankfull	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		400
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	16.5
2.1a Wetted Width (ft)	11.2
2.1b Ratio (wetted/bkfl)	0.68
2.2 Max Depth (ft)	1.8
2.3 Mean Depth (ft)	1.3
2.4 Floodprone Width (ft)	220
2.5 RAF	1.8
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		13.1
2.7 Entrenchment Ratio		13.3
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing (ft)		135
2.12 Substrate Composition		
Bedrock	0	%
Boulder	7	%
Cobble	41	%
Coarse Gravel	22	%
Fine Gravel	15	%
Sand	15	%
Silt/Clay Present	No	
Embedded (chan)	15	%
Embedded (marg)	35	%
LWD (#)	19	
2.13 Average Largest Particle		
Bed	9	inches
Bar	7	inches
2.13a % Subs. Exp.	10	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
C, Gravel, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks	
Typical Bank Slope	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)		
Revetment Type	None	None
Revetment Length (ft)		

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	60	0	20	80
R Trees (%)	60	0	20	80

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	0	100
R Shrub/Sapling (%)	10	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	100	0	20	80
R Herbs (%)	100	0	20	80

Bank Canopy	Left	Right
Canopy %	51-75	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer		
Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	None	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	90	0	20	80
R Trees (%)	90	0	20	80

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	20	0	0	100
R Shrub/Sapling (%)	50	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	80	0	10	90
R Herbs (%)	80	0	10	90

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	None
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	
Field Ditch 0	Road Ditch 0
Urban Storm Pipe 0	Tile Drain 0
Overland Flow 0	Other 0
4.9 # of Beaver Dams	3
Affected Length (ft)	175

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	1	0	1
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts			
	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW12	Segment:	A	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	660	Segment Location:	Raymond, off of trail accessed by power lines off Shattagee Road (very remote).				

1.6 Grade Controls

Type	Location	Present Total Ht (ft)	Ht Above (ft)	Photo	GPS
Ledge		0.5	0.3	Yes	No

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	16	None	No
7.3 Widening Channel	18		No
7.4 Change in Planform	16		No

Total Score: 66

Geomorphic Rating: 0.83

Channel Evolution Model F

Channel Evolution Stage I

Geomorphic Condition Good (0.65-0.84)

Stream Sensitivity High

Channel Adjustment Processes Narrative

Very minor planform changes due to LWD and Beaver Dams.

Notes:

Segment largely unimpacted with wetlands both upstream and downstream. Remote location, little human influence.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW12	Segment:	B	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	650	Segment Location:	Raymond, off of trail accessed by power lines off Shattagee Road, upstream of short segment with channel.				

Step 1. Valley and Floodplain

1.1 Segmentation:		PS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Steep
Continuous	Never	Never
W/in 1 bankfull	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		600
Width Determination		Estimated
Confinement Type		NA
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		NA
2.10 Riffle Type		NA
2.11 Riffle Step Spacing (ft)		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
LWD (#)	NA	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	NA	
Bed Material:	NA	
Subclass Slope:	NA	
Bed Form:	NA	
Field Measured Slope:		NA
2.15 Reference Stream Type		
(if different from P1)	Wetland	

Step 3. Riparian Features

3.1 Stream Banks	
Typical Bank Slope	Shallow

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt	Silt
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)		
Revetment Type	None	None
Revetment Length (ft)		

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	100	0	80	20
R Trees (%)	100	0	80	20

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	20	0	0	100
R Shrub/Sapling (%)	20	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	100	0	90	10
R Herbs (%)	100	0	90	10

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	None	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	90	0	80	20
R Trees (%)	90	0	80	20

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	40	0	0	100
R Shrub/Sapling (%)	40	0		100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	60	0	10	90
R Herbs (%)	60	0	10	90

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	1
Affected Length (ft)	>250

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW12	Segment:	B	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	650	Segment Location:	Raymond, off of trail accessed by power lines off Shattagee Road, upstream of short segment with channel.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0

Total Score:	0
Geomorphic Rating:	0
Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Segment not a stream, large wetland and beaver pond. Unimpacted, far away from roads and trails.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW13	Segment:	None	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	2422	Segment Location:	Raymond and Candia near Crowley Road crossing.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		None	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		*Corridor Land Use*			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Shrub/Sapling	Shrub/Sapling	
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Silt		Silt		Sub-dominant	None	None	
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0	
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)			
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)	0	0	
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive		
height (ft)			Boulder	NA	%	Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive		
Improved Paths	0	0	Cobble	NA	%	Revetment Type	None		None		4.3 Flow Status	Base		
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)					4.4 # of Debris Jams	0		
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None		
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	5	0	20	80	4.6 Up/Downstream Flow Reg	None		
Hillside Slope	Hilly	Steep				**R** Trees (%)	5	0	20	80	4.7 Stormwater Inputs			
Continuous	Never	Never	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	30	0	10	90	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	30	0	10	90	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		0	
Valley Width (ft)		891				**L** Herbs (%)	100	0	30	70	Affected Length (ft)			
Width Determination		Measured	2.13 Average Largest Particle			**R** Herbs (%)	100	0	30	70	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		NA	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	26-50		26-50			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:			Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	30	0	20	80		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		Wetland			R Trees (%)	30	0	20	80		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks			**L** Shrub/Sapling (%)	30	0	10	90	5.5 Straightening	None		
			Typical Bank Slope	Shallow		**R** Shrub/Sapling (%)	30	0	10	90	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None	
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	100	0	30	70				
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	100	0	30	70	Bridge and Culvert Survey		Yes	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW13	Segment:	None	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	2422	Segment Location:	Raymond and Candia near Crowley Road crossing.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	2	Yes	Yes	Yes	Yes

Problems: DA, DB, SB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Only banks and buffers evaluated in this reach. Not able to fully assess reach due to wetlands. Braided channel in wetland complex. In good condition, some minor impact from road crossing. Remnant beaver dam downstream of the culvert.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW14	Segment:	None	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	4244	Segment Location:	Candia upstream of Crowley Road				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor		Left	Right
1.1 Segmentation:		None	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant		Shrub/Sapling	Shrub/Sapling
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant		None	None
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)		0	0
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)			
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)		0	0
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps		Extensive	
height (ft)			Boulder	NA	%	Erosion Height (ft)					4.2 Adjacent Wetlands		Extensive	
Improved Paths	0	0	Cobble	NA	%	Revetment Type	None		None		4.3 Flow Status		Base	
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)					4.4 # of Debris Jams		0	
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type		None	
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	15	0	0	100	4.6 Up/Downstream Flow Reg		None	
Hillside Slope	Very Steep	Steep				**R** Trees (%)	15	0	0	100	4.7 Stormwater Inputs			
Continuous	Unknown	Unknown	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Unknown	Unknown	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	70	0	50	50	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	70	0	50	50	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		0	
Valley Width (ft)		315				**L** Herbs (%)	100	0	10	90	Affected Length (ft)			
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	100	0	10	90	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Very Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		Yes	Bar	NA	inches	Canopy %	51-75		51-75			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Closed					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	20	0	10	90		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		Wetland/E			R Trees (%)	20	0	10	90		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks			**L** Shrub/Sapling (%)	60	0	20	80	5.5 Straightening	None		
			Typical Bank Slope	Moderate		**R** Shrub/Sapling (%)	60	0	20	80	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None	
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	90	0	10	90				
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	90	0	10	90	Bridge and Culvert Survey		Yes	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Fordway Brook	Reach #:	FW14	Segment:	None	Completion Date:	14-Jul-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	4244	Segment Location:	Candia upstream of Crowley Road				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Did not assess entire reach due to poison ivy along banks and difficult walking conditions in wetland complex. Very thick brush. Reach was not impacted and was in reference condition. Upper end of reach looks more confined on map but was not accessible for assessment.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Upper Exeter River

Phase 2 Stream Geomorphic

Assessment Data

Upper Exeter River Subwatershed - Reach/Segment Cross-Reference Table		
Reach/ Segment ID	**Town(s)**	**Segment Location**
UE01	Raymond	Most downstream reach of Upper Exeter, mostly wetland
UE02	Raymond	Reach extends from just downstream of Hanson Road downstream to Blueberry Hill Road
UE03	Chester	Reach runs along Shepard Home Road and Hanson Road
UE04-A	Chester	Downstream of Freemont Road crossing in Chester
UE04-B	Chester	Freemont Road crossing in Chester
UE05	Chester/Fremont/Danville/Sandown	Long wetland reach in Sandown and Chester
UE06-A	Sandown	Downstream of Odell Road up to start of wetland above old dam structure
UE06-B	Sandown	Upstream of Odell Road and below channel segment downstream of Densen Dam
UE06-C	Sandown	Below Densen Pond and above wetland
UE07	Sandown	Densen Pond near Mark Traeger's house
UE08-A	Sandown	Near Fremont Road crossing and upstream of Densen Pond
UE08-B	Sandown	Wetland upstream of old dam near Fremont Road in Sandown
UE08-C	Sandown	Channel segment between wetlands DS Phillips Road and US Fremont Road
UE08-D	Sandown	Wetland downstream of Phillips Road in Sandown
UE09	Sandown	Lilly Pond near Phillips Road in Sandown
UE10	Sandown	Wetland near Main Street in Sandown
UE11-A	Sandown	Wetland located downstream of Wells Village Road in Sandown
UE11-B	Sandown	Channel influenced by wetland located downstream of Wells Village Road in Sandown
UE12-A	Sandown	Near Wells Village Road
UE12-B	Chester	Near Wells Village Road
UE12-C	Chester	Wetland and influenced channel located downstream of bedrock gorge
UE12-D	Chester	Bedrock channel located downstream of Deep Hole Road dam
UE13	Chester	Impounded pond located off Deep Hole Road
UE14-A	Chester	Wetland located downstream of power lines and upstream of Deep Hole pond
UE14-B	Chester	Segment located downstream of powerline bridge, impacted by wetland segment, deep channel
UE14-C	Chester	Segment located upstream of power lines and downstream of uppermost wetland segment in reach
UE14-D	Chester	Wetland located near Sandown Road in Chester
UE15-A	Chester	Downstream of Haverhill Road, bedrock dominated segment upstream of large wetland
UE15-B	Chester	Near Haverhill Road culvert, upstream to culvert in field DS of channelized segment
UE15-C	Chester	Near Derry Road
UE15-D	Chester	Upstream of Derry Road
UE16	Chester	Wetland upstream of Derry Road

Phase 2 Reach Summary Statistics for the Upper Exeter River																			
Reach/ Segment	Watershed Area (mi^2)	Phase 1 Confinement	Reference Channel Width (ft)	Channel Dimensions			Channel & Floodplain Ratios			Reference Stream Type	Existing Stream Type	Dominant Bed Substrate	Bedform	Sinuosity	RGA* Rating	RHA* Rating	Reach Sensitivity	CEM†	CEM† Stage
				Width (ft)	Mean Depth (ft)	Area (ft^2)	Width to Depth	Entrench-ment	Incision										
UE01[A]	49.2	Very Broad	84	--	--	--	--	--	--	E	E	Sand	Riffle-Pool	moderate	Good	Good	High	--	--
UE02[A]	46.8	Broad	82	--	--	--	--	--	--	E	E	Sand	Riffle-Pool	moderate	Good	Good	High	--	--
UE03	35.9	Broad	72	84.0	2.0	168	42.0	10.6	1.0	C	C	Gravel	Riffle-Pool	moderate	Good	Fair	High	F	I
UE04-A[A]	26.3	Narrow	62	--	--	--	--	--	--	C	C	Gravel	Riffle-Pool	low	Good	Good	High	--	--
UE04-B	26.3	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UE05	25.7	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UE06-A[A]	17.0	Narrow	50	--	--	--	--	--	--	C	C	Gravel	Riffle-Pool	low	Fair	Good	Very High	--	--
UE06-B	17.0	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UE06-C	17.0	Broad	50	61.5	1.6	98.4	38.4	9.5	1.0	C	C	Cobble	Riffle-Pool	low	Good	Good	Moderate	D	II c
UE07	16.7	Wetland/Pond	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UE08-A	16.6	Narrowly Conf.	49	69.3	1.5	104	46.2	1.1	4.2	C	F	Cobble	Riffle-Pool	low	Poor	Fair	Extreme	F	III
UE08-B	16.6	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UE08-C	16.6	Narrow	49	56.8	2.0	113.6	28.4	1.4	1.0	B	B	Cobble	Riffle-Pool	low	Good	Good	Moderate	F	I
UE08-D	16.6	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UE09	16.2	Wetland/Pond	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UE10	15.7	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UE11-A	7.8	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UE11-B[A]	7.8	Very Broad	34	--	--	--	--	--	--	E	E	Sand	Riffle-Pool	low	Reference	Good	High	--	--
UE12-A	7.6	Broad	34	29.7	2.5	74.3	11.9	2.2	1.0	C	C	Gravel	Riffle-Pool	low	Good	Good	High	D	II c
UE12-B	7.6	Broad	34	22.0	2.1	46.2	10.5	4.0	1.0	E	E	Gravel	Riffle-Pool	low	Good	Good	High	F	I
UE12-C[A]	7.6	Very Broad	34	--	--	--	--	--	--	E	E	Gravel	Riffle-Pool	moderate	Reference	Good	High	--	--
UE12-D[A]	7.6	Narrowly Conf.	34	--	--	--	--	--	--	G	G	Bedrock	Step Pool	low	Good	NA	Low	--	--
UE13	5.3	Wetland/Pond	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UE14-A	5.0	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UE14-B[A]	5.0	Very Broad	27		--	--	--	--	--	C	C	Gravel	Riffle-Pool	low	Reference	Good	High	--	--
UE14-C	5.0	Very Broad	27	17.8	1.3	23.1	13.7	7.5	1.0	C	C	Gravel	Riffle-Pool	moderate	Reference	Good	High	F	I
UE14-D	5.0	Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UE15-A	0.9	Semi Conf.	12	19.0	1.8	34.2	10.6	1.8	1.0	B	B	Cobble	Step Pool	low	Good	Fair	Moderate	F	I
UE15-B	0.9	Very Broad	12	20.7	1.35	27.9	15.3	29.5	1.6	C	C	Gravel	Riffle-Pool	low	Fair	Fair	High	F	II
UE15-C	0.9	Very Broad	12	8.8	1.0	8.7	8.9	2.0	2.0	Wetland or E	B	Sand/silt	Riffle-Pool	low	Fair	Poor	Extreme	F	II
UE15-D	0.9	Very Broad	12	33	0.6	21.12	51.6	3.2	1.0	D	D	Gravel	Braided	low	Good	Good	Extreme	F	I
UE16	0.5	Wetland/Pond	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

A Administrative judgment used for determining stream type, RGA, and RHA condition for impounded reaches
* RGA = Rapid Geomorphic Assessment, RHA = Rapid Habitat Assessment
† CEM = Channel Evolution Model
NA - not applicable

Summary of the Rapid Habitat Assessment (RHA) Values for Upper Exeter River, NH														
Reach Point ID	Bedform	Woody Debris Cover	Bed Substrate Cover	Scour and Depositional Features	Channel Morphology	Hydrologic Characteristics	Connectivity	River Banks		Riparian Area		Total Score	Percentage**	Habitat Condition
								Left Bank	Right Bank	Left Corridor	Right Corridor			
UE03-0	Riffle-pool	9	16	10	7	13	16	8	7	7	5	98	61%	Fair
UE06-C	Riffle-pool	12	17	12	13	13	11	8	7	9	9	111	69%	Good
UE08-A	Riffle-pool	8	16	11	4	8	7	6	3	4	1	68	43%	Fair
UE08-C	Riffle-pool	7	16	14	14	12	15	8	8	9	7	110	69%	Good
UE12-A	Riffle-pool	15	17	13	15	18	12	9	9	7	10	125	78%	Good
UE12-B	Riffle-pool	17	13	15	16	16	15	9	9	9	8	127	79%	Good
UE14-C	Riffle-pool	13	19	12	19	17	13	10	9	9	9	130	81%	Good
UE15-A	Step-pool	12	17	7	18	7	3	8	8	7	7	94	59%	Fair
UE15-B	Riffle-pool	8	14	11	13	8	9	7	7	5	5	87	54%	Fair
UE15-C	Riffle-pool	3	8	2	3	8	9	7	5	5	3	53	33%	Poor
UE15-D	Braided	13	18	12	11	9	11	8	8	8	10	108	68%	Good
Total Possible Score		**20**	**20**	**20**	**20**	**20**	**20**	**10**	**10**	**10**	**10**	**160**	**100%**	**Reference**

** Percentages are calculated from a reference RHA score of 160

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE01	Segment:	None	Completion Date:	21-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	6356	Segment Location:	Raymond, most downstream reach of Upper Exeter, mostly wetland.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		None	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest	
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	Residential	None	
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0	
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)			
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)	0	0	
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	84		0		4.1 Springs/ Seeps	Extensive		
height (ft)			Boulder	NA	%	Erosion Height (ft)	5.5				4.2 Adjacent Wetlands	Extensive		
Improved Paths	0	0	Cobble	NA	%	Revetment Type	None		None		4.3 Flow Status	Average		
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)					4.4 # of Debris Jams	2		
Development	144	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None		
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	80	0	20	80	4.6 Up/Downstream Flow Reg	None		
Hillside Slope	Hilly	Steep				**R** Trees (%)	80	0	20	80	4.7 Stormwater Inputs			
Continuous	Never	Never	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	70	0	80	20	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	70	0	80	20	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	41			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	1		
Valley Width (ft)		1100				**L** Herbs (%)	70	2	18	80	Affected Length (ft)	Unknown		
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	70	2	18	80	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Very Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	51-75		51-75			0	0	0
Human Caused Change?		Yes	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	1
2.1 Bankfull Width (ft)	NA		Stream Type:	E		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	Sand		Dominant	>150		>150			1	1	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	26-50		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	Riffle-Pool		Length <25 ft	117		117			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			**L** Trees (%)	80	0	20	80		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		E, Sand, Riffle-Pool			**R** Trees (%)	80	0	20	80		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks			**L** Shrub/Sapling (%)	30	0	0	100	5.5 Straightening	None		
			Typical Bank Slope	Steep		**R** Shrub/Sapling (%)	30	0	0	100	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8						**L** Herbs (%)	20	0	0	100				
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs (%)	20	0	0	100	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE01	Segment:	None	Completion Date:	21-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	6356	Segment Location:	Raymond, most downstream reach of Upper Exeter, mostly wetland.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Did not map lower 2500 feet of reach. Reach was too deep to walk, and was not accessible to paddle due to log/debris jams. Lots of wetland refuge. Reach is largely unimpacted and close to reference condition with very little bank erosion. Water usage: Pennichuck water works at lower end of reach. Very minor change in valley width at lower end of reach due to a road.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE02	Segment:	None	Completion Date:	21-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	7745	Segment Location:	Raymond, reach extends from just downstream of Hanson Road downstream to Blueberry Hill Road				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		None	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest	
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	Residential	None	
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0	
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)			
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)	0	0	
Roads	204	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	36		0		4.1 Springs/ Seeps	Extensive		
height (ft)			Boulder	NA	%	Erosion Height (ft)	2				4.2 Adjacent Wetlands	Extensive		
Improved Paths	0	0	Cobble	NA	%	Revetment Type	Multiple		None		4.3 Flow Status	Average		
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)	408				4.4 # of Debris Jams	3		
Development	555	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None		
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	60	0	50	50	4.6 Up/Downstream Flow Reg	None		
Hillside Slope	Steep	Steep				**R** Trees (%)	80	0	50	50	4.7 Stormwater Inputs			
Continuous	Never	Sometimes	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Sometimes	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	90	0	80	20	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	90	0	80	20	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	58			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	5		
Valley Width (ft)		650				**L** Herbs (%)	40	2	8	90	Affected Length (ft)	Unknown		
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	40	2	8	90	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	51-75		51-75			0	0	0
Human Caused Change?		Yes	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	E		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	Sand		Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	26-50		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	Riffle-Pool		Length <25 ft	326		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	70	0	40	60		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		E, sand, Riffle-Pool			R Trees (%)	70	0	40	60		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks			**L** Shrub/Sapling (%)	40	0	10	90	5.5 Straightening	None		
			Typical Bank Slope	Steep		**R** Shrub/Sapling (%)	40	0	10	90	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	50	0	0	100				
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	50	0	0	100	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE02	Segment:	0	Completion Date:	21-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	7745	Segment Location:	Raymond, reach extends from just downstream of Hanson Road downstream to Blueberry Hill Road				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	48	Yes	Yes	Yes	Yes

Problems: None

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0

Total Score: 0

Geomorphic Rating: 0

Channel Evolution Model 0

Channel Evolution Stage 0

Geomorphic Condition 0

Stream Sensitivity 0

Channel Adjustment Processes Narrative

Notes:

Wetland with defined channel. Reach in good condition, minor influence on buffer from residential houses. Minor human caused change in valley width due to houses and roads.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE03	Segment:	None	Completion Date:	21-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	4284	Segment Location:	Chester, reach runs along Shepard Home Road and Hanson Road				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	107	0
height (ft)	unknown	
Roads	3373	0
height (ft)	13	
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	171	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Never	Never
W/in 1 bankfull	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		600
Width Determination		Measured
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		Yes

Step 2. Stream Channel

2.1 Bankfull Width (ft)	84
2.1a Wetted Width (ft)	28.5
2.1b Ratio (wetted/bkfl)	0.34
2.2 Max Depth (ft)	3.3
2.3 Mean Depth (ft)	2.0
2.4 Floodprone Width (ft)	892
2.5 RAF	3.3
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		41.6
2.7 Entrenchment Ratio		10.6
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Mod (1.2-1.5)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing (ft)		400
2.12 Substrate Composition		
Bedrock	0	%
Boulder	3	%
Cobble	30	%
Coarse Gravel	26	%
Fine Gravel	5	%
Sand	36	%
Silt/Clay Present	Yes	
Embedded (chan)	14	%
Embedded (marg)	24	%
LWD #	28	
2.13 Average Largest Particle		
Bed	5	inches
Bar	NA	inches
2.13a % Subs. Exp.	25	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
C, Gravel, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks		
Typical Bank Slope	Steep	

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	24	37
Erosion Height (ft)	3	4
Revetment Type	Rip-rap	Rip-rap
Revetment Length (ft)	121	120

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	20	80
R Trees (%)	80	0	20	80

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	60	0	5	95
R Shrub/Sapling (%)	60	0	5	95

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	90	0	0	100
R Herbs (%)	90	0	0	100

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	0-25	0-25
Length <25 ft	260	386

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	20	80
R Trees (%)	80	0	20	80

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	40	0	0	100
R Shrub/Sapling (%)	40	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	60	0	0	100
R Herbs (%)	60	2	0	98

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	Residential
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Average
4.4 # of Debris Jams	1
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	2
	Diagonal	Delta	Island
	0	0	1

5.2 Other Features	Flood	NCO	Avulsion
	2	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	Straightening
Length (ft)	1683
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE03	Segment:	None	Completion Date:	21-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	4284	Segment Location:	Chester, reach runs along Shepard Home Road and Hanson Road				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	25	Yes	Yes	Yes	Yes

Problems: SA, SB, A

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	18	None	No
7.3 Widening Channel	12		No
7.4 Change in Planform	14		No

Total Score: 60

Geomorphic Rating: 0.75

Channel Evolution Model F

Channel Evolution Stage I

Geomorphic Condition Good (0.65-0.84)

Stream Sensitivity High

Channel Adjustment Processes Narrative

Minor widening and planform adjustment.

Notes:

Lower end of reach is more influenced by wetlands downstream. Road runs within corridor in places. Cross section measured at wider location in valley. Limited riffle habitat. Cross section was taken near upper end of the reach where there were a couple of defined riffles. The riffles were in wider locations than what was typical of the rest of the reach. The cross section was located on a flood chute, making the wide to depth ratio high.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE04	Segment:	A	Completion Date:	21-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	O	Rain:	No
Segment Length (ft):	498	Segment Location:	Downstream of Freemont Road crossing in Chester				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right		
1.1 Segmentation:		CD	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use				
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest		
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	None	Residential		
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0		
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)				
height (ft)			2.10 Riffle Type		NA	Material Type	Sand		Sand		Gullies (number)	0	0		
Roads	380	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)				
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**				
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive			
height (ft)			Boulder	NA	%	Erosion Height (ft)					4.2 Adjacent Wetlands	Present			
Improved Paths	0	0	Cobble	NA	%	Revetment Type	Rip-rap		Rip-rap		4.3 Flow Status	Average			
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)	54		55		4.4 # of Debris Jams	0			
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None			
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	65	0	20	80	4.6 Up/Downstream Flow Reg	None			
Hillside Slope	Very Steep	Very Steep				**R** Trees (%)	65	0	20	80	4.7 Stormwater Inputs				
Continuous	Sometimes	Never	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	1	
W/in 1 bankfull	Sometimes	Never	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	30	0	0	100	Urban Storm Pipe	0	Tile Drain	0	
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	30	0	0	100	Overland Flow	0	Other	0	
1.5 Valley Features			LWD (#)	5			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	0			
Valley Width (ft)		312				**L** Herbs (%)	80	0	0	100	Affected Length (ft)				
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	80	0	0	100	**Step 5. Channel Bed & Planform Changes**				
Confinement Type		Narrow	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side	
Rock Gorge?		No	Bar	NA	inches	Canopy %	76-100		76-100			0	0	1	
Human Caused Change?		Yes	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island	
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	1	0	
2.1 Bankfull Width (ft)	NA		Stream Type:	C		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion	
2.1a Wetted Width (ft)	NA		Bed Material:	Gravel		Dominant	>150		>150			1	0	0	
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	None		Sub-dominant	None		None			Braiding			
2.2 Max Depth (ft)	NA		Bed Form:	Riffle-Pool		Length <25 ft	81		80			0			
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts				
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	80	0	30	70		# SRs	# HCs	Trib Rejuv.	
2.5 RAF	NA		C, Gravel, Riffle-Pool			R Trees (%)	80	0	20	80		0	0	No	
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None	
			3.1 Stream Banks			**L** Shrub/Sapling (%)	20	0	0	100	5.5 Straightening	None			
			Typical Bank Slope	Steep		**R** Shrub/Sapling (%)	50	0	0	100	Length (ft)				
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None			
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	30	0	0	100					
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	80	0	0	100	Bridge and Culvert Survey	Yes			

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE04	Segment:	A	Completion Date:	21-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	O	Rain:	No
Segment Length (ft):	498	Segment Location:	Downstream of Freemont Road crossing in Chester				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	23.1	Yes	Yes	Yes	Yes

Problems: SA, SB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Segment is stable, right bank floods regularly all the way to valley wall (road). Numerous flood chutes and low spots in flood plain. Very high width/depth ratio (bankfull width too wide for cross section). Width of active channel is 42 feet. Segment is in good condition, some encroachment from road, no significant stormwater problems. Channel constriction is double culvert with scour above and below.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE04	Segment:	B	Completion Date:	6-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	5680	Segment Location:	Freemont Road crossing in Chester				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right		
1.1 Segmentation:		PS	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use				
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest		
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	Residential	Residential		
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0		
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)				
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)	0	0		
Roads	983	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)				
height (ft)	unknown		2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**				
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive			
height (ft)			Boulder	NA	%	Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive			
Improved Paths	0	0	Cobble	NA	%	Revetment Type	None		None		4.3 Flow Status	Average			
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)					4.4 # of Debris Jams	0			
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None			
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	80	0	70	30	4.6 Up/Downstream Flow Reg	None			
Hillside Slope	Very Steep	Very Steep				**R** Trees (%)	80	0	70	30	4.7 Stormwater Inputs				
Continuous	Never	Never	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0	
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	70	0	90	10	Urban Storm Pipe	2	Tile Drain	0	
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	70	0	90	10	Overland Flow	0	Other	0	
1.5 Valley Features			LWD (#)	NA			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	0			
Valley Width (ft)		595				**L** Herbs (%)	100	0	10	90	Affected Length (ft)				
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	100	0	10	90	**Step 5. Channel Bed & Planform Changes**				
Confinement Type		NA	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side	
Rock Gorge?		No	Bar	NA	inches	Canopy %	76-100		76-100			0	0	0	
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island	
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0	
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion	
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>150		>150			0	0	0	
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	0-25		51-100			Braiding			
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	263		0			0			
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts				
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	90	0	70	30		# SRs	# HCs	Trib Rejuv.	
2.5 RAF	NA		Wetland			R Trees (%)	90	0	70	30		0	0	No	
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None	
			3.1 Stream Banks			**L** Shrub/Sapling (%)	30	0	0	100	5.5 Straightening	None			
			Typical Bank Slope	Shallow		**R** Shrub/Sapling (%)	30	0	0	100	Length (ft)				
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None			
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	10	0	0	100					
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	10	0	0	100	Bridge and Culvert Survey	Yes			

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE04	Segment:	B	Completion Date:	6-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	5680	Segment Location:	Freemont Road crossing in Chester				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	26.8	Yes	Yes	Yes	Yes

Problems: None

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Segment is wetland, relatively unimpacted. Minor stormwater inputs at Freemont Road bridge.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE05	Segment:	None	Completion Date:	6-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	30464	Segment Location:	Long wetland reach in Sandown and Chester				

Step 1. Valley and Floodplain

1.1 Segmentation:		PS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	164	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Hilly
Continuous	Never	Never
W/in 1 bankfull	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		1701
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		NA
2.10 Riffle Type		NA
2.11 Riffle Step Spacing (ft)		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
LWD (#)	NA	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	NA	
Bed Material:	NA	
Subclass Slope:	NA	
Bed Form:	NA	
Field Measured Slope:		
2.15 Reference Stream Type		
Wetland		

Step 3. Riparian Features

3.1 Stream Banks		
Typical Bank Slope	Shallow	

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt	Silt
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)		
Revetment Type	None	None
Revetment Length (ft)		

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	80	20
R Trees (%)	80	0	80	20

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	80	0	70	30
R Shrub/Sapling (%)	80	0	70	30

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	20	1	0	99
R Herbs (%)	40	1	0	99

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	51-100	51-100
Length <25 ft	0	150

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	70	0	70	30
R Trees (%)	70	0	70	30

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	20	0	0	100
R Herbs (%)	20	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	Residential
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	None	
Length (ft)		
5.5 Dredging	None	
Bridge and Culvert Survey	Yes	

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE05	Segment:	None	Completion Date:	6-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	30464	Segment Location:	Long wetland reach in Sandown and Chester				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	7.5	Yes	Yes	Yes	Yes
Problems:	SB				
Bridge	65	Yes	Yes	Yes	Yes
Problems:	None				
Culvert	21	Yes	Yes	Yes	Yes
Problems:	SB				
Culvert	12	Yes	Yes	Yes	Yes
Problems:	SB				

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Long reach entirely wetlands. Relatively unimpacted, Sandown Road crossing in Sandown is in poor shape. Road is closed and water is rushing over much of the road, and at far end of road culvert is washed out and road is destroyed. Another bridge is just downstream of the culvert for the former railroad trail, not a maintained road. Minimal impacts to reach, minor encroachment and lack of buffer in area near Sandown Road culverts in Freemont.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE06	Segment:	A	Completion Date:	20-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	O	Rain:	No
Segment Length (ft):	896	Segment Location:	Sandown, downstream of Odell Road up to start of wetland above old dam structure.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		CD	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant		Forest	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant		None	None
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)		0	0
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)			
height (ft)			2.10 Riffle Type		NA	Material Type	Gravel		Gravel		Gullies (number)		0	0
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps		Present	
height (ft)			Boulder	NA	%	Erosion Height (ft)					4.2 Adjacent Wetlands		Present	
Improved Paths	0	0	Cobble	NA	%	Revetment Type	Multiple		Rip-rap		4.3 Flow Status		Average	
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)	279		110		4.4 # of Debris Jams		0	
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type		None	
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	70	0	60	40	4.6 Up/Downstream Flow Reg		None	
Hillside Slope	Very Steep	Steep				**R** Trees (%)	85	0	90	10	4.7 Stormwater Inputs			
Continuous	Sometimes	Sometimes	Silt/Clay Present	No			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Sometimes	Sometimes	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	70	0	10	90	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	20	0	10	90	Overland Flow	1	Other	0
1.5 Valley Features			LWD (#)	15			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		0	
Valley Width (ft)		250				**L** Herbs (%)	70	2	20	78	Affected Length (ft)			
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	50	2	20	78	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Narrow	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	51-75		76-100			0	0	2
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Closed					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	2
2.1 Bankfull Width (ft)	NA		Stream Type:	C		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	Gravel		Dominant	>150		>150			2	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	Riffle-Pool		Length <25 ft	59		80			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	70	0	60	40		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		C, Gravel, Riffle-Pool			R Trees (%)	90	0	90	10		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks			**L** Shrub/Sapling (%)	40	0	0	100	5.5 Straightening	None		
			Typical Bank Slope	Steep		**R** Shrub/Sapling (%)	10	0	0	100	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None	
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	50	2	0	98				
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	20	2	0	98	Bridge and Culvert Survey		Yes	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE06	Segment:	A	Completion Date:	20-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	O	Rain:	No
Segment Length (ft):	896	Segment Location:	Sandown, downstream of Odell Road up to start of wetland above old dam structure.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	15	Yes	Yes	Yes	Yes
Problems: SB					
Other	20	Yes	No	Yes	
Problems: A					

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Reason for segmentation is due to large influence from wetland below, although segment does have a defined channel. "Other" constriction is an old dam in ruins. Segment is influenced by wetlands downstream, no riffles in segment for cross section. Narrowly confined at top of segment (120 feet valley width), unconfined rest of segment. Culvert has gravel-cobble sized rip rap falling into channel that could be replaced with vegetation.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE06	Segment:	B	Completion Date:	20-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	1034	Segment Location:	Sandown, upstream of Odell Road and below channel segment downstream of Densen Dam				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right		
1.1 Segmentation:		CD	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use				
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest		
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	None	None		
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0		
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)				
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)	0	0		
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)				
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**				
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		40		4.1 Springs/ Seeps	Extensive			
height (ft)			Boulder	NA	%	Erosion Height (ft)			2		4.2 Adjacent Wetlands	Extensive			
Improved Paths	0	0	Cobble	NA	%	Revetment Type	None		None		4.3 Flow Status	Average			
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)					4.4 # of Debris Jams	0			
Development	43	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None			
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	80	0	20	80	4.6 Up/Downstream Flow Reg	None			
Hillside Slope	Very Steep	Steep				**R** Trees (%)	80	0	20	80	4.7 Stormwater Inputs				
Continuous	Never	Sometimes	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0	
W/in 1 bankfull	Never	Sometimes	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	80	0	20	80	Urban Storm Pipe	0	Tile Drain	0	
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	80	0	20	80	Overland Flow	0	Other	0	
1.5 Valley Features			LWD (#)	NA			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	2			
Valley Width (ft)		540				**L** Herbs (%)	90	5	20	75	Affected Length (ft)	Unknown			
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	90	5	20	75	**Step 5. Channel Bed & Planform Changes**				
Confinement Type		NA	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side	
Rock Gorge?		No	Bar	NA	inches	Canopy %	51-75		51-75			0	0	0	
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island	
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0	
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion	
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>150		>150			0	0	0	
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	None		None			Braiding			
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	0		0			0			
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts				
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	80	0	30	70		# SRs	# HCs	Trib Rejuv.	
2.5 RAF	NA		Wetland			R Trees (%)	90	0	40	60		0	0	No	
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None	
			3.1 Stream Banks			**L** Shrub/Sapling (%)	30	0	0	100	5.5 Straightening	None			
			Typical Bank Slope	Moderate		**R** Shrub/Sapling (%)	30	0	0	100	Length (ft)				
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None			
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	50	0	0	100					
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	20	0	0	100	Bridge and Culvert Survey	Yes			

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE06	Segment:	B	Completion Date:	20-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	1034	Segment Location:	Sandown, upstream of Odell Road and below channel segment downstream of Densen Dam				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Wetland segment, unimpacted and in reference condition.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE06	Segment:	C	Completion Date:	20-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	1057	Segment Location:	Sandown below Densen Pond and above wetland				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous	Never	Never
W/in 1 bankfull	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		450
Width Determination		Measured
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	61.5
2.1a Wetted Width (ft)	29.7
2.1b Ratio (wetted/bkfl)	0.48
2.2 Max Depth (ft)	2.7
2.3 Mean Depth (ft)	1.6
2.4 Floodprone Width (ft)	582
2.5 RAF	2.7
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		38.4
2.7 Entrenchment Ratio		9.5
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing (ft)		134
2.12 Substrate Composition		
Bedrock	0	%
Boulder	6	%
Cobble	46	%
Coarse Gravel	28	%
Fine Gravel	1	%
Sand	19	%
Silt/Clay Present	No	
Embedded (chan)	26	%
Embedded (marg)	35	%
LWD #	11	
2.13 Average Largest Particle		
Bed	5.5	inches
Bar	2.7	inches
2.13a % Subs. Exp.	10	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Cobble	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
C, Cobble, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	40
Erosion Height (ft)		2
Revetment Type	None	Rip-rap
Revetment Length (ft)		28

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	50	50
R Trees (%)	80	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	0	100
R Shrub/Sapling (%)	10	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	70	0	0	100
R Herbs (%)	70	0	0	100

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	None	None
Length <25 ft	0	29

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	60	40
R Trees (%)	80	0	60	40

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	0	100
R Shrub/Sapling (%)	10	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	30	0	0	100
R Herbs (%)	30	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	Upstream

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	1	4
	Diagonal	Delta	Island
	0	0	1

5.2 Other Features	Flood	NCO	Avulsion
	2	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	None	
Length (ft)		
5.5 Dredging	None	
Bridge and Culvert Survey	Yes	

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE06	Segment:	C	Completion Date:	20-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	1057	Segment Location:	Sandown below Densen Pond and above wetland				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	41.9	Yes	Yes	Yes	Yes

Problems: None

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	16	None	No
7.3 Widening Channel	14		No
7.4 Change in Planform	13		No

Total Score: 59

Geomorphic Rating: 0.74

Channel Evolution Model F

Channel Evolution Stage I

Geomorphic Condition Good (0.65-0.84)

Stream Sensitivity Moderate

Channel Adjustment Processes Narrative

Minor widening and planform adjustment due to dam upstream.

Notes:

Constriction is a foot bridge. Island is due to Densen Dam in upstream reach. Segment has good floodplain access and looks very stable. Some minor lateral bank erosion. High width to depth ratio is due to flood chute.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE07	Segment:	None	Completion Date:	8-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	I	Rain:	Yes
Segment Length (ft):	1063	Segment Location:	Densen Pond near Mark Traeger's house				

Step 1. Valley and Floodplain

1.1 Segmentation:		PS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	409	0
height (ft)	9	
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous	Never	Never
W/in 1 bankfull	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		353
Width Determination		Estimated
Confinement Type		NA
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		NA
2.10 Riffle Type		NA
2.11 Riffle Step Spacing (ft)		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
LWD (#)	NA	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	NA	
Bed Material:	NA	
Subclass Slope:	NA	
Bed Form:	NA	
Field Measured Slope:		
2.15 Reference Stream Type		
Pond		

Step 3. Riparian Features

3.1 Stream Banks				
Typical Bank Slope	Steep			
Step 3. (Cont'd)				
Bank Texture	Left		Right	
Upper				
Material Type	Sand		Sand	
Consistency	Non-cohesive		Non-cohesive	
Lower				
Material Type	Sand		Sand	
Consistency	Non-cohesive		Non-cohesive	
Bank Erosion	Left		Right	
Erosion Length (ft)	0		0	
Erosion Height (ft)				
Revetment Type	Rip-rap		None	
Revetment Length (ft)	96			
Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	50	0	0	100
R Trees (%)	70	0	30	70
	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	70	0	90	10
R Shrub/Sapling (%)	80	0	90	10
	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	80	0	50	50
R Herbs (%)	80	0	20	80
Bank Canopy	Left		Right	
Canopy %	51-75		76-100	
Mid-channel canopy	Open			
3.2 Riparian Buffer				
Buffer Width	Left		Right	
Dominant	>150		>150	
Sub-dominant	0-25		51-100	
Length <25 ft	299		0	
Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	90	0	50	50
R Trees (%)	90	0	50	50
	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	20	0	0	100
R Shrub/Sapling (%)	20	0	0	100
	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	30	0	20	80
R Herbs (%)	20	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	Recreation
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	
Field Ditch 0	Road Ditch 0
Urban Storm Pipe 0	Tile Drain 0
Overland Flow 0	Other 0
4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts			
	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	Straightening
Length (ft)	230
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE07	Segment:	None	Completion Date:	8-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	I	Rain:	Yes
Segment Length (ft):	1063	Segment Location:	Densen Pond near Mark Traeger's house				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS
Dam	DS end	8.5	7.5	Yes	No

4.8 Channel Constrictions Present

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.
Other	25	Yes	No	Yes	No

Problems:

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Other channel constriction is Densen Dam (also grade control). Densen Pond located along Mark Treager's property built 1760. Old mill foundations can be seen in floodplain downstream of dam. Much of the surrounding land is conserved.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE08	Segment:	A	Completion Date:	22-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	365	Segment Location:	Sandown near Fremont Road crossing and upstream of Densen Pond.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	170	176
height (ft)	9	11
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous	Sometimes	Sometimes
W/in 1 bankfull	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		125
Width Determination		Measured
Confinement Type		Semi-Confined
Rock Gorge?		No
Human Caused Change?		Yes

Step 2. Stream Channel

2.1 Bankfull Width (ft)	69.3
2.1a Wetted Width (ft)	28.5
2.1b Ratio (wetted/bkfl)	0.41
2.2 Max Depth (ft)	2.2
2.3 Mean Depth (ft)	1.46
2.4 Floodprone Width (ft)	77.3
2.5 RAF	9.2
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		47.5
2.7 Entrenchment Ratio		1.1
2.8 Incision Ratio		4.2
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Not Applicable
2.11 Riffle Step Spacing (ft)		NA
2.12 Substrate Composition		
Bedrock	0	%
Boulder	10	%
Cobble	49	%
Coarse Gravel	27	%
Fine Gravel	4	%
Sand	10	%
Silt/Clay Present	No	
Embedded (chan)	9	%
Embedded (marg)	22	%
LWD #	2	
2.13 Average Largest Particle		
Bed	6.4	inches
Bar	NA	inches
2.13a % Subs. Exp.	75	%
2.14 Stream Type		
Stream Type:	F	
Bed Material:	Cobble	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
C, Cobble, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks		
Typical Bank Slope	Steep	

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	40	0
Erosion Height (ft)	2	
Revetment Type	Multiple	Multiple
Revetment Length (ft)	162	255

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	20	80
R Trees (%)	10	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	30	0	80	20
R Shrub/Sapling (%)	10	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	80	10	20	70
R Herbs (%)	30	50	20	30

Bank Canopy	Left	Right
Canopy %	76-100	1-25
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	51-100	0-25
Sub-dominant	0-25	>150
Length <25 ft	353	226

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	20	80
R Trees (%)	0	0	0	0

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	20	0	0	100
R Shrub/Sapling (%)	0	0	0	0

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	20	0	10	90
R Herbs (%)	5	0	50	50

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Residential	Residential
Sub-dominant	Forest	Forest
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Minimum
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	1

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	Straightening
Length (ft)	352
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE08	Segment:	A	Completion Date:	22-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	365	Segment Location:	Sandown near Fremont Road crossing and upstream of Densen Pond.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	13.8	Yes	Yes	Yes	Yes
Problems: SA, SB, A					
Other	22	Yes	No	Yes	Yes
Problems: DB, SA					

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	2	C to F	Yes
7.2 Channel Aggradation	8	None	No
7.3 Widening Channel	3		Yes
7.4 Change in Planform	5		No

Total Score: 18

Geomorphic Rating: 0.225

Channel Evolution Model F

Channel Evolution Stage III

Geomorphic Condition Poor (0.0-0.34)

Stream Sensitivity Extreme

Channel Adjustment Processes Narrative

Extreme historic degradation and widening due to old dam. Extreme planform adjustment resulting in split flow. Major aggradation below derelict dam. Riprap is preventing the channel from widening futher.

Notes:

"Other" constriction is an old dam in ruins. Might be a potential dam removal project. Dam has caused extreme channel adjustment. Cross section was very wide, difficult to determine bankfull, difficult to string a level tape to measure from. Stream is unconfined by reference so unconfined RGA has been evaluated.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE08	Segment:	B	Completion Date:	22-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	1306	Segment Location:	Wetland upstream of old dam near Fremont Road in Sandown.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		PS	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant		Forest	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant		None	None
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)		0	0
Berms	50	0	2.9 Sinuosity		NA	Lower					Height (ft)			
height (ft)	3		2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)		0	0
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps		Present	
height (ft)			Boulder	NA	%	Erosion Height (ft)					4.2 Adjacent Wetlands		Extensive	
Improved Paths	0	0	Cobble	NA	%	Revetment Type	None		None		4.3 Flow Status		Average	
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)					4.4 # of Debris Jams		0	
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type		None	
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	80	0	20	80	4.6 Up/Downstream Flow Reg		None	
Hillside Slope	Very Steep	Very Steep				**R** Trees (%)	80	0	20	80	4.7 Stormwater Inputs			
Continuous	Sometimes	Never	Silt/Clay Present	No			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Sometimes	Sometimes	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	50	1	19	80	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	50	1	19	80	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	11			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		0	
Valley Width (ft)		300				**L** Herbs (%)	20	0	0	100	Affected Length (ft)			
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	100	0	10	90	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	76-100		76-100			0	0	0
Human Caused Change?		Yes	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	85	0	70	30		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		Wetland			R Trees (%)	85	0	50	50		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks			**L** Shrub/Sapling (%)	20	0	0	100	5.5 Straightening	None		
			Typical Bank Slope	Steep		**R** Shrub/Sapling (%)	20	30	0	70	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None	
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	20	0	0	100				
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs (%)	20	30	0	70	Bridge and Culvert Survey		Yes	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE08	Segment:	B	Completion Date:	22-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	1306	Segment Location:	Wetland upstream of old dam near Fremont Road in Sandown.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Wetland, generally unimpacted, good to reference condition. Minor human caused change in valley width due to Fremont Road.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE08	Segment:	C	Completion Date:	22-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	950	Segment Location:	Sandown, channel segment between wetlands DS Phillips Road and US Fremont Road.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	569	0
height (ft)	3	
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous	Always	Never
W/in 1 bankfull	Always	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		300
Width Determination		Measured
Confinement Type		Narrow
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	56.8
2.1a Wetted Width (ft)	32
2.1b Ratio (wetted/bkfl)	0.56
2.2 Max Depth (ft)	3.1
2.3 Mean Depth (ft)	2
2.4 Floodprone Width (ft)	78.8
2.5 RAF	3.1
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		28.4
2.7 Entrenchment Ratio		1.4
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing (ft)		172
2.12 Substrate Composition		
Bedrock	0	%
Boulder	21	%
Cobble	38	%
Coarse Gravel	28	%
Fine Gravel	7	%
Sand	6	%
Silt/Clay Present	No	
Embedded (chan)	17	%
Embedded (marg)	30	%
LWD #	5	
2.13 Average Largest Particle		
Bed	7.9	inches
Bar	5.5	inches
2.13a % Subs. Exp.	30	%
2.14 Stream Type		
Stream Type:	B	
Bed Material:	Cobble	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
B, Cobble, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks	
Typical Bank Slope	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)		
Revetment Type	Hard Bank	Hard Bank
Revetment Length (ft)	25	25

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	70	0	0	100
R Trees (%)	70	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	50	0	0	100
R Shrub/Sapling (%)	50	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	70	0	0	100
R Herbs (%)	70	0	0	100

Bank Canopy	Left	Right
Canopy %	51-75	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer		
Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	None	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	70	0	10	90
R Trees (%)	70	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	20	0	0	100
R Shrub/Sapling (%)	20	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	40	0	0	100
R Herbs (%)	40	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Minimum
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	
Field Ditch 0	Road Ditch 0
Urban Storm Pipe 0	Tile Drain 0
Overland Flow 0	Other 0
4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	1
	Diagonal	Delta	Island
	0	0	2

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing: None

5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE08	Segment:	C	Completion Date:	22-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	950	Segment Location:	Sandown, channel segment between wetlands DS Phillips Road and US Fremont Road.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Old abutment	13	Yes	No	Yes	Yes

Problems: SB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	19	None	No
7.2 Channel Aggradation	16	None	No
7.3 Widening Channel	15		No
7.4 Change in Planform	14		No

Total Score: 64

Geomorphic Rating: 0.80

Channel Evolution Model F

Channel Evolution Stage I

Geomorphic Condition Good (0.65-0.84)

Stream Sensitivity Moderate

Channel Adjustment Processes Narrative

Minor widening and planform adjustment.

Notes:

Channel segment is located between wetlands. Segment is unimpacted. Remnant old bridge abutment at top of segment, evidence of old berm/rock wall property boundary along right bank. Good condition.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE08	Segment:	D	Completion Date:	22-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	446	Segment Location:	Wetland downstream of Phillips Road in Sandown.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right		
1.1 Segmentation:		PS	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use				
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest		
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	None	None		
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0		
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)				
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)	0	0		
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)				
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**				
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive			
height (ft)			Boulder	NA	%	Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive			
Improved Paths	0	0	Cobble	NA	%	Revetment Type	Rip-rap		Rip-rap		4.3 Flow Status	Average			
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)	34		28		4.4 # of Debris Jams	0			
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None			
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	70	0	10	90	4.6 Up/Downstream Flow Reg	None			
Hillside Slope	Very Steep	Steep				**R** Trees (%)	70	0	10	90	4.7 Stormwater Inputs				
Continuous	Never	Never	Silt/Clay Present	No			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0	
W/in 1 bankfull	Sometimes	Never	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	80	0	20	80	Urban Storm Pipe	0	Tile Drain	0	
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	80	0	20	80	Overland Flow	0	Other	0	
1.5 Valley Features			LWD (#)	0			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	0			
Valley Width (ft)		300				**L** Herbs (%)	90	0	10	90	Affected Length (ft)				
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	90	0	10	90	**Step 5. Channel Bed & Planform Changes**				
Confinement Type		Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side	
Rock Gorge?		No	Bar	NA	inches	Canopy %	76-100		76-100			0	0	0	
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island	
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0	
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion	
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>150		>150			0	0	0	
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	51-100		None			Braiding			
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	0		0			0			
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts				
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	70	0	20	80		# SRs	# HCs	Trib Rejuv.	
2.5 RAF	NA		Wetland			R Trees (%)	70	0	20	80		0	0	No	
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None	
			3.1 Stream Banks			**L** Shrub/Sapling (%)	40	0	0	100	5.5 Straightening	None			
			Typical Bank Slope	Steep		**R** Shrub/Sapling (%)	40	0	0	100	Length (ft)				
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None			
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	40	0	10	90					
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	90	0	10	90	Bridge and Culvert Survey	Yes			

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE08	Segment:	D	Completion Date:	22-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	446	Segment Location:	Wetland downstream of Phillips Road in Sandown.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	11	Yes	Yes	Yes	Yes

Problems: SA, SB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Wetland, mostly unimpacted except for road crossing, good condition.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE09	Segment:	None	Completion Date:	8-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	I	Rain:	Yes
Segment Length (ft):	1985	Segment Location:	Lilly Pond near Phillips Road in Sandown				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*						3.3 Riparian Corridor		Left		Right
1.1 Segmentation:		None	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right			Corridor Land Use				
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper						Dominant		Forest		Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand			Sub-dominant		None		Residential
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive			Mass Failures (ft)		0		0
Berms	0	0	2.9 Sinuosity		NA	Lower						Height (ft)				
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt			Gullies (number)		0		0
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive			Height (ft)				
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right			**Step 4. Flow & Flow Modifiers**				
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		0			4.1 Springs/ Seeps		Extensive		
height (ft)			Boulder	NA	%	Erosion Height (ft)						4.2 Adjacent Wetlands		Extensive		
Improved Paths	0	0	Cobble	NA	%	Revetment Type	None		None			4.3 Flow Status		Average		
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)						4.4 # of Debris Jams		0		
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous		4.5 Flow Reg Type		None		
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	80	0	25	75		4.6 Up/Downstream Flow Reg		None		
Hillside Slope	Very Steep	Steep				**R** Trees (%)	80	0	25	75		4.7 Stormwater Inputs				
Continuous	Never	Never	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings		Field Ditch	0	Road Ditch		0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	70	0	5	95		Urban Storm Pipe	0	Tile Drain		0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	70	0	5	95		Overland Flow	0	Other		0
1.5 Valley Features			LWD (#)	NA			% Cover	Invasive	Grasses	Forbs		4.9 # of Beaver Dams		0		
Valley Width (ft)		646				**L** Herbs (%)	40	0	5	95		Affected Length (ft)				
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	40	0	5	95		**Step 5. Channel Bed & Planform Changes**				
Confinement Type		NA	Bed	NA	inches	*Bank Canopy*	Left		Right			5.1 Bar Types	Mid	Point		Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	76-100		76-100				0	0		0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open						Diagonal	Delta		Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer							0	0		0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right			5.2 Other Features	Flood	NCO		Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>150		>150				0	0		0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	None		51-100				Braiding			
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	0		0				0			
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous		5.3 Steep Riffles & Headcuts				
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	90	0	50	50			# SRs	# HCs		Trib Rejuv.
2.5 RAF	NA		Pond			R Trees (%)	70	0	50	50			0	0		No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings		5.4 Stream Ford or Animal Crossing:				None
			3.1 Stream Banks			**L** Shrub/Sapling (%)	20	0	0	100		5.5 Straightening	None			
			Typical Bank Slope	Steep		**R** Shrub/Sapling (%)	20	0	0	100		Length (ft)				
							% Cover	Invasive	Grasses	Forbs		5.5 Dredging		None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	25	0	0	100						
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	25	0	0	100		Bridge and Culvert Survey		Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE09	Segment:	None	Completion Date:	8-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	I	Rain:	Yes
Segment Length (ft):	1985	Segment Location:	Lilly Pond near Phillips Road in Sandown				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Natural onstream pond due to slope (Lilly Pond). Much of the surrounding land is conserved.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE10	Segment:	None	Completion Date:	22-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	4385	Segment Location:	Wetland near Main Street in Sandown.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Never	Never
W/in 1 bankfull	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		724
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		NA
2.10 Riffle Type		NA
2.11 Riffle Step Spacing (ft)		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt/Clay Present	No	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
LWD (#)	0	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	NA	
Bed Material:	NA	
Subclass Slope:	NA	
Bed Form:	NA	
Field Measured Slope:		
2.15 Reference Stream Type		
Wetland		

Step 3. Riparian Features

3.1 Stream Banks	
Typical Bank Slope	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt	Silt
Consistency	Non-cohesive	Non-cohesive
Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)		
Revetment Type	None	None
Revetment Length (ft)		

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	0	100
R Trees (%)	80	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	100	0	80	20
R Shrub/Sapling (%)	100	0	80	20

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	100	0	10	90
R Herbs (%)	100	0	10	90

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	26-50	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	20	80
R Trees (%)	80	0	20	80

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	40	0	10	90
R Shrub/Sapling (%)	40	0	10	90

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	50	0	0	100
R Herbs (%)	50	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	1
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	1
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE10	Segment:	None	Completion Date:	22-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	4385	Segment Location:	Wetland near Main Street in Sandown.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	19	Yes	Yes	Yes	Yes

Problems: SA, SB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Wetland, unimpacted except for road crossing, reference condition. Landowner said there is a beaver dam in reach.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE11	Segment:	A	Completion Date:	20-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	3187	Segment Location:	Wetland located downstream of Wells Village Road in Sandown.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right			
1.1 Segmentation:		CD	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use					
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest			
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Silt		Silt		Sub-dominant	None	None			
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0			
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)					
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)	0	0			
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)					
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**					
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive				
height (ft)			Boulder	NA	%	Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive				
Improved Paths	0	0	Cobble	NA	%	Revetment Type	None		None		4.3 Flow Status	Average				
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)					4.4 # of Debris Jams	0				
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None				
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	80	0	20	80	4.6 Up/Downstream Flow Reg	None				
Hillside Slope	Very Steep	Very Steep				**R** Trees (%)	80	0	0	100	4.7 Stormwater Inputs					
Continuous	Never	Never	Silt/Clay Present	No			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0		
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	100	0	0	100	Urban Storm Pipe	0	Tile Drain	0		
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	100	0	0	100	Overland Flow	0	Other	0		
1.5 Valley Features			LWD (#)	0			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	0				
Valley Width (ft)		600				**L** Herbs (%)	100	10	40	50	Affected Length (ft)					
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	100	10	40	50	**Step 5. Channel Bed & Planform Changes**					
Confinement Type		NA	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side		
Rock Gorge?		No	Bar	NA	inches	Canopy %	51-75		51-75			0	0	0		
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island		
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0		
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion		
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>150		>150			0	0	0		
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	None		None			Braiding				
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	0		0			0				
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts					
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	90	0	20	80		# SRs	# HCs	Trib Rejuv.		
2.5 RAF	NA		Wetland			R Trees (%)	90	0	20	80		0	0	No		
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None		
			3.1 Stream Banks			**L** Shrub/Sapling (%)	40	0	0	100	5.5 Straightening	None				
			Typical Bank Slope	Shallow		**R** Shrub/Sapling (%)	40	0	0	100	Length (ft)					
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None				
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	70	0	0	100						
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	70	0	0	100	Bridge and Culvert Survey	Yes				

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE11	Segment:	A	Completion Date:	20-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	3187	Segment Location:	Wetland located downstream of Wells Village Road in Sandown.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Wetland, remotely located and unimpacted. Reference condition.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE11	Segment:	B	Completion Date:	20-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	O	Rain:	No
Segment Length (ft):	1808	Segment Location:	Channel influenced by wetland located downstream of Wells Village Road in Sandown.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	X. Steep	X. Steep
Continuous	Sometimes	Sometimes
W/in 1 bankfull	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		400
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		NA
2.10 Riffle Type		NA
2.11 Riffle Step Spacing (ft)		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
LWD (#)	68	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	NA	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
E,Sand, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks		
Typical Bank Slope	Steep	

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt	Silt
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	62
Erosion Height (ft)		3.5
Revetment Type	None	None
Revetment Length (ft)		

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	70	0	50	50
R Trees (%)	70	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	0	100
R Shrub/Sapling (%)	10	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	70	0	0	100
R Herbs (%)	70	0	0	100

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	None	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	90	0	80	20
R Trees (%)	90	0	80	20

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	5	0	0	100
R Shrub/Sapling (%)	5	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	10	0	0	100
R Herbs (%)	10	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Average
4.4 # of Debris Jams	3
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	
Field Ditch	0
Road Ditch	0
Urban Storm Pipe	0
Tile Drain	0
Overland Flow	0
Other	0
4.9 # of Beaver Dams	4
Affected Length (ft)	966

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	1	2	2
	Diagonal	Delta	Island
	0	1	0

5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	None	
Length (ft)		
5.5 Dredging	None	
Bridge and Culvert Survey	Yes	

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE11	Segment:	B	Completion Date:	20-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	O	Rain:	No
Segment Length (ft):	1808	Segment Location:	Channel influenced by wetland located downstream of Wells Village Road in Sandown.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Reason for not assessing segment was heavy influenced by wetland DS of segment. Reference condition, unimpacted. Lots of woody debris, soft underfoot. Good undercut banks, good refuge area, very little riffle coverage (only 30 feet).

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE12	Segment:	A	Completion Date:	19-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	4635	Segment Location:	Sandown near Wells Village Road.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height		
Roads	534	0
height	unknown	
Railroads	0	0
height		
Improved Paths	0	0
height		
Development	55	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		285
Width Determination		Measured
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		Yes

Step 2. Stream Channel

2.1 Bankfull Width (ft)	29.7
2.1a Wetted Width (ft)	25.9
2.1b Ratio (wetted/bkfl)	0.87
2.2 Max Depth (ft)	2.7
2.3 Mean Depth (ft)	2.5
2.4 Floodprone Width (ft)	65.2
2.5 RAF	2.7
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		12.1
2.7 Entrenchment Ratio		2.2
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing (ft)		162
2.12 Substrate Composition		
Bedrock	0	%
Boulder	2	%
Cobble	24	%
Coarse Gravel	35	%
Fine Gravel	17	%
Sand	22	%
Silt/Clay Present	No	
Embedded (chan)	6	%
Embedded (marg)	20	%
LWD #	82	
2.13 Average Largest Particle		
Bed	5.8	inches
Bar	3.2	inches
2.13a % Subs. Exp.	10	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
C, Gravel, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks		
Typical Bank Slope	Steep	

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	40	83
Erosion Height (ft)	4	3.5
Revetment Type	Hard Bank	Hard Bank
Revetment Length (ft)	43	

Near Bank Veg. Type	43	Invasive	Conifer	Deciduous
L Trees (%)	80	0	90	10
R Trees (%)	80	0	90	10

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	0	100
R Shrub/Sapling (%)	10	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	80	0	0	100
R Herbs (%)	80	0	0	100

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	51-100	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	90	0	80	20
R Trees (%)	90	0	80	20

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	30	0	0	100
R Shrub/Sapling (%)	30	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	10	0	0	100
R Herbs (%)	10	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Minimum
4.3 Flow Status	Average
4.4 # of Debris Jams	2
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	

Field Ditch	0	Road Ditch	2
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	5	1	12
	Diagonal	Delta	Island
	1	0	2

5.2 Other Features	Flood	NCO	Avulsion
	6	1	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	Straightening
Length (ft)	661
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE12	Segment:	A	Completion Date:	19-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	4635	Segment Location:	Sandown near Wells Village Road.				

1.6 Grade Controls

Type	Location	Present Total Ht (ft)	Ht Above (ft)	Photo	GPS
Waterfall	DS end	4.5	1.9	Yes	No

4.8 Channel Constrictions

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	9.9	Yes	Yes	Yes	Yes
Problems: DA, SA, SB					
Old abutme	18	Yes	No	Yes	Yes
Problems: SA					

Present

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type: Unconfined

	Score	STD	Historic
7.1 Channel Degradation	17	None	No
7.2 Channel Aggradation	9	None	No
7.3 Widening Channel	17		No
7.4 Change in Planform	11		No

Total Score: 54

Geomorphic Rating: 0.68

Channel Evolution Model: D

Channel Evolution Stage: II c

Geomorphic Condition: Good (0.65-0.84)

Stream Sensitivity: High

Channel Adjustment Processes Narrative

Major aggradation (mid-channel accumulation) minor planform adjustment (minor flood chutes and two islands). Aggradation associated with undersized culvert at Wells Village Road.

Notes:

Scour is within old abutment more than above it. Wells Village Road culvert is newly replaced and is causing major problems upstream. Lots of fine deposition above and huge scour pools above and below the structure.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE12	Segment:	B	Completion Date:	19-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	2288	Segment Location:	Sandown near Wells Village Road.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous	Sometimes	Sometimes
W/in 1 bankfull	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		170
Width Determination		Measured
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		Yes

Step 2. Stream Channel

2.1 Bankfull Width (ft)	22
2.1a Wetted Width (ft)	13.8
2.1b Ratio (wetted/bkfl)	0.63
2.2 Max Depth (ft)	3
2.3 Mean Depth (ft)	2.1
2.4 Floodprone Width (ft)	88.5
2.5 RAF	3
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		10.5
2.7 Entrenchment Ratio		4.0
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing (ft)		136
2.12 Substrate Composition		
Bedrock	0	%
Boulder	3	%
Cobble	22	%
Coarse Gravel	20	%
Fine Gravel	15	%
Sand	39	%
Silt/Clay Present	No	
Embedded (chan)	20	%
Embedded (marg)	60	%
LWD #	61	
2.13 Average Largest Particle		
Bed	5.1	inches
Bar	Sand	inches
2.13a % Subs. Exp.	10	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
E, Gravel, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks	
Typical Bank Slope	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	127	103
Erosion Height (ft)	6	6
Revetment Type	Hard Bank	Multiple
Revetment Length (ft)	67	117

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	50	50
R Trees (%)	80	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	100	2	90	8
R Shrub/Sapling (%)	100	2	90	8

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	40	2	20	78
R Herbs (%)	40	2	20	78

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer		
Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	None	0-25
Length <25 ft	0	155

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	85	0	80	20
R Trees (%)	85	0	80	20

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	20	0	0	100
R Shrub/Sapling (%)	20	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	10	0	0	100
R Herbs (%)	10	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	Residential
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	1	0
Height (ft)	Unknown	

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Average
4.4 # of Debris Jams	1
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	2
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	7
	Diagonal	Delta	Island
	1	1	5

5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts			
	# SRs	# HCs	Trib Rejuv.
	1	0	No

5.4 Stream Ford or Animal Crossing:	Stream Ford
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE12	Segment:	B	Completion Date:	19-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	2288	Segment Location:	Sandown near Wells Village Road.				

1.6 Grade Controls

Type	Location	Present Total Ht (ft)	Ht Above (ft)	Photo	GPS
Ledge	US end	1.5	0	Yes	No

4.8 Channel Constrictions

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Old abutment	18	Yes	No	Yes	Yes
Problems: A					
Old abutment	20	Yes	No	Yes	Yes
Problems: DB, SB					
Other	22	Yes	No	Yes	Yes
Problems: SA					

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type: Unconfined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	14	None	No
7.3 Widening Channel	16		No
7.4 Change in Planform	11		No

Total Score: 57

Geomorphic Rating: 0.71

Channel Evolution Model: F

Channel Evolution Stage: I

Geomorphic Condition: Good (0.65-0.84)

Stream Sensitivity: High

Channel Adjustment Processes Narrative

Minor localized planform adjustment due to old abutments and dams (constrictions); Minor human caused change in valley width due to old dam.

Notes:

Three old abutments and dam structures in segment ("other" is an old dam).

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE12	Segment:	C	Completion Date:	19-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	2211	Segment Location:	Wetland and influenced channel located downstream of bedrock gorge.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		VW	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant		Forest	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant		None	None
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)		0	0
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)			
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)		1	0
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	74		0		4.1 Springs/ Seeps		Extensive	
height (ft)			Boulder	NA	%	Erosion Height (ft)	7				4.2 Adjacent Wetlands		Extensive	
Improved Paths	0	0	Cobble	NA	%	Revetment Type	None		None		4.3 Flow Status		Average	
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)					4.4 # of Debris Jams		2	
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type		None	
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	40	0	50	50	4.6 Up/Downstream Flow Reg		None	
Hillside Slope	Very Steep	Very Steep				**R** Trees (%)	40	0	50	50	4.7 Stormwater Inputs			
Continuous	Never	Never	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Sometimes	Never	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	70	0	50	50	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	70	0	50	50	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	31			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		1	
Valley Width (ft)		400				**L** Herbs (%)	100	10	60	30	Affected Length (ft)		200	
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	100	10	60	30	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Very Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	51-75		51-75			0	0	1
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	1	0
2.1 Bankfull Width (ft)	NA		Stream Type:	E		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	Gravel		Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	Riffle-Pool		Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	80	0	80	20		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		E, Gravel, Riffle-Pool			R Trees (%)	70	0	80	20		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks			**L** Shrub/Sapling (%)	20	0	0	100	5.5 Straightening	None		
			Typical Bank Slope	Shallow		**R** Shrub/Sapling (%)	20	0	0	100	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None	
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	20	10	20	70				
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	20	10	20	70	Bridge and Culvert Survey		Yes	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE12	Segment:	C	Completion Date:	19-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	2211	Segment Location:	Wetland and influenced channel located downstream of bedrock gorge.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Segment strongly influenced by wetland. In reference condition.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE12	Segment:	D	Completion Date:	19-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	B	Rain:	No
Segment Length (ft):	639	Segment Location:	Bedrock channel located downstream of Deep Hole Road dam.				

Step 1. Valley and Floodplain

1.1 Segmentation:		VW
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Steep
Continuous	Sometimes	Sometimes
W/in 1 bankfull	Always	Always
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		30
Width Determination		Measured
Confinement Type		Narrowly-Confined
Rock Gorge?		Yes
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		NA
2.10 Riffle Type		NA
2.11 Riffle Step Spacing (ft)		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
LWD (#)	31	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	G	
Bed Material:	Bedrock	
Subclass Slope:	NA	
Bed Form:	Step Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
G, Bedrock, Step-Pool		G1

Step 3. Riparian Features

3.1 Stream Banks		
Typical Bank Slope	Steep	

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Bedrock	Bedrock
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)		
Revetment Type	Multiple	Hard Bank
Revetment Length (ft)	75	23

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	90	0	30	70
R Trees (%)	90	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	0	100
R Shrub/Sapling (%)	10	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	30	0	0	100
R Herbs (%)	30	0	0	100

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	None	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	90	0	40	60
R Trees (%)	90	0	40	60

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	20	0	0	100
R Shrub/Sapling (%)	20	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	10	0	0	100
R Herbs (%)	10	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	None
4.3 Flow Status	Average
4.4 # of Debris Jams	1
4.5 Flow Reg Type	Recreation
4.6 Up/Downstream Flow Reg	Upstream

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	4
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	Straightening
Length (ft)	47
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE12	Segment:	D	Completion Date:	19-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	B	Rain:	No
Segment Length (ft):	639	Segment Location:	Bedrock channel located downstream of Deep Hole Road dam.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS
Ledge	mid seg	1.5	1.4	Yes	No

4.8 Channel Constrictions Present

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.
Old abutment	7	Yes	No	Yes	Yes

Problems: DS, DB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Bedrock gorge, may have incised down to bedrock at one point. Good condition

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE13	Segment:	None	Completion Date:	6-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	I	Rain:	Yes
Segment Length (ft):	3095	Segment Location:	Impounded pond located off Deep Hole Road				

Step 1. Valley and Floodplain

1.1 Segmentation:		PS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height		
Roads	0	0
height		
Railroads	0	0
height		
Improved Paths	0	0
height		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous	Never	Never
W/in 1 bnkfl	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		1222
Width Determination		Estimated
Confinement Type		NA
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		NA
2.10 Riffle Type		NA
2.11 Riffle Step Spacing (ft)		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
LWD (#)	NA	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	NA	
Bed Material:	NA	
Subclass Slope:	NA	
Bed Form:	NA	
Field Measured Slope:		
2.15 Reference Stream Type		
Pond/Wetland		

Step 3. Riparian Features

3.1 Stream Banks	
Typical Bank Slope	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt	Silt
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)		
Revetment Type	None	None
Revetment Length (ft)		

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	100	0	95	5
R Trees (%)	100	0	95	5

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	50	50
R Shrub/Sapling (%)	10	0	50	50

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	90	0	30	70
R Herbs (%)	90	0	30	70

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	None	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	70	30
R Trees (%)	80	0	70	30

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	0	100
R Shrub/Sapling (%)	10	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	20	0	0	100
R Herbs (%)	20	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	Recreation
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	
Field Ditch	0
Road Ditch	0
Urban Storm Pipe	0
Tile Drain	0
Overland Flow	0
Other	0
4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE13	Segment:	None	Completion Date:	6-Aug-08
Organization:	BCE	Observers:	CS, MN	Why Not Assessed:	I	Rain:	Yes
Segment Length (ft):	3095	Segment Location:	Impounded pond located off Deep Hole Road				

1.6 Grade Controls — Present

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS
Dam	DS end	4.5	4.2	Yes	No

4.8 Channel Constrictions — Present

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.
Other	8.4	Yes	No	Yes	No

Problems: SB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0

Total Score: 0

Geomorphic Rating: 0

Channel Evolution Model 0

Channel Evolution Stage 0

Geomorphic Condition 0

Stream Sensitivity 0

Channel Adjustment Processes Narrative

Notes:

Pond is impounded by old dam (constriction and grade control). Spoke with landowner who pays tax on the dam. There appears to be a second dam downstream of the one in this reach at the outflow of the pond that is located in reach UE12. Difficult to access pond and dam, far from road. Looks like some development is starting at the end of Deep Hole Road, unsure of who is developing or how much development is planned.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE14	Segment:	A	Completion Date:	5-Aug-08
Organization:	BCE	Observers:	CS, MN, SS, SC	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	1235	Segment Location:	Wetland located downstream of power lines and upstream of pond in UE13.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		PS	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest	
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	None	None	
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0	
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)			
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)	0	0	
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)			
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive		
height (ft)			Boulder	NA	%	Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive		
Improved Paths	0	0	Cobble	NA	%	Revetment Type	None		None		4.3 Flow Status	Average		
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)					4.4 # of Debris Jams	0		
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None		
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	60	0	0	100	4.6 Up/Downstream Flow Reg	None		
Hillside Slope	Steep	Steep				**R** Trees (%)	50	0	0	100	4.7 Stormwater Inputs			
Continuous	Never	Never	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	70	0	80	20	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	70	0	80	20	Overland Flow	0	Other	0
1.5 Valley Features			LWD (#)	NA			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	1		
Valley Width (ft)		1200				**L** Herbs (%)	100	0	80	20	Affected Length (ft)			
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	100	0	80	20	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		NA	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	51-75		51-75			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>150		>150			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	None		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			**L** Trees (%)	80	0	30	70		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		Wetland			**R** Trees (%)	80	0	20	80		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks			**L** Shrub/Sapling (%)	20	0	5	95	5.5 Straightening	None		
			Typical Bank Slope	Shallow		**R** Shrub/Sapling (%)	20	0	5	95	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8						**L** Herbs (%)	40	0	0	100				
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs (%)	40	0	0	100	Bridge and Culvert Survey	Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE14	Segment:	A	Completion Date:	5-Aug-08
Organization:	BCE	Observers:	CS, MN, SS, SC	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	1235	Segment Location:	Wetland located downstream of power lines and upstream of pond in UE13.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Wetland segment in reference condition.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE14	Segment:	B	Completion Date:	5-Aug-08
Organization:	BCE	Observers:	CS, MN, SS, SC	Why Not Assessed:	I	Rain:	Yes
Segment Length (ft):	158	Segment Location:	Segment located downstream of powerline bridge, impacted by wetland segment, deep channel.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor		Left		Right
1.1 Segmentation:		PS	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use				
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant		Forest		Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant		None		None
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)		0		0
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)				
height (ft)			2.10 Riffle Type		NA	Material Type	Sand		Sand		Gullies (number)		0		0
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)				
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**				
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps		Extensive		
height (ft)			Boulder	NA	%	Erosion Height (ft)					4.2 Adjacent Wetlands		Extensive		
Improved Paths	0	0	Cobble	NA	%	Revetment Type	None		None		4.3 Flow Status		Average		
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)					4.4 # of Debris Jams		0		
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type		None		
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	70	0	10	90	4.6 Up/Downstream Flow Reg		None		
Hillside Slope	Hilly	Steep				**R** Trees (%)	70	0	0	100	4.7 Stormwater Inputs				
Continuous	Never	Never	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch		0
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	10	5	5	90	Urban Storm Pipe	0	Tile Drain		0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	20	5	5	90	Overland Flow	0	Other		0
1.5 Valley Features			LWD (#)	NA			% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		0		
Valley Width (ft)		750				**L** Herbs (%)	90	0	15	85	Affected Length (ft)				
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	90	0	5	95	**Step 5. Channel Bed & Planform Changes**				
Confinement Type		NA	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point		Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	76-100		51-75			0	0		0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta		Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0		0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO		Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>150		>150			0	0		0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	None		None			Braiding			
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	0		0			0			
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts				
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			L Trees (%)	80	0	30	70		# SRs	# HCs		Trib Rejuv.
2.5 RAF	NA		C4, Gravel, Riffle-Pool			R Trees (%)	80	0	60	40		0	0		No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:				None
			3.1 Stream Banks			**L** Shrub/Sapling (%)	15	0	0	100	5.5 Straightening	None			
			Typical Bank Slope	Shallow		**R** Shrub/Sapling (%)	20	0	0	100	Length (ft)				
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8						L Herbs (%)	70	0	0	100					
Channel Constrictions on Sheet 2 of this workbook.						R Herbs (%)	40	0	0	100	Bridge and Culvert Survey		Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE14	Segment:	B	Completion Date:	5-Aug-08
Organization:	BCE	Observers:	CS, MN, SS, SC	Why Not Assessed:	I	Rain:	Yes
Segment Length (ft):	158	Segment Location:	Segment located downstream of powerline bridge, impacted by wetland segment, deep channel.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Segment highly influenced by wetland segment downstream; deep channel; Two deep pools in only a couple hundred feet. This segment may be a borderline "E" channel. This was difficult to determine due to the wetland influence.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE14	Segment:	C	Completion Date:	5-Aug-08
Organization:	BCE	Observers:	CS, MN, SS, SC	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1168	Segment Location:	Segment located upstream of power lines and downstream of uppermost wetland segment in reach, Chester.				

Step 1. Valley and Floodplain

1.1 Segmentation:		PS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height		
Roads	0	0
height		
Railroads	0	0
height		
Improved Paths	0	0
height		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Never	Never
W/in 1 bnkfl	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		575
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	17.8
2.1a Wetted Width (ft)	9.2
2.1b Ratio (wetted/bkfl)	0.52
2.2 Max Depth (ft)	2.2
2.3 Mean Depth (ft)	1.3
2.4 Floodprone Width (ft)	133.5
2.5 RAF	2.2
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		14.0
2.7 Entrenchment Ratio		7.5
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		84
2.12 Substrate Composition		
Bedrock	0	%
Boulder	7	%
Cobble	27	%
Coarse Gravel	37	%
Fine Gravel	17	%
Sand	12	%
Silt/Clay Present	Yes	
Embedded (chan)	0	%
Embedded (marg)	20	%
LWD (#)	25	
2.13 Average Largest Particle		
Bed	3.7	inches
Bar	1.3	inches
2.13a % Subs. Exp.	10	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
C, Gravel, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	29	37
Erosion Height (ft)	2	10
Revetment Type	Rip-rap	Rip-rap
Revetment Length (ft)	10	10

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	70	0	70	30
R Trees (%)	70	0	70	30

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	5	0	0	100
R Shrub/Sapling (%)	5	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	100	0	0	100
R Herbs (%)	100	0	0	100

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	None	None
Length <25 ft	35	35

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	70	30
R Trees (%)	50	0	60	40

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	5	0	0	100
R Shrub/Sapling (%)	5	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	20	0	0	100
R Herbs (%)	40	0	10	90

3.3 Riparian Corridor

Corridor Land Use	Left	Right
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Average
4.4 # of Debris Jams	2
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	5	14
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	2	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

	# SRs	# HCs	Trib Rejuv.
	1	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE14	Segment:	C	Completion Date:	5-Aug-08
Organization:	BCE	Observers:	CS, MN, SS, SC	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1168	Segment Location:	Segment located upstream of power lines and downstream of uppermost wetland segment in reach, Chester.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	9.2	Yes	Yes	Yes	Yes

Problems: SB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	19	None	No
7.2 Channel Aggradation	18	None	No
7.3 Widening Channel	19		No
7.4 Change in Planform	16		No

Total Score: 72

Geomorphic Rating: 0.90

Channel Evolution Model F

Channel Evolution Stage I

Geomorphic Condition Reference (0.85-1.0)

Stream Sensitivity High

Channel Adjustment Processes Narrative

All reference condition.

Notes:

Segment is more sinuous than indicated by NHD layer. Extremely stable segment, dense moss cover on banks. Stable planform, good floodplain access. Good trees along bank, have not fallen to create woody debris cover because banks are so stable.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE14	Segment:	D	Completion Date:	23-Jul-08
Organization:	BCE	Observers:	CS, MN, DS	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	1701	Segment Location:	Wetland located near Sandown Road in Chester				

Step 1. Valley and Floodplain

1.1 Segmentation:		PS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Steep
Continuous	Never	Never
W/in 1 bankfull	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		650
Width Determination		Estimated
Confinement Type		NA
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		NA
2.10 Riffle Type		NA
2.11 Riffle Step Spacing (ft)		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
LWD (#)	NA	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	NA	
Bed Material:	NA	
Subclass Slope:	NA	
Bed Form:	NA	
Field Measured Slope:		
2.15 Reference Stream Type		
Wetland		

Step 3. Riparian Features

3.1 Stream Banks		
Typical Bank Slope	Shallow	

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt	Silt
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)		
Revetment Type	None	None
Revetment Length (ft)		

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	10	0	30	70
R Trees (%)	10	0	70	20

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	5	0	0	100
R Shrub/Sapling (%)	5	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	100	0	60	40
R Herbs (%)	100	0	60	40

Bank Canopy	Left	Right
Canopy %	51-75	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	51-100	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	90	0	50	50
R Trees (%)	90	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	20	0	0	100
R Shrub/Sapling (%)	20	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	40	0	0	100
R Herbs (%)	40	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE14	Segment:	D	Completion Date:	23-Jul-08
Organization:	BCE	Observers:	CS, MN, DS	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	1701	Segment Location:	Wetland located near Sandown Road in Chester				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0

Total Score:	0
Geomorphic Rating:	0
Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Wetland segment in reference condition. Minimally influenced by road near edge of wetland on LB. Braided channel (losing stream) flowing into deep wetland.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exter River NH DES						
Stream:	Upper Exeter	Reach #:	UE15	Segment:	A	Completion Date:	23-Jul-08
Organization:	BCE	Observers:	CS, MN, DS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	696	Segment Location:	Chester, downstream of Haverhill Road, bedrock dominated segment upstream of large wetland.				

Step 1. Valley and Floodplain

1.1 Segmentation:		GC
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous	Sometimes	Always
W/in 1 bankfull	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		40
Width Determination		Measured
Confinement Type		Semi-Confined
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	19
2.1a Wetted Width (ft)	8
2.1b Ratio (wetted/bkfl)	0.42
2.2 Max Depth (ft)	2.6
2.3 Mean Depth (ft)	1.8
2.4 Floodprone Width (ft)	33.8
2.5 RAF	2.6
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		10.5
2.7 Entrenchment Ratio		1.8
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing (ft)		NE
2.12 Substrate Composition		
Bedrock	34	%
Boulder	4	%
Cobble	27	%
Coarse Gravel	16	%
Fine Gravel	6	%
Sand	8	%
Silt/Clay Present	No	
Embedded (chan)	4	%
Embedded (marg)	30	%
# LWD	16	
2.13 Average Largest Particle		
Bed	7	inches
Bar	3.9	inches
2.13a % Subs. Exp.	80	%
2.14 Stream Type		
Stream Type:	B	
Bed Material:	Cobble	
Subclass Slope:	None	
Bed Form:	Step Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
B, Cobble, Step-Pool		

Step 3. Riparian Features

3.1 Stream Banks		
Typical Bank Slope	Steep	

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Bedrock	Bedrock
Consistency	Cohesive	Cohesive
Bank Erosion	Left	Right
Erosion Length (ft)	28	24
Erosion Height (ft)	12	5
Revetment Type	None	None
Revetment Length (ft)		

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	70	0	20	80
R Trees (%)	70	0	20	80

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	0	100
R Shrub/Sapling (%)	10	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	80	0	0	100
R Herbs (%)	90	0	0	100

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	101-150	101-150
Sub-dominant	26-50	26-50
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	20	80
R Trees (%)	80	0	20	80

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	15	0	0	100
R Shrub/Sapling (%)	15	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	40	0	0	100
R Herbs (%)	40	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	Hay
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Minimum
4.2 Adjacent Wetlands	Minimum
4.3 Flow Status	Base
4.4 # of Debris Jams	1
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	3
	Diagonal	Delta	Island
	0	0	1

5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exter River NH DES						
Stream:	Upper Exeter	Reach #:	UE15	Segment:	A	Completion Date:	39652
Organization:	BCE	Observers:	CS, MN, DS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	696	Segment Location:	Chester, downstream of Haverhill Road, bedrock dominated segment upstream of large wetland.				

1.6 Grade Controls

Type	Location	Present Total Ht (ft)	Ht Above (ft)	Photo	GPS
Ledge	DS end	1.8	1.5	Yes	No
Ledge	mid seg	2.9	2.5	Yes	No
Ledge	mid seg	2.3	1.7	Yes	No
Waterfall	mid seg	3.5	3.1	Yes	No
Ledge	mid seg	1.4	1.3	Yes	No
Ledge	US end	1.8	1.7	Yes	No

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type	Confined Score	STD	Historic
7.1 Channel Degradation	20	None	No
7.2 Channel Aggradation	14	None	No
7.3 Widening Channel	18		No
7.4 Change in Planform	13		No

Total Score: 65

Geomorphic Rating: 0.81

Channel Evolution Model F

Channel Evolution Stage I

Geomorphic Condition Good (0.65-0.84)

Stream Sensitivity Moderate

Channel Adjustment Processes Narrative

Some minor planform adjustment and aggradation.

Notes:

Multiple bedrock grade controls, riffle spacing not evaluated due to bedrock dominated segment.
Very low bank erosion.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE15	Segment:	B	Completion Date:	23-Jul-08
Organization:	BCE	Observers:	CS, MN, DS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1301	Segment Location:	Chester near Haverhill Road culvert, upstream to culvert in field DS of channelized segment.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	137	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Never	Never
W/in 1 bankfull	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		731
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	20.7
2.1a Wetted Width (ft)	5.6
2.1b Ratio (wetted/bkfl)	0.27
2.2 Max Depth (ft)	2.2
2.3 Mean Depth (ft)	1.4
2.4 Floodprone Width (ft)	611
2.5 RAF	3.4
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		15.3
2.7 Entrenchment Ratio		29.5
2.8 Incision Ratio		1.6
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing (ft)		71
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	23	%
Coarse Gravel	32	%
Fine Gravel	18	%
Sand	27	%
Silt/Clay Present	No	
Embedded (chan)	11	%
Embedded (marg)	27	%
LWD #	16	
2.13 Average Largest Particle		
Bed	7	inches
Bar	5.6	inches
2.13a % Subs. Exp.	50	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
C, Gravel, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks		
Typical Bank Slope	Steep	

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	15	79
Erosion Height (ft)	4.5	3
Revetment Type	Rip-rap	Multiple
Revetment Length (ft)	254	286

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	30	0	0	100
R Trees (%)	80	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	70	0	30	70
R Shrub/Sapling (%)	30	0	10	90

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	80	5	35	60
R Herbs (%)	70	0	10	90

Bank Canopy	Left	Right
Canopy %	51-75	51-75
Mid-channel canopy	Closed	

3.2 Riparian Buffer		
Buffer Width	Left	Right
Dominant	26-50	51-100
Sub-dominant	51-100	0-25
Length <25 ft	150	176

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	40	0	0	100
R Trees (%)	80	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	50	0	0	100
R Shrub/Sapling (%)	20	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	70	0	50	50
R Herbs (%)	50	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Residential	Forest
Sub-dominant	Forest	Residential
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Minimum
4.2 Adjacent Wetlands	Minimum
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	1
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	2	3	12
	Diagonal	Delta	Island
	1	0	0

5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts			
	# SRs	# HCs	Trib Rejuv.
	1	0	No

5.4 Stream Ford or Animal Crossing:			None
5.5 Straightening	Straightening		
Length (ft)	420		
5.5 Dredging		None	
Bridge and Culvert Survey		Yes	

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE15	Segment:	B	Completion Date:	23-Jul-08
Organization:	BCE	Observers:	CS, MN, DS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1301	Segment Location:	Chester near Haverhill Road culvert, upstream to culvert in field DS of channelized segment.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	2.8	Yes	Yes	Yes	Yes
Problems: DA, SB, A					
Old abutme	3.8	Yes	No	Yes	Yes
Problems: DA					
Culvert	2.6	Yes	Yes	Yes	Yes
Problems: DB, SB					

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	9	None	Yes
7.2 Channel Aggradation	9	None	No
7.3 Widening Channel	16		No
7.4 Change in Planform	13		No

Total Score: 47

Geomorphic Rating: 0.59

Channel Evolution Model F

Channel Evolution Stage II

Geomorphic Condition Fair (0.35-0.64)

Stream Sensitivity Very High

Channel Adjustment Processes Narrative

Major aggradation (mid channel bars, one steep riffle, one diagonal bar); minor planform adjustment. Channel evolution stage is FII or possibly early FIII.

Notes:

Pools not much deeper than runs. Channelized through upper part of segment. 2 undersized culverts and an old abutment in segment. Some invasive species (Japanese knotweed). 50% exposed substrate (less in channelized section, more in wider sections). RAF identified in office upon review of cross section. This incision ratio of 1.56 makes sense given the historic straightening that has taken place at the upper end of this segment.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE15	Segment:	C	Completion Date:	22-Jul-08
Organization:	BCE	Observers:	CS, MN, DS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	925	Segment Location:	Chester near Derry Road.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height (ft)		
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Never	Never
W/in 1 bankfull	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		957
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	8.8
2.1a Wetted Width (ft)	3
2.1b Ratio (wetted/bkfl)	0.34
2.2 Max Depth (ft)	1.4
2.3 Mean Depth (ft)	1.0
2.4 Floodprone Width (ft)	17.2
2.5 RAF	2.8
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		8.9
2.7 Entrenchment Ratio		2.0
2.8 Incision Ratio		2.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Eroded
2.11 Riffle Step Spacing		NE
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	8	%
Fine Gravel	25	%
Sand & Silt	67	%
Silt/Clay Present	Yes	
Embedded (chan)	NE	%
Embedded (marg)	NE	%
LWD #	0	
2.13 Average Largest Particle		
Bed	NE	inches
Bar	NE	inches
2.13a % Subs. Exp.	20	%
2.14 Stream Type		
Stream Type:	B	
Bed Material:	Silt/Sand	
Subclass Slope:	c	
Bed Form:	Riffle-Pool	
Field Measured Slope:		
2.15 Reference Stream Type		
Wetland or E, Silt/sand		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	84	50
Erosion Height (ft)	3	3
Revetment Type	None	None
Revetment Length (ft)		

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	30	0	10	90
R Trees (%)	5	0	5	95

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	10	0	0	100
R Shrub/Sapling (%)	5	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	90	0	50	50
R Herbs (%)	100	0	50	50

Bank Canopy	Left	Right
Canopy %	26-50	1-25
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	101-150	0-25
Sub-dominant	0-25	101-150
Length <25 ft	26	216

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	30	0	0	100
R Trees (%)	0	0	0	0

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	20	0	0	100
R Shrub/Sapling (%)	20	0	5	95

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	70	0	0	100
R Herbs (%)	100	0	70	30

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Hay	Hay
Sub-dominant	Forest	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive
4.2 Adjacent Wetlands	Altered
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	2
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	1	Yes

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	Straightening
Length (ft)	819
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE15	Segment:	C	Completion Date:	22-Jul-08
Organization:	BCE	Observers:	CS, MN, DS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	925	Segment Location:	Chester near Derry Road.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	2	Other	Yes
7.2 Channel Aggradation	14	None	No
7.3 Widening Channel	18		No
7.4 Change in Planform	16		No

Total Score: 50

Geomorphic Rating: 0.63

Channel Evolution Model F

Channel Evolution Stage II

Geomorphic Condition Fair (0.35-0.64)

Stream Sensitivity High

Channel Adjustment Processes Narrative

Extreme historic degradation (active headcut), minor aggradation. Does not appear to have started to widen at all (little bank erosion).

Notes:

Large part of segment has been channelized. Seems like it was a large wetland complex that was ditched to form one channel and drain surrounding wetland for agricultural use. The upper most part of this segment is still a wetland complex, and there is a rejuvenating tributary (one channel of wetland) and head cut at the point where the channelization stops. Stream type departure due to deep channelization (no floodplain access) but stream used to be a wetland (wetland stream type to B type).

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE15	Segment:	D	Completion Date:	23-Jul-08
Organization:	BCE	Observers:	CS, MN, DS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1881	Segment Location:	Chester upstream of Derry Road.				

Step 1. Valley and Floodplain

1.1 Segmentation:		PS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	914	0
height (ft)	5.5	
Roads	0	0
height (ft)		
Railroads	0	0
height (ft)		
Improved Paths	0	0
height (ft)		
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Never	Never
W/in 1 bankfull	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		625
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	33
2.1a Wetted Width (ft)	5
2.1b Ratio (wetted/bkfl)	0.15
2.2 Max Depth (ft)	1.6
2.3 Mean Depth (ft)	0.6
2.4 Floodprone Width (ft)	105.4
2.5 RAF	1.6
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		51.6
2.7 Entrenchment Ratio		3.2
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Not Applicable
2.11 Riffle Step Spacing		53
2.12 Substrate Composition		
Bedrock	0	%
Boulder	5	%
Cobble	37	%
Coarse Gravel	21	%
Fine Gravel	13	%
Sand	24	%
Silt/Clay Present	No	
Embedded (chan)	3	%
Embedded (marg)	23	%
LWD #	21	
2.13 Average Largest Particle		
Bed	7	inches
Bar	NE	inches
2.13a % Subs. Exp.	80	%
2.14 Stream Type		
Stream Type:	D	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Braided	
Field Measured Slope:		
2.15 Reference Stream Type		
D, Gravel, Braided		

Step 3. Riparian Features

3.1 Stream Banks		
Typical Bank Slope	Steep	

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Mix	Mix
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)		
Revetment Type	Rip-rap	Rip-rap
Revetment Length (ft)	60	20

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	80	0	10	90
R Trees (%)	80	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	20	0	0	100
R Shrub/Sapling (%)	20	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	90	0	0	100
R Herbs (%)	90	0	0	100

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	51-100	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees (%)	90	0	10	90
R Trees (%)	90	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrub/Sapling (%)	30	0	0	100
R Shrub/Sapling (%)	30	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs (%)	80	0	0	100
R Herbs (%)	80	0	0	100

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Hay	None
Mass Failures (ft)	0	0
Height (ft)		
Gullies (number)	0	0
Height (ft)		

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	1
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	1	1	2
	Diagonal	Delta	Island
	0	1	4

5.2 Other Features	Flood	NCO	Avulsion
	11	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	None	
Length (ft)		
5.5 Dredging	None	
Bridge and Culvert Survey	Yes	

Note: General comments, Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE15	Segment:	D	Completion Date:	23-Jul-08
Organization:	BCE	Observers:	CS, MN, DS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1881	Segment Location:	Chester upstream of Derry Road.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	5.8	Yes	Yes	Yes	Yes

Problems: SA, SB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	18	None	No
7.2 Channel Aggradation	16	None	No
7.3 Widening Channel	16		No
7.4 Change in Planform	13		No

Total Score: 63

Geomorphic Rating: 0.79

Channel Evolution Model F

Channel Evolution Stage I

Geomorphic Condition Good (0.65-0.84)

Stream Sensitivity Extreme

Channel Adjustment Processes Narrative

Minor planform adjustment (multiple flood chutes are a function of braided channel, some planform adjustment due to debris).

Notes:

Riparian wetland adjacent to channel (forested wetland). Lots of seeps, multiple thread channel in places, very high width/depth ratio. Ferns and moss along banks and in buffer. Old rock wall (berm) runs along upper end of channel.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE16	Segment:	None	Completion Date:	23-Jul-08
Organization:	BCE	Observers:	CS, MN, DS	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	2527	Segment Location:	Chester, wetland upstream of Derry Road.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right		
1.1 Segmentation:		None	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		Corridor Land Use				
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest		
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	None	None		
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0		
Berms	0	0	2.9 Sinuosity		NA	Lower					Height (ft)				
height (ft)			2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)	0	0		
Roads	0	0	2.11 Riffle Step Spacing (ft)		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)				
height (ft)			2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**				
Railroads	0	0	Bedrock	NA	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Extensive			
height (ft)			Boulder	NA	%	Erosion Height (ft)					4.2 Adjacent Wetlands	Extensive			
Improved Paths	0	0	Cobble	NA	%	Revetment Type	None		None		4.3 Flow Status	Base			
height (ft)			Coarse Gravel	NA	%	Revetment Length (ft)					4.4 # of Debris Jams	0			
Development	0	0	Fine Gravel	NA	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None			
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees (%)	80	0	20	80	4.6 Up/Downstream Flow Reg	None			
Hillside Slope	Steep	Hilly				**R** Trees (%)	80	0	20	80	4.7 Stormwater Inputs				
Continuous	Never	Never	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0	
W/in 1 bankfull	Never	Never	Embedded (chan)	NA	%	**L** Shrub/Sapling (%)	90	0	10	90	Urban Storm Pipe	0	Tile Drain	0	
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrub/Sapling (%)	90	0	10	90	Overland Flow	0	Other	0	
1.5 Valley Features							% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		1		
Valley Width (ft)		610				**L** Herbs (%)	100	0	70	30	Affected Length (ft)		>500		
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs (%)	100	0	70	30	**Step 5. Channel Bed & Planform Changes**				
Confinement Type		Very Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side	
Rock Gorge?		No	Bar	NA	inches	Canopy %	76-100		76-100			0	0	0	
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island	
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	1	
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion	
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>150		>150			0	0	0	
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	None		None			Braiding			
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	0		0			0			
2.3 Mean Depth (ft)	NA		Field Measured Slope:			*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts				
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			**L** Trees (%)	90	0	30	70		# SRs	# HCs	Trib Rejuv.	
2.5 RAF	NA		Wetland			**R** Trees (%)	90	0	30	70		0	0	No	
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None	
			3.1 Stream Banks			**L** Shrub/Sapling (%)	30	0	0	100	5.5 Straightening	None			
			Typical Bank Slope	Shallow		**R** Shrub/Sapling (%)	30	0	0	100	Length (ft)				
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None		
Note: General comments, Step 1.6 Grade Controls and Step 4.8						**L** Herbs (%)	70	0	0	100					
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs (%)	70	0	0	100	Bridge and Culvert Survey		Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River Watershed						
Stream:	Upper Exeter	Reach #:	UE16	Segment:	None	Completion Date:	23-Jul-08
Organization:	BCE	Observers:	CS, MN, DS	Why Not Assessed:	W	Rain:	Yes
Segment Length (ft):	2527	Segment Location:	Chester, wetland upstream of Derry Road.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Notes:

Did not assess entire reach due to large wetland and no further access upstream. Huge beaver pond and a series of beaver ponds and wetlands in entire reach according to topographic maps and orthophotos. Reach is unimpacted and far away from roads and development.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Dudley Brook

Phase 2 Stream Geomorphic

Assessment Data

Dudley-Bloody Brook Subwatershed - Reach/Segment Cross-Reference Table			
Surface Water	**Reach/ Segment ID**	**Town(s)**	**Segment Location**
Little River	LR01-A	Exeter	From the confluence with Exeter River up to the end of the impoundment approx. 680' upstream of the Linden St. crossing
Little River	LR01-B	Exeter	From the segment break upstream of Linden St. to the reach break at the bend downstream of Rt. 111
Little River	LR02-A	Exeter	From the reach break downstream of Rt. 111 up to the grade control/dam
Little River	LR02-B	Exeter	Impounded area behind small grade control upstream of Rt. 111 crossing
Little River	LR02-C	Exeter	Downstream of the Colcord Pond Dam until impounded area begins
Little River	LR03	Exeter	Colcord Pond extends from just downstream of Brentwood Rd. up to Garrison Ln
Little River	LR04-A	Exeter	From Garrison Lane up to change in confinement approximately 300 feet upstream of power lines
Little River	LR04-B	Exeter	From the change in confinemnt at the segment break up to the confluence with a small tributary entering from the north
Little River	LR05	Exeter	From the confluence with a small tributary entering from the north up to the confluence with Bloody Broo
Dudley Brook	DB01-A	Exeter	From the confluence with the Little River up to a sharp change in slope at Segment B
Dudley Brook	DB01-B	Exeter	From a large pool at a sharp break in slope up to a beaver dam located 1200 feet northeast of the Rt 111 crossing
Dudley Brook	DB01-C	Exeter, Brentwood	From beaver dam at segment break with Segment B up to reach break with DB.02 at Pickpocket Road
Dudley Brook	DB02	Brentwood	From Pickpocket Road crossing up to Rt. 111-A crossing
Dudley Brook	DB03	Brentwood	From Rt. 111-A crossing up to the confluence with a tributary entering from the west
Bloody Brook	BB01-A	Exeter	From the confluence with the Little River up to a large beaver dam
Bloody Brook	BB01-B	Exeter	From the segment break with A up to the eastern end of ponding from the large beaver dams
Bloody Brook	BB02	Exeter	From the eastern end of ponding from the large beaver dams up to the Route 101 crossing
Bloody Brook	BB03-A	Exeter	From Route 101 crossing up to wooded area northeast of reservoir
Bloody Brook	BB03-B	Exeter	From the wooded area northeast of the reservoir up to the reach break with BB.04
Bloody Brook	BB04	Exeter	From approx. 400 feet downstream of Watson Rd up to wetland area to the northeast

Appendix X - Phase 2 Reach Summary Statistics for the Little River, Dudley Brook & Bloody Brook																			
Reach/ Segment	Watershed Area (mi^2)	Phase 1 Confinement	Reference Channel Width (ft)	Channel Dimensions			Channel & Floodplain Ratios			Reference Stream Type	Existing Stream Type	Dominant Bed Substrate	Bedform	Sinuosity	RGA* Rating	RHA* Rating	Reach Sensitivity	CEM†	CEM† Stage
				Width (ft)	Mean Depth (ft)	Area (ft^2)	Width to Depth	Entrench-ment	Incision										
LR01-A[A]	15.8	Broad	48.1	--	--	--	--	--	--	E	E	Silt	Dune-Ripple	Moderate	Fair	Fair	Extreme	--	--
LR01-B	14.9	Very Broad	46.8	33.4	3.0	100.2	11.2	9.7	1.2	E	E	Sand	Dune-Ripple	Moderate	Fair	Fair	Extreme	F	I
LR02-A	14.2	Broad	45.7	31.8	2.5	79.5	12.6	6.0	1.2	E	E	Sand	Dune-Ripple	Low	Fair	Fair	Extreme	F	II
LR02-B[A]	14.1	Broad	45.5	--	--	--	--	--	--	E	E	Silt	Dune-Ripple	Low	Good	Fair	High	--	--
LR02-C	13.9	Semi Conf.	45.2	56.3	2.9	163.3	19.6	3.1	1.0	Cb	Cb	Gravel	Riffle-Pool	Low	Fair	Fair	Very High	D	II b
LR03	13.9	Impounded	45.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LR04-A	12.9	Semi Conf.	43.6	26.1	2.0	52.2	13.2	3.9	1.0	Cb	Cb	Cobble	Riffle-Pool	Low	Good	Good	Moderate	F	I
LR04-B	12.9	Broad	43.5	32.4	3.6	116.6	9.1	8.1	1.1	E	E	Sand	Dune-Ripple	Low	Good	Good	High	F	I
LR05	12.7	Very Broad	43.2	18.0	1.9	34.0	9.5	19.1	1.0	E	E	Sand	Dune-Ripple	Moderate	Reference	Good	High	F	I
BB01-A	2.0	Very Broad	17.3	10.2	1.5	15.2	6.8	20.2	1.0	E	E	Silt	Dune-Ripple	High	Good	Reference	High	F	I
BB01-B[A]	1.9	Very Broad	17.1	--	--	--	--	--	--	E	E	Sand	Dune-Ripple	Moderate	Good	Fair	High	--	--
BB02[A]	1.4	Very Broad	14.6	--	--	--	--	--	--	E	E	Sand	Dune-Ripple	Moderate	Good	Good	High	--	--
BB03-A[A]	0.9	Very Broad	11.9	--	--	--	--	--	--	E	E	Sand	Dune-Ripple	Moderate	Fair	Fair	Extreme	--	--
BB03-B	0.8	Broad	11.4	6.9	1.2	8.3	5.7	7.0	1.0	E	E	Sand	Dune-Ripple	High	Good	Reference	High	F	I
BB04	0.7	Very Broad	10.5	8.0	1.1	8.8	7.5	17.9	1.0	E	E	Sand	Dune-Ripple	Moderate	Fair	Good	Extreme	D	II c
DB01-A	7.8	Very Broad	34.1	24.0	2.1	50.4	11.4	13.4	1.0	E	E	Sand	Dune-Ripple	Moderate	Good	Good	High	D	II c
DB01-B	7.8	Narrow	34.1	28.0	1.5	42.0	18.2	4.8	1.0	Cb	Cb	Cobble	Riffle-Pool	Low	Good	Good	Moderate	F	I
DB01-C[A]	7.9	Very Broad	34.2	--	--	--	--	--	--	E	E	Sand	Dune-Ripple	Moderate	Good	Fair	High	--	--
DB02[A]	6.8	Very Broad	31.8	--	--	--	--	--	--	E	E	Sand	Dune-Ripple	Moderate	Fair	Fair	Extreme	--	--
DB03[A]	5.9	Very Broad	29.6	--	--	--	--	--	--	E	E	Sand	Dune-Ripple	Low	Good	Fair	High	--	--

A Administrative judgment used for determining stream type, RGA, and RHA condition for impounded reaches

* RGA = Rapid Geomorphic Assessment, RHA = Rapid Habitat Assessment

† CEM = Channel Evolution Model

Summary of the Rapid Habitat Assessment (RHA) Data for the Little River, Bloody Brook, and Dudley Brook															
Surface Water	Reach/ Segment	Channel Bedform	Woody Debris Cover	Bed Substrate Cover	Scour and Depositional Features	Channel Morphology	Hydrologic Characteristics	Connectivity	River Banks		Riparian Area		Total Score	Percentage*	Habitat Condition**
									Left	Right	Left	Right			
Little River	LR01-A	Dune-ripple	-	-	-	-	-	-	-	-	-	-	-	-	NE
	LR01-B	Dune-ripple	16	12	10	12	12	8	3	5	3	4	85	53%	Fair
	LR02-A	Dune-ripple	12	12	10	11	10	8	3	4	3	5	78	49%	Fair
	LR02-B	-	-	-	-	-	-	-	-	-	-	-	-	-	NE
	LR02-C	Riffle-pool	12	11	9	12	11	8	6	7	6	8	90	56%	Fair
	LR03	-	-	-	-	-	-	-	-	-	-	-	-	-	NE
	LR04-A	Riffle-pool	14	13	15	17	13	13	8	8	7	8	116	73%	Good
	LR04-B	Dune-ripple	19	13	17	18	15	15	9	7	10	8	131	82%	Good
	LR05	Dune-ripple	16	16	15	18	16	16	6	6	9	9	127	79%	Good
Bloody Brook	BB01-A	Dune-ripple	17	13	17	20	18	15	8	8	9	9	134	84%	Good
	BB01-B	Dune-ripple	-	-	-	-	-	-	-	-	-	-	-	-	NE
	BB02	Dune-ripple	-	-	-	-	-	-	-	-	-	-	-	-	NE
	BB03-A	Dune-ripple	-	-	-	-	-	-	-	-	-	-	-	-	NE
	BB03-B	Dune-ripple	19	16	19	19	18	16	9	9	7	8	140	88%	Reference
	BB04	Dune-ripple	17	9	15	18	17	13	7	6	8	6	116	73%	Good
Dudley Brook	DB01-A	Dune-ripple	17	13	16	18	17	14	7	7	9	9	127	79%	Good
	DB01-B	Riffle-pool	12	16	13	14	12	14	6	6	6	6	105	66%	Good
	DB01-C	Dune-ripple	-	-	-	-	-	-	-	-	-	-	-	-	NE
	DB02	Dune-ripple	-	-	-	-	-	-	-	-	-	-	-	-	NE
	DB03	Dune-ripple	-	-	-	-	-	-	-	-	-	-	-	-	NE
Total Possible Score			**20**	**20**	**20**	**20**	**20**	**20**	**10**	**10**	**10**	**10**	**160**	**100%**	**Reference**

* Percentages are calculated from a reference RHA score of 160

** All RHA data collected using the VTANR Riffle-Pool/Dune-Ripple RHA field form

Note: Reaches that lacked fluvial processes were not suitable for the RHA protocol (NE = not evaluated)

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR01	Segment:	A	Completion Date:	19-Aug-08
Organization:	FEA	Observers:	SPP, EPF, SAS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	6,545	Segment Location:	From the confluence with Exeter River up to the end of the impoundment approx. 680' upstream of the Linden St. crossing.				

Step 1. Valley and Floodplain

1.1 Segmentation:		FS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	2,265	0
height	5	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	4,420	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Hilly
Continuous	Sometimes	Never
W/in 1 bnkfl	Sometimes	Sometimes
Texture	Sand	NE
1.5 Valley Features		
Valley Width (ft)		340
Width Determination		Estimated
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type		NA
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt & Smaller	NA	%
Silt/Clay Present	NA	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	NA	%
# LWD	42	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Silt	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Silt, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	60
Erosion Height (ft)	0	2
Revetment Type	Rip-rap	Rip-rap
Revetment Length (ft)	100	10

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	20	0	10	90
R Trees	20	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	40	0	75	25
R Shrubs/Saplings	40	0	75	25

	% Cover	Invasive	Grasses	Forbs
L Herbs	90	10	15	75
R Herbs	90	10	15	75

Bank Canopy	Left	Right
Canopy %	26-50	26-50
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	>200	0-25
Length <25 ft	290	975

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	50	0	25	75
R Trees	50	0	25	75

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	65	35
R Shrubs/Saplings	60	0	65	35

	% Cover	Invasive	Grasses	Forbs
L Herbs	80	20	15	65
R Herbs	80	20	15	65

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Shrub/Sapling	Shrub/Sapling
Sub-dominant	Residential	Residential
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Average
4.4 # of Debris Jams	4
4.5 Flow Reg Type	Public Water Supply
4.6 Up/Downstream Flow Reg	Downstream

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	1
Urban Storm Pipe	1	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	2
Affected Length (ft)	3,900

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	1	0	0
	Diagonal	Delta	Island
	0	0	

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	1		

5.3 Steep Riffles & Headcuts	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	None	
Length (ft)	0	
5.5 Dredging	None	
Bridge and Culvert Survey	Yes	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR01	Segment:	A	Completion Date:	19-Aug-08
Organization:	FEA	Observers:	SPP, EPF, SAS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	6,545	Segment Location:	From the confluence with Exeter River up to the end of the impoundment approx. 680' upstream of the Linden St. crossing.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	40.5	Yes	Yes	Yes	Yes
Problems:	DA, DB				
Culvert	26	Yes	Yes	Yes	Yes
Problems:	DA				
Bridge	85	No	No	No	Yes
Problems:	None				
Bridge	45	Yes	Yes	Yes	Yes
Problems:	None				

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Because of extensive impounding from beaver activity and the backwater from the Great dam this reach was not completely assessed. Only applicable data (Step 3 banks and buffers) was collected because the segment was not governed by fluvial processes. Braiding noted under planform changes (Step 5.2) is associated with beaver activity, not increased sediment load from human impacts.

Notes:

An administrative judgement was used to determine RGA scores for the purposes of FEH development. Extensive corridor development and adjacent roads in the lower reach contributed to the "fair" RGA rating. RHA data not be used to evaluate aquatic habitat conditions or compare with non-impounded reaches, as the protocol is intended for fluvial systems.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR01	Segment:	B	Completion Date:	21-Aug-08
Organization:	FEA	Observers:	SPP, EPF, SAS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	2,560	Segment Location:	From the segment break upstream of Linden St. to the reach break at the bend downstream of Rt. 111				

Step 1. Valley and Floodplain

1.1 Segmentation:		OT
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	1350	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Very Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	Sand
1.5 Valley Features		
Valley Width (ft)		340
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	33.4
2.1a Wetted Width (ft)	22
2.1b Ratio (wetted/bkfl)	0.66
2.2 Max Depth (ft)	4.7
2.3 Mean Depth (ft)	3.0
2.4 Floodprone Width (ft)	325
2.5 RAF	5.7
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		11.2
2.7 Entrenchment Ratio		9.7
2.8 Incision Ratio		1.2
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type	Complete	
2.11 Riffle Step Spacing		300
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	0	%
Fine Gravel	0	%
Sand	75	%
Silt & Smaller	25	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	25	%
# LWD	29	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	5	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Undercut	Undercut

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	190	230
Erosion Height (ft)	3.5	2.5
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	50	0	20	80
R Trees	60	0	20	80

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	80	20
R Shrubs/Saplings	70	0	80	20

	% Cover	Invasive	Grasses	Forbs
L Herbs	70	20	20	60
R Herbs	70	0	20	80

Bank Canopy	Left	Right
Canopy %	26-50	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer		
Buffer Width	Left	Right
Dominant	26-50	>200
Sub-dominant	0-25	None
Length <25 ft	740	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	30	0	20	80
R Trees	70	0	20	80

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	40	20	60	20
R Shrubs/Saplings	80	0	60	40

	% Cover	Invasive	Grasses	Forbs
L Herbs	80	50	10	40
R Herbs	60	0	20	80

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Shrub/Sapling	Residential
Sub-dominant	Forest	Shrub/Sapling
Mass Failures (ft)	0	30
Height (ft)	0	12
Gullies (number)	1	0
Height (ft)	3	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	1
4.5 Flow Reg Type	Public Water Supply
4.6 Up/Downstream Flow Reg	Downstream

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	0
Urban Storm Pipe	1	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	1	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	None	
Length (ft)	0	
5.5 Dredging	None	
Bridge and Culvert Survey	Yes	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR01	Segment:	B	Completion Date:	21-Aug-08
Organization:	FEA	Observers:	SPP, EPF, SAS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	2,560	Segment Location:	From the segment break upstream of Linden St. to the reach break at the bend downstream of Rt. 111				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	14	Yes	Yes	Yes	Yes

Problems: None

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	13	None	No
7.2 Channel Aggradation	11	None	No
7.3 Widening Channel	13		No
7.4 Change in Planform	13		No
Total Score:	50		
Geomorphic Rating:	0.63		

Channel Evolution Model F
Channel Evolution Stage II
Geomorphic Condition Fair (0.35-0.64)
Stream Sensitivity Extreme

Channel Adjustment Processes Narrative

Minor aggradation, incision, and widening. The segment is largely stable with some areas of minor incision. The constriction at the B&M railroad trestle is causing a mid channel bar to form downstream. At the site of the crossing the channel has some erosion on the banks that could be associated with cuttings done by the railroad to maintain a clear path for the trains.

Notes:

A noteworthy mass failure is found downstream of the crossing on the right side slope. The failure has occurred where lots of debris has accumulated at the site of an old beaver dam. The failure is composed of non-cohesive sands and appears to be part of natural fluvial geomorphic processes.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR02	Segment:	A	Completion Date:	19-Aug-08
Organization:	FEA	Observers:	SPP, EPF, SAS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,327	Segment Location:	From the reach break downstream of Rt. 111 up to the grade control/dam				

Step 1. Valley and Floodplain

1.1 Segmentation:		GC
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	300	0
height	7	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	585	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Sometimes	Never
W/in 1 bnkfl	Sometimes	Sometimes
Texture	Boulder/Couble	NE
1.5 Valley Features		
Valley Width (ft)		195
Width Determination		Measured
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	31.8
2.1a Wetted Width (ft)	19
2.1b Ratio (wetted/bkfl)	0.60
2.2 Max Depth (ft)	3.7
2.3 Mean Depth (ft)	2.5
2.4 Floodprone Width (ft)	191
2.5 RAF	4.5
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		12.6
2.7 Entrenchment Ratio		6.0
2.8 Incision Ratio		1.2
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		300
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	6	%
Fine Gravel	26	%
Sand	45	%
Silt & Smaller	23	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	15	%
# LWD	31	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:	Not Evaluated	
2.15 Reference Stream Type		
E, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	110	0
Erosion Height (ft)	2.5	0
Revetment Type	Hard Bank	Hard Bank
Revetment Length (ft)	340	30

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	70	0	10	90
R Trees	80	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	90	0	80	20
R Shrubs/Saplings	90	0	80	20

	% Cover	Invasive	Grasses	Forbs
L Herbs	60	0	20	80
R Herbs	60	0	20	80

Bank Canopy	Left	Right
Canopy %	26-50	26-50
Mid-channel canopy	Open	

3.2 Riparian Buffer		
Buffer Width	Left	Right
Dominant	76-100	>200
Sub-dominant	0-25	101-150
Length <25 ft	205	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	70	0	10	90
R Trees	90	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	60	40
R Shrubs/Saplings	50	0	60	40

	% Cover	Invasive	Grasses	Forbs
L Herbs	70	0	10	90
R Herbs	70	0	10	90

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Shrub/Sapling	Forest
Sub-dominant	Residential	Shrub/Sapling
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Minimum
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	Recreation
4.6 Up/Downstream Flow Reg	Upstream
4.7 Stormwater Inputs	

Field Ditch	0	Road Ditch	1
Urban Storm Pipe	1	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	2	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	0
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR02	Segment:	A	Completion Date:	19-Aug-08
Organization:	FEA	Observers:	SPP, EPF, SAS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,327	Segment Location:	From the reach break downstream of Rt. 111 up to the grade control/dam				

1.6 Grade Controls — Present

Type	Location	Total Ht	Ht Above	Photo	GPS
Dam	Upstream	4.8	2.4	Yes	Yes

4.8 Channel Constrictions — Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	20	Yes	Yes	Yes	Yes

Problems: None

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type: Unconfined

	Score	STD	Historic
7.1 Channel Degradation	11	None	No
7.2 Channel Aggradation	12	None	No
7.3 Widening Channel	11		No
7.4 Change in Planform	13		No
Total Score:	47		
Geomorphic Rating:	0.59		

Channel Evolution Model: F
Channel Evolution Stage: III
Geomorphic Condition: Fair
Stream Sensitivity: Extreme

Channel Adjustment Processes Narrative

Incision and widening due to decrease in sediment supply from the upstream impoundment. The segment has become more channelized from the combination of decreased sediment supply and encroachment from Rt. 111.

Notes:

At the upstream segment break there is a small (4.8' high) grade control made from slabs of concrete. The grade control seems to be serving no purpose to the channel - perhaps it was built to pond the upstream water for fishing or an unknown water withdrawal. Removal of this grade control would improve the overall connectivity of the reach and restore fluival processes in the segment above. Its removal may also reduce flooding to adjacent properties.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR02	Segment:	B	Completion Date:	19-Aug-08
Organization:	FEA	Observers:	SPP, EPF, SAS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,156	Segment Location:	Impounded area behind small grade control upstream of Rt. 111 crossing.				

Step 1. Valley and Floodplain		
1.1 Segmentation:		GC
1.2 Alluvial Fan:		No
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	200	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Steep
Continuous	Sometimes	Never
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		195
Width Determination		Estimated
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		No
Step 2. Stream Channel		
2.1 Bankfull Width (ft)	NA	
2.1a Wetted Width (ft)	NA	
2.1b Ratio (wetted/bkfl)	NA	
2.2 Max Depth (ft)	NA	
2.3 Mean Depth (ft)	NA	
2.4 Floodprone Width (ft)	NA	
2.5 RAF	NA	
*Human Elevated FP	NA	

Step 2. (Cont'd)		
2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		NA
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt & Smaller	NA	%
Silt/Clay Present	NA	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	NA	%
# LWD	27	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Silt	
Subclass Slope:	None	
Bed Form:	NA	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Sand, Dune-ripple		
Step 3. Riparian Features		
3.1 Stream Banks	Left	Right
Typical Bank Slope	Shallow	Shallow

Step 3. (Cont'd)				
Bank Texture	Left		Right	
Upper				
Material Type	Silt		Silt	
Consistency	Cohesive		Cohesive	
Lower				
Material Type	Clay		Clay	
Consistency	Cohesive		Cohesive	
Bank Erosion	Left		Right	
Erosion Length (ft)	0		0	
Erosion Height (ft)	0		0	
Revetment Type	None		None	
Revetment Length (ft)	0		0	
Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	10	0	20	80
R Trees	10	0	20	80
	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	10	0	50	50
R Shrubs/Saplings	10	0	50	50
	% Cover	Invasive	Grasses	Forbs
L Herbs	80	0	10	90
R Herbs	80	0	10	90
Bank Canopy	Left		Right	
Canopy %	1-25		1-25	
Mid-channel canopy	Open			
3.2 Riparian Buffer				
Buffer Width	Left		Right	
Dominant	>200		>200	
Sub-dominant	0-25		None	
Length <25 ft	180		0	
Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	10	90
R Trees	90	0	10	90
	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	70	0	40	60
R Shrubs/Saplings	70	0	40	60
	% Cover	Invasive	Grasses	Forbs
L Herbs	60	0	20	80
R Herbs	60	0	10	90

3.3 Riparian Corridor		Left	Right
Corridor Land Use			
Dominant		Shrub/Sapling	Forest
Sub-dominant		Residential	Shrub/Sapling
Mass Failures (ft)		0	0
Height (ft)		0	0
Gullies (number)		0	0
Height (ft)		0	0
Step 4. Flow & Flow Modifiers			
4.1 Springs/ Seeps		Present	
4.2 Adjacent Wetlands		Extensive	
4.3 Flow Status		Base	
4.4 # of Debris Jams		0	
4.5 Flow Reg Type		Recreation	
4.6 Up/Downstream Flow Reg		Both	
4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0
4.9 # of Beaver Dams		0	
Affected Length (ft)		0	
Step 5. Channel Bed & Planform Changes			
5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0
5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	2		
5.3 Steep Riffles & Headcuts			
	# SRs	# HCs	Trib Rejuv.
	0	0	No
5.4 Stream Ford or Animal Crossing:			None
5.5 Straightening	None		
Length (ft)	0		
5.5 Dredging		None	
Bridge and Culvert Survey		No	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR02	Segment:	B	Completion Date:	19-Aug-08
Organization:	FEA	Observers:	SPP, EPF, SAS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,156	Segment Location:	Impounded area behind small grade control upstream of Rt. 111 crossing.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Due to impounding from the backwater of a small dam in the downstream reach, this reach was not completely assessed. Only applicable data for banks and buffers (Step 3) were collected because the segment was not governed by fluvial processes.

Notes:

Braiding noted under planform changes (Step 5.2) is associated mainly with beaver activity. Some increased sediment load behind the grade control at the downstream segment break may also be leading to increased aggradation upstream.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR02	Segment:	C	Completion Date:	19-Aug-08
Organization:	FEA	Observers:	SPP, EPF, SAS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	500	Segment Location:	Downstream of the Colcord Pond Dam				

Step 1. Valley and Floodplain

1.1 Segmentation:		GC
1.2 Alluvial Fan:		No
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Always	Always
Texture	Boulder/Cobble	Boulder/Cobble
1.5 Valley Features		
Valley Width (ft)		185
Width Determination		Measured
Confinement Type		Semi-Confined
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	56.3
2.1a Wetted Width (ft)	36
2.1b Ratio (wetted/bkfl)	0.64
2.2 Max Depth (ft)	4.9
2.3 Mean Depth (ft)	2.9
2.4 Floodprone Width (ft)	174.8
2.5 RAF	4.9
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		19.6
2.7 Entrenchment Ratio		3.1
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Sedimented
2.11 Riffle Step Spacing		70
2.12 Substrate Composition		
Bedrock	0	%
Boulder	6	%
Cobble	11	%
Coarse Gravel	35	%
Fine Gravel	29	%
Sand	17	%
Silt & Smaller	2	%
Silt/Clay Present	Yes	
Embedded (chan)	15	%
Embedded (marg)	20	%
Detritus	10	%
# LWD	9	
2.13 Average Largest Particle		
Bed	16	inches
Bar	NA	inches
2.13a % Subs. Exp.	25	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	b	
Bed Form:	Riffle-Pool	
Field Measured Slope:		NA
2.15 Reference Stream Type		
Cb, Gravel, Riffle-pool		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Boulder/Cobble	Boulder/Cobble
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	35	65
R Trees	90	0	60	40

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	20	0	10	90
R Shrubs/Saplings	30	0	10	90

	% Cover	Invasive	Grasses	Forbs
L Herbs	30	0	10	90
R Herbs	20	0	5	95

Bank Canopy	Left	Right
Canopy %	26-50	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	51-75	>200
Sub-dominant	76-100	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	20	80
R Trees	95	0	40	60

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	10	0	0	100
R Shrubs/Saplings	30	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs	15	0	20	80
R Herbs	40	0	20	80

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	Shrub/Sapling
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Minimum
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	Recreation
4.6 Up/Downstream Flow Reg	Both

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	3	0	0
	Diagonal	Delta	Island
	0	0	1

5.2 Other Features	Flood	NCO	Avulsion
	3	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	No
5.5 Straightening	None
Length (ft)	0
5.5 Dredging	None
Bridge and Culvert Survey	No

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR02	Segment:	C	Completion Date:	19-Aug-08
Organization:	FEA	Observers:	SPP, EPF, SAS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	500	Segment Location:	Downstream of the Colcord Pond Dam				

1.6 Grade Controls — Present

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS
Dam	Upstream	7.8	6.2	Yes	No

4.8 Channel Constrictions — None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type: Confined

	Score	STD	Historic
7.1 Channel Degradation	15	None	No
7.2 Channel Aggradation	11	None	No
7.3 Widening Channel	11		No
7.4 Change in Planform	13		No
Total Score:	50		
Geomorphic Rating:	0.63		

Channel Evolution Model: D
Channel Evolution Stage: II b
Geomorphic Condition: Fair (0.35-0.64)
Stream Sensitivity: Very High

Channel Adjustment Processes Narrative

Aggradation and changes in planform due to decreased sediment transport below the dam. Note: Side channels and floodchutes releasing large amounts of sediment during large storm events that lead to flows throught spillway channels.

Notes:

This segment is short and in a confined setting where the valley walls pinch in on both side slopes. The sediment size is much larger than on any downstream reach/segment comprised mostly of coarse gravel with large boulders scattered about the channel. Widening score was lowered due to measured channel width (56.3ft) departure from predicted reference channel width (45.2 ft) for coarse-bottomed streams.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR03	Segment:	0	Completion Date:	21-Aug-08
Organization:	FEA	Observers:	SPP, PR	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	4,051	Segment Location:	Colcord Pond extends from just downstream of Brentwood Rd. up to Garrison Ln.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	680	660
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Always	Always
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		250
Width Determination		Estimated
Confinement Type		NA
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		NA
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt & Smaller	NA	%
Silt/Clay Present	NA	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	NA	%
# LWD	14	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	NA	
Bed Material:	NA	
Subclass Slope:	NA	
Bed Form:	NA	
Field Measured Slope:		NA
2.15 Reference Stream Type		
C, Gravel, Riffle-pool		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Silt	Silt
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	Hard Bank	None
Revetment Length (ft)	30	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	60	0	75	25
R Trees	65	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	50	50
R Shrubs/Saplings	50	0	40	60

	% Cover	Invasive	Grasses	Forbs
L Herbs	75	25	35	40
R Herbs	55	20	40	40

Bank Canopy	Left	Right
Canopy %	26-50	26-50
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>200	26-50
Sub-dominant	51-75	>200
Length <25 ft	445	435

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	85	0	60	40
R Trees	80	0	70	30

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	40	0	30	70
R Shrubs/Saplings	40	30	0	70

	% Cover	Invasive	Grasses	Forbs
L Herbs	50	20	25	55
R Herbs	50	15	25	60

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	Residential
Mass Failures (ft)	15	0
Height (ft)	20	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	5
4.5 Flow Reg Type	Recreation
4.6 Up/Downstream Flow Reg	Downstream

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	1
Affected Length (ft)	800

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	None	
Length (ft)	0	
5.5 Dredging	None	
Bridge and Culvert Survey	Yes	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR03	Segment:	0	Completion Date:	21-Aug-08
Organization:	FEA	Observers:	SPP, PR	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	4051	Segment Location:	Colcord Pond extends from just downstream of Brentwood Rd. up to Garrison Ln.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	28	Yes	Yes	Yes	Yes

Problems: None

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Due to impounding from the backwater of the Colcord Pond Dam, this reach was not completely assessed. Only applicable data for banks and buffers (Step 3) were collected because the segment was not governed by fluvial processes.

Notes:

No administrative judgment was used for RGA scores and FEH development because reference stream type was not discernable.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR04	Segment:	A	Completion Date:	18-Aug-08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	1,278	Segment Location:	From Garrison Lane up to change in confinement approximately 300 feet upstream of power lines.				

Step 1. Valley and Floodplain

1.1 Segmentation:		VW
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		105
Width Determination		Measured
Confinement Type		Semi-Confined
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	26.1
2.1a Wetted Width (ft)	15
2.1b Ratio (wetted/bkfl)	0.57
2.2 Max Depth (ft)	3.1
2.3 Mean Depth (ft)	2.0
2.4 Floodprone Width (ft)	102
2.5 RAF	3.1
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		13.2
2.7 Entrenchment Ratio		3.9
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		250
2.12 Substrate Composition		
Bedrock	0	%
Boulder	9	%
Cobble	46	%
Coarse Gravel	19	%
Fine Gravel	10	%
Sand	16	%
Silt & Smaller	0	%
Silt/Clay Present	No	
Embedded (chan)	40	%
Embedded (marg)	30	%
Detritus	15	%
# LWD	30	
2.13 Average Largest Particle		
Bed	12	inches
Bar	NA	inches
2.13a % Subs. Exp.	10	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Cobble	
Subclass Slope:	b	
Bed Form:	Riffle-Pool	
Field Measured Slope:		NE
2.15 Reference Stream Type		
Cb, Cobble, Riffle-pool		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Boulder/Cobble	Boulder/Cobble
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Boulder/Cobble	Boulder/Cobble
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	80	20
R Trees	80	0	80	20

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	50	0	50	50
R Shrubs/Saplings	50	0	50	50

	% Cover	Invasive	Grasses	Forbs
L Herbs	30	0	20	80
R Herbs	30	0	20	80

Bank Canopy	Left	Right
Canopy %	51-75	51-75
Mid-channel canopy	Closed	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	51-75	101-150
Length <25 ft	50	None

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	70	30
R Trees	80	0	70	30

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	40	60
R Shrubs/Saplings	60	0	40	60

	% Cover	Invasive	Grasses	Forbs
L Herbs	40	0	20	80
R Herbs	40	0	20	80

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	Residential
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Minimum
4.2 Adjacent Wetlands	None
4.3 Flow Status	Base
4.4 # of Debris Jams	1
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	1	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	2	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	0
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR04	Segment:	A	Completion Date:	18-Aug-08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	1,278	Segment Location:	From Garrison Lane up to change in confinement approximately 300 feet upstream of power lines.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	22	Yes	Yes	Yes	Yes
Problems:	None				
Old abutment	23	Yes	No	Yes	Yes
Problems:	DA				

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Confined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	15	None	No
7.3 Widening Channel	18		No
7.4 Change in Planform	14		No
Total Score:	63		
Geomorphic Rating:	0.79		

Channel Evolution Model F
Channel Evolution Stage I
Geomorphic Condition Good (0.65-0.84)
Stream Sensitivity Moderate

Channel Adjustment Processes Narrative

Minor flood chutes appear to be natural. A confined RGA assessment was used because of the confinement ratio being semi-confined (3.9) although the bedform is riffle-pool. The steep riffle observed upstream of the Garrison Ln. bridge is the result of the old abutments.

Notes:

Excellent wood inputs and riparian buffer. Pool formation and cover also in reference range, with 7 large pools.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR04	Segment:	B	Completion Date:	18-Aug-08
Organization:	FEA, NH-DES	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	4,256	Segment Location:	From the change in confinemnt at the segment break up to the confluence with a small tributary entering from the north.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	410	0
height	4	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	250	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Hilly
Continuous	Never	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	Boulder/Cobble
1.5 Valley Features		
Valley Width (ft)		265
Width Determination		Measured
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	32.4
2.1a Wetted Width (ft)	28
2.1b Ratio (wetted/bkfl)	0.86
2.2 Max Depth (ft)	5.1
2.3 Mean Depth (ft)	3.6
2.4 Floodprone Width (ft)	264
2.5 RAF	5.8
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		9.1
2.7 Entrenchment Ratio		8.1
2.8 Incision Ratio		1.1
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		250
2.12 Substrate Composition		
Bedrock	0	%
Boulder	4	%
Cobble	6	%
Coarse Gravel	8	%
Fine Gravel	10	%
Sand	68	%
Silt & Smaller	4	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	12	%
# LWD	142	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	2	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Sand Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	40
Erosion Height (ft)	0	3
Revetment Type	None	Rip-rap
Revetment Length (ft)	0	260

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	70	0	10	90
R Trees	70	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	40	0	80	20
R Shrubs/Saplings	40	0	80	20

	% Cover	Invasive	Grasses	Forbs
L Herbs	80	0	60	40
R Herbs	80	0	60	40

Bank Canopy	Left	Right
Canopy %	51-75	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>200	>200
Sub-dominant	None	101-150
Length <25 ft	None	260

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	20	80
R Trees	80	0	20	80

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	50	0	70	30
R Shrubs/Saplings	50	0	70	30

	% Cover	Invasive	Grasses	Forbs
L Herbs	80	0	40	60
R Herbs	80	0	40	60

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	Residential
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Minimum
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	7
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	1
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	1
Affected Length (ft)	250

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	1	3	1
	Diagonal	Delta	Island
	0	0	1

5.2 Other Features	Flood	NCO	Avulsion
	3	0	0
	Braiding		
	1		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	0
5.5 Dredging	None
Bridge and Culvert Survey	No

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR04	Segment:	B	Completion Date:	18-Aug-08
Organization:	FEA, NH-DES	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	4,256	Segment Location:	From the change in confinemnt at the segment break up to the confluence with a small tributary entering from the north.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Old abutment	23	Yes	No	Yes	Yes
Problems:	DB				

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	15	None	No
7.2 Channel Aggradation	13	None	No
7.3 Widening Channel	16		No
7.4 Change in Planform	15		No
Total Score:	59		
Geomorphic Rating:	0.74		

Channel Evolution Model F
Channel Evolution Stage I
Geomorphic Condition Good
Stream Sensitivity High

Channel Adjustment Processes Narrative

Minor aggradation and planform changes (ie, flood chutes) appear to be a natural part of the system with high LWD densities. Braiding noted in Step 5.2 is associated with past beaver activity.

Notes:

Segment is largely stable, with an accessible floodplain throughout. Old abutments are constricting the channel where a bridge once was that served the conserved lands trail. The structure has been washed downstream approximately 350 feet.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR05	Segment:	0	Completion Date:	18-Aug-08
Organization:	FEA, NH-DES	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	2,368	Segment Location:	From the confluence with a small tributary entering from the north up to the confluence with Bloody Brook.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Hilly
Continuous	Never	Sometimes
W/in 1 bnkfl	Never	Sometimes
Texture	NE	Clay
1.5 Valley Features		
Valley Width (ft)		345
Width Determination		Measured
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	18
2.1a Wetted Width (ft)	10.4
2.1b Ratio (wetted/bkfl)	0.58
2.2 Max Depth (ft)	2.7
2.3 Mean Depth (ft)	1.9
2.4 Floodprone Width (ft)	344
2.5 RAF	2.7
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		9.5
2.7 Entrenchment Ratio		19.1
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type	Complete	
2.11 Riffle Step Spacing		60
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	0	%
Fine Gravel	0	%
Sand	82	%
Silt & Smaller	18	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	15	%
# LWD	30	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	10	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NE
2.15 Reference Stream Type		
E, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt	Silt
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	10	0	30	70
R Trees	10	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	50	0	80	20
R Shrubs/Saplings	50	0	80	20

	% Cover	Invasive	Grasses	Forbs
L Herbs	95	0	80	20
R Herbs	95	0	80	20

Bank Canopy	Left	Right
Canopy %	1-25	1-25
Mid-channel canopy	Open	

3.2 Riparian Buffer	Left	Right
Buffer Width		
Dominant	>200	>200
Sub-dominant	None	None
Length <25 ft	None	None

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	20	0	40	60
R Trees	20	0	40	60

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	80	20
R Shrubs/Saplings	60	0	80	20

	% Cover	Invasive	Grasses	Forbs
L Herbs	90	0	80	20
R Herbs	90	0	80	20

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Shrub/Sapling	Shrub/Sapling
Sub-dominant	Forest	Forest
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	4
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	
Field Ditch	0
Road Ditch	0
Urban Storm Pipe	0
Tile Drain	0
Overland Flow	0
Other	0
4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	1	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	None	
Length (ft)	0	
5.5 Dredging	None	
Bridge and Culvert Survey	No	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Little River	Reach #:	LR05	Segment:	0	Completion Date:	18-Aug-08
Organization:	FEA, NH-DES	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	2,368	Segment Location:	From the confluence with a small tributary entering from the north up to the confluence with Bloody Brook.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	18	None	No
7.2 Channel Aggradation	18	None	No
7.3 Widening Channel	18		No
7.4 Change in Planform	16		No
Total Score:	70		
Geomorphic Rating:	0.88		

Channel Evolution Model F
Channel Evolution Stage I
Geomorphic Condition Reference (0.85-1.0)
Stream Sensitivity High

Channel Adjustment Processes Narrative

Reach is completely isolated and well buffered. The lack of antrhopogenic structures allow for excellent channel stability and floodplain processes.

Notes:

Healthy riparian buffer noted for entire reach. Evidence of recent beaver activity in the lower reach.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Bloody Brook	Reach #:	BB01	Segment:	A	Completion Date:	20-Aug-08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:		Rain:	No
Segment Length (ft):	300	Segment Location:	From the confluence with the Little River up to a large beaver dam.				

Step 1. Valley and Floodplain

1.1 Segmentation:		OT
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Hilly
Continuous	Never	Never
W/in 1 bnkfl	Never	Never
Texture	NA	NA
1.5 Valley Features		
Valley Width (ft)		450
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	10.2
2.1a Wetted Width (ft)	6
2.1b Ratio (wetted/bkfl)	0.59
2.2 Max Depth (ft)	2.3
2.3 Mean Depth (ft)	1.5
2.4 Floodprone Width (ft)	206
2.5 RAF	2.3
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		6.8
2.7 Entrenchment Ratio		20.2
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		High (>1.5)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		60
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	0	%
Fine Gravel	0	%
Sand	45	%
Silt & Smaller	55	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	35	%
# LWD	10	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Silt	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Silt, Dune-Ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Undercut	Undercut

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	20	0	40	60
R Trees	25	0	40	60

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	50	50
R Shrubs/Saplings	60	0	50	50

	% Cover	Invasive	Grasses	Forbs
L Herbs	80	0	35	65
R Herbs	80	0	35	65

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer		
Buffer Width	Left	Right
Dominant	>200	>200
Sub-dominant	None	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	75	0	45	55
R Trees	75	0	45	55

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	70	0	30	70
R Shrubs/Saplings	70	0	30	70

	% Cover	Invasive	Grasses	Forbs
L Herbs	60	0	30	70
R Herbs	60	0	30	70

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	None	None
Height (ft)	NA	NA
Gullies (number)	None	None
Height (ft)	NA	NA

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	1
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	1	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	2	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	NA
5.5 Dredging	None
Bridge and Culvert Survey	No

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River				
Stream:	Bloody Brook	Reach #:	BB01	Segment: A	Completion Date: 8/20/08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed: 0	Rain: No
Segment Length (ft):	300	Segment Location:	From the confluence with the Little River up to a large beaver dam.		

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	16	None	No
7.3 Widening Channel	16		No
7.4 Change in Planform	16		No
Total Score:	64		
Geomorphic Rating:	0.80		

Channel Evolution Model F
Channel Evolution Stage I
Geomorphic Condition Good (0.65-0.84)
Stream Sensitivity High

Channel Adjustment Processes Narrative

Minor flood chutes appear to be natural part of planform adjustments. Areas of siltation along the adjacent floodplain indicated that recent storms (July, 2008) led to overbank flow and deposition of sediment. Robust riparian vegetation contributes to healthy floodplain functions.

Notes:

Reach likely was historically impacted from agricultural land uses. Riparian forest appeared to be early to mid-successional with an older cohort of white pine. Direct impacts to the channel (ie, straightening) were not evident however, as assessment of stage I of channel evolution was made with high confidence.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Bloody Brook	Reach #:	BB01	Segment:	B	Completion Date:	20-Aug-08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	Wetland	Rain:	No
Segment Length (ft):	3,435	Segment Location:	From the segment break with A up to the eastern end of ponding from the large beaver dams.				

Step 1. Valley and Floodplain

1.1 Segmentation:		OT
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Hilly
Continuous	Never	Never
W/in 1 bnkfl	Never	Never
Texture	NA	NA
1.5 Valley Features		
Valley Width (ft)		520
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type	Not Applicable	
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt & Smaller	NA	%
Silt/Clay Present	NA	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	NA	%
# LWD	NA	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	0	0
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	5	0	80	20
R Trees	5	0	80	20

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	10	0	100	0
R Shrubs/Saplings	10	0	100	0

	% Cover	Invasive	Grasses	Forbs
L Herbs	100	0	70	30
R Herbs	100	0	70	30

Bank Canopy	Left	Right
Canopy %	1-25	1-25
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>200	>200
Sub-dominant	None	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	50	50
R Trees	80	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	40	60
R Shrubs/Saplings	60	0	40	60

	% Cover	Invasive	Grasses	Forbs
L Herbs	80	0	30	70
R Herbs	80	0	30	70

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Shrub/Sapling	Shrub/Sapling
Sub-dominant	Forest	Forest
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	3
Affected Length (ft)	3435

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:	0
5.5 Straightening	None
Length (ft)	0
5.5 Dredging	None
Bridge and Culvert Survey	No

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Bloody Brook	Reach #:	BB01	Segment:	B	Completion Date:	8/20/08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	Wetland	Rain:	No
Segment Length (ft):	3435	Segment Location:	From the segment break with A up to the eastern end of ponding from the large beaver dams.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Only banks, buffers, and corridor data collected due to ponding throuhgout the segment from 3 beaver ponds. Healthy riparian vegetation and floodplain function was observed throughout the reach. No RGA and RHA data collected for reach.

Notes:

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Bloody Brook	Reach #:	BB02	Segment:	0	Completion Date:	20-Aug-08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	Wetland	Rain:	No
Segment Length (ft):	1,373	Segment Location:	From the eastern end of ponding from the large beaver dams up to the Route 101 crossing.				

Step 1. Valley and Floodplain

1.1 Segmentation:		OT
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Hilly
Continuous	Never	Never
W/in 1 bnkfl	Never	Never
Texture	NA	NA
1.5 Valley Features		
Valley Width (ft)		520
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type	Not Applicable	
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt & Smaller	NA	%
Silt/Clay Present	NA	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	NA	%
# LWD	NA	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	0	0
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	10	0	10	90
R Trees	10	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	70	0	90	10
R Shrubs/Saplings	70	0	90	10

	% Cover	Invasive	Grasses	Forbs
L Herbs	90	0	60	40
R Herbs	90	0	60	40

Bank Canopy	Left	Right
Canopy %	1-25	1-25
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>200	>200
Sub-dominant	None	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	60	40
R Trees	80	0	70	30

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	0	10	90
R Shrubs/Saplings	30	0	10	90

	% Cover	Invasive	Grasses	Forbs
L Herbs	20	0	90	10
R Herbs	20	0	90	10

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Shrub/Sapling	Shrub/Sapling
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	3
Affected Length (ft)	1373

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	0
5.5 Straightening	Straightening
Length (ft)	110
5.5 Dredging	None
Bridge and Culvert Survey	No

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Bloody Brook	Reach #:	BB02	Segment:	0	Completion Date:	8/20/08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	Wetland	Rain:	No
Segment Length (ft):	1373	Segment Location:	From the eastern end of ponding from the large beaver dams up to the Route 101 crossing.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0

Total Score: 0

Geomorphic Rating: 0

Channel Evolution Model 0

Channel Evolution Stage 0

Geomorphic Condition 0

Stream Sensitivity 0

Channel Adjustment Processes Narrative

Only banks, buffers, and corridor data collected due to ponding throuhgout the segment from 3 beaver ponds. Healthy riparian vegetation and floodplain function was observed throughout the reach. No significant aggradation or channel incision downstream of the Rt 101 crossing was noted.

Notes:

No RGA and RHA data collected for reach.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Bloody Brook	Reach #:	BB03	Segment:	A	Completion Date:	20-Aug-08 \
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	Wetland	Rain:	No
Segment Length (ft):	1,760	Segment Location:	From Route 101 crossing up to wooded area northeast of reservoir.				

Step 1. Valley and Floodplain

1.1 Segmentation:		OT
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	390	0
height	9	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Hilly
Continuous	Never	Never
W/in 1 bnkfl	Never	Never
Texture	NA	NA
1.5 Valley Features		
Valley Width (ft)		340
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type	Not Applicable	
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt & Smaller	NA	%
Silt/Clay Present	NA	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	NA	%
# LWD	NA	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	Rip-rap	Rip-rap
Revetment Length (ft)	480	370

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	5	0	10	90
R Trees	5	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	0	90	10
R Shrubs/Saplings	30	0	90	10

	% Cover	Invasive	Grasses	Forbs
L Herbs	90	0	60	40
R Herbs	90	20	50	30

Bank Canopy	Left	Right
Canopy %	1-25	1-25
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	76-100	76-100
Sub-dominant	0-25	0-25
Length <25 ft	590	490

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	20	0	40	60
R Trees	10	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	40	0	80	20
R Shrubs/Saplings	20	0	80	20

	% Cover	Invasive	Grasses	Forbs
L Herbs	20	0	70	30
R Herbs	30	10	60	30

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Shrub/Sapling	Shrub/Sapling
Sub-dominant	Residential	Residential
Mass Failures (ft)	None	None
Height (ft)	NA	NA
Gullies (number)	None	None
Height (ft)	NA	NA

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	1
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	2
Affected Length (ft)	1760

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	0
5.5 Straightening	Straightening
Length (ft)	920
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Bloody Brook	Reach #:	BB03	Segment:	A	Completion Date:	8/20/08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	Wetland	Rain:	No
Segment Length (ft):	1,760	Segment Location:	From Route 101 crossing up to wooded area northeast of reservoir.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	85	Yes	Yes	No	Yes
Problems:	None				
Bridge	80	Yes	Yes	No	Yes
Problems:	None				
Culvert	4	Yes	Yes	Yes	Yes
Problems:	SB				

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Only banks, buffers, and corridor data collected due to ponding throuhgout the segment from 2 beaver ponds. Healthy riparian vegetation and floodplain function was observed throughout the middle reach, however the Route 101 crossing and reservoir in upper reach adversely impact buffer conditions. No RGA and RHA data collected for reach.

Notes:

Berm and channel straightening noted in along reservoir in the upper segment. Potential restoration site for revegetation of banks and buffers.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Bloody Brook	Reach #:	BB03	Segment:	B	Completion Date:	20-Aug-08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:		Rain:	No
Segment Length (ft):	3,210	Segment Location:	From the wooded area northeast of the reservoir up to the reach break with BB.04				

Step 1. Valley and Floodplain

1.1 Segmentation:		OT
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	270	0
height	6	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	1450	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	Boulder	Boulder
1.5 Valley Features		
Valley Width (ft)		60
Width Determination		Measured
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	6.9
2.1a Wetted Width (ft)	4.5
2.1b Ratio (wetted/bkfl)	0.65
2.2 Max Depth (ft)	1.8
2.3 Mean Depth (ft)	1.2
2.4 Floodprone Width (ft)	48
2.5 RAF	1.8
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		5.7
2.7 Entrenchment Ratio		7.0
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		High (>1.5)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		40
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	0	%
Fine Gravel	0	%
Sand	100	%
Silt & Smaller	0	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	15	%
# LWD	96	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	25	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Undercut	Undercut

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	90	0	90	10
R Trees	90	0	90	10

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	10	0	0	100
R Shrubs/Saplings	10	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs	5	0	90	10
R Herbs	5	0	90	10

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer	Left	Right
Buffer Width		
Dominant	51-75	51-75
Sub-dominant	76-100	76-100
Length <25 ft	150	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	90	0	90	10
R Trees	90	0	90	10

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	0	10	90
R Shrubs/Saplings	30	0	10	90

	% Cover	Invasive	Grasses	Forbs
L Herbs	5	0	20	80
R Herbs	5	0	20	80

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	Residential
Mass Failures (ft)	None	None
Height (ft)	NA	NA
Gullies (number)	None	None
Height (ft)	NA	NA

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Minimum
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	16
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	1	20	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	2	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	None	
Length (ft)	0	
5.5 Dredging	None	
Bridge and Culvert Survey		Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Bloody Brook	Reach #:	BB03	Segment:	B	Completion Date:	8/20/08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	0	Rain:	No
Segment Length (ft):	3,210	Segment Location:	From the wooded area northeast of the reservoir up to the reach break with BB.04				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	3	Yes	Yes	Yes	Yes

Problems: None

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	15	None	No
7.2 Channel Aggradation	16	None	No
7.3 Widening Channel	14		No
7.4 Change in Planform	15		No
Total Score:	60		
Geomorphic Rating:	0.75		

Channel Evolution Model F
Channel Evolution Stage I
Geomorphic Condition Good (0.65-0.84)
Stream Sensitivity High

Channel Adjustment Processes Narrative

Excellent sinuosity and habitat formation throughout segment. Minor impacts from residential encroachment and stream crossings, however channel processes have not been severely impacted. Habitat for LWD, pools, and undercut banks all ranked in the reference range for this stream type.

Notes:

Minor neck cutoffs due to high sinuosity appear to be natural part of planform adjustments. Areas of siltation along the adjacent floodplain indicated that recent storms (July, 2008) led to overbank flow and deposition of sediment.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Bloody Brook	Reach #:	BB04	Segment:	0	Completion Date:	20-Aug-08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	3,244	Segment Location:	From approx. 400 feet downstream of Watson Rd up to wetland area to the northeast.				

Step 1. Valley and Floodplain

1.1 Segmentation:		
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	800	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Hilly
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		145
Width Determination		Measured
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	8.0
2.1a Wetted Width (ft)	5.5
2.1b Ratio (wetted/bkfl)	0.69
2.2 Max Depth (ft)	1.6
2.3 Mean Depth (ft)	1.1
2.4 Floodprone Width (ft)	143
2.5 RAF	1.6
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		7.5
2.7 Entrenchment Ratio		17.9
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type	Complete	
2.11 Riffle Step Spacing		50
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	0	%
Fine Gravel	0	%
Sand	80	%
Silt & Smaller	20	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	30	%
# LWD	30	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	40	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	Rip-rap	Rip-rap
Revetment Length (ft)	15	15

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	90	0	60	40
R Trees	90	0	60	40

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	70	30
R Shrubs/Saplings	60	0	70	30

	% Cover	Invasive	Grasses	Forbs
L Herbs	50	0	30	70
R Herbs	50	0	30	70

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	101-150	51-75
Sub-dominant	26-50	26-50
Length <25 ft	0	80

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	90	0	50	50
R Trees	90	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	70	0	40	60
R Shrubs/Saplings	70	0	40	60

	% Cover	Invasive	Grasses	Forbs
L Herbs	60	0	20	80
R Herbs	60	0	20	80

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	Residential
Mass Failures (ft)	0	0
Height (ft)	NA	NA
Gullies (number)	0	0
Height (ft)	NA	NA

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	5
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	1	1	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	0
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Bloody Brook	Reach #:	BB04	Segment:	0	Completion Date:	8/20/08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	3,244	Segment Location:	From approx. 400 feet downstream of Watson Rd up to wetland area to the northeast.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	2	Yes	Yes	Yes	Yes
Problems:	SB				
Culvert	2	Yes	Yes	Yes	Yes
Problems:	DA				

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	13	None	No
7.2 Channel Aggradation	10	None	No
7.3 Widening Channel	11		No
7.4 Change in Planform	11		No
Total Score:	45		
Geomorphic Rating:	0.56		

Channel Evolution Model D
Channel Evolution Stage II c
Geomorphic Condition Fair (0.35-0.64)
Stream Sensitivity Extreme

Channel Adjustment Processes Narrative

Major aggradation of fine sediment occurring upslope of Watson Rd culvert due to undersized culvert and possible sediment supply from recent construction in upslope watershed. Reduced habitat in this area due to sedimentation.

Notes:

Channel features typical of fluvial systems end approximately 1500 feet upstream of Watson Rd crossing.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Dudley Brook	Reach #:	DB01	Segment:	A	Completion Date:	18-Aug-08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,215	Segment Location:	From the confluence with the Little River up to a sharp change in slope at Segment B.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Hilly
Continuous	Never	Sometimes
W/in 1 bnkfl	Never	Sometimes
Texture	NA	NA
1.5 Valley Features		
Valley Width (ft)		340
Width Determination		Measured
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	24
2.1a Wetted Width (ft)	18.2
2.1b Ratio (wetted/bkfl)	0.76
2.2 Max Depth (ft)	3.2
2.3 Mean Depth (ft)	2.1
2.4 Floodprone Width (ft)	321
2.5 RAF	3.2
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		11.4
2.7 Entrenchment Ratio		13.4
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		180
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	4	%
Fine Gravel	8	%
Sand	72	%
Silt & Smaller	16	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	20	%
# LWD	46	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	20	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Undercut	Undercut

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	100	0
Erosion Height (ft)	2	0
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	70	0	20	80
R Trees	70	0	40	60

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	50	0	70	30
R Shrubs/Saplings	50	0	70	30

	% Cover	Invasive	Grasses	Forbs
L Herbs	90	0	30	70
R Herbs	90	0	30	70

Bank Canopy	Left	Right
Canopy %	51-75	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>200	>200
Sub-dominant	None	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	20	80
R Trees	80	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	60	40
R Shrubs/Saplings	30	0	20	80

	% Cover	Invasive	Grasses	Forbs
L Herbs	80	0	40	60
R Herbs	20	0	10	90

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	3
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	1	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	2	1	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:		0
5.5 Straightening	None	
Length (ft)	0	
5.5 Dredging	None	
Bridge and Culvert Survey	No	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Dudley Brook	Reach #:	DB01	Segment:	A	Completion Date:	8/18/08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,215	Segment Location:	From the confluence with the Little River up to a sharp change in slope at Segment B.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	13	None	No
7.3 Widening Channel	15		No
7.4 Change in Planform	11		No
Total Score:	55		
Geomorphic Rating:	0.69		

Channel Evolution Model D
Channel Evolution Stage II c
Geomorphic Condition Good (0.65-0.84)
Stream Sensitivity High

Channel Adjustment Processes Narrative

Minor, natural flood chutes crossing the meander bends throughout the segment. Flood chutes and overland flow over vigorous floodplain vegetation indicate healthy floodplain processes. Some aggradation in the lower reach near the confluence with Little River may be due to backwater at the confluence during high flow events.

Notes:

Good habitat conditions with excellent wood inputs and good pool and undercut bank formation.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Dudley Brook	Reach #:	DB01	Segment:	B	Completion Date:	18-Aug-08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	500	Segment Location:	From a large pool at a sharp break in slope up to a beaver dam located 1200 feet northeast of the Rt 111 crossing.				

Step 1. Valley and Floodplain		
1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	Boulder	Boulder
1.5 Valley Features		
Valley Width (ft)		135
Width Determination		Measured
Confinement Type		Narrow
Rock Gorge?		No
Human Caused Change?		No
Step 2. Stream Channel		
2.1 Bankfull Width (ft)	28.0	
2.1a Wetted Width (ft)	19.0	
2.1b Ratio (wetted/bkfl)	0.68	
2.2 Max Depth (ft)	2.6	
2.3 Mean Depth (ft)	1.5	
2.4 Floodprone Width (ft)	135	
2.5 RAF	2.6	
*Human Elevated FP	NA	

Step 2. (Cont'd)		
2.6 Width/Depth Ratio		18.2
2.7 Entrenchment Ratio		4.8
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		180
2.12 Substrate Composition		
Bedrock	0	%
Boulder	33	%
Cobble	56	%
Coarse Gravel	1	%
Fine Gravel	4	%
Sand	6	%
Silt & Smaller	0	%
Silt/Clay Present	No	
Embedded (chan)	15	%
Embedded (marg)	25	%
Detritus	10	%
# LWD	8	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	20	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Cobble	
Subclass Slope:	b	
Bed Form:	Riffle-Pool	
Field Measured Slope:		NA
2.15 Reference Stream Type		
Cb, Cobble, Riffle-pool		
Step 3. Riparian Features		
3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)				
Bank Texture	Left		Right	
Upper				
Material Type	Boulder/Cobble		Boulder/Cobble	
Consistency	Non-cohesive		Non-cohesive	
Lower				
Material Type	Boulder/Cobble		Boulder/Cobble	
Consistency	Non-cohesive		Non-cohesive	
Bank Erosion	Left		Right	
Erosion Length (ft)	0		0	
Erosion Height (ft)	0		0	
Revetment Type	Hard Bank		Hard Bank	
Revetment Length (ft)	50		50	
Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	100	0	90	10
R Trees	100	0	90	10
	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	10	0	0	100
R Shrubs/Saplings	10	0	0	100
	% Cover	Invasive	Grasses	Forbs
L Herbs	10	0	0	100
R Herbs	10	0	0	100
Bank Canopy	Left		Right	
Canopy %	76-100		76-100	
Mid-channel canopy	Closed			
3.2 Riparian Buffer				
Buffer Width	Left		Right	
Dominant	>200		>200	
Sub-dominant	None		None	
Length <25 ft	0		0	
Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	100	0	90	10
R Trees	100	0	90	10
	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	20	0	0	100
R Shrubs/Saplings	20	0	0	100
	% Cover	Invasive	Grasses	Forbs
L Herbs	20	0	20	80
R Herbs	20	0	20	80

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0
Step 4. Flow & Flow Modifiers		
4.1 Springs/ Seeps	None	
4.2 Adjacent Wetlands	None	
4.3 Flow Status	Base	
4.4 # of Debris Jams	0	
4.5 Flow Reg Type	None	
4.6 Up/Downstream Flow Reg	None	
4.7 Stormwater Inputs		
Field Ditch	0	Road Ditch 0
Urban Storm Pipe	0	Tile Drain 0
Overland Flow	0	Other 0
4.9 # of Beaver Dams	0	
Affected Length (ft)	0	
Step 5. Channel Bed & Planform Changes		
5.1 Bar Types	Mid	Point	Side
	1	0	0
	Diagonal	Delta	Island
	0	0	0
5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		
5.3 Steep Riffles & Headcuts			
	# SRs	# HCs	Trib Rejuv.
	0	0	No
5.4 Stream Ford or Animal Crossing:			0
5.5 Straightening	None		
Length (ft)	0		
5.5 Dredging	None		
Bridge and Culvert Survey		No	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Dudley Brook	Reach #:	DB01	Segment:	B	Completion Date:	8/18/08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	500	Segment Location:	From a large pool at a sharp break in slope up to a beaver dam located 1200 feet northeast of the Rt 111 crossing.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Old abutment	14	Yes	Yes	Yes	Yes

Problems: SB, DA

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	13	None	No
7.3 Widening Channel	18		No
7.4 Change in Planform	11		No
Total Score:	58		
Geomorphic Rating:	0.73		

Channel Evolution Model F
Channel Evolution Stage I
Geomorphic Condition Good (0.65-0.84)
Stream Sensitivity Moderate

Channel Adjustment Processes Narrative

Minor aggradation behind abutments causing flood chute around the structure in the upper reach. Otherwise channel is stable and naturally armored. Two large pools with LWD collected within them provide good habitat for macroinvertebrates typical of this stream type.

Notes:

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Dudley Brook	Reach #:	DB01	Segment:	C	Completion Date:	18-Aug-08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	Wetland	Rain:	No
Segment Length (ft):	5,346	Segment Location:	From beaver dam at segment break with Segment B up to reach break with DB.02 at Pickpocket Road.				

Step 1. Valley and Floodplain

1.1 Segmentation:		OT
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	100	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Hilly
Continuous	Never	Never
W/in 1 bnkfl	Never	Never
Texture	NA	NA
1.5 Valley Features		
Valley Width (ft)		450
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type	Not Applicable	
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt & Smaller	NA	%
Silt/Clay Present	NA	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	NA	%
# LWD	NA	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Silt	Silt
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	0	0
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	10	0	0	100
R Trees	10	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	0	100	0
R Shrubs/Saplings	30	0	100	0

	% Cover	Invasive	Grasses	Forbs
L Herbs	100	10	70	20
R Herbs	100	10	70	20

Bank Canopy	Left	Right
Canopy %	1-25	1-25
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>200	>200
Sub-dominant	76-100	51-75
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	40	0	40	60
R Trees	40	0	40	60

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	80	20
R Shrubs/Saplings	60	0	80	20

	% Cover	Invasive	Grasses	Forbs
L Herbs	80	20	60	20
R Herbs	80	20	60	20

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Shrub/Sapling	Shrub/Sapling
Sub-dominant	Forest	Forest
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None
4.7 Stormwater Inputs	
Field Ditch	0
Road Ditch	0
Urban Storm Pipe	0
Tile Drain	0
Overland Flow	0
Other	0
4.9 # of Beaver Dams	3
Affected Length (ft)	5,346

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	1		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	0
5.5 Straightening	Straightening
Length (ft)	365
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Dudley Brook	Reach #:	DB01	Segment:	C	Completion Date:	8/18/08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	Wetland	Rain:	No
Segment Length (ft):	5,346	Segment Location:	From beaver dam at segment break with Segment B up to reach break with DB.02 at Pickpocket Road.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	24	Yes	Yes	No	Yes

Problems: None

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Only banks, buffers, and corridor data collected due to ponding throughout the segment from at least 3 beaver ponds. Healthy riparian vegetation and floodplain function was observed throughout the reach. No RGA and RHA data collected for reach.

Notes:

Braiding noted under planform changes (Step 5.2) is associated with beaver activity, not increased sediment load from human impacts.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Dudley Brook	Reach #:	DB02	Segment:	0	Completion Date:	21-Aug-08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	Wetland	Rain:	No
Segment Length (ft):	5,311	Segment Location:	From Pickpocket Road crossing up to Rt. 111-A crossing.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Hilly
Continuous	Never	Never
W/in 1 bnkfl	Never	Never
Texture	NA	NA
1.5 Valley Features		
Valley Width (ft)		520
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type	Not Applicable	
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt & Smaller	NA	%
Silt/Clay Present	NA	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	NA	%
# LWD	NA	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Silt	Silt
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	0	0
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	10	0	0	100
R Trees	10	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	0	90	10
R Shrubs/Saplings	30	0	90	10

	% Cover	Invasive	Grasses	Forbs
L Herbs	100	10	60	30
R Herbs	100	10	60	30

Bank Canopy	Left	Right
Canopy %	1-25	1-25
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>200	>200
Sub-dominant	0-25	0-25
Length <25 ft	720	400

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	40	0	40	60
R Trees	40	0	40	60

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	70	30
R Shrubs/Saplings	60	0	70	30

	% Cover	Invasive	Grasses	Forbs
L Herbs	70	30	50	20
R Herbs	70	30	50	20

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Shrub/Sapling	Shrub/Sapling
Sub-dominant	Forest	Forest
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	4
Affected Length (ft)	5,311

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	1
	Braiding		
	1		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	0
5.5 Straightening	Straightening
Length (ft)	2900
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Dudley Brook	Reach #:	DB02	Segment:	0	Completion Date:	8/21/08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	Wetland	Rain:	No
Segment Length (ft):	5,311	Segment Location:	From Pickpocket Road crossing up to Rt. 111-A crossing.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Culvert	11	Yes	Yes	No	Yes

Problems: None

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model	0
Channel Evolution Stage	0
Geomorphic Condition	0
Stream Sensitivity	0

Channel Adjustment Processes Narrative

Only banks, buffers, and corridor data collected due to ponding throughout the segment from 4 beaver dams/ponds. Healthy riparian vegetation and floodplain function was observed throughout the reach. No RGA and RHA data collected for reach.

Notes:

Braiding and historic avulsion noted under planform changes (Step 5.2) is associated with beaver activity, not increased sediment load from human impacts. Significant channel straightening was noted in the middle and upper reach, especially near the Route 111A crossing (55% of reach length). RGA rating assessed as fair due to this impact.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Dudley Brook	Reach #:	DB03	Segment:	0	Completion Date:	22-Aug-08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	Wetland	Rain:	No
Segment Length (ft):	9,466	Segment Location:	From Rt. 111-A crossing up to the confluence with a tributary entering from the west.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	710	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Hilly
Continuous	Never	Never
W/in 1 bnkfl	Never	Never
Texture	NA	NA
1.5 Valley Features		
Valley Width (ft)		630
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Not Applicable
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt & Smaller	NA	%
Silt/Clay Present	NA	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	NA	%
# LWD	NA	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NA
2.15 Reference Stream Type		
E, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Silt	Silt
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	30
Erosion Height (ft)	0	4
Revetment Type	Rip-rap	Rip-rap
Revetment Length (ft)	15	15

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	10	0	30	70
R Trees	20	0	60	40

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	0	90	10
R Shrubs/Saplings	20	0	90	10

	% Cover	Invasive	Grasses	Forbs
L Herbs	100	10	70	20
R Herbs	100	10	70	20

Bank Canopy	Left	Right
Canopy %	1-25	1-25
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>200	>200
Sub-dominant	0-25	0-25
Length <25 ft	1000	1290

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	40	0	40	60
R Trees	50	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	70	0	60	40
R Shrubs/Saplings	70	0	60	40

	% Cover	Invasive	Grasses	Forbs
L Herbs	70	10	40	50
R Herbs	70	10	40	50

3.3 Riparian Corridor

Corridor Land Use	Left	Right
Dominant	Shrub/Sapling	Shrub/Sapling
Sub-dominant	Pasture	Pasture
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	3
Affected Length (ft)	9,150

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
1	0	No

5.4 Stream Ford or Animal Crossing:	0
5.5 Straightening	Straightening
Length (ft)	1,350
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Dudley Brook	Reach #:	DB03	Segment:	0	Completion Date:	8/22/08
Organization:	FEA	Observers:	SPP, EPF	Why Not Assessed:	Wetland	Rain:	No
Segment Length (ft):	9,466	Segment Location:	From Rt. 111-A crossing up to the confluence with a tributary entering from the west.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	16	Yes	Yes	No	Yes
Problems:	DA, SA				
Old abutment	23	Yes	Yes	No	Yes
Problems:	DB				

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	0		
Geomorphic Rating:	0		

Channel Evolution Model 0
Channel Evolution Stage 0
Geomorphic Condition 0
Stream Sensitivity 0

Channel Adjustment Processes Narrative

Only banks, buffers, and corridor data collected (no RGA/RHA) due to ponding throughout the segment from 3 beaver dams/ponds. Healthy riparian vegetation and floodplain function was observed throughout the upper reach, however pasture impacts were noted in lower reach along farm off Rt 111-A.

Notes:

Immediately upstream of Rt 111-A there is eroded bank (right bank). This appears to be caused by impacts from grazing animals and reduced bank resistance due to lack of woody vegetation. The erosion may also be exacerbated by the increased stream power from the old abutments causing a constriction immediately upstream, and/or the downstream bridge constrcition.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Lower Exeter River

Phase 2 Stream Geomorphic

Assessment Data

Lower Exeter River Subwatershed - Reach/Segment Cross-Reference Table		
Reach/ Segment ID	**Town(s)**	**Segment Location**
LE01	Exeter	From the just upstream of the dam in downtown Exeter to the reachbreak at the confluence witht the Little River
LE02	Exeter	From reach break at the confluence with the Little River to a slight change in confinement approx. 1.25 miles upstream
LE03	Exeter	From Change in confinement to the confluence with the Great Brook
LE04	Exeter	From the conflunce with the Great Brook Marsh area to the upstream reach break downstream of Powder Mill Rd.
LE05	Exeter	From the change in confinement downstream of Powder Mill Rd. to 900 feet upstream of the bridge.
LE06	Exeter	From the reach break at the confinement change to the gas line crossing perpendicular to Powder Mill Rd
LE07	Exeter	From reach break to just downstream of the gas line crossing perpindicular to Powder Mill Rd.
LE08	Exeter	From the change in confinement at the gas line to just downstream of Kingston Rd
LE09-A	Exeter	From the reach break at the change in confinement extending upstream to riffle downstream of bend to south
LE09-B	Exeter	From segment break below sharp bend up to reach break at change in confinement
LE10-A	Exeter	From the reach break the segment extends upstream to a change in planform approx. 700 ft. downstream of the Pickpocket dam
LE10-B	Exeter, Brentwood	Segment extends from approx. 700 feet downstream of the Pickpocket dam up to the reach break at the dam
LE11	Exeter, Brentwood	Just upstream of Pickpocket Dam
LE12	Brentwood	From confluence with Little River South down to impounded section influenced by Pickpocket Dam

Phase 2 Reach Summary Statistics for the Lower Exeter River																			
Reach/ Segment	Watershed Area (mi^2)	Phase 1 Confinement	Reference Channel Width (ft)	Channel Dimensions			Channel & Floodplain Ratios			Reference Stream Type	Existing Stream Type	Dominant Bed Substrate	Bedform	Sinuosity	RGA* Rating	RHA* Rating	Reach Sensitivity	CEM†	CEM† Stage
				Width (ft)	Mean Depth (ft)	Area (ft^2)	Width to Depth	Entrench-ment	Incision										
LE01[A]	108.5	Broad	123.5	--	--	--	--	--	--	E	E	Silt	Dune-Ripple	moderate	Good	Fair	High	--	--
LE02[A]	92.4	Broad	114.1	--	--	--	--	--	--	E	E	Silt	Dune-Ripple	moderate	Good	Good	High	--	--
LE03[A]	89.2	Very Broad	112.2	--	--	--	--	--	--	E	E	Silt	Dune-Ripple	high	Good	Fair	High	--	--
LE04	89.1	Very Broad	112.1	67.0	6.1	408.7	10.9	23.9	1.0	E	E	Silt	Dune-Ripple	very high	Good	Fair	High	F	I
LE05	76.8	Semi Conf.	104.2	49.0	3.7	181.3	13.2	1.5	1.0	Bc	Bc	Cobble	Riffle-Pool	low	Good	Fair	Moderate	F	I
LE06	76.7	Broad**	104.2	76.5	4.6	351.9	16.7	4.7	1.2	C	C	Sand	Dune-Ripple	moderate	Fair	Fair	Very High	F	II
LE07	76.5	Broad	104.1	67.0	6.0	404.0	11.1	9.3	1.2	E	E	Sand	Dune-Ripple	high	Good	Good	High	F	II
LE08	75.9	Semi Conf.	103.7	73.9	3.6	266.0	20.6	3.0	1.0	C	C	Cobble	Riffle-Pool	low	Good	Fair	Moderate	D	IIc
LE09-A	75.8	Narrow	103.6	63.0	5.2	327.6	12.2	4.9	1.0	E	E	Sand	Riffle-Pool	low	Good	Fair	High	F	I
LE09-B	75.5	Narrow	103.4	87.5	2.5	219.7	34.9	1.5	1.1	Bc	Bc	Gravel	Riffle-Pool	moderate	Good	Fair	High	F	I
LE10-A	75.4	Semi Conf.	103.3	63.4	3.3	209.2	19.2	3.0	1.6	C	C	Cobble	Riffle-Pool	low	Good	Fair	Moderate	F	IV
LE10-B	75.3	Semi Conf.**	103.3	89.5	2.8	250.6	32.0	1.9	1.0	Bc	Bc	Cobble	Riffle-Pool	low	Fair	Fair	High	D	IIc
LE11	75.2	Impounded	103.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LE12[A]	74.8	Very Broad	102.9	--	--	--	--	--	--	E	E	Silt	Dune-Ripple	moderate	Good	Good	High	--	--

A Administrative judgment used for determining stream type, RGA, and RHA condition for impounded reaches

* RGA = Rapid Geomorphic Assessment, RHA = Rapid Habitat Assessment

** Human caused change in valley width noted in field, but not enough to change confinement type

† CEM = Channel Evolution Model

Summary of the Rapid Habitat Assessment (RHA) Data for the Lower Exeter River														
Reach/ Segment	Channel Bedform	Woody Debris Cover	Bed Substrate Cover	Scour and Depositional Features	Channel Morphology	Hydrologic Characteristics	Connectivity	River Banks		Riparian Area		Total Score	Percentage*	Habitat Condition**
								Left	Right	Left	Right			
LE01	Dune-ripple	8	12	10	11	13	7	3	5	2	4	75	47%	Fair
LE02	Dune-ripple	10	13	10	15	15	12	8	8	8	9	108	68%	Good
LE03	Dune-ripple	10	12	5	16	13	12	7	7	10	10	102	64%	Fair
LE04	Dune-ripple	11	8	6	16	16	13	8	7	8	6	99	62%	Fair
LE05	Riffle-pool	3	12	8	15	17	11	5	7	2	7	87	54%	Fair
LE06	Dune-ripple	15	15	8	10	15	10	3	7	2	7	92	58%	Fair
LE07	Dune-ripple	16	18	14	15	17	11	9	8	8	7	123	77%	Good
LE08	Riffle-pool	13	11	10	14	14	13	4	6	4	7	96	60%	Fair
LE09-A	Riffle-pool	12	9	11	15	15	12	4	6	5	6	95	59%	Fair
LE09-B	Riffle-pool	9	12	12	13	14	12	6	6	5	7	96	60%	Fair
LE10-A	Riffle-pool	10	16	13	12	13	12	5	7	6	9	103	64%	Fair
LE10-B	Riffle-pool	12	12	11	10	11	9	3	6	4	8	86	54%	Fair
LE11	-	-	-	-	-	-	-	-	-	-	-	-	-	NE
LE12	Dune-ripple	14	13	8	16	13	11	8	8	10	9	110	69%	Good
Total Possible Score		**20**	**20**	**20**	**20**	**20**	**20**	**10**	**10**	**10**	**10**	**160**	**100%**	**Reference**

* Percentages are calculated from a reference RHA score of 160

** All RHA data collected using the VTANR Riffle-Pool/Dune-Ripple RHA field form

Note: Reaches that lacked fluvial processes were not suitable for the RHA protocol; However data originally collected is presented for LE01, LE02, LE03, & LE12

NE = not evaluated

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Lower Exeter River	Reach #:	LE01	Segment:	0	Completion Date:	9-Jul-08
Organization:	FEA, BCE, NHDES	Observers:	SS, CS, PR	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	3,109	Segment Location:	From the just upstream of the dam in downtown Exeter to the reachbreak at the confluence witht the Little River				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	1376	724
height	8	8
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	1100	900
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Flat
Continuous	Never	Never
W/in 1 bnkfl	Never	Never
Texture	Not Evaluated	Not Evaluated
1.5 Valley Features		
Valley Width (ft)		460
Width Determination		Measured
Confinement Type		Semi-Confined
Rock Gorge?		No
Human Caused Change?		Yes

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type	Not Applicable	
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt & Smaller	NA	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	NA	%
# LWD	5	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Silt	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:	Not Evaluated	
2.15 Reference Stream Type		
E, Silt, Dune-Ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt/clay	Silt/clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	55	0
Erosion Height (ft)	3.3	0
Revetment Type	Rip-rap	Rip-rap
Revetment Length (ft)	135	125

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	30	1	0	100
R Trees	70	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	40	0	10	30
R Shrubs/Saplings	80	0	30	70

	% Cover	Invasive	Grasses	Forbs
L Herbs	80	0	65	35
R Herbs	20	0	95	5

Bank Canopy	Left	Right
Canopy %	26-50	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	0-25	76-100
Sub-dominant	26-50	0-25
Length <25 ft	2740	485

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	30	0	0	100
R Trees	70	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	20	0	0	20
R Shrubs/Saplings	60	0	15	85

	% Cover	Invasive	Grasses	Forbs
L Herbs	70	0	85	15
R Herbs	25	0	95	5

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Residential	Residential
Sub-dominant	Commercial/Industrial	Forest
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Minimum
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	Public Water Supply
4.6 Up/Downstream Flow Reg	Downstream

4.7 Stormwater Inputs

Field Ditch	2	Road Ditch	0
Urban Storm Pipe	1	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Lower Exeter River	Reach #:	LE01	Segment:	0	Completion Date:	9-Jul-08
Organization:	FEA, BCE, NHDES	Observers:	SS, CS, PR	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	3,109	Segment Location:	From the just upstream of the dam in downtown Exeter to the reachbreak at the confluence witht the Little River				

1.6 Grade Controls — Present

Type	Location	Total Ht	Ht Above	Photo	GPS
Dam	downstream	4.0	NA	Yes	No

4.8 Channel Constrictions — Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	85	Yes	Yes	Yes	Yes
Problems:	None				
Bridge	65	Yes	Yes	Yes	Yes
Problems:	None				

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type: Unconfined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	13	None	No
7.3 Widening Channel	15		No
7.4 Change in Planform	16		No
Total Score:	60		
Geomorphic Rating:	0.75		

Channel Evolution Model: NA
Channel Evolution Stage: NA
Geomorphic Condition: Good (0.65-0.84)
Stream Sensitivity: High

Channel Adjustment Processes Narrative

Notes:

Reach is impounded by Great Dam and is not governed by fluvial processes. Geometry data originally collected for stream typing and RGA score was not used to develop sensitivity ratings for FEH and other corridor planning purposes, and should not be compared to non-impounded reaches upstream of LE-03. Rather, an administrative judgement was used to determine RGA and RHA scores. RHA data should not be used to evaluate aquatic habitat conditions or compare with non-impounded reaches, as the protocol is intended for fluvial systems.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Lower Exeter River	Reach #:	LE02	Segment:	0	Completion Date:	9-Jul-08
Organization:	FEA; BCS	Observers:	CS, SS, PR	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	6,586	Segment Location:	From reach break at the confluence with the Little River to a slight change in confinement approx. 1.25 miles upstream.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Flat	Flat
Continuous	Never	Never
W/in 1 bnkfl	Never	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		840
Width Determination		Estimated
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		Yes

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type	Not Applicable	
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt & Smaller	NA	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	NA	%
# LWD	56	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	5	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Silt	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NE
2.15 Reference Stream Type		
E, Silt, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt/clay	Silt/clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	30
Erosion Height (ft)	0	4.5
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	85	0	30	70
R Trees	80	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	20	0	0	100
R Shrubs/Saplings	30	0	5	95

	% Cover	Invasive	Grasses	Forbs
L Herbs	70	0	10	90
R Herbs	70	0	20	80

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	101-150	101-150
Sub-dominant	0-25	None
Length <25 ft	375	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	90	0	25	75
R Trees	90	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	10	0	0	100
R Shrubs/Saplings	30	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs	70	0	10	90
R Herbs	75	0	10	90

3.3 Riparian Corridor

Corridor Land Use	Left	Right
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	Public Water Supply
4.6 Up/Downstream Flow Reg	Downstream

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	No

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Lower Exeter River	Reach #:	LE02	Segment:	0	Completion Date:	9-Jul-08
Organization:	FEA; BCS	Observers:	CS, SS, PR	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	6,586	Segment Location:	From reach break at the confluence with the Little River to a slight change in confinement approx. 1.25 miles upstream.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	11	None	No
7.3 Widening Channel	16		No
7.4 Change in Planform	14		No
Total Score:	57		
Geomorphic Rating:	0.71		

Channel Evolution Model	NA
Channel Evolution Stage	NA
Geomorphic Condition	Good (0.65-0.84)
Stream Sensitivity	High

Channel Adjustment Processes Narrative

One flood chute was noted in the upper reach along the left bank. This feature is a natural part of the highly-sinuous planform typical of this setting - it is not an indication of human-induced migration.

Notes:

Reach is impounded by Great Dam and is not governed by fluvial processes. Geometry data originally collected for stream typing and RGA score was not used to develop sensitivity ratings for FEH and other corridor planning purposes, and should not be compared to non-impounded reaches upstream of LE-03. Rather, an administrative judgement was used to determine RGA and RHA scores. RHA data should not be used to evaluate aquatic habitat conditions or compare with non-impounded reaches, as the protocol is intended for fluvial systems.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Lower Exeter River	Reach #:	LE03	Segment:	0	Completion Date:	9-Jul-08
Organization:	FEA; BCS	Observers:	CS, SS, PR	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	2,057	Segment Location:	From Change in confinement to the confluence with the Great Brook.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Flat	Flat
Continuous	Never	Never
W/in 1 bnkfl	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		1,350
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity		High (>1.5)
2.10 Riffle Type		Not Applicable
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt & Smaller	NA	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	NA	%
# LWD	33	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Silt	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NE
2.15 Reference Stream Type		
E, Silt, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt/clay	Silt/clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	90	0	0	100
R Trees	80	0	5	95

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	80	0	0	100
R Shrubs/Saplings	85	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs	85	0	20	80
R Herbs	85	0	15	85

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>200	>200
Sub-dominant	None	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	70	0	0	100
R Trees	90	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	65	0	0	100
R Shrubs/Saplings	75	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs	80	0	30	70
R Herbs	85	0	5	95

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	None
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	Public Water Supply
4.6 Up/Downstream Flow Reg	Downstream

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	1	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	No

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River				
Stream:	Lower Exeter River	Reach #:	LE03	Segment:	Completion Date: 9-Jul-08
Organization:	FEA; BCS	Observers:	CS, SS, PR	Why Not Assessed: NA	Rain: Yes
Segment Length (ft):	2,057	Segment Location:	From Change in confinement to the confluence with the Great Brook.		

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	12	None	No
7.3 Widening Channel	16		No
7.4 Change in Planform	16		No
Total Score:	60		
Geomorphic Rating:	0.75		

Channel Evolution Model	NA
Channel Evolution Stage	NA
Geomorphic Condition	Good (0.65-0.84)
Stream Sensitivity	High

Channel Adjustment Processes Narrative

One neck cutoff was noted in the lower reach along the right bank. This feature is a natural part of the highly-sinuous planform typical of this setting - it is not an indication of human-induced migration.

Notes:

Reach is impounded by Great Dam and is not governed by fluvial processes. Geometry data originally collected for stream typing and RGA score was not used to develop sensitivity ratings for FEH and other corridor planning purposes, and should not be compared to non-impounded reaches upstream of LE-03. Rather, an administrative judgement was used to determine RGA and RHA scores. RHA data should not be used to evaluate aquatic habitat conditions or compare with non-impounded reaches, as the protocol is intended for fluvial systems.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Lower Exeter						
Stream:	Exeter River	Reach #:	LE04	Segment:	0	Completion Date:	9-Jul-08
Organization:	BCE & FEA	Observers:	CS, SS, RP, EF, SP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	11,495	Segment Location:	From the conflunce with the Great Brook Marsh area to the upstream reach break downstream of Powder Mill Rd.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	2905	0
height	6	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	410	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Flat	Flat
Continuous	Never	Never
W/in 1 bnkfl	Never	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		1,655
Width Determination		Estimated
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	67
2.1a Wetted Width (ft)	59
2.1b Ratio (wetted/bkfl)	0.88
2.2 Max Depth (ft)	8.9
2.3 Mean Depth (ft)	6.1
2.4 Floodprone Width (ft)	1,600
2.5 RAF	8.9
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		10.9
2.7 Entrenchment Ratio		23.9
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Oxbows (>1.5)
2.10 Riffle Type		Not Applicable
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	0	%
Fine Gravel	0	%
Sand	10	%
Silt & Smaller	90	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	50	%
# LWD	112	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Silt	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NE
2.15 Reference Stream Type		
E, Silt, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt	Silt
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	50	500
Erosion Height (ft)	5.5	4.7
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	90	0	10	90
R Trees	80	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	20	80
R Shrubs/Saplings	50	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs	75	0	20	80
R Herbs	20	0	80	20

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>200	26-50
Sub-dominant	None	0-25
Length <25 ft	170	2340

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	90	0	10	90
R Trees	70	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	40	0	20	80
R Shrubs/Saplings	60	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs	75	0	20	80
R Herbs	20	0	80	20

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	Residential
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	1
Height (ft)	0	3

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Average
4.4 # of Debris Jams	2
4.5 Flow Reg Type	Public Water Supply
4.6 Up/Downstream Flow Reg	Downstream

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	2
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	3	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Lower Exeter				
Stream:	Exeter River	Reach #:	LE04	Segment:	Completion Date: 9-Jul-08
Organization:	BCE & FEA	Observers:	CS, SS, RP, EF, SP	Why Not Assessed: NA	Rain: Yes
Segment Length (ft):	11,495	Segment Location:	From the conflunce with the Great Brook Marsh area to the upstream reach break downstream of Powder Mill Rd.		

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	108	Yes	Yes	Yes	Yes

Problems: None

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	15	None	No
7.2 Channel Aggradation	15	None	No
7.3 Widening Channel	15		No
7.4 Change in Planform	14		No
Total Score:	59		
Geomorphic Rating:	0.74		

Channel Evolution Model F
Channel Evolution Stage I
Geomorphic Condition Good (0.65-0.84)
Stream Sensitivity High

Channel Adjustment Processes Narrative

One neck cutoff was noted in the lower reach along the right bank where a large white pine falling into the stream has caused a large debris jam. This feature is a natural part of the highly-sinuous planform typical of this setting - it is not an indication of human-induced migration.

Notes:

Upstream end of the reach appears less impacted by the Great Dam impoundment, but the lower reach is lentic in nature. The change in slope at Reach LE-5 represents the limits of the influence of the Great Dam during high water. Channel geometry data was collected at 2 cross-sections, above and below Rt. 108 crossing, and data were very similar.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Lower Exeter						
Stream:	Exeter River	Reach #:	LE05	Segment:	0	Completion Date:	9-Jul-08
Organization:	FEA; BCE	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,064	Segment Location:	From the change in confinement downstream of Powder Mill Rd. to 900 feet upstream of the bridge.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	830	0
height	8	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	810	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Extremely Steep
Continuous	Always	Always
W/in 1 bnkfl	Always	Always
Texture	NE	Till
1.5 Valley Features		
Valley Width (ft)		113
Width Determination		Measured
Confinement Type		Semi-Confined
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	49
2.1a Wetted Width (ft)	43.6
2.1b Ratio (wetted/bkfl)	0.89
2.2 Max Depth (ft)	4.6
2.3 Mean Depth (ft)	3.7
2.4 Floodprone Width (ft)	72.7
2.5 RAF	4.6
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		13.2
2.7 Entrenchment Ratio		1.5
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		410
2.12 Substrate Composition		
Bedrock	7	%
Boulder	5	%
Cobble	30	%
Coarse Gravel	26	%
Fine Gravel	8	%
Sand	22	%
Silt & Smaller	1	%
Silt/Clay Present	Yes	
Embedded (chan)	30	%
Embedded (marg)	40	%
Detritus	10	%
# LWD	1	
2.13 Average Largest Particle		
Bed	10	inches
Bar	NA	inches
2.13a % Subs. Exp.	5	%
2.14 Stream Type		
Stream Type:	B	
Bed Material:	Cobble	
Subclass Slope:	c	
Bed Form:	Riffle-Pool	
Field Measured Slope:		NE
2.15 Reference Stream Type		
Bc, Cobble, Riffle-pool		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Mix	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Boulder/Cobble	Boulder/Cobble
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	Rip-rap	None
Revetment Length (ft)	400	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	20	0	20	80
R Trees	80	0	60	40

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	50	30	20
R Shrubs/Saplings	40	0	20	80

	% Cover	Invasive	Grasses	Forbs
L Herbs	90	80	10	10
R Herbs	80	0	20	80

Bank Canopy	Left	Right
Canopy %	1-25	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer		
Buffer Width	Left	Right
Dominant	0-25	>200
Sub-dominant	26-50	None
Length <25 ft	810	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	20	0	20	80
R Trees	80	0	60	40

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	50	30	20
R Shrubs/Saplings	40	0	20	80

	% Cover	Invasive	Grasses	Forbs
L Herbs	90	80	10	10
R Herbs	80	0	20	80

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Residential	Forest
Sub-dominant	Shrub/Sapling	None
Mass Failures (ft)	50	0
Height (ft)	12	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	None
4.2 Adjacent Wetlands	None
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	0
Urban Storm Pipe	1	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Lower Exeter						
Stream:	Exeter River	Reach #:	LE05	Segment:	0	Completion Date:	9-Jul-08
Organization:	FEA; BCE	Observers:	SPP, EPF	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,064	Segment Location:	From the change in confinement downstream of Powder Mill Rd. to 900 feet upstream of the bridge.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	55	Yes	Yes	No	Yes

Problems: Scour below

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Confined

	Score	STD	Historic
7.1 Channel Degradation	13	None	No
7.2 Channel Aggradation	13	None	No
7.3 Widening Channel	16		No
7.4 Change in Planform	15		No
Total Score:	57		
Geomorphic Rating:	0.71		

Channel Evolution Model F
Channel Evolution Stage I
Geomorphic Condition Good
Stream Sensitivity Moderate

Channel Adjustment Processes Narrative

Riffle-pool channel with stable features and no major departure in form. A small increase in sand substrate is noted in the bed substrate histogram (bimodal). Armoring and encroachment along the left bank limits the channel's ability to migrate to the north, however given the setting and slope a straight channel may be natural.

Notes:

One large mass failure noted on the left bank adjacent a trailer home. Low habitat score reflects the lack of woody debris and pool formation, as well as significant buffer/vegetation impacts on the left back. Armoring and lack of native woody vegetation on the left bank adversely affect LWD loading and cover, and prevent the formation of undercut banks and pools.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Lower Exeter						
Stream:	Exeter River	Reach #:	LE06	Segment:	0	Completion Date:	9-Jul-08
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	3,832	Segment Location:	From the reach break at the confinement change to the gas line crossing perpendicular to Powder Mill Rd.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	3100	0
height	8	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	3100	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Hilly
Continuous	Sometimes	Never
W/in 1 bnkfl	Always	Never
Texture	Clay	NE
1.5 Valley Features		
Valley Width (ft)		495
Width Determination		Estimated
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		Yes

Step 2. Stream Channel

2.1 Bankfull Width (ft)	76.5
2.1a Wetted Width (ft)	62.5
2.1b Ratio (wetted/bkfl)	0.82
2.2 Max Depth (ft)	7.4
2.3 Mean Depth (ft)	4.6
2.4 Floodprone Width (ft)	360
2.5 RAF	8.9
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		16.7
2.7 Entrenchment Ratio		4.7
2.8 Incision Ratio		1.2
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type		Eroded
2.11 Riffle Step Spacing		960
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	4	%
Fine Gravel	11	%
Sand	46	%
Silt & Smaller	39	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	35	%
# LWD	123	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	5	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NE
2.15 Reference Stream Type		
C, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Undercut	Undercut

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	220	100
Erosion Height (ft)	6.5	5
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	60	0	40	60
R Trees	70	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	25	0	25	75
R Shrubs/Saplings	15	0	20	80

	% Cover	Invasive	Grasses	Forbs
L Herbs	15	20	30	50
R Herbs	15	20	40	40

Bank Canopy	Left	Right
Canopy %	26-50	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	0-25	>150
Sub-dominant	26-50	26-50
Length <25 ft	3100	300

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	50	0	30	70
R Trees	70	0	25	75

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	25	0	25	75
R Shrubs/Saplings	10	0	25	75

	% Cover	Invasive	Grasses	Forbs
L Herbs	25	20	40	40
R Herbs	20	20	40	40

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Residential	Forest
Sub-dominant	Forest	Hay
Mass Failures (ft)	60	0
Height (ft)	15	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Minimum
4.2 Adjacent Wetlands	Minimum
4.3 Flow Status	Average
4.4 # of Debris Jams	6
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	2	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	2	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	No

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Lower Exeter				
Stream:	Exeter River	Reach #:	LE06	Segment:	Completion Date: 9-Jul-08
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed: NA	Rain: Yes
Segment Length (ft):	3,832	Segment Location:	From the reach break at the confinement change to the gas line crossing perpendicular to Powder Mill Rd.		

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	13	None	No
7.2 Channel Aggradation	12	None	No
7.3 Widening Channel	13		No
7.4 Change in Planform	12		No
Total Score:	50		
Geomorphic Rating:	0.63		

Channel Evolution Model F
Channel Evolution Stage II
Geomorphic Condition Fair (0.35-0.64)
Stream Sensitivity Very High

Channel Adjustment Processes Narrative

Minor incision due to encroachment and reduction of floodplain access over time. One flood chute in lower reach indicates some planform movement along the undeveloped, right bank. Minor aggradation (middle channel) behind larger debris jams.

Notes:

The lack of native, woody vegetation along the left bank is leading to reduced boundary resistance and severe bank erosion at sharp bends. One large mass failure in the upper reach in less cohesive substrate could threaten adjacent property in the near future. Aquatic habitat is limited by the lack of good pool formation and impacts to the left bank/buffer.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Lower Exeter						
Stream:	Exeter River	Reach #:	LE07	Segment:	0	Completion Date:	9-Jul-08
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	5,044	Segment Location:	From reach break to just downstream of the gas line crossing perpindicular to Powder Mill Rd.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	360	0
height	5	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Hilly
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	Clay	Clay
1.5 Valley Features		
Valley Width (ft)		630
Width Determination		Measured
Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	67
2.1a Wetted Width (ft)	54
2.1b Ratio (wetted/bkfl)	0.81
2.2 Max Depth (ft)	7.4
2.3 Mean Depth (ft)	6.0
2.4 Floodprone Width (ft)	624
2.5 RAF	9.2
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		11.1
2.7 Entrenchment Ratio		9.3
2.8 Incision Ratio		1.2
*Human Elevated Incision		NA
2.9 Sinuosity		High (>1.5)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		530
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	0	%
Fine Gravel	3	%
Sand	53	%
Silt & Smaller	44	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	30	%
# LWD	149	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	10	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:		NE
2.15 Reference Stream Type		
E, Sand, Dune-ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Undercut	Undercut

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Silt	Silt
Consistency	Cohesive	Cohesive
Lower		
Material Type	Clay	Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	510	1435
Erosion Height (ft)	6.1	6.5
Revetment Type	Other	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	60	40
R Trees	80	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	15	0	80	20
R Shrubs/Saplings	15	0	80	20

	% Cover	Invasive	Grasses	Forbs
L Herbs	65	0	30	70
R Herbs	65	0	30	70

Bank Canopy	Left	Right
Canopy %	51-75	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>200	101-150
Sub-dominant	None	76-100
Length <25 ft	0	235

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	60	40
R Trees	80	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	15	0	80	20
R Shrubs/Saplings	15	0	80	20

	% Cover	Invasive	Grasses	Forbs
L Herbs	65	0	30	70
R Herbs	65	0	30	70

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	Hay
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	1
Height (ft)	0	4

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Low
4.4 # of Debris Jams	7
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	1	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	5	1
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Lower Exeter				
Stream:	Exeter River	Reach #:	LE07	Segment:	Completion Date: 9-Jul-08
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed: NA	Rain: Yes
Segment Length (ft):	5,044	Segment Location:	From reach break to just downstream of the gas line crossing perpindicular to Powder Mill Rd.		

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	104	Yes	Yes	No	Yes

Problems: SB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	14	None	No
7.2 Channel Aggradation	13	None	No
7.3 Widening Channel	12		No
7.4 Change in Planform	13		No
Total Score:	52		
Geomorphic Rating:	0.65		

Channel Evolution Model F
Channel Evolution Stage II
Geomorphic Condition Good (0.65-0.84)
Stream Sensitivity High

Channel Adjustment Processes Narrative

Minor incision noted along extensive floodplain along right bank. Cohesive clay banks and underlying clay bed limit the degree of incision. Floodchute in lower reach upstream of railroad crossing indicates minor changes in planform - possibly due to the channel/floodprone constriction.

Notes:

Good habitat noted throughout reach, and many schools of small mouth bass observed in the pools and glides. Excellent wood inputs and pool cover, and very healthy bank/riparian vegetation noted throughout.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Lower Exeter						
Stream:	Exeter River	Reach #:	LE08	Segment:	0	Completion Date:	8-Jul-08
Organization:	FEA; BCE	Observers:	SPP, CS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,428	Segment Location:	From the change in confinement at the gas line to just downstream of Kingston Rd.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	110	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Very Steep
Continuous	Never	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		220
Width Determination		Measured
Confinement Type		Semi-Confined
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	73.9
2.1a Wetted Width (ft)	55
2.1b Ratio (wetted/bkfl)	0.74
2.2 Max Depth (ft)	5.5
2.3 Mean Depth (ft)	3.6
2.4 Floodprone Width (ft)	219
2.5 RAF	5.5
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		20.6
2.7 Entrenchment Ratio		3.0
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		700
2.12 Substrate Composition		
Bedrock	4	%
Boulder	8	%
Cobble	30	%
Coarse Gravel	24	%
Fine Gravel	13	%
Sand	19	%
Silt & Smaller	2	%
Silt/Clay Present	Yes	
Embedded (chan)	30	%
Embedded (marg)	40	%
Detritus	10	%
# LWD	32	
2.13 Average Largest Particle		
Bed	13	inches
Bar	NA	inches
2.13a % Subs. Exp.	20	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Cobble	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:		NE
2.15 Reference Stream Type		
C, Cobble, Riffle-pool		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Mix	Mix
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	40	40
Erosion Height (ft)	5	4.5
Revetment Type	None	None
Revetment Length (ft)	10	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	50	0	0	100
R Trees	80	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	65	0	50	50
R Shrubs/Saplings	40	0	50	50

	% Cover	Invasive	Grasses	Forbs
L Herbs	20	0	70	30
R Herbs	20	0	70	30

Bank Canopy	Left	Right
Canopy %	26-50	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	101-150	101-150
Sub-dominant	0-25	51-75
Length <25 ft	350	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	10	90
R Trees	90	0	10	90

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	50	0	50	50
R Shrubs/Saplings	50	0	50	50

	% Cover	Invasive	Grasses	Forbs
L Herbs	20	0	70	30
R Herbs	20	0	70	30

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	None
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	None
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	2	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	No

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Lower Exeter						
Stream:	Exeter River	Reach #:	LE08	Segment:	0	Completion Date:	8-Jul-08
Organization:	FEA; BCE	Observers:	SPP, CS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,428	Segment Location:	From the change in confinement at the gas line to just downstream of Kingston Rd.				

1.6 Grade Controls — Present

Type	Location	Total Ht (ft)	Ht Above	Photo	GPS
Ledge	Mid-reach	1.9	at grade	Yes	No

4.8 Channel Constrictions — None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type: Confined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	11	None	No
7.3 Widening Channel	12		No
7.4 Change in Planform	13		No
Total Score:	52		
Geomorphic Rating:	0.65		

Channel Evolution Model: D
Channel Evolution Stage: II c
Geomorphic Condition: Good (0.65-0.84)
Stream Sensitivity: Moderate

Channel Adjustment Processes Narrative

Minor aggradation, widening and planform. A bedrock grade control is found mid-reach that seperates two distinctively long, deep glides/pools. Downstream of the grade control a historic canal or mill sluice was observed off the right bank; mill likley utilized water power that accompanies elevation change. Some widening is present both above and below the grade control, but the reach is largely stable.

Notes:

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Lower Exeter						
Stream:	Exeter River	Reach #:	LE09	Segment:	A	Completion Date:	10-Jul-08
Organization:	FEA; BCE	Observers:	SPP, CS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,819	Segment Location:	From the reach break at the change in confinement extending upstream to riffle downstream of bend to south.				

Step 1. Valley and Floodplain

1.1 Segmentation:		FS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	380	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Steep
Continuous	Never	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	Sand	Mix
1.5 Valley Features		
Valley Width (ft)		310
Width Determination		Measured
Confinement Type		Narrow
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	63
2.1a Wetted Width (ft)	54
2.1b Ratio (wetted/bkfl)	0.86
2.2 Max Depth (ft)	8.9
2.3 Mean Depth (ft)	5.2
2.4 Floodprone Width (ft)	310
2.5 RAF	8.9
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		12.2
2.7 Entrenchment Ratio		4.9
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Eroded
2.11 Riffle Step Spacing		Not Applicable
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	5	%
Fine Gravel	5	%
Sand	65	%
Silt & Smaller	25	%
Silt/Clay Present	Yes	
Embedded (chan)	10	%
Embedded (marg)	20	%
Detritus	10	%
# LWD	50	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	8	inches
2.13a % Subs. Exp.	5	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:	Not Evaluated	
2.15 Reference Stream Type		
E, Sand, Riffle-pool		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Clay	Sand
Consistency	Cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	150	0
Erosion Height (ft)	5	0
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	70	0	10	90
R Trees	90	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	0	0	100
R Shrubs/Saplings	50	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs	70	0	30	70
R Herbs	60	0	40	60

Bank Canopy	Left	Right
Canopy %	51-75	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>150	101-150
Sub-dominant	0-25	76-100
Length <25 ft	560	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	10	90
R Trees	90	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	0	0	100
R Shrubs/Saplings	50	0	0	100

	% Cover	Invasive	Grasses	Forbs
L Herbs	70	0	30	70
R Herbs	60	0	60	40

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	Residential
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Minimum
4.3 Flow Status	Average
4.4 # of Debris Jams	1
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	1	0	1
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Lower Exeter						
Stream:	Exeter River	Reach #:	LE09	Segment:	A	Completion Date:	10-Jul-08
Organization:	FEA; BCE	Observers:	SPP, CS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,819	Segment Location:	From the reach break at the change in confinement extending upstream to riffle downstream of bend to south.				

1.6 Grade Controls — Present

Type	Location	Total Ht (ft)	Ht Above	Photo	GPS
Ledge	Lower reach	1.6	0.5	Yes	Yes

4.8 Channel Constrictions — Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	38	Yes	Yes	Yes	Yes

Problems: None

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type: Unconfined

	Score	STD	Historic
7.1 Channel Degradation	15	None	No
7.2 Channel Aggradation	12	None	No
7.3 Widening Channel	13		No
7.4 Change in Planform	14		No
Total Score:	54		
Geomorphic Rating:	0.68		

Channel Evolution Model: F
Channel Evolution Stage: I
Geomorphic Condition: Good (0.65-0.84)
Stream Sensitivity: High

Channel Adjustment Processes Narrative

Segment has natural slope changes on upstream and downstream ends that are causing aggradation. Otherwise the channel is stable.

Notes:

The majority of the channel (approx. 1200 ft.) is deep and slow moving under base flow conditions. A change in slope on both the upstream and downstream ends of this segment (bound by grade controls) are responsible for the slow moving, deep water. The downstream end of the segment has some ripple-pool features, but the length wasn't long enought to segment.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Lower Exeter						
Stream:	Exeter River	Reach #:	LE09	Segment:	B	Completion Date:	10-Jul-08
Organization:	FEA; BCE	Observers:	SPP; CS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	765	Segment Location:	From segment break below sharp bend up to reach break at change in confinement.				

Step 1. Valley and Floodplain

1.1 Segmentation:		FS
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Very Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	Mix
1.5 Valley Features		
Valley Width (ft)		350
Width Determination		Measured
Confinement Type		Narrow
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	87.5
2.1a Wetted Width (ft)	61
2.1b Ratio (wetted/bkfl)	0.70
2.2 Max Depth (ft)	3.6
2.3 Mean Depth (ft)	2.5
2.4 Floodprone Width (ft)	135
2.5 RAF	4
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		34.9
2.7 Entrenchment Ratio		1.5
2.8 Incision Ratio		1.1
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		300
2.12 Substrate Composition		
Bedrock	20	%
Boulder	5	%
Cobble	21	%
Coarse Gravel	35	%
Fine Gravel	13	%
Sand	6	%
Silt & Smaller	0	%
Silt/Clay Present	No	
Embedded (chan)	10	%
Embedded (marg)	15	%
Detritus	10	%
# LWD	8	
2.13 Average Largest Particle		
Bed	14	inches
Bar	8	inches
2.13a % Subs. Exp.	5	%
2.14 Stream Type		
Stream Type:	B	
Bed Material:	Gravel	
Subclass Slope:	c	
Bed Form:	Riffle-Pool	
Field Measured Slope:	Not Evaluated	
2.15 Reference Stream Type		
Bc, Gravel, Riffle-pool		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Mix	Mix
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	30	50
Erosion Height (ft)	8	5
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	20	80
R Trees	75	0	20	80

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	20	0	10	90
R Shrubs/Saplings	20	0	10	90

	% Cover	Invasive	Grasses	Forbs
L Herbs	70	0	30	70
R Herbs	50	0	20	80

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Closed	

3.2 Riparian Buffer		
Buffer Width	Left	Right
Dominant	>150	>150
Sub-dominant	0-25	None
Length <25 ft	125	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	20	80
R Trees	75	0	20	80

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	20	0	10	90
R Shrubs/Saplings	20	0	10	90

	% Cover	Invasive	Grasses	Forbs
L Herbs	70	0	30	70
R Herbs	50	0	20	80

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	Residential
Mass Failures (ft)	0	20
Height (ft)	0	20
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present		
4.2 Adjacent Wetlands	None		
4.3 Flow Status	Average		
4.4 # of Debris Jams	0		
4.5 Flow Reg Type	None		
4.6 Up/Downstream Flow Reg	Upstream		
4.7 Stormwater Inputs			
Field Ditch	1	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0
4.9 # of Beaver Dams	0		
Affected Length (ft)			

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	1	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
1	0	No

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	None	
Length (ft)		
5.5 Dredging	None	
Bridge and Culvert Survey	No	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Lower Exeter						
Stream:	Exeter River	Reach #:	LE09	Segment:	B	Completion Date:	10-Jul-08
Organization:	FEA; BCE	Observers:	SPP; CS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	765	Segment Location:	From segment break below sharp bend up to reach break at change in confinement.				

1.6 Grade Controls — Present

Type	Location	Total Ht (ft)	Ht Above (ft)	Photo	GPS
Ledge	Mid-segment	1.6	0.5	Yes	Yes

4.8 Channel Constrictions — None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	15	None	No
7.3 Widening Channel	11		No
7.4 Change in Planform	16		No
Total Score:	58		
Geomorphic Rating:	0.73		

Channel Evolution Model	F
Channel Evolution Stage	I
Geomorphic Condition	Good (0.65-0.84)
Stream Sensitivity	High

Channel Adjustment Processes Narrative

Channel is experiencing minor widening but overall had good access to adjacent floodplain along the inside of the only major bend to the southeast. Only minor bank erosion indicated that the high width-depth ratio (35) may be natural for the narrow valley setting.

Notes:

This very short segment was broken out due to the minor channel widening in combination with the coarse substrate. The riffle downstream of the grade control was well formed, but approx. 300 feet upstream the riffle was degraded.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Lower Exeter						
Stream:	Exeter River	Reach #:	LE10	Segment:	A	Completion Date:	10-Jul-08
Organization:	FEA; BCE	Observers:	SPP, CS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,183	Segment Location:	From the reach break the segment extends upstream to a change in planform approx. 700 ft. downstream of the Pickpocket dam.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		Alluvial Fan
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	530	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Very Steep
Continuous	Never	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		190
Width Determination		Measured
Confinement Type		Semi-Confined
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	63.4
2.1a Wetted Width (ft)	46
2.1b Ratio (wetted/bkfl)	0.73
2.2 Max Depth (ft)	4.6
2.3 Mean Depth (ft)	3.3
2.4 Floodprone Width (ft)	189.7
2.5 RAF	7.3
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		19.2
2.7 Entrenchment Ratio		3.0
2.8 Incision Ratio		1.6
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		350
2.12 Substrate Composition		
Bedrock	7	%
Boulder	12	%
Cobble	43	%
Coarse Gravel	24	%
Fine Gravel	3	%
Sand	9	%
Silt & Smaller	2	%
Silt/Clay Present	Yes	
Embedded (chan)	10	%
Embedded (marg)	25	%
Detritus	10	%
# LWD	11	
2.13 Average Largest Particle		
Bed	13	inches
Bar	6	inches
2.13a % Subs. Exp.	25	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Cobble	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:	Not Evaluated	
2.15 Reference Stream Type		
C, Cobble, Riffle-pool		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Mix	Mix
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	20	50
Erosion Height (ft)	3	2.5
Revetment Type	Hard Bank	None
Revetment Length (ft)	180	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	70	0	10	90
R Trees	95	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	0	20	80
R Shrubs/Saplings	40	0	10	90

	% Cover	Invasive	Grasses	Forbs
L Herbs	85	0	50	50
R Herbs	30	0	10	90

Bank Canopy	Left	Right
Canopy %	26-50	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	26-50	>200
Sub-dominant	76-100	None
Length <25 ft	225	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	60	0	10	90
R Trees	95	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	20	80	0
R Shrubs/Saplings	40	0	10	90

	% Cover	Invasive	Grasses	Forbs
L Herbs	85	0	70	30
R Herbs	30	0	10	90

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Residential	Forest
Sub-dominant	Forest	None
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive		
4.2 Adjacent Wetlands	None		
4.3 Flow Status	Average		
4.4 # of Debris Jams	0		
4.5 Flow Reg Type	Flood Control		
4.6 Up/Downstream Flow Reg	Upstream		
4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0
4.9 # of Beaver Dams	0		
Affected Length (ft)			

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	2	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts	# SRs	# HCs	Trib Rejuv.
	0	0	Yes

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	None	
Length (ft)		
5.5 Dredging	None	
Bridge and Culvert Survey	No	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Lower Exeter						
Stream:	Exeter River	Reach #:	LE10	Segment:	A	Completion Date:	10-Jul-08
Organization:	FEA; BCE	Observers:	SPP, CS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,183	Segment Location:	From the reach break the segment extends upstream to a change in planform approx. 700 ft. downstream of the Pickpocket dan				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Old abut.	43	Yes	No	Yes	Yes
Problems:	DA, SB				

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Confined

	Score	STD	Historic
7.1 Channel Degradation	12	None	Yes
7.2 Channel Aggradation	14	None	Yes
7.3 Widening Channel	13		Yes
7.4 Change in Planform	14		No
Total Score:	53		
Geomorphic Rating:	0.66		

Channel Evolution Model F
Channel Evolution Stage IV
Geomorphic Condition Good (0.65-0.84)
Stream Sensitivity Moderate

Channel Adjustment Processes Narrative

Channel is stabilizing and has evolved to stage IV of the CEM. The presence of an historic mill (old abutments) likely led to aggradation upstream (segment B), and historic incision and widening in this segment. Channel in this segment has since recovered and developed a small floodplain at a lower elevation (see cross-section).

Notes:

Historic bridge abutments act as a mild constriction point to the channel, but with little problems except minor scour below. Channel is much more stable than in upstream segment where significant aggradation was observed, however rejuventaing tributaries in this segment further indicates historic incision. A withdrawal hose was observed in the channel downstream of the cross-section but its use is unknown.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Lower Exeter	Reach #:	LE10	Segment:	B	Completion Date:	8-Jul-08
Organization:	FEA	Observers:	SP, CS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	704	Segment Location:	The segment extends from approx. 700 feet downstream of the Pickpocket dam up to the reach break at the dam.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	400	0
height	11	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	360	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Never	Never
W/in 1 bnkfl	Sometimes	Never
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		285
Width Determination		Measured
Confinement Type		Semi-Confined
Rock Gorge?		No
Human Caused Change?		Yes

Step 2. Stream Channel

2.1 Bankfull Width (ft)	89.5
2.1a Wetted Width (ft)	64
2.1b Ratio (wetted/bkfl)	0.72
2.2 Max Depth (ft)	4.4
2.3 Mean Depth (ft)	2.8
2.4 Floodprone Width (ft)	170.5
2.5 RAF	4.4
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		32.0
2.7 Entrenchment Ratio		1.9
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Sedimented
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	0	%
Boulder	29	%
Cobble	62	%
Coarse Gravel	6	%
Fine Gravel	0	%
Sand	3	%
Silt & Smaller	0	%
Silt/Clay Present	No	
Embedded (chan)	5	%
Embedded (marg)	15	%
Detritus	10	%
# LWD	12	
2.13 Average Largest Particle		
Bed	16	inches
Bar	NE	inches
2.13a % Subs. Exp.	30	%
2.14 Stream Type		
Stream Type:	B	
Bed Material:	Cobble	
Subclass Slope:	c	
Bed Form:	Riffle-Pool	
Field Measured Slope:		NE
2.15 Reference Stream Type		
Bc, Cobble, Riffle-pool		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Mix	Mix
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	50	40
Erosion Height (ft)	7	4
Revetment Type	Rip-rap	0
Revetment Length (ft)	70	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	70	0	0	100
R Trees	80	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	40	0	20	80
R Shrubs/Saplings	50	0	30	70

	% Cover	Invasive	Grasses	Forbs
L Herbs	40	0	25	75
R Herbs	40	0	25	75

Bank Canopy	Left	Right
Canopy %	26-50	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	26-50	101-150
Sub-dominant	0-25	26-50
Length <25 ft	120	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	60	0	0	100
R Trees	70	0	0	100

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	0	20	80
R Shrubs/Saplings	50	0	20	80

	% Cover	Invasive	Grasses	Forbs
L Herbs	50	0	50	50
R Herbs	50	0	50	50

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Residential	Forest
Sub-dominant	None	Residential
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	None
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	Flood Control
4.6 Up/Downstream Flow Reg	Upstream

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	1
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams: 0

Affected Length (ft)

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	2	0	2
	Diagonal	Delta	Island
	2	0	4

5.2 Other Features	Flood	NCO	Avulsion
	2	0	0
	Braiding		
	3		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
1	0	No

5.4 Stream Ford or Animal Crossing: None

5.5 Straightening: None

Length (ft): 0

5.5 Dredging: None

Bridge and Culvert Survey: Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Lower Exeter	Reach #:	LE10	Segment:	B	Completion Date:	8-Jul-08
Organization:	FEA	Observers:	SP, CS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	704	Segment Location:	The segment extends from approx. 700 feet downstream of the Pickpocket dam up to the reach break at the dam.				

1.6 Grade Controls None

Type	Location	Total Ht (ft)	Ht Above	Photo	GPS
Dam	Upstream	12	16	Yes	No
Ledge	Upstream	2	0	Yes	No

4.8 Channel Constrictions Present

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	48	Yes	Yes	Yes	Yes

Problems: SB

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Confined

	Score	STD	Historic
7.1 Channel Degradation	15	None	No
7.2 Channel Aggradation	5	None	No
7.3 Widening Channel	9		No
7.4 Change in Planform	5		No
Total Score:	34		
Geomorphic Rating:	0.43		

Channel Evolution Model D
Channel Evolution Stage IIc
Geomorphic Condition Fair
Stream Sensitivity High

Channel Adjustment Processes Narrative

Widening, aggradation and changes in planform are the dominant processes this segment. The presence of an historic mill in downstream segment A likely led to aggradation in this segment. Reduced channel-forming discharge due to Pickpocket Dam has caused aggraded material to remain in this segment.

Notes:

Some widening observed immediately downstream of the dam along the left bank where Pickpocket Rd. has encroached the valley and floodplain. The lower end of this segment has braided flows, steep riffles, and several diagonal bars.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Lower Exeter River	Reach #:	LE11	Segment:	0	Completion Date:	8-Jul-08
Organization:	FEA;BCE	Observers:	EPF, CMB	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	3,236	Segment Location:	Just upstream of Pickpocket Dam.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	One	Both
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	1100	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		736
Width Determination		Estimated
Confinement Type		NA
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type	Not Applicable	
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	NA	%
Boulder	NA	%
Cobble	NA	%
Coarse Gravel	NA	%
Fine Gravel	NA	%
Sand	NA	%
Silt & Smaller	NA	%
Silt/Clay Present	NA	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	NA	%
# LWD	17	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	NA	%
2.14 Stream Type		
Stream Type:	NA	
Bed Material:	NA	
Subclass Slope:	NA	
Bed Form:	NA	
Field Measured Slope:		NE
2.15 Reference Stream Type		
(if different from P1)	NA	

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt/clay	Silt/clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0	0
Revetment Type	None	Rip-rap
Revetment Length (ft)	0	250

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	40	60
R Trees	70	0	60	40

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	50	0	30	70
R Shrubs/Saplings	60	0	70	30

	% Cover	Invasive	Grasses	Forbs
L Herbs	30	0	25	75
R Herbs	80	0	70	30

Bank Canopy	Left	Right
Canopy %	51-75	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>200	>200
Sub-dominant	None	0-25
Length <25 ft	0	250

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	40	60
R Trees	70	0	60	40

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	50	0	30	70
R Shrubs/Saplings	60	0	70	30

	% Cover	Invasive	Grasses	Forbs
L Herbs	30	0	25	75
R Herbs	80	0	70	30

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Shrub/Sapling	Shrub/Sapling
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Minimum
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Average
4.4 # of Debris Jams	0
4.5 Flow Reg Type	Flood Control
4.6 Up/Downstream Flow Reg	Downstream
4.7 Stormwater Inputs	
Field Ditch	0
Road Ditch	0
Urban Storm Pipe	0
Tile Drain	0
Overland Flow	0
Other	0
4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	No

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Lower Exeter River	Reach #:	LE11	Segment:	0	Completion Date:	8-Jul-08
Organization:	FEA;BCE	Observers:	EPF, CMB	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	3,236	Segment Location:	Just upstream of Pickpocket Dam.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	0	0	0
7.2 Channel Aggradation	0	0	0
7.3 Widening Channel	0		0
7.4 Change in Planform	0		0
Total Score:	NA		
Geomorphic Rating:	NA		
Channel Evolution Model	NA		
Channel Evolution Stage	NA		
Geomorphic Condition	NA		
Stream Sensitivity	NA		

Channel Adjustment Processes Narrative

Notes:

Reach is impounded by Pickpocket Dam and is not governed by fluvial processes. Geometry data originally collected for stream typing and RGA score was not used to develop sensitivity ratings for FEH and other corridor planning purposes, and should not be compared to non-impounded reaches downstream of LE11. No administrative judgement was used to determine RGA or RHA scores due to severe impoundment - reference stream typing not possible and therefore no default FEH corridor developed.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Exeter River						
Stream:	Lower Exeter River	Reach #:	LE12	Segment:	0	Completion Date:	8-Jul-08
Organization:	FEA; BCE	Observers:	EPF, CMB	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	9,138	Segment Location:	From confluence with Little River South down to impounded section influenced by Pickpocket Dam.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor		Left		Right
1.1 Segmentation:		None	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		*Corridor Land Use*				
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant		Forest		Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant		Shrub/Sapling		Shrub/Sapling
Length (ft)	One	Both	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)		0		0
Berms	0	0	2.9 Sinuosity	Moderate (1.2-1.5)		Lower					Height (ft)		0		0
height	0	0	2.10 Riffle Type	Not Applicable		Material Type	Silt/clay		Silt/clay		Gullies (number)		0		0
Roads	0	0	2.11 Riffle Step Spacing		NA	Consistency	Cohesive		Cohesive		Height (ft)		0		0
height	0	0	2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**				
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps		Present		
height	0	0	Boulder	0	%	Erosion Height (ft)	0		0		4.2 Adjacent Wetlands		Extensive		
Improved Paths	0	0	Cobble	0	%	Revetment Type	0		0		4.3 Flow Status		Average		
height	0	0	Coarse Gravel	0	%	Revetment Length (ft)	0		0		4.4 # of Debris Jams		2		
Development	100	0	Fine Gravel	0	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type		Flood Control		
1.4 Adjacent Side	Left	Right	Sand	NA	%	**L** Trees	80	0	80	20	4.6 Up/Downstream Flow Reg		Downstream		
Hillside Slope	Hilly	Hilly	Silt & Smaller	NA	%	**R** Trees	80	0	80	20	4.7 Stormwater Inputs				
Continuous	Sometimes	Sometimes	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch		0
W/in 1 bnkfl	Sometimes	Sometimes	Embedded (chan)	NA	%	**L** Shrubs/Saplings	30	0	70	30	Urban Storm Pipe	0	Tile Drain		0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrubs/Saplings	30	0	70	30	Overland Flow	0	Other		0
1.5 Valley Features			Detritus	NA	%		% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		0		
Valley Width (ft)		1,227	# LWD	126		**L** Herbs	20	0	50	50	Affected Length (ft)		0		
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs	20	0	50	50	**Step 5. Channel Bed & Planform Changes**				
Confinement Type		Very Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point		Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	51-75		51-75			0	0		0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta		Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0		0
2.1 Bankfull Width (ft)	NA		Stream Type:	E		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO		Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	Silt		Dominant	101-150		101-150			0	0		0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	None		Sub-dominant	None		0-25			Braiding			
2.2 Max Depth (ft)	NA		Bed Form:	Dune-Ripple		Length <25 ft	0		100			0			
2.3 Mean Depth (ft)	NA		Field Measured Slope:	Not Evaluated		Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts				
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			**L** Trees	70	0	40	60		# SRs	# HCs		Trib Rejuv.
2.5 RAF	NA		E, Silt, Dune-Ripple			**R** Trees	70	0	40	60		0	0		No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:				None
			3.1 Stream Banks	Left	Right	**L** Shrubs/Saplings	60	0	80	20	5.5 Straightening	None			
			Typical Bank Slope	Steep	Steep	**R** Shrubs/Saplings	60	0	80	20	Length (ft)				
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None		
Note: Step 1.6 Grade Controls and Step 4.8						**L** Herbs	80	0	50	50					
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs	80	0	50	50	Bridge and Culvert Survey		No		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Exeter River						
Stream:	Lower Exeter River	Reach #:	LE12	Segment:	0	Completion Date:	8-Jul-08
Organization:	FEA; BCE	Observers:	EPF, CMB	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	9,138	Segment Location:	From confluence with Little River South down to impounded section influenced by Pickpocket Dam.				

1.6 Grade Controls None

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions None

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	18	None	No
7.2 Channel Aggradation	11	None	No
7.3 Widening Channel	15		No
7.4 Change in Planform	18		No
Total Score:	62		
Geomorphic Rating:	0.78		

Channel Evolution Model	NA
Channel Evolution Stage	NA
Geomorphic Condition	Good (0.65-0.84)
Stream Sensitivity	High

Channel Adjustment Processes Narrative

See below for discussion of reach processes. LWD, debris jams, and undercut banks are all present in upper reach, indicating that good habitat existed prior to flooding caused by Pickpocket Dam.

Notes:

Reach is impounded by Pickpocket Dam and is not governed by fluvial processes. Geometry data originally collected for stream typing and RGA score was not used to develop sensitivity ratings for FEH and other corridor planning purposes, and should not be compared to non-impounded reaches downstream of LE11. Rather, an administrative judgement was used to determine RGA and RHA scores. RHA data not be used to evaluate aquatic habitat conditions or compare with non-impounded reaches, as the protocol is intended for fluvial systems.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Appendix B

Moderate and High Priority

Bridges and Culverts

Fordway Brook

Location: Old Bye Road, Raymond
Segment ID: FW09
Culvert Length- 48 feet
Culvert Height – 7.3 feet
Culvert Width – 12 feet

Inlet

Outlet

Geomorphic Compatibility – Mostly Incompatible

Percent Bankfull Width – Undersized (56%)
Slope – Culvert slope lower than channel slope
Approach Angle – Sharp bend; alignment downstream is poor as well
Erosion and Armoring – Failing bank armoring both upstream and downstream; bank erosion upstream on bend
Sediment Continuity – Scour above, deposition above (steep riffle and side bar), and deposition below (diagonal bar)
Additional problems noted: Wood debris and sediment (riprap and large boulders) partially obstructing inlet (high ice/debris jam potential); riprap on left bank sticks out into channel creating additional channel constriction; no vegetation along the banks

Aquatic Organism Passage – Reduced

- Structure opening partially obstructed
- Sediment not throughout structure

Fordway Brook

Location: Lane Road, Raymond
Segment ID: FW10-B

Culvert Length- 57 feet	Culvert Length- 60 feet
Culvert Height – 3.6 feet	Culvert Height – 3.7 feet
Culvert Width – 4.5 feet	Culvert Width – 5.0 feet

Inlet

Outlet

Geomorphic Compatibility – Mostly Compatible

Percent Bankfull Width – Undersized (37%)
Slope – Culvert slope same as channel slope
Approach Angle – Channelized straight
Erosion and Armoring – Armoring upstream and downstream intact; no bank erosion noted
Sediment Continuity – Deposition below, scour below
Additional problems noted: Structure lacks capacity to pass 25 and 50 year storm events; Town of Raymond Road Agent Survey reports brook has flooded over road.

Aquatic Organism Passage – Reduced

- Sediment not throughout structure

Fordway Brook

Location: Old Chester Road, Raymond
Segment ID: FW10-E

Culvert Length- 14 feet	Culvert Length- 14 feet
Culvert Height – 2.5 feet	Culvert Height – 2.5 feet
Culvert Width – 2.5 feet	Culvert Width – 2.5 feet

Outlet Culvert #1

Outlet Culvert #2

Geomorphic Compatibility – Partially Compatible

Percent Bankfull Width – Undersized (20%)
Slope – Culvert slope same as channel slope
Approach Angle – Naturally straight
Erosion and Armoring – Armoring upstream and downstream intact; no bank erosion noted
Sediment Continuity – Deposition below (appears to be from road gravel), scour below
Additional problems noted: Structure lacks capacity to pass 25 year and 50 year storm events

Aquatic Organism Passage – Reduced

- Sediment not throughout structure

Fordway Brook

Location: Shattagee Road, Raymond
Segment ID: FW11-B
Culvert Length- 30 feet
Culvert Height – 4.8 feet
Culvert Width – 4.8 feet

Inlet

Outlet

Geomorphic Compatibility – Partially Compatible

Percent Bankfull Width – Undersized (22%)
Slope – Culvert slope same as channel slope
Approach Angle – Mild bend
Erosion and Armoring – Armoring upstream and downstream intact; minor bank erosion upstream and high bank erosion downstream of structure
Sediment Continuity – Scour below, deposition above (mid channel bar and point bar),
Additional problems noted: Culvert in poor condition – deteriorating steel; Town of Raymond Road Agent Survey reports brook has flooded over road.

Aquatic Organism Passage – Reduced

- Structure opening partially obstructed by debris
- Sediment not throughout structure

Fordway Brook

Location: Crowley Road, Candia
Segment ID: FW13
Culvert Length- 33 feet
Culvert Height – 2.0 feet
Culvert Width – 2.0 feet

Inlet

Outlet

Geomorphic Compatibility – Partially Compatible

Percent Bankfull Width – Undersized (18%)
Slope – Culvert slope slightly higher than channel slope
Approach Angle – Naturally straight
Erosion and Armoring – Armoring upstream and downstream intact; no bank erosion noted
Sediment Continuity – Deposition above and below, scour below
Additional problems noted: Woody debris at outlet (may be remnant beaver dam); structure lacks capacity to pass 25 and 50 year storm events

Aquatic Organism Passage – Reduced

- Structure opening partially obstructed by wood debris
- Sediment not throughout structure

Upper Exeter River

Location: Sandown Road, Danville
Segment ID: UE05
Culvert Length- 34.6 feet
Culvert Height – 7.1 feet
Culvert Width – 7.5 feet

Inlet

Outflanked Culvert

Geomorphic Compatibility – Mostly Compatible

Percent Bankfull Width – Undersized (12%)
Slope – Culvert slope same as channel slope
Approach Angle – Naturally straight
Erosion and Armoring – Armoring upstream intact; no bank erosion noted
Sediment Continuity –Scour below
Additional problems noted: Woody debris at inlet; structure lacks capacity to pass 25 and 50 year storm events; structure outflanked and water flowing over road

Aquatic Organism Passage – Reduced

- Structure opening partially obstructed by wood debris
- Sediment not throughout structure

Upper Exeter River

Location: Fremont Road, Sandown
Segment ID: UE08-A
Bridge Length- 26.5 feet
Bridge Clearance – 8.5 feet
Bridge Span – 13.8 feet

Inlet

Outlet

Geomorphic Compatibility – Fully Incompatible

Percent Bankfull Width – Undersized (28%)
Approach Angle – Sharp bend
Erosion and Armoring – Armoring upstream intact and armoring downstream failing; minor bank erosion downstream
Sediment Continuity –Scour above, scour below
Additional problems noted: None

Aquatic Organism Passage – Not applicable for Bridges

Upper Exeter River

Location: Wells Village Road, Danville
Segment ID: UE12-A
Culvert Length- 50 feet
Culvert Height – 6.7 feet
Culvert Width – 9.9 feet

Inlet

Outlet

Geomorphic Compatibility – Mostly Compatible

Percent Bankfull Width – Undersized (33%)
Slope – Culvert slope same as channel slope
Approach Angle – Mild bend
Erosion and Armoring – No hard bank armoring; minor bank erosion upstream
Sediment Continuity –Deposition above (sand in channel and soft underfoot); extreme scour above and below structure
Additional problems noted: None

Aquatic Organism Passage – Reduced

- Sediment not throughout structure

Upper Exeter River

Location: Power lines Crossing off Route 121, Chester
Segment ID: UE15-B
Bridge Length- 17.3 feet
Bridge Clearance – 3.4 feet
Bridge Span – 9.2 feet

Inlet

Outlet

Geomorphic Compatibility – Mostly Incompatible

Percent Bankfull Width – Undersized (41%)
Approach Angle – Sharp bend
Erosion and Armoring – Upstream and downstream hard bank armoring failing; no bank erosion noted
Sediment Continuity –Deposition above and scour below
Additional problems noted: Failing rip rap obstructing inlet

Aquatic Organism Passage – Not Applicable for Bridges

Upper Exeter River

Location: Farm field West of Haverhill Road, Chester
Segment ID: UE15-B
Culvert Length- 48 feet
Culvert Height – 5.3 feet
Culvert Width – 2.8 feet

Inlet

Outlet

Geomorphic Compatibility – Mostly Incompatible

Percent Bankfull Width – Undersized (13%)
Slope – Culvert slope higher than channel slope
Approach Angle – Channelized straight
Erosion and Armoring – No hard bank armoring; minor bank erosion downstream
Sediment Continuity –Scour below and deposition below
Additional problems noted: Channelized above culvert; structure lacks capacity to pass 25 and 50 year storm events

Aquatic Organism Passage – Reduced

- Sediment not throughout structure

Upper Exeter River

Location: Haverhill Road, Chester
Segment ID: UE15-B
Culvert Length- 48 feet
Culvert Height – 5.3 feet
Culvert Width – 2.8 feet

Inlet

Outlet

Geomorphic Compatibility – Mostly Incompatible

Percent Bankfull Width – undersized (14 %)
Slope – culvert slope lower than channel slope
Approach Angle – naturally straight
Erosion and Armoring – Failing bank armoring both upstream and downstream; minor bank erosion downstream
Sediment Continuity – deposition above (mid channel, side bar, lots of sand in channel above structure), scour below
Additional problems noted: Old stone culvert, very narrow structure for channel; alignment downstream is poor; concrete bottom; wood debris and riprap obstructing structure opening

Aquatic Organism Passage – Reduced

- Structure opening partially obstructed
- Sediment not throughout structure

Dudley Brook (Little River) Subwatershed

Location: B&M Railroad Crossing, Exeter
Segment ID: LR01-B
Bridge Length: 45 feet
Bridge Clearance: 13.0 feet
Bridge Span: 14.0 feet

Deposition downstream

Stable abutments

Geomorphic Compatibility – Mostly Incompatible

Percent Bankfull Width – Undersized (42%)
Approach Angle – Sharp bend upstream
Erosion and Armoring – Minor bank erosion upstream; Mass failure downstream
Sediment Continuity – Minor deposition upstream (point bar) and downstream (mid-channel bar)
Additional problems noted – Structure lacks capacity to pass 25 and 50 year storm events; Limited vegetation along banks around rail bed

Aquatic Organism Passage – Not Applicable for Bridges

Dudley Brook (Bloody Brook) Subwatershed

Location: Private Driveway off Watson Road, Exeter
Segment ID: BB04
Culvert Length: 17 feet
Culvert Height: 2.0 feet
Culvert Width: 2.0 feet

Inlet

Outlet

Geomorphic Compatibility – Mostly Incompatible

Percent Bankfull Width – Undersized (25%)
Approach Angle – Sharp bend upstream
Erosion and Armoring – Minor bank erosion both upstream and downstream
Sediment Continuity – Moderate scour below in plunge pool
Additional problems noted – Structure lacks capacity to pass 25 and 50 year storm events; Rust and deterioration noted

Aquatic Organism Passage – Reduced

- Sediment not found throughout structure bottom

Dudley Brook (Bloody Brook) Subwatershed

Location: Watson Road, Exeter
Segment ID: BB04
Culvert Length- 40 feet
Culvert Height – 2.0 feet
Culvert Width – 2.0 feet

Deposition Upstream

Outlet

Geomorphic Compatibility – Mostly Incompatible

Percent Bankfull Width – undersized (25%)
Slope – Significant break in valley slope downstream
Approach Angle – sharp bend upstream
Erosion and Armoring – Minor bank erosion downstream
Sediment Continuity – High degree of fine sediment deposition upstream
Additional problems noted – Structure lacks capacity to pass 25 and 50 year storm events; Fine sediment deposition extends several hundred feet upstream

Aquatic Organism Passage – Reduced

- Sediment not found throughout structure

Appendix C

Rainfall-Runoff Modeling Results for Structure Flood Capacity

Rainfall-Runoff Modeling for Structure Flood Capacity

Introduction

One component of the Exeter River Watershed Restoration Plan is the development of rainfall-runoff data for bridges and culverts determined to be incompatible with geomorphic stability and aquatic organism passage. For these structures, the Natural Resources Conservation Service TR20 hydrologic model and methods (NRCS, 1992) were utilized for calculating peak runoff rates and routing to the structures for 24 hour storms with recurrence intervals of 25 and 50 years. The inclusion of rainfall-runoff modeling to determine structure capacity to accommodate large runoff events further ensures that the prioritization of structures for replacement is based on multiple sources of scientifically-defensible data.

Structure Selection

Using the data collected during the Phase 2 bridge and culvert assessments, we rated each structure using the Vermont Geomorphic Compatibility Screening Tool (MMI, 2008a) and the Vermont Aquatic Organism Passage (AOP) Screening Tool (MMI, 2008b) developed by the Vermont Agency of Natural Resources (VTANR). The screening results provided a basis for selecting reaches to include for capacity modeling (Table 1).

Table 1. Structures Selected for Runoff Modeling

Subwatershed	Reach or Segment	Crossing Location	Structure Type	Geomorphic Compatibility	AOP
Dudley Brook	LR01-B	B&M Railroad	Bridge	Mostly Incompatible	NA
	DB03	Route 111-A	Bridge	Mostly Incompatible	Reduced
	BB03-B	Kelby Scott Way	Culvert	Mostly Incompatible	Reduced
	BB04	Private Drive	Culvert	Partially Compatible	Reduced
	BB04	Watson Road	Culvert	Partially Compatible	NA
Upper Exeter	UE05	Sandown Road	Culvert	Mostly Compatible	Reduced
	UE08-A	Fremont Road	Bridge	Fully Incompatible	NA
	UE12-A	Wells Village Rd	Culvert	Mostly Compatible	Reduced
	UE14-C	Power Lines	Bridge	Mostly Incompatible	NA
	UE15-B	Field Crossing	Culvert	Mostly Incompatible	Reduced
	UE15-B	Haverill Road	Culvert	Mostly Incompatible	Reduced
Fordway Brook	FW01-A	Chester Road	Bridge	Mostly Incompatible	NA
	FW07-D	Lane Road	Culvert	Partially Compatible	Reduced
	FW09	Old Bye Road	Culvert	Mostly Incompatible	Reduced
	FW10-B	Lane Road	Culvert	Mostly Compatible	Reduced
	FW10-E	Old Chester Road	Culvert	Partially Compatible	Reduced
	FW11-B	Shattagee Road	Culvert	Partially Compatible	Reduced
	FW13	Crowley Road	Culvert	Partially Compatible	Reduced

All structures that were determined to be fully or mostly incompatible with geomorphic stability were selected for runoff modeling. In addition, other structures were selected if the structure width was well below the predicted reference channel width calculated using the equation developed by the New Hampshire Stream Team (2005), or if geomorphic instability was noted around the structure. Due to known flooding concerns at the Lane Road crossing in segment FW10-B in the Fordway Brook subwatershed, this structure was also included in the analysis. A total of 18 structures within the Dudley Brook, Upper Exeter, and Fordway Brook subwatersheds were selected for runoff modeling. None of the bridges in the Lower Exeter subwatershed were rated as incompatible with geomorphic stability.

Modeling Methods

TR20 Model

The Natural Resources Conservation Service (NRCS) TR20 model and methods (SCS, 1992) have been utilized for the calculation of peak runoff rates and routing to the selected structures for 24 hour storms with recurrence intervals of 2, 10, 25, 50, and 100 years. Rainfall depths for Rockingham County for each storm event were obtained from the New Hampshire NRCS website (NRCS, 2008), as presented in Table 2.

Table 2. Rockingham County Rainfall Data

Storm Frequency	Storm Depth (in)
2 year	3.0
10 year	4.3
25 year	5.2
50 year	5.7
100 year	6.4

In addition to rainfall depths and watershed area, the NRCS TR20 methods use two other key variables specific to the upslope drainage area: curve number (CN), and time of concentration (Tc). The CN value is used to approximate the amount of runoff that would occur during a particular rainfall event, based on the soil and land use characteristics. The Tc value is an estimation of the time required for one drop of water to travel from the most hydrologically remote area of the watershed to the outlet. Weighted CN values for the drainage areas upslope of each structure have been calculated using NRCS soils data acquired through the New Hampshire Geographically Referenced Analysis and Information Transfer System (GRANIT), and 2006 land cover data from the NOAA Coastal Change Analysis Program (C-CAP; NOAA, 2008). Tc values for each structure subwatershed were calculated using elevation data provided by New Hampshire Geological Survey (NHGS) and roughness coefficients (manning's n values) based on

Chow (1959). Summaries of the area, curve number, and time of concentration calculations for all drainage areas are found in the Attachment.

USGS Gaging Data and Flow-Frequency Studies

Two streamflow gages are currently in operation in the Exeter River watershed on the main stem of the river, and one gaging station was historically operated on Dudley Brook. On the Exeter River, the gage at the Haigh Road in Brentwood has been in operation since 1996. A second gage is found on the Upper Exeter River at the Odell Road crossing in Sandown, however this gage has only been in operation since September 2008 as it is part of a new monitoring network established by USGS and the New Hampshire Rivers Management Advisory Committee. The Dudley Brook gage was in operation from 1962 to 1985, and has recently been part of two USGS flood-frequency studies for large flow events in 2006 and 2007. A sufficient data set exists for the calculation of flow-frequency values for the Dudley Brook site using traditional USGS Log-Pearson type-3 methods. However the Exeter River Haigh Road gage has recorded two very large storm events during its 13 year period (Olson, 2007; Flynn, 2008), making the calculation of accurate flow-frequency values from this data set difficult.

Various United States Geological Survey (USGS) studies have documented different methods used to estimate the flow frequency statistics for the Dudley Brook and Exeter River sites. Following the New Hampshire flood event of May 2006, the USGS published a review of the peak discharge data for 14 gaging sites in the state, including the Dudley Brook and Exeter River gages. The flow-frequency statistics for the Dudley Brook site based on the Log-Pearson type-3 frequency analysis are summarized in the USGS report (Olson, 2007), and have been referenced for our modeling analysis (Table 3). Alternatively, for the Exeter River, the USGS is currently developing a regression equation to predict peak discharges on ungaged streams using the following basin characteristics: drainage area; April precipitation; percent wetlands; channel slope. Due to the difficulties in using the 13 year flow record for the Exeter River to estimate flow frequencies, the new USGS regression equation has been used for this site (Olson, 2008).

Table 3. Flow-Frequency Data (cfs) for Selected Gages

Watershed Gage	Drainage Area (mi^2)	2 Year	10 Year	25 Year	50 Year	100 Year
Exeter River	63.5	783*	1540*	1980*	2330*	2760*
Dudley Brook	5.8	167	326	426	511	604

* Provisional data provided by USGS (Olson, 2008)

Model Calibration

USGS studies comparing different peak flow estimation methods for the New Hampshire coastal region have shown that uncalibrated TR20 model results have limited predictability of gaged peak flow rates for small basins (Hodgkins et al., 2007). While the TR20 model is widely used by engineers and environmental scientists to predict peak flow rates for small, ungaged basins, the model has been shown to be extremely sensitive to key input variables, especially the Tc value. Model calibration with historical gaging data on a subwatershed level allows for increased confidence in predicting peak flow values for rating structure capacity.

Using the selected flow-frequency data summarized in Table 3, the TR20 model was calibrated to conform to peak flow rates for the 25 and 50 year events. These flood events are typically used by engineers to appropriately size highway culverts and bridges (USDOT, 2005). A satisfactory level of model agreement for each event at each site was determined *a priori* to be less than 10 percent. For the model calibration, rainfall depths and distributions (Type I) were kept constant while Tc and CN values were adjusted.

Table 4. TR20 Calibration Results by Subwatershed

Sub-watershed	Road Crossing	Drainage area (mi^2)	25 Year Storm			50 Year Storm		
			USGS (cfs)	TR20 (cfs)	% Difference	USGS (cfs)	TR20 (cfs)	% Difference
Upper Exeter	Sandown Road	19.0	592	568	4.1%	697	747	7.2%
Dudley Bk.	Route 111-A	5.8	426	428	0.5%	511	517	1.2%

Within the Dudley Brook watershed, Tc values were adjusted to bring the peak flow values within 10 percent of the gage values for subwatershed DB03, whose outlet is found immediately downstream of the historical gage location at the Route 111-A crossing. Once this level of agreement was reached (see Table 4), all other Tc values for the Dudley Brook subwatershed were adjusted by the same factor. For the Exeter River, the peak flow values presented in Table 3 were normalized by drainage area to the most downstream crossing selected for modeling (Sandown Road) within the Upper Exeter subwatershed. CN values were adjusted to bring the peak flow values within 10 percent of the normalized peak flow rates. Once this level of agreement was reached (see Table 4), all other CN values for the Upper Exeter and Fordway Brook subwatersheds were adjusted by the same factor. Given the similarity in soil types and extensive floodplain wetland coverage between the Upper Exeter and Fordway Brook subwatersheds, the same model calibration approach was used for these two subwatersheds. Adjusted Tc and CN values for calibration purposes are presented in TR20 input summary sheets in the Attachment.

Structure Capacity Results

Using the calibrated TR20 peak flow results for the 25 and 50 year storm events, each of the 18 structures were evaluated for their ability to accommodate these discharges while flowing at full capacity. Streamflow velocities and discharges through each structure were estimated using the Manning formula (Chow, 1959), as follows:

$$V = \frac{k}{n} R_h^{\frac{2}{3}} \cdot S^{\frac{1}{2}}$$

Where:
V = average cross-sectional velocity (ft/s)
k = conversion constant (1.49 for English units)
n = roughness coefficient (dimensionless)
R_h = hydraulic radius (ft)
S = channel or structure slope (ft/ft)

Data for structure type, dimensions, and material were recorded during the Phase 2 bridge and culvert assessments. This data was the basis for determining each structure's cross-sectional area, hydraulic radius, and roughness coefficients per Chow (1959) and Gupta (2008). Structure slope has been assumed to be equal to channel slope immediately upstream and downstream of the crossing, as measured with GIS using elevation data provided by NHGS. More resolute survey methods (beyond Phase 2 methods) would be needed to calculate accurate structure slopes to refine the capacity estimations. The estimation of structure capacity does not account for increased capacity with stream stages that result in additional head above the inlet, or scenarios with additional inlet or outlet controls (Gupta, 2008).

The results of the structure capacity analysis are included in a summary table in the Attachment. Of the 18 structures selected for modeling, 10 structures are not appropriately sized to accommodate the 25 year storm event, while 12 will not accommodate the 50 year storm event.

References

Chow, V., 1959, Open Channel Hydraulics, McGraw-Hill College, New York, NY

Flynn, R.H., 2008, Flood of April 2007 in New Hampshire: U.S. Geological Survey Scientific Investigations Report 2008–5120, 53 p.

Gupta, R.S., 2008, Hydrology and Hydraulic Systems, Waveland Press, Inc., Long Grove, Illinois

Hodgkins, G.A., Hebson, Charles, Lombard, P.J., and Mann, Alexander, 2007, Comparison of peak flow estimation methods for small drainage basins in Maine: U.S. Geological Survey Scientific Investigations Report 2007-5170, 32 p.

MMI – Milone & MacBroom, 2008a, The Vermont Culvert Geomorphic Compatibility Screening Tool, February, 2008

MMI – Milone & MacBroom, 2008b, The Vermont Culvert Aquatic Organism Passage Screening Tool, February, 2008

NOAA - National Oceanic and Atmospheric Administration, 2008, Land Cover Analysis Data for New England – Coastal Change Analysis Program. Accessed October, 2008 and available at: http://www.csc.noaa.gov/crs/lca/ccap.html

NRCS – Natural Resources Conservation Service, 2008, New Hampshire County Rainfall Frequency Data. Accessed online in November 2008 at: http://www.nh.nrcs.usda.gov/technical/NHcountyrainfall.html

Olson, S.A., 2007, Flood of May 2006 in New Hampshire: U.S. Geological Survey Open-File Report 2007–1122, 32 p.

Olson, 2008, Personal communication with Scott Olson about new USGS regression equations to estimate flood-flow frequency.

SCS – Soil Conservation Service, 1992, TR-20 Computer Program for Project Formulation Hydrology. U. S. Department of Agriculture. Soil Conservation Service. Washington, D.C. May, 1992

USDOT – U.S. Department of Transportation, 2005, Hydraulic Design of Highway Culverts, Publication No. FHWA-NHI-01-020, May, 2005

ATTACHMENT

TR20 SUMMARY DATA

Table 5. Structure Capacity Results for the 25 and 50 Year Storm Events

Subwatershed	Reach or Segment	Town	Crossing Location	Drainage Area (sqmi)	Structure Data				Manning's Data for Structure Capacity Flowing Full					Structure Capacity for Flood Events			
														25 Year Storm		50 Year Storm	
					Type	Height (ft)	Width (ft)	Area (ft^2)	R (ft)	Slope (ft/ft)	n	Velocity (ft/s)	Q (cfs)	Q (cfs)	% Capacity	Q (cfs)	% Capacity
Dudley Brook	LR01-B	Exeter	B&M Railroad	14.9	Bridge	13.0	14.0	182.0	3.4	0.0013	0.021	5.8	1,143	1,225	**93%**	1,469	**78%**
	DB03	Brentwood	Route 111-A	5.8	Bridge	6.5	16.0	104.0	2.3	0.0015	0.020	5.1	571	433	132%	524	109%
	BB03-B	Exeter	Kelby Scott Way	0.7	Culvert	2.0	2.0	3.1	0.5	0.0093	0.013	7.0	24	81	**29%**	100	**24%**
	BB04	Exeter	Private Drive	0.7	Culvert	2.0	2.0	3.1	0.5	0.0139	0.024	4.6	16	86	**18%**	107	**15%**
	BB04	Exeter	Watson Road	0.7	Culvert	2.0	2.0	3.1	0.5	0.0102	0.013	7.3	25	86	**29%**	107	**23%**
Upper Exeter	UE05	Fremont	Sandown Road	19.0	Culvert	7.1	7.5	41.8	1.8	0.0003	0.024	1.7	77	569	**13%**	747	**10%**
	UE08-A	Sandown	Fremont Road	15.6	Bridge	9.5	13.8	131.1	2.8	0.0030	0.025	6.5	927	547	170%	732	127%
	UE12-A	Sandown	Wells Village Road	6.4	Culvert	6.7	9.9	54.1	2.1	0.0047	0.024	7.0	410	255	161%	359	114%
	UE14-C	Chester	Power Lines	1.3	Bridge	4.4	9.2	48.8	1.5	0.0048	0.035	3.9	208	101	205%	141	148%
	UE15-B	Chester	Field Crossing	0.8	Culvert	2.6	2.6	5.3	0.7	0.0073	0.024	4.0	23	67	**34%**	95	**24%**
	UE15-B	Chester	Haverill Road	0.8	Culvert	5.3	2.8	14.8	0.9	0.0073	0.026	4.6	75	67	111%	95	**78%**
Fordway Brook	FW01-A	Raymond	Chester Road	10.0	Bridge	5.7	13.9	79.2	2.0	0.0008	0.020	3.3	284	363	**78%**	484	**59%**
	FW07-D	Raymond	Lane Road	5.8	Culvert	7.0	9.7	54.7	2.1	0.0027	0.024	5.3	312	235	133%	323	**97%**
	FW09	Raymond	Old Bye Road	4.6	Culvert	7.3	12.0	87.6	2.3	0.0100	0.035	7.4	702	191	368%	268	262%
	FW10-B	Raymond	Lane Road*	4.2	Culvert	3.7	4.8	14.2	1.1	0.0034	0.024	3.8	116	169	**69%**	239	**49%**
	FW10-E	Raymond	Old Chester Road*	3.3	Culvert	2.5	2.5	4.9	0.6	0.0048	0.024	3.2	33	135	**25%**	196	**17%**
	FW11-B	Raymond	Shattagee Road	1.7	Culvert	4.8	4.8	18.1	1.2	0.0070	0.024	5.9	115	72	161%	106	108%
	FW13	Candia	Crowley Road	0.5	Culvert	2.0	2.0	3.1	0.5	0.0099	0.024	3.9	13	18	**73%**	30	**45%**

* Accounts for capacity of 2 culverts at crossing.
Values shaded in red indicate inadequate flood capacity for design storms

Maximum:	368%	262%
Minimum:	13%	10%
Mean:	106%	77%
Median:	86%	68%

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: LR01-B
Crossing: B&M Railroad Bridge
Model Scenario: Existing Conditions

Area (sqmi): 14.90
Area (acres): 9537.4

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
A	Bare	58.3	0.6%	77	4486.0
A	Commercial	0.3	0.0%	89	27.6
A	Forest	278.3	2.9%	30	8347.5
A	Meadow	229.1	2.4%	30	6873.3
A	Open Space	18.1	0.2%	39	704.0
A	Residential	135.1	1.4%	77	10400.4
A	Shrub	31.1	0.3%	30	931.8
A	Water/Wetland	10.5	0.1%	100	1052.0
B	Bare	56.0	0.6%	86	4818.6
B	Commercial	9.0	0.1%	92	828.9
B	Forest	2746.6	28.8%	55	151061.9
B	Meadow	507.2	5.3%	58	29419.3
B	Open Space	18.4	0.2%	61	1120.6
B	Residential	183.9	1.9%	85	15634.9
B	Shrub	176.9	1.9%	48	8489.3
B	Water/Wetland	61.8	0.6%	100	6178.0
C	Bare	52.6	0.6%	91	4787.5
C	Commercial	2.6	0.0%	94	246.3
C	Forest	2495.6	26.2%	70	174693.4
C	Meadow	731.1	7.7%	71	51908.8
C	Open Space	28.1	0.3%	74	2075.7
C	Residential	153.0	1.6%	90	13769.1
C	Shrub	206.5	2.2%	65	13422.5
C	Water/Wetland	282.0	3.0%	100	28197.0
D	Bare	158.6	1.7%	94	14904.6
D	Commercial	4.8	0.1%	95	454.1
D	Forest	462.4	4.8%	77	35607.1
D	Meadow	94.5	1.0%	78	7370.2
D	Open Space	12.7	0.1%	80	1016.8
D	Residential	89.8	0.9%	92	8264.4
D	Shrub	40.0	0.4%	73	2920.0
D	Water/Wetland	202.7	2.1%	100	20266.0
	Total :	9537.36	100.0%		630277.6

Weighted Curve Number: 66.1
Total Developed Land: 578.6 acres
Percent Developed Land: 6%

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	8	2.7%	1	0.40	0.2092
6,895	Shallow Conc. Flow	45	0.7%	4	0.95	2.0122
12,025	Small Tributary	50	0.4%	5	1.32	2.5326
18,215	Small Tributary	23	0.1%	5	0.74	6.8008
16,280	Large Tributary	42	0.3%	6	1.81	2.4982
53715	- Total Distance Traveled	168	- Total Change in Elev.			
					Sum Tt:	14.0531

Time of Concentration (hrs): 14.05
Adjusted Tc for Calibration (hrs): 30.21

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: BB03-B
Crossing: Kelby Scott Way
Model Scenario: Existing Conditions

Area (sqmi): 0.69
Area (acres): 439.8

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
A	Forest	18.8	4.3%	30	563.7
A	Meadow	0.9	0.2%	30	25.5
A	Residential	1.0	0.2%	77	77.8
A	Shrub	0.8	0.2%	30	23.4
A	Water/Wetland	0.3	0.1%	100	34.0
B	Bare	0.8	0.2%	86	66.2
B	Forest	287.5	65.4%	55	15814.7
B	Meadow	6.6	1.5%	58	384.0
B	Residential	6.2	1.4%	85	530.4
B	Shrub	8.7	2.0%	48	416.2
B	Water/Wetland	11.5	2.6%	100	1151.0
D	Bare	0.1	0.0%	94	13.2
D	Forest	60.5	13.8%	77	4657.0
D	Meadow	0.7	0.1%	78	50.7
D	Residential	2.2	0.5%	92	203.3
D	Shrub	1.4	0.3%	73	103.7
D	Water/Wetland	31.8	7.2%	100	3176.0
	Total :	439.78	100.0%		27290.6

Weighted Curve Number: 62.1
Total Developed Land: 9.5 acres
Percent Developed Land: 2%

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	5	1.7%	1	0.31	0.2668
2,625	Shallow Conc. Flow	52	2.0%	4	1.63	0.4486
3,745	Small Tributary	12	0.3%	5	1.16	0.8939
6670	- Total Distance Traveled	69	- Total Change in Elev.			
					Sum Tt:	1.6093

Time of Concentration (hrs): 1.61
Adjusted Tc for Calibration (hrs): 3.46

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: BB04
Crossings: Watson Road & Private Drive
Model Scenario: Existing Conditions

Area (sqmi): 0.65
Area (acres): 417.1

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
A	Forest	8.0	1.9%	30	239.1
A	Meadow	0.9	0.2%	30	25.5
A	Residential	0.7	0.2%	77	57.0
A	Shrub	0.8	0.2%	30	23.4
A	Water/Wetland	0.3	0.1%	100	34.0
B	Bare	0.8	0.2%	86	66.2
B	Forest	276.6	66.3%	55	15213.0
B	Meadow	6.6	1.6%	58	384.0
B	Residential	6.2	1.5%	85	528.7
B	Shrub	8.0	1.9%	48	384.0
B	Water/Wetland	11.5	2.8%	100	1151.0
D	Bare	0.1	0.0%	94	13.2
D	Forest	60.5	14.5%	77	4657.0
D	Meadow	0.7	0.2%	78	50.7
D	Residential	2.2	0.5%	92	203.3
D	Shrub	1.4	0.3%	73	103.7
D	Water/Wetland	31.8	7.6%	100	3176.0
	Total :	417.06	100.0%		26309.7

Weighted Curve Number: 63.1
Total Developed Land: 9.2 acres
Percent Developed Land: 2%

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	5	1.7%	1	0.31	0.2668
2,625	Shallow Conc. Flow	52	2.0%	4	1.63	0.4486
2,845	Small Tributary	8	0.3%	5	1.09	0.7231
5770	- Total Distance Traveled	65	- Total Change in Elev.			
					Sum Tt:	1.4384

Time of Concentration (hrs): 1.44
Adjusted Tc for Calibration (hrs): 3.09

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: DB03
Crossing: Route 111-A (upper crossing)
Model Scenario: Existing Conditions

Area (sqmi): 5.77
Area (acres): 3692.7

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
A	Bare	10.1	0.3%	77	773.9
A	Forest	74.7	2.0%	30	2242.2
A	Meadow	71.1	1.9%	30	2133.0
A	Open Space	0.2	0.0%	39	7.8
A	Residential	9.8	0.3%	77	755.4
A	Shrub	7.8	0.2%	30	234.6
A	Water/Wetland	0.3	0.0%	100	31.0
B	Bare	23.9	0.6%	86	2057.1
B	Commercial	6.4	0.2%	92	590.6
B	Forest	1063.8	28.8%	55	58511.2
B	Meadow	434.9	11.8%	58	25225.4
B	Open Space	4.3	0.1%	61	261.1
B	Residential	73.8	2.0%	85	6271.3
B	Shrub	69.4	1.9%	48	3331.7
B	Water/Wetland	16.3	0.4%	100	1627.0
C	Bare	9.1	0.2%	91	823.6
C	Commercial	0.1	0.0%	94	11.3
C	Forest	922.8	25.0%	70	64598.8
C	Meadow	477.4	12.9%	71	33891.9
C	Open Space	3.9	0.1%	74	290.8
C	Residential	26.9	0.7%	90	2416.5
C	Shrub	90.4	2.4%	65	5873.4
C	Water/Wetland	70.2	1.9%	100	7020.0
D	Bare	4.6	0.1%	94	428.6
D	Commercial	0.2	0.0%	95	15.2
D	Forest	135.0	3.7%	77	10398.1
D	Meadow	36.7	1.0%	78	2862.6
D	Open Space	0.5	0.0%	80	37.6
D	Residential	4.9	0.1%	92	450.8
D	Shrub	10.3	0.3%	73	753.4
D	Water/Wetland	33.0	0.9%	100	3302.0
	Total :	3692.74	100.0%		237227.7

Weighted Curve Number: 64.2
Total Developed Land: 122.0 acres
Percent Developed Land: 3%

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	8	2.7%	1	0.40	0.2092
6,895	Shallow Conc. Flow	45	0.7%	4	0.95	2.0122
12,025	Small Tributary	50	0.4%	5	1.32	2.5326
19220	- Total Distance Traveled	103	- Total Change in Elev.			
					Sum Tt:	4.7540

Time of Concentration (hrs): 4.75
Adjusted Tc for Calibration (hrs): 10.22

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: UE05
Crossing: Sandown Road
Model Scenario: Existing Conditions

Area (sqmi): 19.00
Area (acres): 12158.9

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
A	Bare	11.5	0.1%	77	881.7
A	Commercial	1.5	0.0%	89	132.6
A	Forest	255.9	2.1%	30	7676.1
A	Meadow	126.5	1.0%	30	3793.8
A	Open Space	9.5	0.1%	39	368.6
A	Residential	55.4	0.5%	77	4268.1
A	Shrub	4.6	0.0%	30	137.1
A	Water/Wetland	40.0	0.3%	100	4003.0
B	Bare	127.2	1.0%	86	10939.2
B	Commercial	0.4	0.0%	92	35.0
B	Forest	5312.5	43.7%	55	292187.0
B	Meadow	838.7	6.9%	58	48642.9
B	Open Space	88.2	0.7%	61	5377.8
B	Residential	455.7	3.7%	85	38731.1
B	Shrub	170.9	1.4%	48	8205.1
B	Water/Wetland	193.9	1.6%	100	19386.0
C	Bare	87.4	0.7%	91	7956.1
C	Commercial	0.1	0.0%	94	4.7
C	Forest	1820.9	15.0%	70	127461.6
C	Meadow	577.6	4.8%	71	41010.3
C	Open Space	29.5	0.2%	74	2179.3
C	Residential	175.3	1.4%	90	15775.2
C	Shrub	115.2	0.9%	65	7485.4
C	Water/Wetland	35.2	0.3%	100	3522.0
D	Bare	9.1	0.1%	94	859.2
D	Forest	834.0	6.9%	77	64218.8
D	Meadow	74.3	0.6%	78	5797.0
D	Open Space	16.8	0.1%	80	1346.4
D	Residential	30.3	0.2%	92	2788.5
D	Shrub	10.6	0.1%	73	770.2
D	Water/Wetland	650.5	5.4%	100	65050.0
	Total :	12158.85	100.0%		790989.5

Weighted Curve Number: 65.1
Ajdusted Curve Number for Model Calibration: 48.2
Total Developed Land: 718.6 acres
Percent Developed Land: 6%

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	10	3.3%	1	0.45	0.1863
1,950	Shallow Conc. Flow	130	6.7%	4	2.92	0.1857
1,070	Shallow Conc. Flow	15	1.4%	4	1.38	0.2160
8,910	Small Tributary	125	1.4%	5	2.37	1.0463
39,280	Large Tributary	127	0.3%	6	2.01	5.4354
51510	- Total Distance Traveled	407	- Total Change in Elev.			
					Sum Tt:	7.0697

Time of Concentration (hrs): 7.07

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: UE08-A
Crossing: Fremont Road
Model Scenario: Existing Conditions

Area (sqmi): 15.61
Area (acres): 9990.4

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
A	Bare	9.2	0.1%	77	711.5
A	Commercial	1.5	0.0%	89	132.6
A	Forest	148.4	1.5%	30	4451.7
A	Meadow	67.0	0.7%	30	2010.6
A	Open Space	9.4	0.1%	39	365.4
A	Residential	53.4	0.5%	77	4111.8
A	Shrub	3.5	0.0%	30	105.9
A	Water/Wetland	27.3	0.3%	100	2734.0
B	Bare	107.6	1.1%	86	9251.9
B	Commercial	0.4	0.0%	92	35.0
B	Forest	4196.2	42.0%	55	230792.1
B	Meadow	676.0	6.8%	58	39206.8
B	Open Space	85.4	0.9%	61	5207.0
B	Residential	434.2	4.3%	85	36907.0
B	Shrub	146.1	1.5%	48	7011.4
B	Water/Wetland	155.4	1.6%	100	15538.0
C	Bare	85.4	0.9%	91	7770.5
C	Commercial	0.1	0.0%	94	4.7
C	Forest	1696.8	17.0%	70	118777.4
C	Meadow	565.1	5.7%	71	40120.0
C	Open Space	29.6	0.3%	74	2188.9
C	Residential	173.0	1.7%	90	15566.4
C	Shrub	108.9	1.1%	65	7079.8
C	Water/Wetland	30.1	0.3%	100	3010.0
D	Bare	9.1	0.1%	94	859.2
D	Forest	592.9	5.9%	77	45653.3
D	Meadow	52.9	0.5%	78	4124.6
D	Open Space	15.4	0.2%	80	1228.0
D	Residential	29.4	0.3%	92	2704.8
D	Shrub	8.5	0.1%	73	617.6
D	Water/Wetland	472.4	4.7%	100	47243.0
	Total :	9990.40	100.0%		655520.8

Weighted Curve Number: 65.6
Ajdusted Curve Number for Model Calibration: 48.6
Total Developed Land: 691.9 acres
Percent Developed Land: 7%

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	10	3.3%	1	0.45	0.1863
1,950	Shallow Conc. Flow	130	6.7%	4	2.92	0.1857
1,070	Shallow Conc. Flow	15	1.4%	4	1.38	0.2160
8,910	Small Tributary	125	1.4%	5	2.37	1.0463
26,110	Large Tributary	105	0.4%	6	2.22	3.2693
38340	- Total Distance Traveled	385	- Total Change in Elev.			
					Sum Tt:	4.9036

Time of Concentration (hrs): 4.90

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: UE12-A
Crossing: Wells Village Road
Model Scenario: Existing Conditions

Area (sqmi): 6.37
Area (acres): 4077.9

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
B	Bare	17.7	0.4%	86	1521.3
B	Forest	1629.7	40.0%	55	89631.3
B	Meadow	332.0	8.1%	58	19256.6
B	Open Space	9.2	0.2%	61	559.4
B	Residential	79.4	1.9%	85	6751.6
B	Shrub	62.0	1.5%	48	2974.6
B	Water/Wetland	31.5	0.8%	100	3145.0
C	Bare	36.4	0.9%	91	3309.7
C	Commercial	0.1	0.0%	94	4.7
C	Forest	1048.6	25.7%	70	73398.5
C	Meadow	367.8	9.0%	71	26115.9
C	Open Space	11.0	0.3%	74	817.0
C	Residential	98.1	2.4%	90	8828.1
C	Shrub	66.3	1.6%	65	4306.9
C	Water/Wetland	25.3	0.6%	100	2529.0
D	Bare	0.1	0.0%	94	10.3
D	Forest	129.7	3.2%	77	9988.4
D	Meadow	19.7	0.5%	78	1537.4
D	Open Space	0.1	0.0%	80	6.4
D	Residential	1.7	0.0%	92	157.3
D	Shrub	2.2	0.1%	73	161.3
D	Water/Wetland	109.5	2.7%	100	10949.0
	Total :	4077.89	100.0%		265959.7

Weighted Curve Number: 65.2
Ajdusted Curve Number for Model Calibration: 48.3
Total Developed Land: 179.3 acres
Percent Developed Land: 4%

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	10	3.3%	1	0.45	0.1863
1,950	Shallow Conc. Flow	130	6.7%	4	2.92	0.1857
1,070	Shallow Conc. Flow	15	1.4%	4	1.38	0.2160
8,910	Small Tributary	125	1.4%	5	2.37	1.0463
9,630	Large Tributary	85	0.9%	6	3.18	0.8411
21860	- Total Distance Traveled	365	- Total Change in Elev.			
					Sum Tt:	2.4754

Time of Concentration (hrs): 2.48

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: UE14-C
Crossing: Power Lines off Rt. 121
Model Scenario: Existing Conditions

Area (sqmi): 1.33
Area (acres): 851.7

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
B	Bare	2.1	0.2%	86	178.9
B	Forest	54.3	6.4%	55	2986.0
B	Meadow	20.9	2.5%	58	1212.2
B	Open Space	0.6	0.1%	61	37.8
B	Residential	13.5	1.6%	85	1150.9
B	Shrub	4.9	0.6%	48	235.2
C	Bare	9.2	1.1%	91	838.1
C	Commercial	0.1	0.0%	94	4.7
C	Forest	469.6	55.1%	70	32874.1
C	Meadow	159.2	18.7%	71	11302.5
C	Open Space	2.2	0.3%	74	161.3
C	Residential	57.9	6.8%	90	5209.2
C	Shrub	30.9	3.6%	65	2010.5
C	Water/Wetland	7.6	0.9%	100	760.0
D	Forest	6.8	0.8%	77	522.8
D	Meadow	2.9	0.3%	78	223.1
D	Shrub	0.4	0.1%	73	31.4
D	Water/Wetland	8.7	1.0%	100	865.0
	Total :	851.73	100.0%		60603.6

Weighted Curve Number:	71.2	
Ajdusted Curve Number for Model Calibration:	52.7	
Total Developed Land:	71.5	acres
Percent Developed Land:	8%	

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	10	3.3%	1	0.45	0.1863
1,950	Shallow Conc. Flow	130	6.7%	4	2.92	0.1857
1,070	Shallow Conc. Flow	15	1.4%	4	1.38	0.2160
8,910	Small Tributary	125	1.4%	5	2.37	1.0463
12230	- Total Distance Traveled	280	- Total Change in Elev.			
					Sum Tt:	1.6343
					Time of Concentration (hrs):	1.63

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: UE15-B
Crossing: Haverill Road
Model Scenario: Existing Conditions

Area (sqmi): 0.82
Area (acres): 526.8

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
B	Bare	0.8	0.2%	86	71.4
B	Forest	50.9	9.7%	55	2798.4
B	Meadow	13.2	2.5%	58	764.4
B	Open Space	0.5	0.1%	61	28.7
B	Residential	7.1	1.4%	85	606.9
B	Shrub	2.2	0.4%	48	103.2
C	Bare	5.1	1.0%	91	466.8
C	Forest	293.1	55.6%	70	20514.9
C	Meadow	91.3	17.3%	71	6484.4
C	Open Space	1.7	0.3%	74	125.1
C	Residential	34.5	6.6%	90	3108.6
C	Shrub	14.3	2.7%	65	930.2
C	Water/Wetland	5.0	0.9%	100	499.0
D	Forest	3.7	0.7%	77	281.8
D	Water/Wetland	3.4	0.6%	100	342.0
	Total :	526.79	100.0%		37125.8

Weighted Curve Number:	70.5	
Ajdusted Curve Number for Model Calibration:	52.2	
Total Developed Land:	41.7	acres
Percent Developed Land:	8%	

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	10	3.3%	1	0.45	0.1863
1,950	Shallow Conc. Flow	130	6.7%	4	2.92	0.1857
1,070	Shallow Conc. Flow	15	1.4%	4	1.38	0.2160
4,470	Small Tributary	50	1.1%	5	2.12	0.5852
7790	- Total Distance Traveled	205	- Total Change in Elev.			
					Sum Tt:	1.1733
					Time of Concentration (hrs):	1.17

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: FW01-A
Crossing: Chester Road
Model Scenario: Existing Conditions

Area (sqmi): 9.99
Area (acres): 6393.0

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
A	Bare	10.4	0.2%	77	803.1
A	Forest	79.6	1.2%	30	2388.3
A	Meadow	7.4	0.1%	30	222.3
A	Residential	7.2	0.1%	77	553.6
A	Shrub	0.9	0.0%	30	26.1
A	Water/Wetland	6.6	0.1%	100	662.0
B	Bare	84.0	1.3%	86	7224.0
B	Commercial	2.0	0.0%	92	185.8
B	Forest	2602.5	40.7%	55	143134.8
B	Meadow	224.0	3.5%	58	12991.4
B	Open Space	24.6	0.4%	61	1501.8
B	Residential	118.8	1.9%	85	10093.8
B	Shrub	139.1	2.2%	48	6677.8
B	Water/Wetland	76.6	1.2%	100	7660.0
C	Bare	37.5	0.6%	91	3411.6
C	Forest	1724.4	27.0%	70	120705.9
C	Meadow	80.3	1.3%	71	5699.2
C	Open Space	30.3	0.5%	74	2241.5
C	Residential	130.2	2.0%	90	11715.3
C	Shrub	78.6	1.2%	65	5107.1
C	Water/Wetland	39.1	0.6%	100	3914.0
D	Bare	16.5	0.3%	94	1551.0
D	Forest	476.8	7.5%	77	36715.9
D	Meadow	27.2	0.4%	78	2121.6
D	Open Space	1.1	0.0%	80	90.4
D	Residential	11.1	0.2%	92	1020.3
D	Shrub	26.7	0.4%	73	1947.6
D	Water/Wetland	329.6	5.2%	100	32955.0
	Total :	6392.96	100.0%		423321.1

Weighted Curve Number: 66.2
Ajdusted Curve Number for Model Calibration: 49.1
Total Developed Land: 269.2 acres
Percent Developed Land: 4%

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	8	2.7%	1	0.40	0.2092
425	Shallow Conc. Flow	25	5.9%	4	2.75	0.0430
14,410	Small Tributary	240	1.7%	5	2.57	1.5582
29,660	Large Tributary	157	0.5%	6	2.52	3.2744
44795	- Total Distance Traveled	430	- Total Change in Elev.			
					Sum Tt:	5.0848

Time of Concentration (hrs): 5.08

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: FW07-D
Crossing: Lane Road
Model Scenario: Existing Conditions

Area (sqmi): 5.75
Area (acres): 3678.4

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
B	Bare	17.6	0.5%	86	1509.3
B	Forest	1553.3	42.2%	55	85432.1
B	Meadow	131.1	3.6%	58	7604.4
B	Open Space	13.1	0.4%	61	799.1
B	Residential	81.9	2.2%	85	6963.2
B	Shrub	83.8	2.3%	48	4023.8
B	Water/Wetland	36.8	1.0%	100	3675.0
C	Bare	25.6	0.7%	91	2326.0
C	Forest	1043.6	28.4%	70	73049.9
C	Meadow	45.0	1.2%	71	3195.0
C	Open Space	24.8	0.7%	74	1838.2
C	Residential	104.6	2.8%	90	9415.8
C	Shrub	28.1	0.8%	65	1825.9
C	Water/Wetland	25.0	0.7%	100	2503.0
D	Bare	1.8	0.0%	94	169.2
D	Forest	276.1	7.5%	77	21262.0
D	Meadow	11.7	0.3%	78	909.5
D	Open Space	1.1	0.0%	80	90.4
D	Residential	7.8	0.2%	92	713.9
D	Shrub	18.4	0.5%	73	1341.0
D	Water/Wetland	147.3	4.0%	100	14728.0
	Total :	3678.41	100.0%		243374.6

Weighted Curve Number: 66.2
Ajdusted Curve Number for Model Calibration: 49.0
Total Developed Land: 194.3 acres
Percent Developed Land: 5%

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	8	2.7%	1	0.40	0.2092
425	Shallow Conc. Flow	25	5.9%	4	2.75	0.0430
14,410	Small Tributary	240	1.7%	5	2.57	1.5582
13,255	Large Tributary	87	0.7%	6	2.78	1.3260
28390	- Total Distance Traveled	360	- Total Change in Elev.			
					Sum Tt:	3.1363

Time of Concentration (hrs): 3.14

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: FW09
Crossing: Old Bye Road
Model Scenario: Existing Conditions

Area (sqmi): 4.59
Area (acres): 2935.3

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
B	Bare	16.1	0.5%	86	1388.0
B	Forest	1285.5	43.8%	55	70702.0
B	Meadow	114.5	3.9%	58	6642.2
B	Open Space	3.7	0.1%	61	228.1
B	Residential	60.2	2.1%	85	5117.0
B	Shrub	72.9	2.5%	48	3500.2
B	Water/Wetland	34.9	1.2%	100	3490.0
C	Bare	21.2	0.7%	91	1925.6
C	Forest	854.2	29.1%	70	59794.0
C	Meadow	29.7	1.0%	71	2105.2
C	Open Space	3.8	0.1%	74	280.5
C	Residential	44.8	1.5%	90	4028.4
C	Shrub	18.2	0.6%	65	1181.7
C	Water/Wetland	22.9	0.8%	100	2293.0
D	Bare	0.4	0.0%	94	35.7
D	Forest	191.0	6.5%	77	14705.5
D	Meadow	9.6	0.3%	78	745.7
D	Residential	3.4	0.1%	92	314.6
D	Shrub	18.2	0.6%	73	1329.3
D	Water/Wetland	130.2	4.4%	100	13021.0
	Total :	2935.34	100.0%		192827.6

Weighted Curve Number: 65.7
Ajdusted Curve Number for Model Calibration: 48.7
Total Developed Land: 108.4 acres
Percent Developed Land: 4%

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	8	2.7%	1	0.40	0.2092
425	Shallow Conc. Flow	25	5.9%	4	2.75	0.0430
14,410	Small Tributary	240	1.7%	5	2.57	1.5582
7,970	Large Tributary	60	0.8%	6	2.96	0.7487
23105	- Total Distance Traveled	333	- Total Change in Elev.			
					Sum Tt:	2.5591

Time of Concentration (hrs): 2.56

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: FW10-B
Crossing: Lane Road
Model Scenario: Existing Conditions

Area (sqmi): 4.19
Area (acres): 2683.2

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
B	Bare	12.7	0.5%	86	1091.3
B	Forest	1247.4	46.5%	55	68608.7
B	Meadow	109.7	4.1%	58	6359.7
B	Open Space	1.1	0.0%	61	65.3
B	Residential	44.1	1.6%	85	3751.1
B	Shrub	67.1	2.5%	48	3219.8
B	Water/Wetland	34.9	1.3%	100	3490.0
C	Bare	13.2	0.5%	91	1200.3
C	Forest	732.1	27.3%	70	51247.0
C	Meadow	22.4	0.8%	71	1592.5
C	Open Space	0.0	0.0%	74	3.0
C	Residential	16.5	0.6%	90	1481.4
C	Shrub	14.8	0.6%	65	961.4
C	Water/Wetland	22.9	0.9%	100	2293.0
D	Bare	0.0	0.0%	94	2.8
D	Forest	184.3	6.9%	77	14191.1
D	Meadow	8.7	0.3%	78	675.5
D	Residential	3.2	0.1%	92	297.2
D	Shrub	17.8	0.7%	73	1302.3
D	Water/Wetland	130.2	4.9%	100	13021.0
	Total :	2683.16	100.0%		174854.3

Weighted Curve Number: 65.2
Ajdusted Curve Number for Model Calibration: 48.3
Total Developed Land: 63.8 acres
Percent Developed Land: 2%

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	8	2.7%	1	0.40	0.2092
425	Shallow Conc. Flow	25	5.9%	4	2.75	0.0430
14,410	Small Tributary	240	1.7%	5	2.57	1.5582
4,550	Large Tributary	17	0.4%	6	2.14	0.5892
19685	- Total Distance Traveled	290	- Total Change in Elev.		Sum Tt:	2.3996

Time of Concentration (hrs): 2.40

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: FW10-E
Crossing: Old Chester Road
Model Scenario: Existing Conditions

Area (sqmi): 3.28
Area (acres): 2098.5

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
B	Bare	9.2	0.4%	86	788.6
B	Forest	1029.4	49.1%	55	56615.4
B	Meadow	101.7	4.8%	58	5898.0
B	Open Space	0.5	0.0%	61	28.7
B	Residential	33.1	1.6%	85	2812.7
B	Shrub	61.0	2.9%	48	2926.1
B	Water/Wetland	25.0	1.2%	100	2495.0
C	Bare	8.7	0.4%	91	790.8
C	Forest	484.2	23.1%	70	33892.6
C	Meadow	13.8	0.7%	71	979.8
C	Residential	12.6	0.6%	90	1136.7
C	Shrub	9.2	0.4%	65	595.4
C	Water/Wetland	18.1	0.9%	100	1814.0
D	Bare	0.0	0.0%	94	2.8
D	Forest	166.6	7.9%	77	12826.7
D	Meadow	5.3	0.3%	78	411.8
D	Residential	3.1	0.1%	92	282.4
D	Shrub	15.0	0.7%	73	1092.1
D	Water/Wetland	102.3	4.9%	100	10231.0
	Total :	2098.53	100.0%		135620.5

Weighted Curve Number: 64.6
Ajdusted Curve Number for Model Calibration: 47.9
Total Developed Land: 48.8 acres
Percent Developed Land: 2%

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	8	2.7%	1	0.40	0.2092
425	Shallow Conc. Flow	25	5.9%	4	2.75	0.0430
14,410	Small Tributary	240	1.7%	5	2.57	1.5582
15135	- Total Distance Traveled	273	- Total Change in Elev.			
					Sum Tt:	1.8104

Time of Concentration (hrs): 1.81

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: FW11-B
Crossing: Shattagee Road
Model Scenario: Existing Conditions

Area (sqmi): 1.66
Area (acres): 1064.1

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
B	Bare	6.7	0.6%	86	578.8
B	Forest	492.6	46.3%	55	27093.6
B	Meadow	48.0	4.5%	58	2782.3
B	Open Space	0.2	0.0%	61	9.8
B	Residential	10.3	1.0%	85	871.3
B	Shrub	25.5	2.4%	48	1221.6
B	Water/Wetland	13.8	1.3%	100	1377.0
C	Bare	4.0	0.4%	91	361.3
C	Forest	356.0	33.5%	70	24917.2
C	Meadow	4.0	0.4%	71	283.3
C	Residential	4.2	0.4%	90	374.4
C	Shrub	5.8	0.5%	65	375.1
C	Water/Wetland	10.9	1.0%	100	1085.0
D	Bare	0.0	0.0%	94	1.9
D	Forest	32.8	3.1%	77	2524.8
D	Meadow	0.2	0.0%	78	18.7
D	Residential	0.2	0.0%	92	16.6
D	Shrub	6.5	0.6%	73	476.7
D	Water/Wetland	42.7	4.0%	100	4269.0
	Total :	1064.09	100.0%		68638.1

Weighted Curve Number:	64.5	
Ajdusted Curve Number for Model Calibration:	47.8	
Total Developed Land:	14.6	acres
Percent Developed Land:	1%	

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	8	2.7%	1	0.40	0.2092
425	Shallow Conc. Flow	25	5.9%	4	2.75	0.0430
11,620	Small Tributary	230	2.0%	5	2.79	1.1565
12345	- Total Distance Traveled	263	- Total Change in Elev.			
					Sum Tt:	1.4087

Time of Concentration (hrs): 1.41

Fitzgerald Environmental Associates, LLC.
Project: NHDES Exeter River Geomorphic Assessment
November 25, 2008

Subwatershed: FW13
Crossing: Crowley Road
Model Scenario: Existing Conditions

Area (sqmi): 0.50
Area (acres): 319.5

1. RUNOFF CURVE NUMBER CALCULATION

Hydrologic Soil Group	Cover Description	Cover Area (acres)	Cover Area (%)	Curve Number (CN)	Area * CN
B	Bare	2.3	0.7%	86	200.4
B	Forest	170.9	53.5%	55	9397.9
B	Meadow	25.9	8.1%	58	1502.8
B	Residential	0.2	0.1%	85	15.3
B	Shrub	1.8	0.6%	48	85.4
B	Water/Wetland	0.0	0.0%	100	1.0
C	Bare	3.7	1.2%	91	339.4
C	Forest	99.2	31.0%	70	6941.9
C	Meadow	1.0	0.3%	71	71.0
C	Residential	0.0	0.0%	90	0.9
C	Shrub	0.3	0.1%	65	18.9
C	Water/Wetland	2.8	0.9%	100	280.0
D	Forest	11.2	3.5%	77	863.9
D	Residential	0.2	0.1%	92	14.7
	Total :	319.46	100.0%		19733.5

Weighted Curve Number: 61.8
Ajdusted Curve Number for Model Calibration: 45.8
Total Developed Land: 0.4 acres
Percent Developed Land: 0%

2. TIME OF CONCENTRATION CALCULATION

Distance (ft)	Cover Type	Change in Elev. (ft)	% Slope	Code	Equation Velocity (ft/sec)	Travel Time (hrs)
300	Overland	8	2.7%	1	0.40	0.2092
425	Shallow Conc. Flow	25	5.9%	4	2.75	0.0430
5,220	Small Tributary	190	3.6%	5	3.74	0.3877
5945	- Total Distance Traveled	223	- Total Change in Elev.			
					Sum Tt:	0.6399

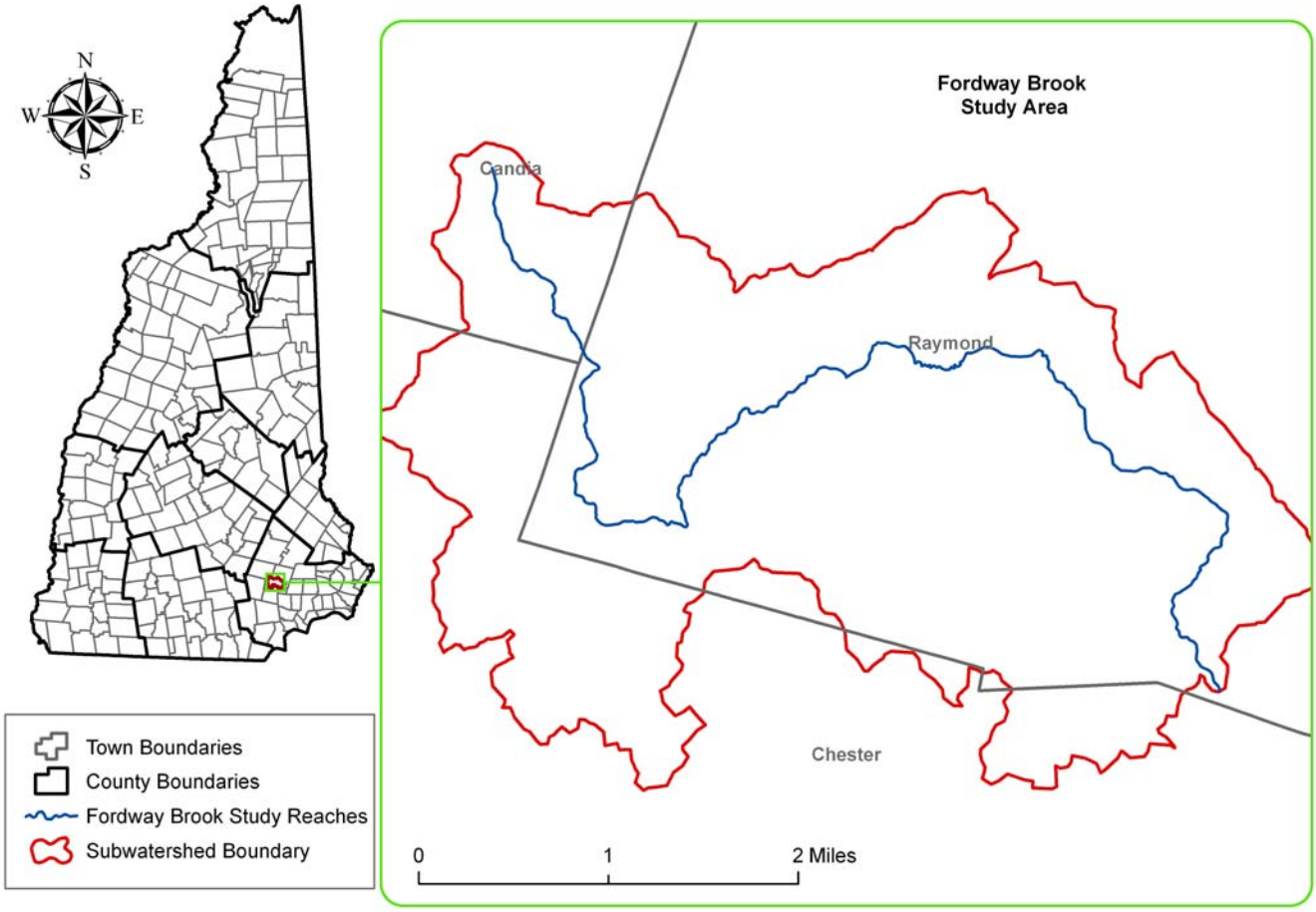
Time of Concentration (hrs): 0.64

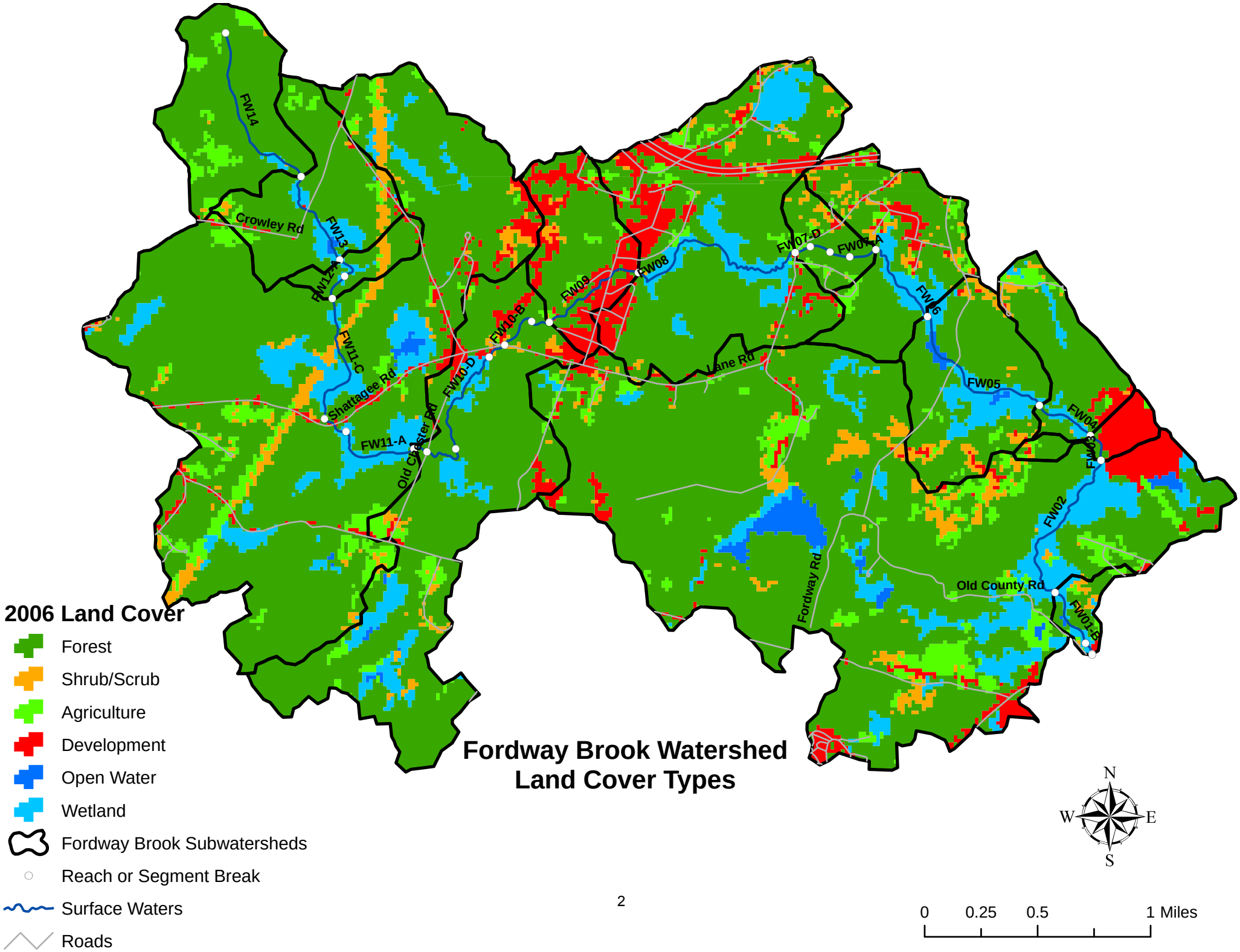
Appendix D

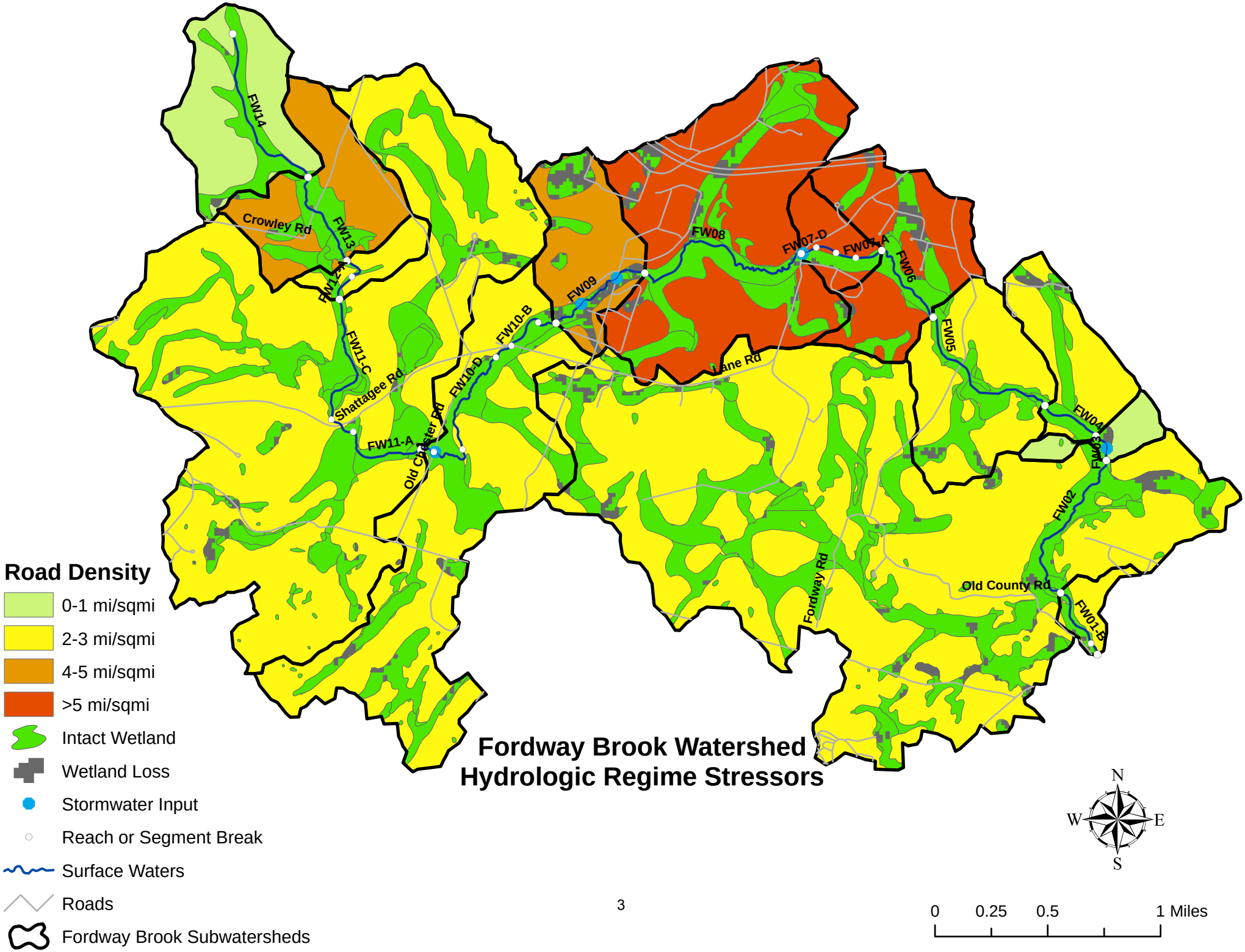
Stressor and Departure Maps

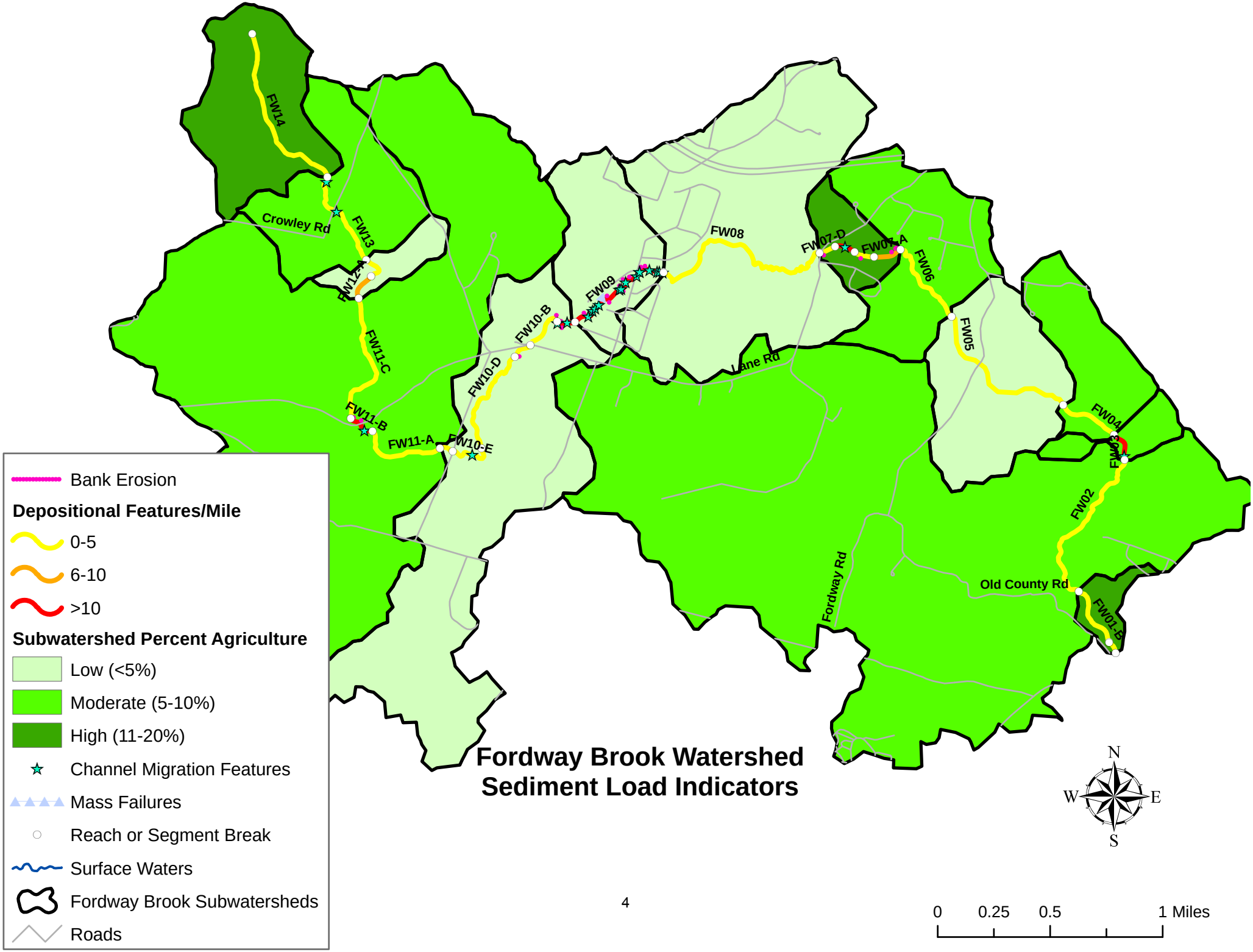
Fordway Brook

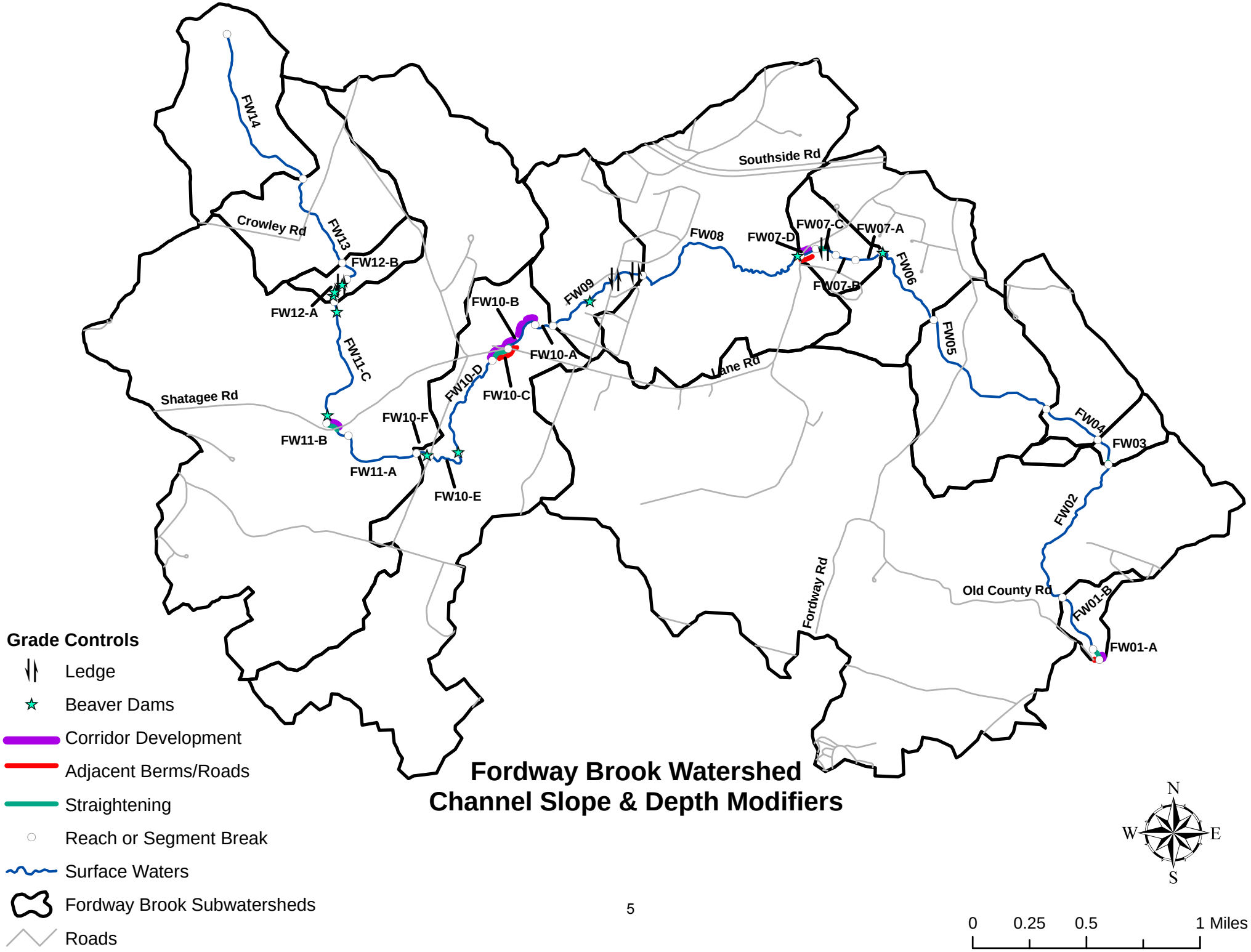
Stressor and Departure Maps



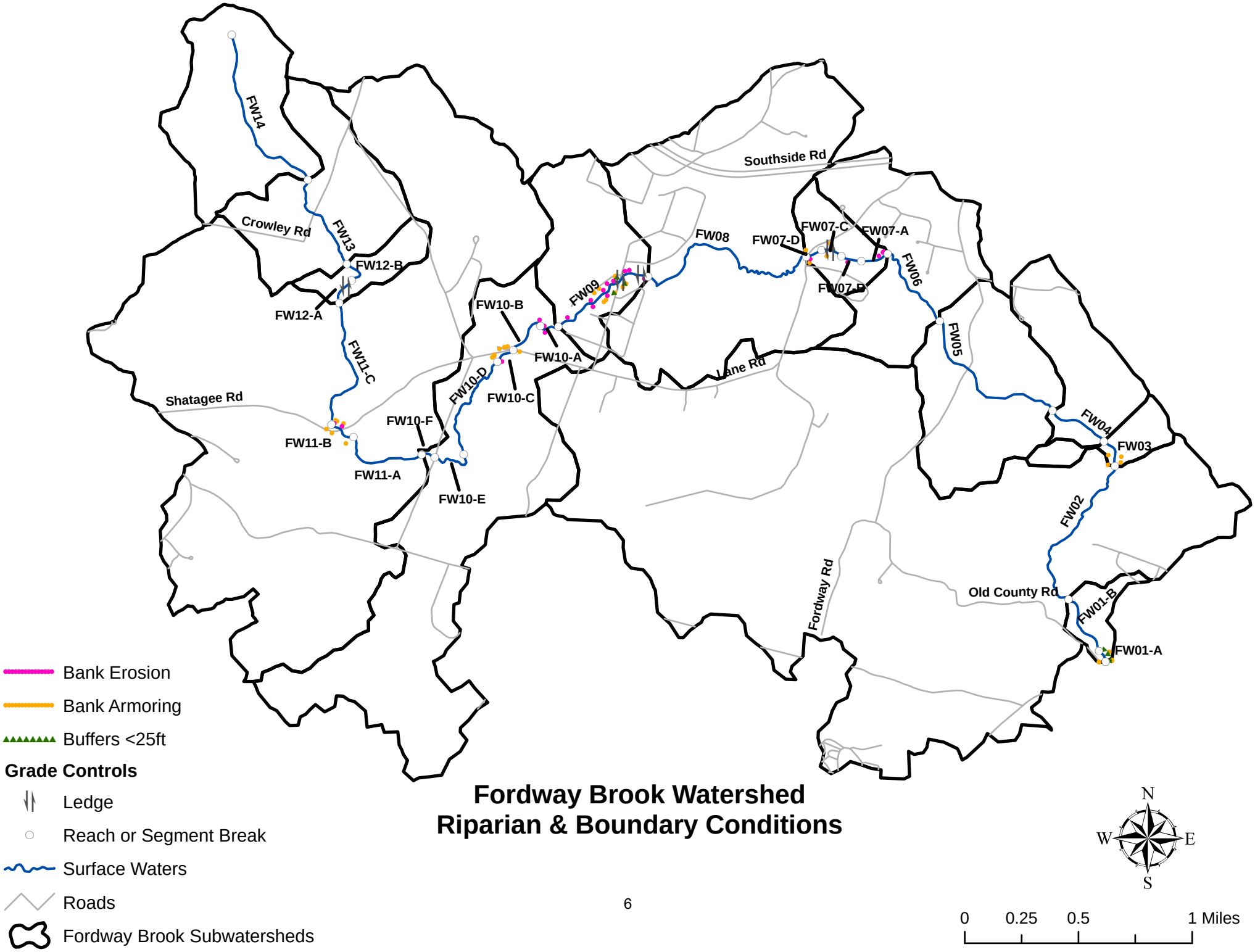

Fordway Brook Watershed
Land Cover Types
2006 Land Cover
Forest
Shrub/Scrub
Agriculture
Development
Open Water
Wetland
Fordway Brook Subwatersheds
Reach or Segment Break
Surface Waters
Roads
FW14
Crowley Rd
FW13
FW12-A
FW11-C
Shattagee Rd
FW11-A
Old Chester Rd
FW10-D
FW10-B
FW09
FW08
FW07-D
FW07-A
FW06
Lane Rd
FW05
FW04
FW03
FW02
Fordway Rd
Old County Rd
FW01-B
N
W
E
S
0
0.25
0.5
1 Miles


Fordway Brook Watershed
Hydrologic Regime Stressors
Road Density
0-1 mi/sqmi
2-3 mi/sqmi
4-5 mi/sqmi
>5 mi/sqmi
Intact Wetland
Wetland Loss
Stormwater Input
Reach or Segment Break
Surface Waters
Roads
Fordway Brook Subwatersheds
FW14
Crowley Rd
FW13
FW11-A
FW11-C
Shattagee Rd
FW11-A
Old Chester Rd
FW10-D
FW10-B
FW09
FW08
FW07-D
FW07-A
FW06
FW05
Lane Rd
FW04
FW03
FW02
Fordway Rd
Old County Rd
FW01-B
N
W
E
S
0
0.25
0.5
1 Miles

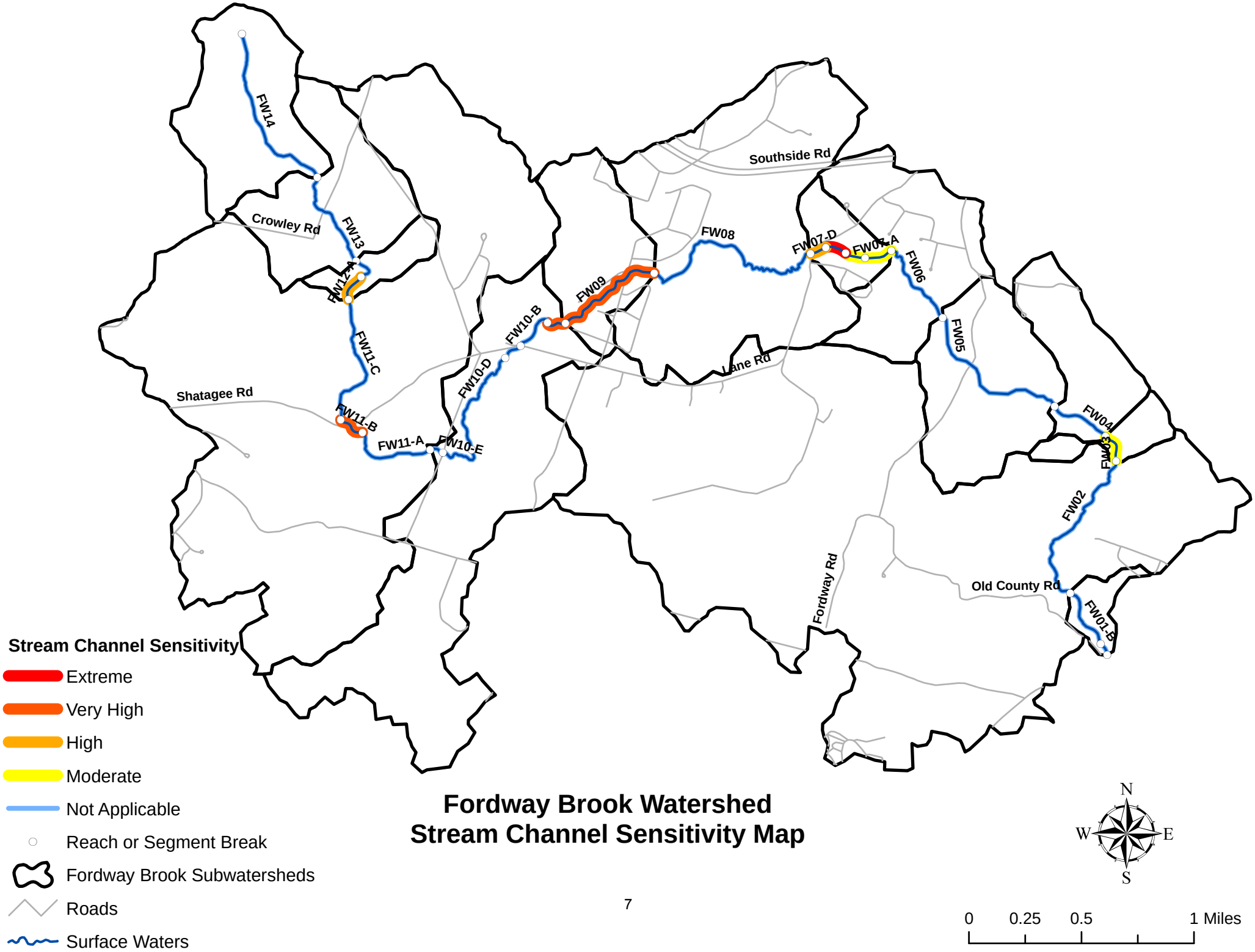

Fordway Brook Watershed
Sediment Load Indicators
FW14
FW13
FW12-A
FW11-C
FW11-B
FW11-A
FW10-E
FW10-D
FW10-B
FW09
FW08
FW07-D
FW07-A
FW06
FW05
FW04
FW03
FW02
FW01-B
Crowley Rd
Lane Rd
Fordway Rd
Old County Rd
Bank Erosion
Depositional Features/Mile
0-5
6-10
>10
Subwatershed Percent Agriculture
Low (<5%)
Moderate (5-10%)
High (11-20%)
Channel Migration Features
Mass Failures
Reach or Segment Break
Surface Waters
Fordway Brook Subwatersheds
Roads
N
W
E
S
0
0.25
0.5
1 Miles



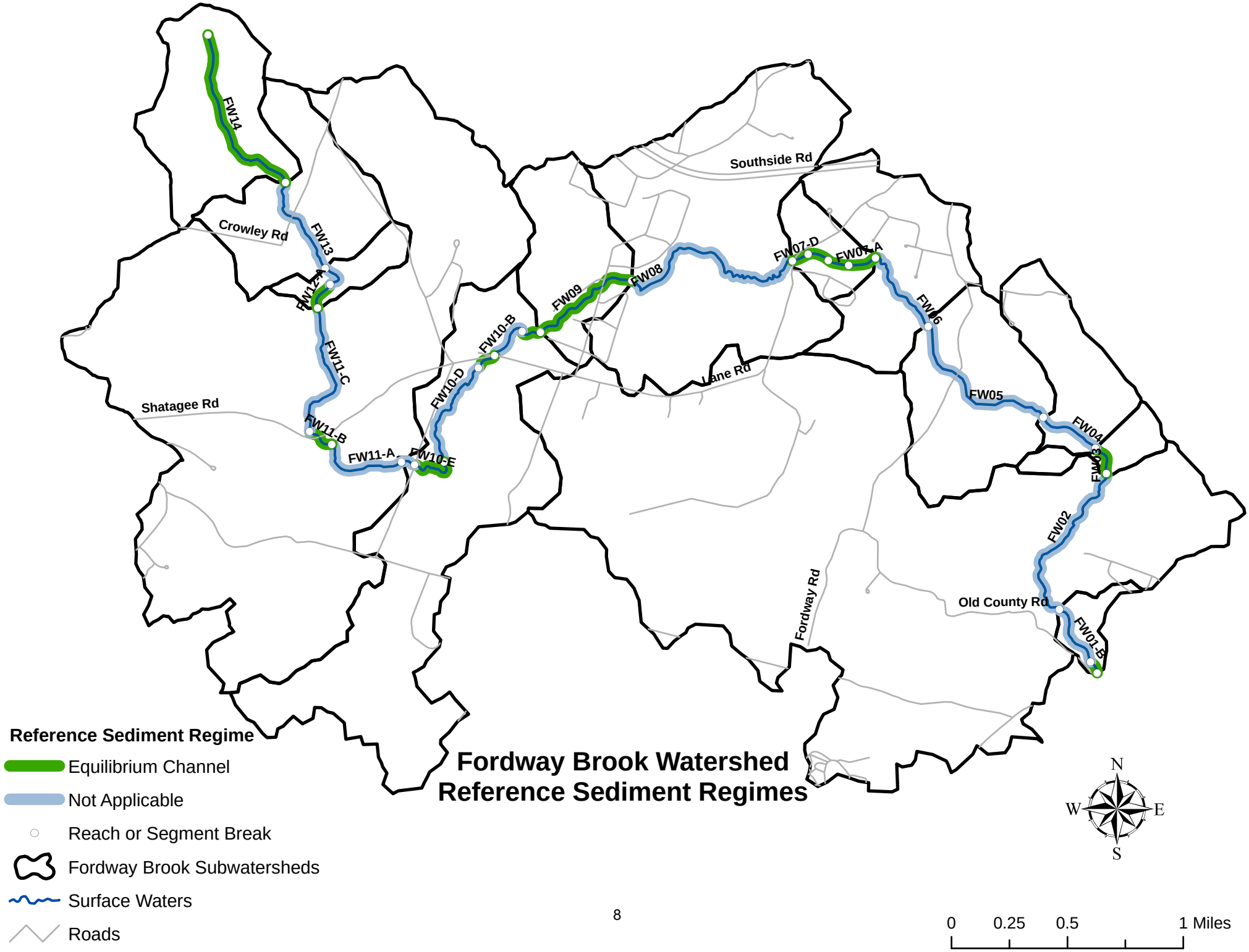
Fordway Brook Watershed
Channel Slope & Depth Modifiers

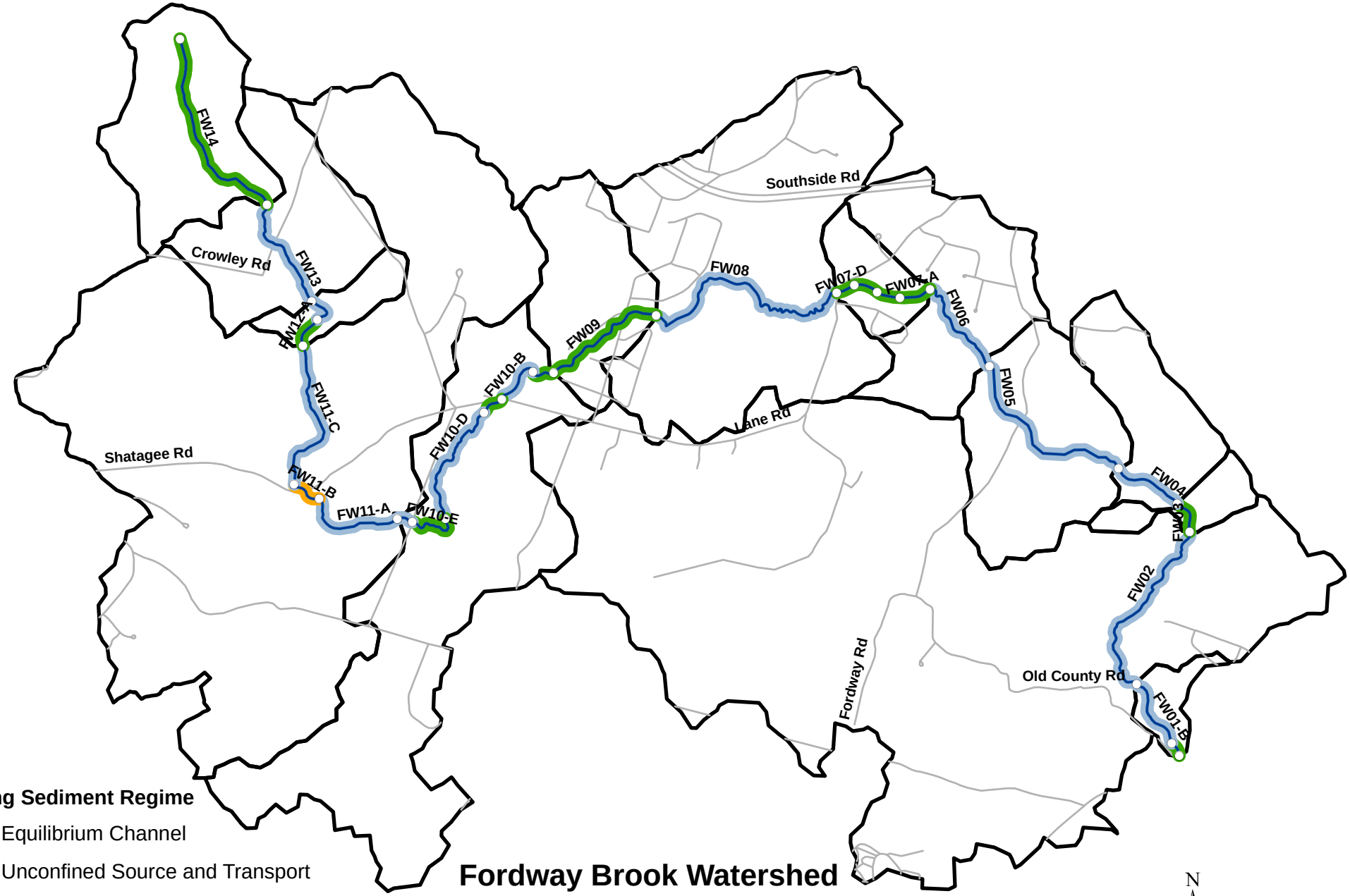


Fordway Brook Watershed
Riparian & Boundary Conditions



Fordway Brook Watershed
Stream Channel Sensitivity Map


Fordway Brook Watershed
Reference Sediment Regimes
Reference Sediment Regime
Equilibrium Channel
Not Applicable
Reach or Segment Break
Fordway Brook Subwatersheds
Surface Waters
Roads
FW14
FW13
FW12-A
FW11-C
FW11-B
FW11-A
FW10-E
FW10-D
FW10-B
FW09
FW08
FW07-D
FW07-A
FW06
FW05
FW04
FW03
FW02
FW01-B
Crowley Rd
Shatagee Rd
Southside Rd
Lane Rd
Fordway Rd
Old County Rd
N
W
E
S
0
0.25
0.5
1 Miles



Existing Sediment Regime

- Equilibrium Channel
- Unconfined Source and Transport
- Not Applicable
- Segment Break
- Fordway Brook Subwatersheds
- Surface Waters
- Roads

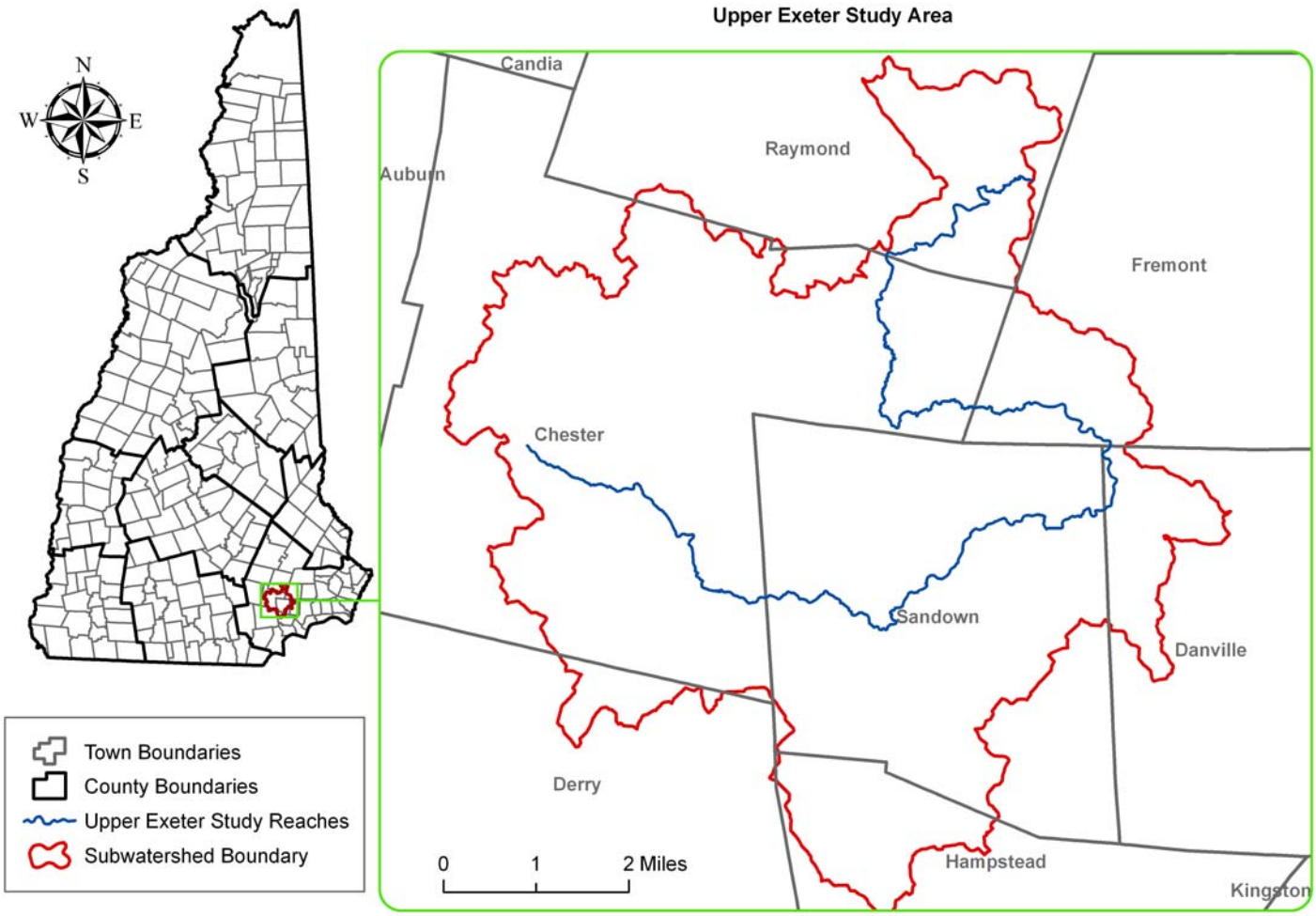
Fordway Brook Watershed
Existing Sediment Regimes

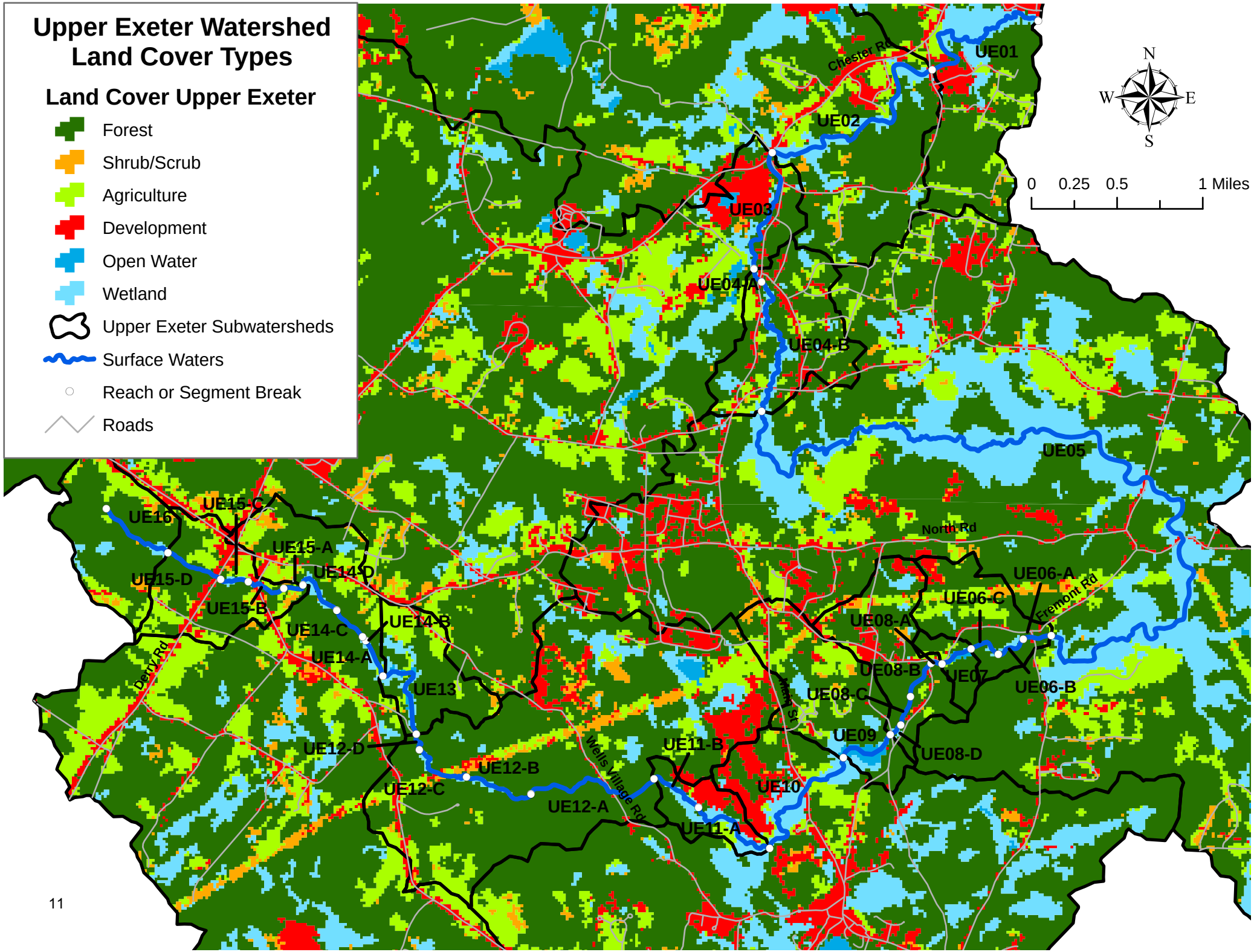
N
W E
S

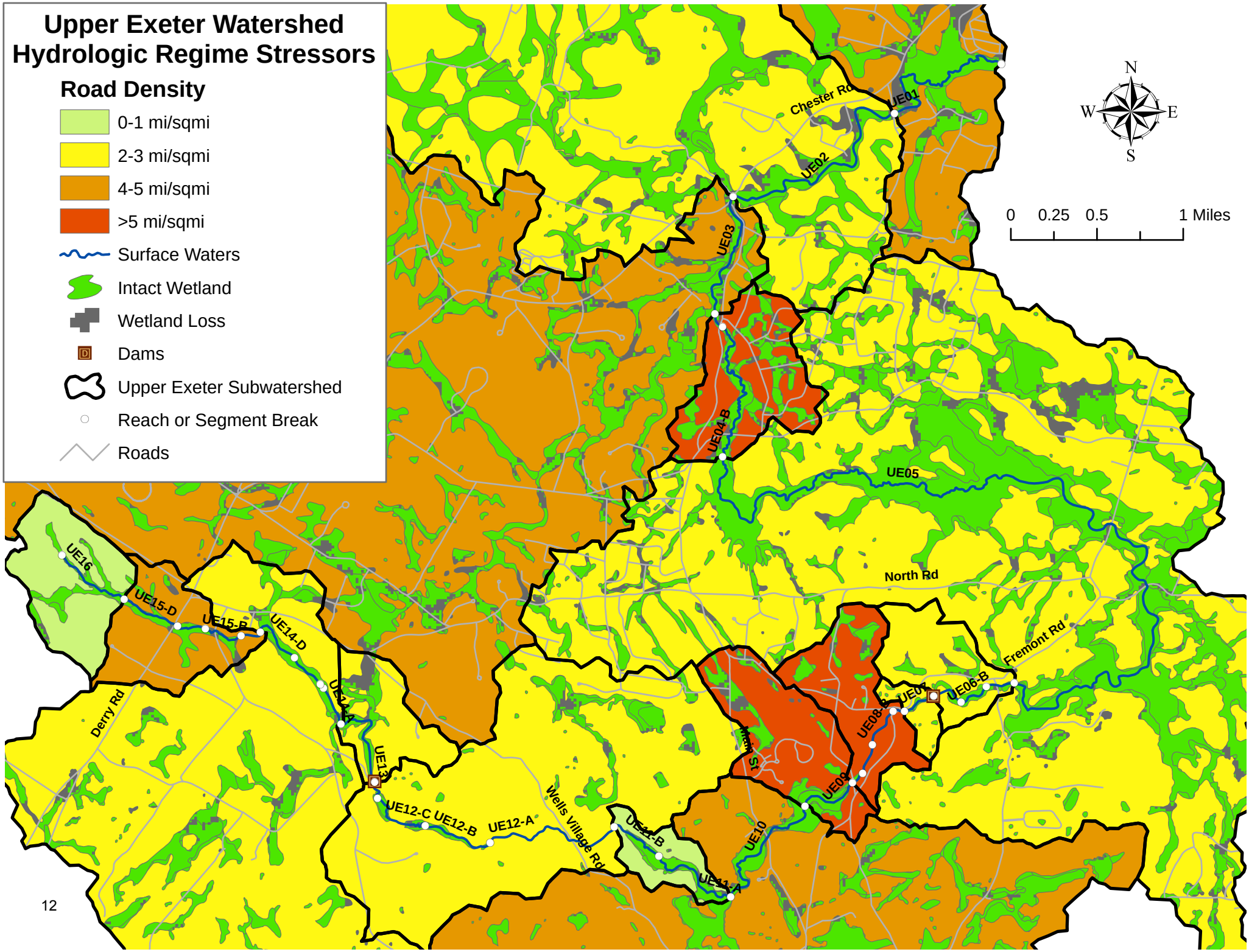
0 0.25 0.5 1 Miles

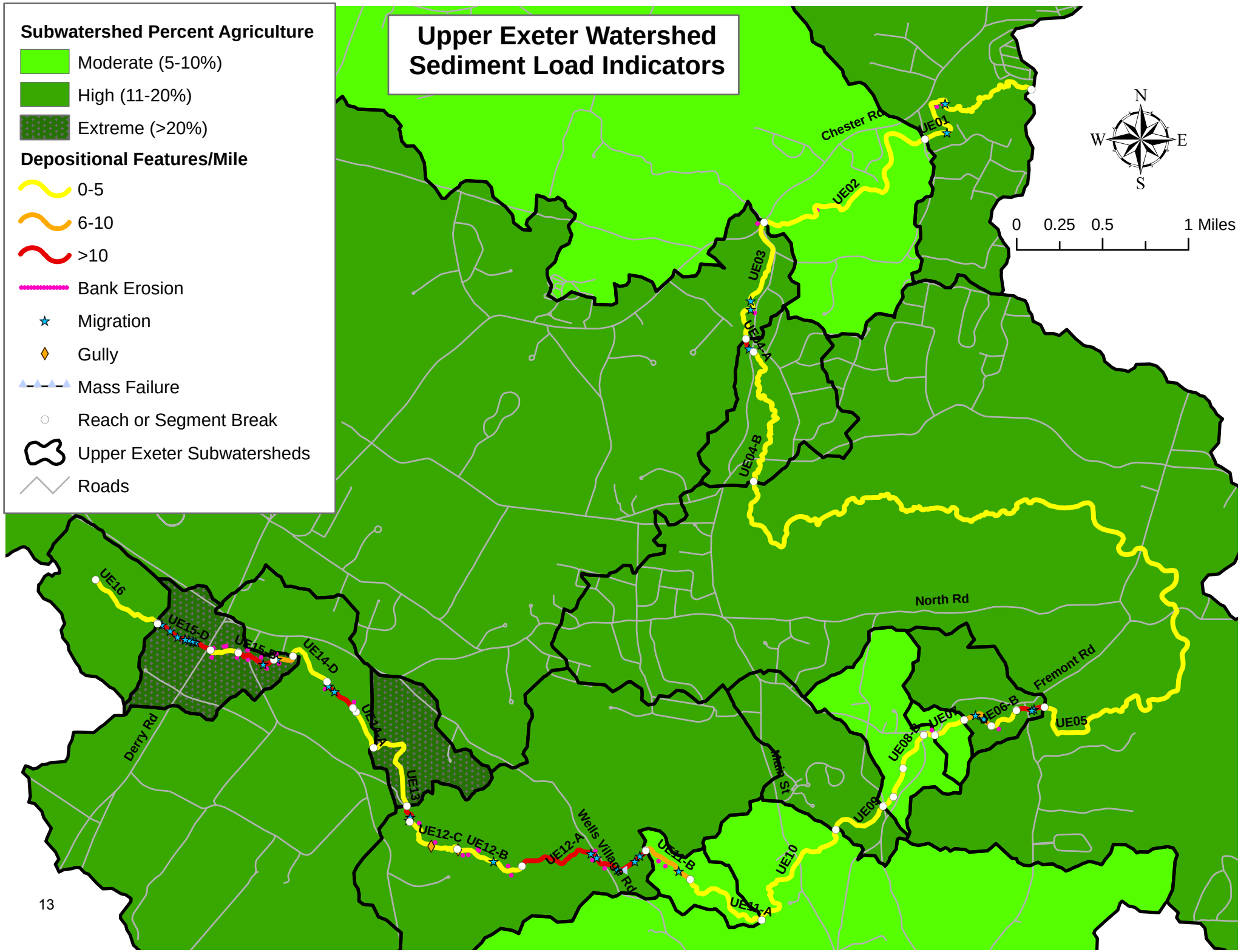
Upper Exeter River

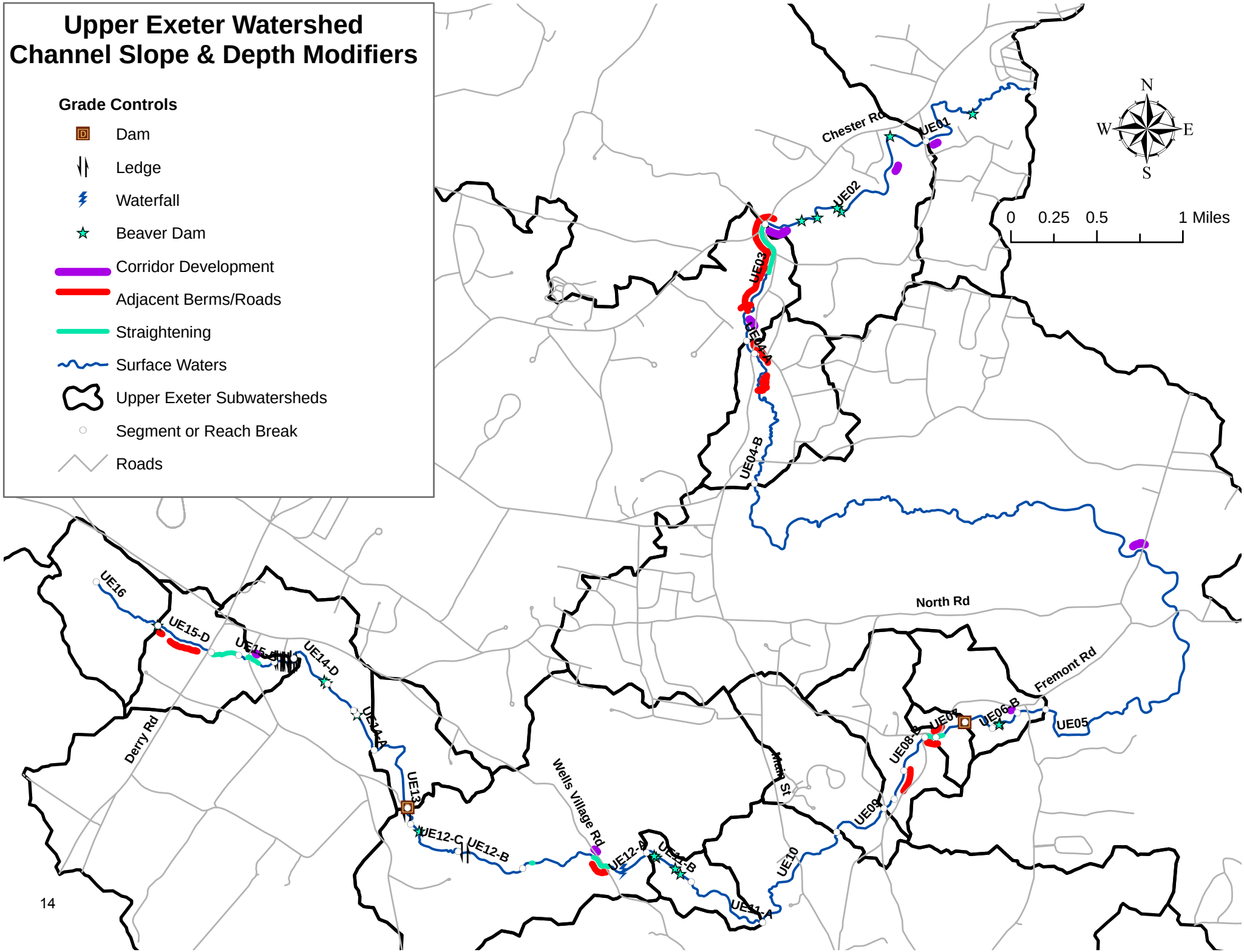
Stressor and Departure Maps




Upper Exeter Watershed
Land Cover Types
Land Cover Upper Exeter
Forest
Shrub/Scrub
Agriculture
Development
Open Water
Wetland
Upper Exeter Subwatersheds
Surface Waters
Reach or Segment Break
Roads
N
W
E
S
0
0.25
0.5
1 Miles
UE01
UE02
UE03
UE04-A
UE04-B
UE05
UE06-A
UE06-B
UE06-C
UE07
UE08-A
UE08-B
UE08-C
UE08-D
UE09
UE10
UE11-A
UE11-B
UE12-A
UE12-B
UE12-C
UE12-D
UE13
UE14-A
UE14-B
UE14-C
UE14-D
UE15-A
UE15-B
UE15-C
UE15-D
UE16
Chester Rd
North Rd
Fremont Rd
Wells Village Rd
Main St
Dery Rd


Upper Exeter Watershed
Hydrologic Regime Stressors
Road Density
0-1 mi/sqmi
2-3 mi/sqmi
4-5 mi/sqmi
>5 mi/sqmi
Surface Waters
Intact Wetland
Wetland Loss
Dams
Upper Exeter Subwatershed
Reach or Segment Break
Roads
N
W
E
S
0 0.25 0.5 1 Miles
Chester Rd
UE01
UE02
UE03
UE04-B
UE05
North Rd
Fremont Rd
UE06-B
UE07
UE08-B
UE09
Main St
UE10
UE11-A
UE11-B
Wells Village Rd
UE12-A
UE12-B
UE12-C
UE13
UE14-A
UE14-D
UE15-B
UE15-D
UE16
Derry Rd


Upper Exeter Watershed
Sediment Load Indicators
Subwatershed Percent Agriculture
Moderate (5-10%)
High (11-20%)
Extreme (>20%)
Depositional Features/Mile
0-5
6-10
>10
Bank Erosion
Migration
Gully
Mass Failure
Reach or Segment Break
Upper Exeter Subwatersheds
Roads
N
W
E
S
0
0.25
0.5
1 Miles
Chester Rd
UE01
UE02
UE03
UE04-A
UE04-B
North Rd
Fremont Rd
UE05
UE06-B
UE07
UE08-B
UE09
UE10
UE11-A
UE11-B
Main St
Wells Village Rd
UE12-A
UE12-B
UE12-C
UE13
UE14-A
UE14-D
UE15-B
UE15-D
UE16
Derry Rd

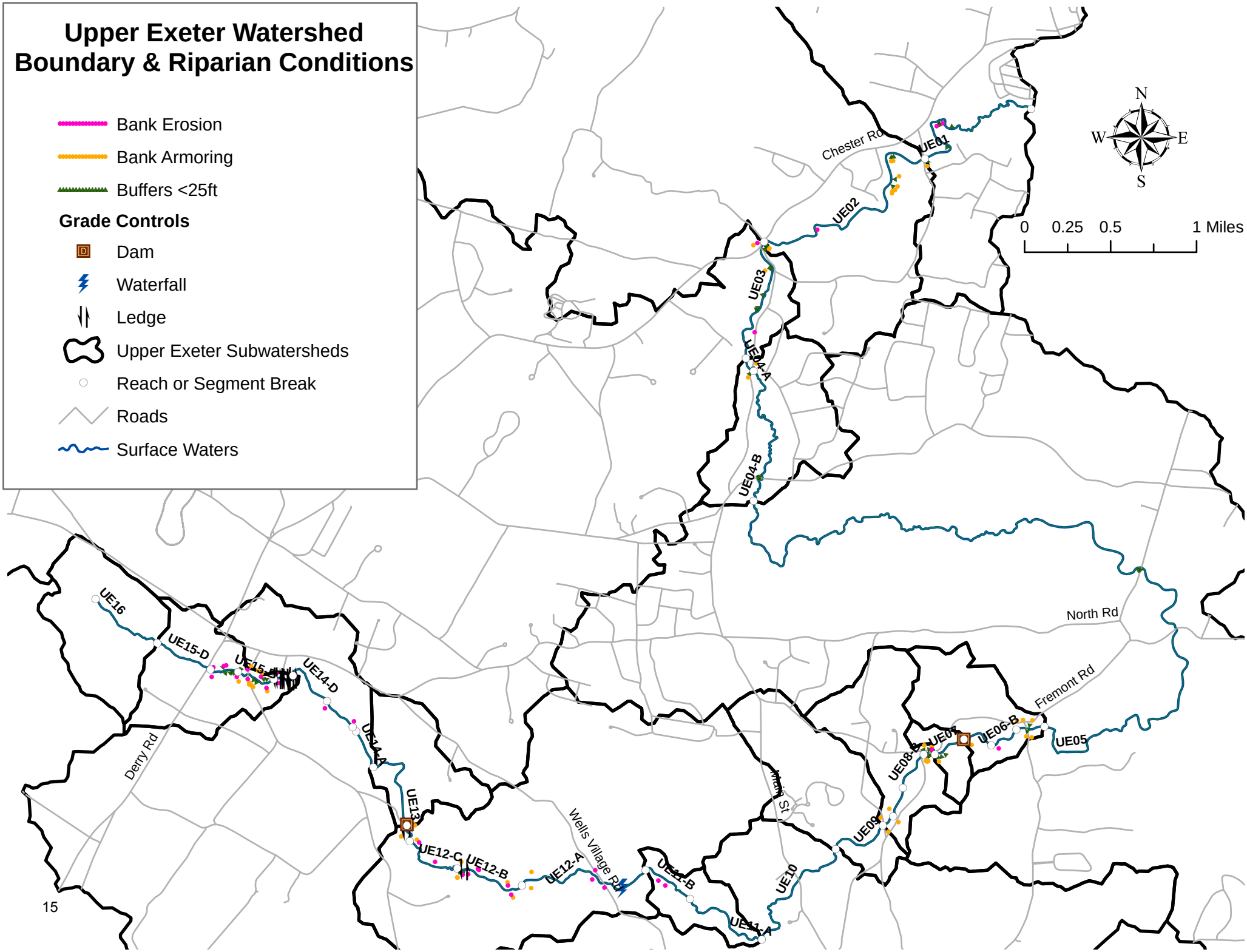

Upper Exeter Watershed
Channel Slope & Depth Modifiers
Grade Controls
Dam
Ledge
Waterfall
Beaver Dam
Corridor Development
Adjacent Berms/Roads
Straightening
Surface Waters
Upper Exeter Subwatersheds
Segment or Reach Break
Roads
N
W
E
S
0
0.25
0.5
1 Miles
Chester Rd
UE01
UE02
UE03
UE04-A
UE04-B
North Rd
Fremont Rd
UE05
UE06-B
UE07
UE08-B
UE09
UE10
UE11-A
UE11-B
UE12-A
UE12-B
UE12-C
UE13
UE14-A
UE14-D
UE15-B
UE15-D
UE16
Derry Rd
Wells Village Rd
Main St

Upper Exeter Watershed Boundary & Riparian Conditions

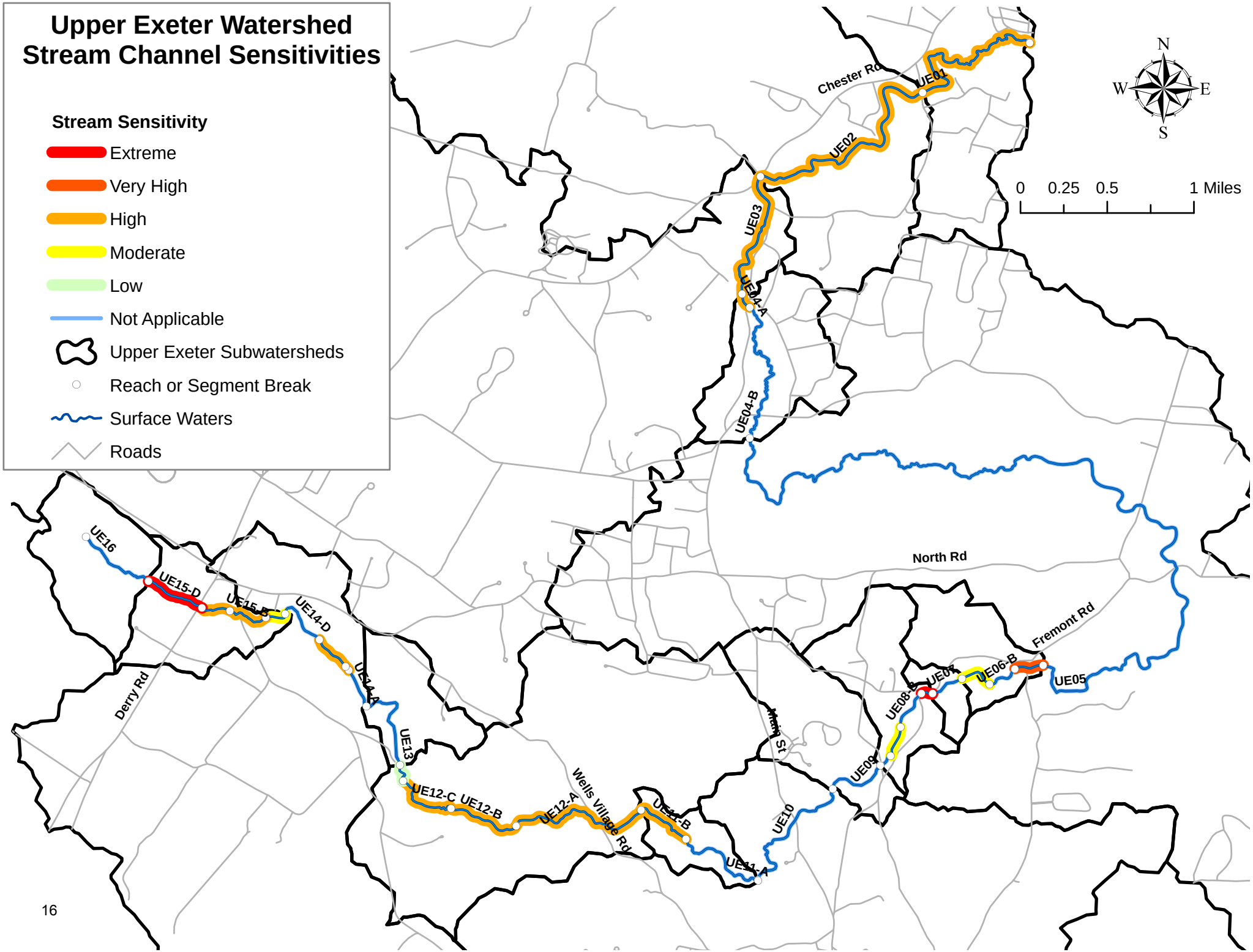
- Bank Erosion
- Bank Armoring
- Buffers <25ft

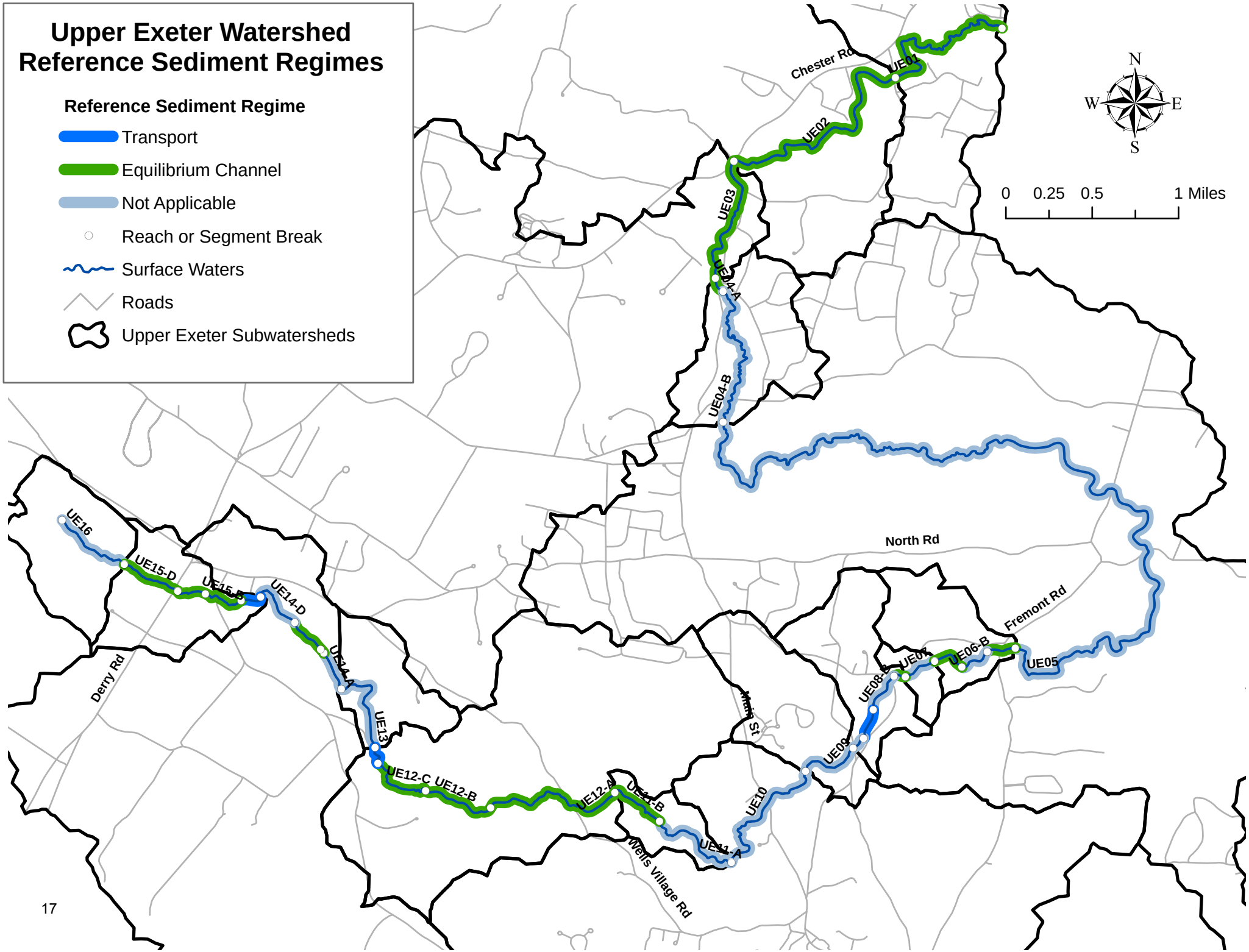
Grade Controls

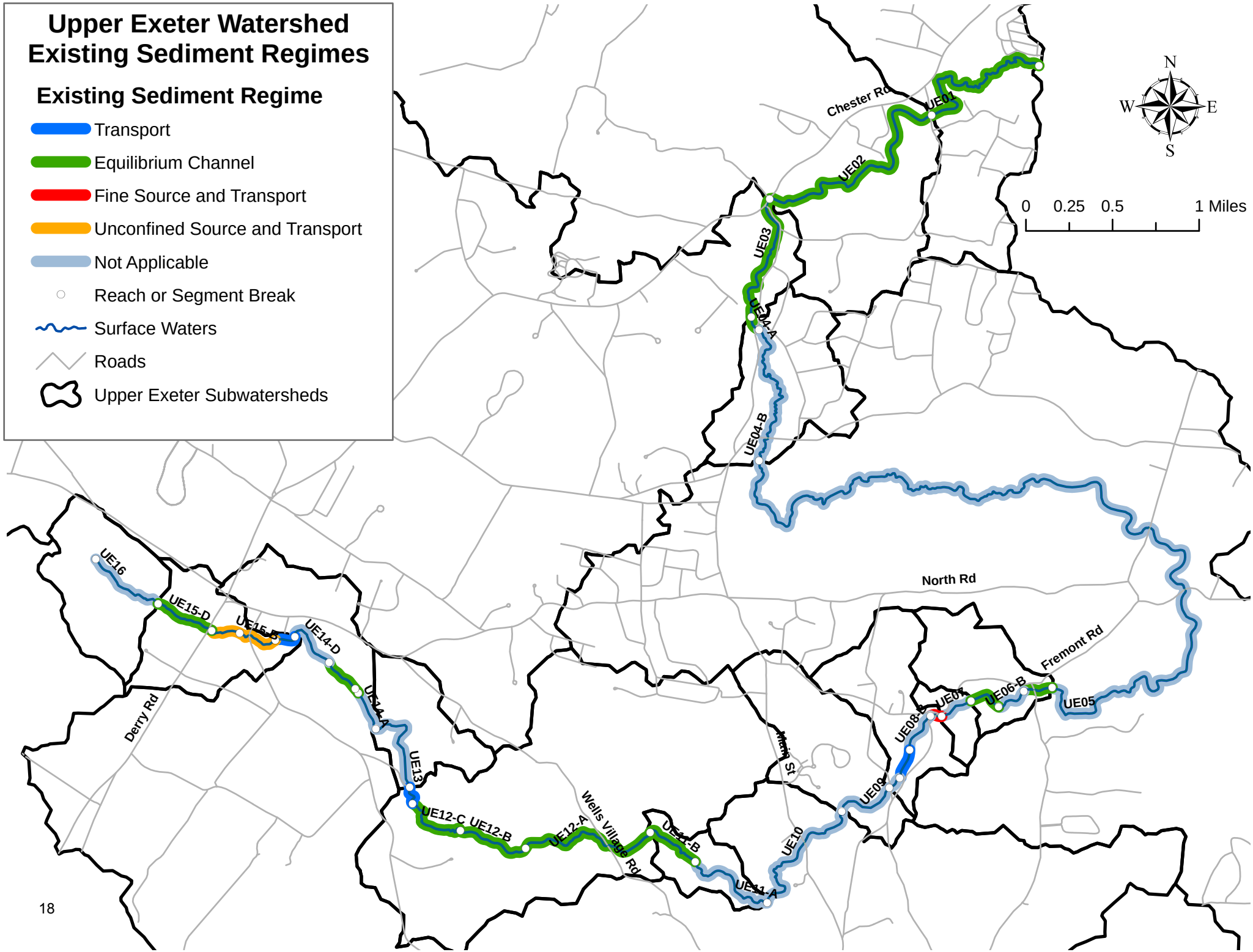
- Dam
- Waterfall
- Ledge
- Upper Exeter Subwatersheds
- Reach or Segment Break
- Roads
- Surface Waters



Upper Exeter Watershed Stream Channel Sensitivities

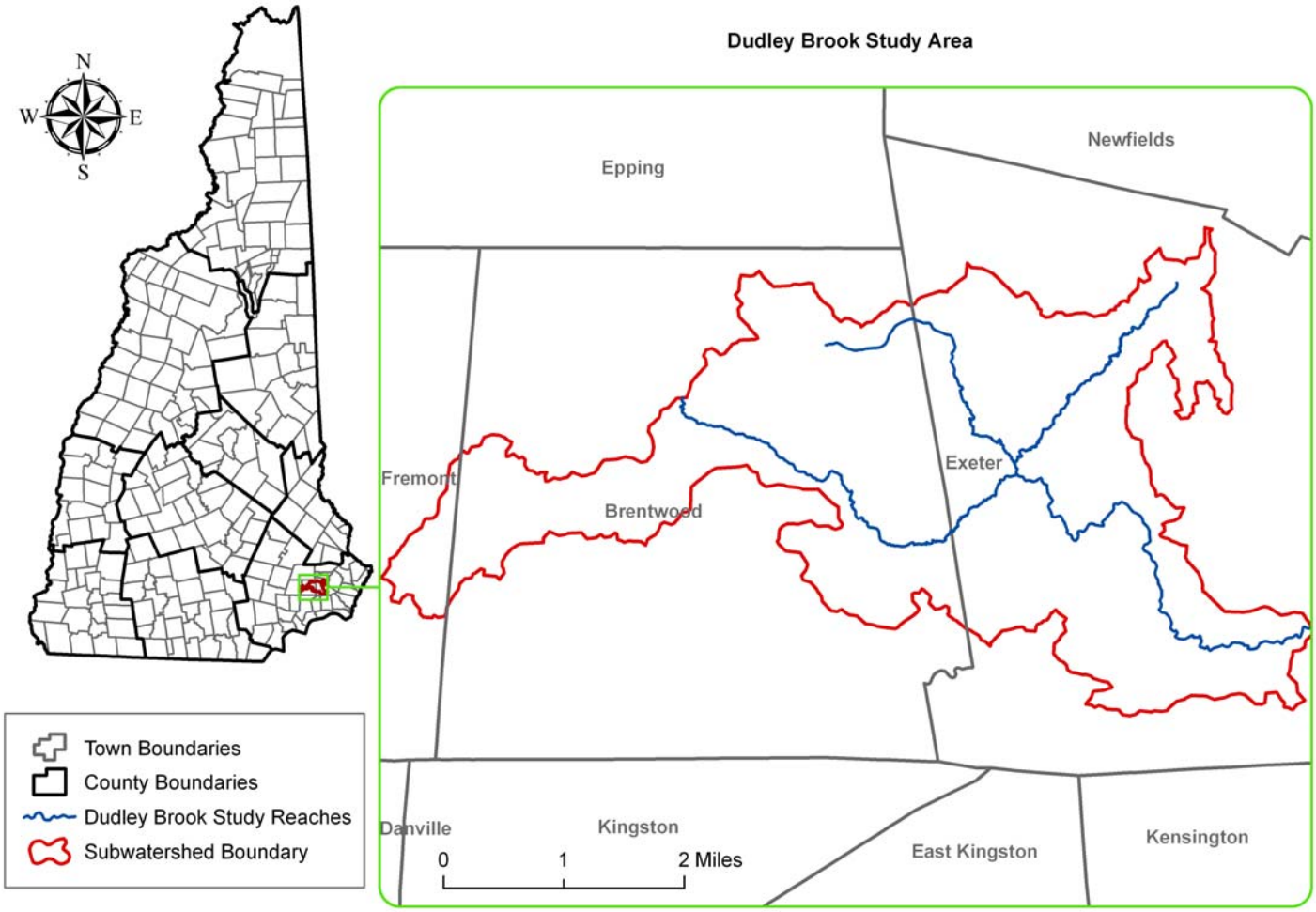


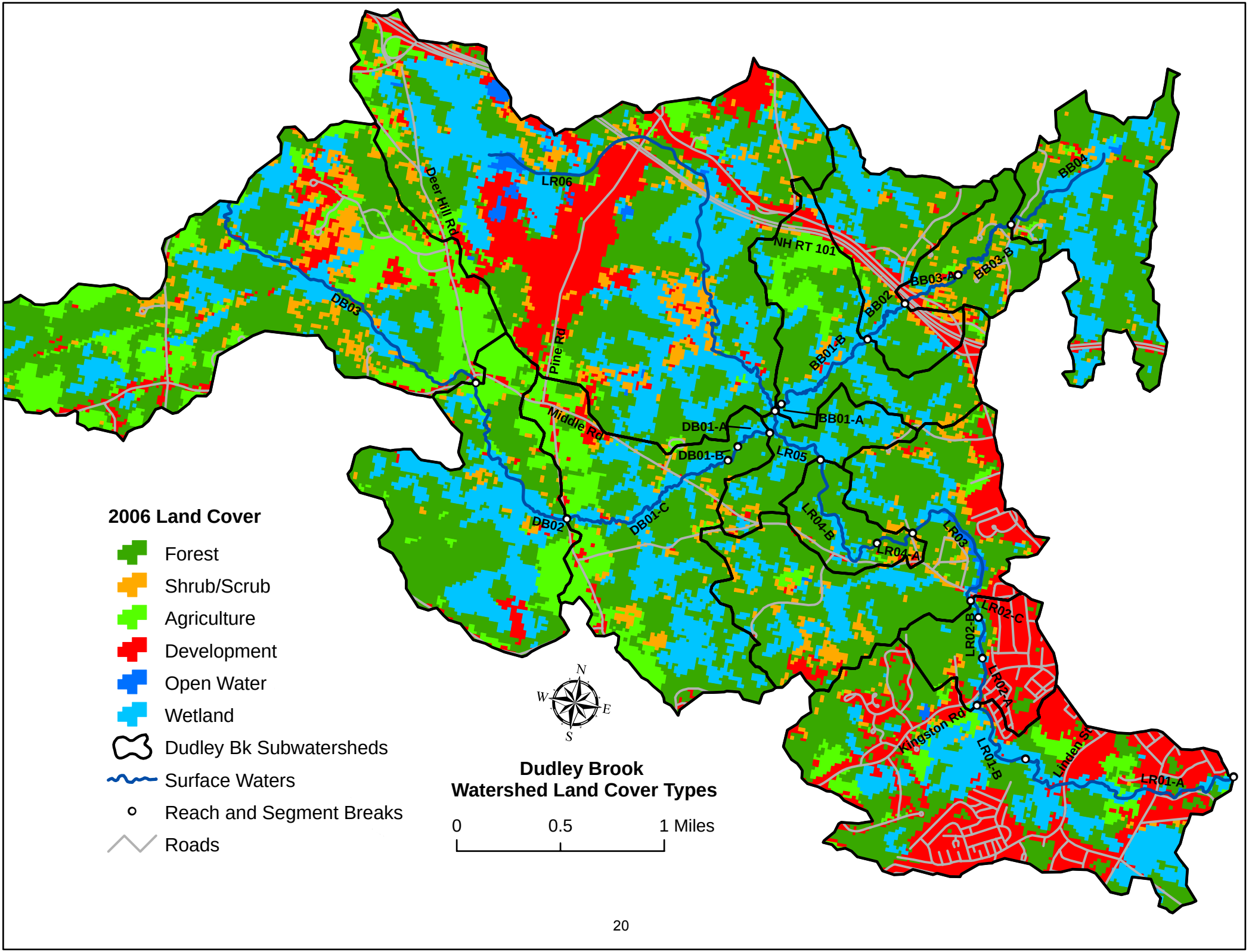

Upper Exeter Watershed
Reference Sediment Regimes
Reference Sediment Regime
Transport
Equilibrium Channel
Not Applicable
Reach or Segment Break
Surface Waters
Roads
Upper Exeter Subwatersheds
N
W
E
S
0
0.25
0.5
1 Miles
Chester Rd
UE01
UE02
UE03
UE04-A
UE04-B
North Rd
Fremont Rd
UE05
UE06-B
UE07
UE08-B
UE09
UE10
UE11-A
UE11-B
UE12-A
UE12-B
UE12-C
UE13
UE14-A
UE14-D
UE15-B
UE15-D
UE16
Derry Rd
Main St
Wells Village Rd

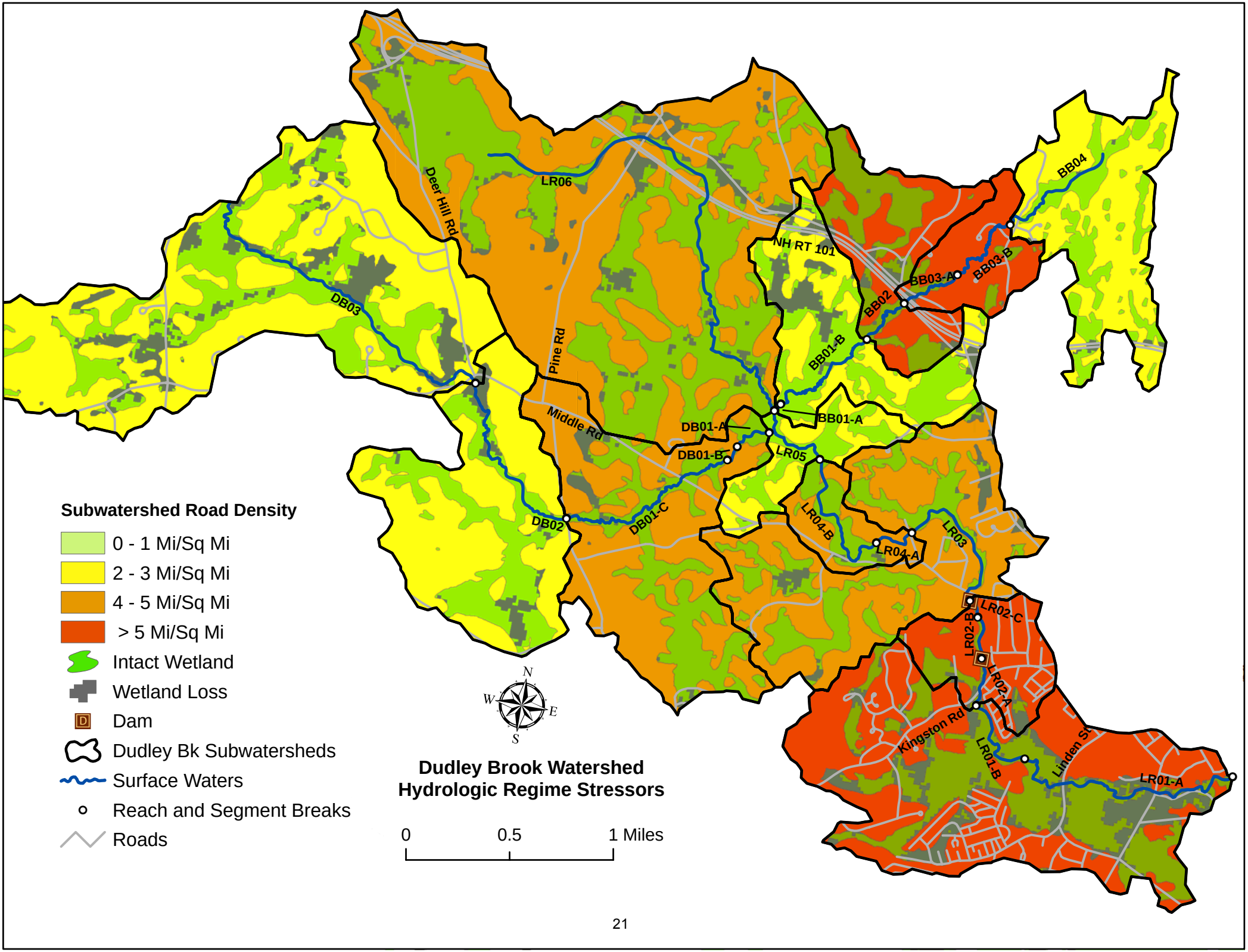

Upper Exeter Watershed
Existing Sediment Regimes
Existing Sediment Regime
Transport
Equilibrium Channel
Fine Source and Transport
Unconfined Source and Transport
Not Applicable
Reach or Segment Break
Surface Waters
Roads
Upper Exeter Subwatersheds
N
W
E
S
0
0.25
0.5
1 Miles
Chester Rd
UE01
UE02
UE03
UE04-A
UE04-B
North Rd
Fremont Rd
UE05
UE06-B
UE07
UE08-B
UE09
UE10
UE11-A
UE11-B
Wells Village Rd
Main St
UE12-A
UE12-B
UE12-C
UE13
UE14-A
UE14-D
UE15-B
UE15-D
UE16
Derry Rd

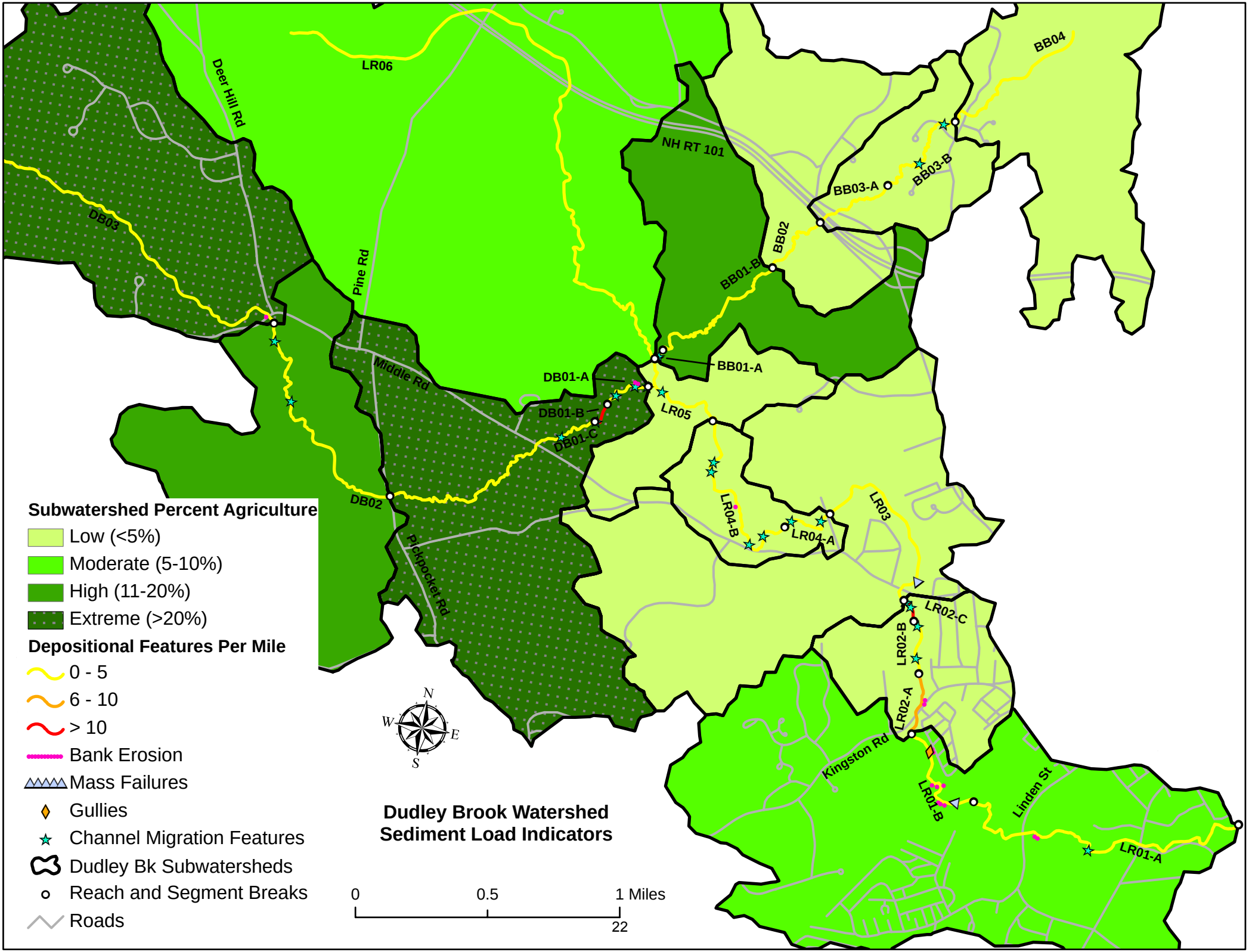
Dudley-Bloody Brooks

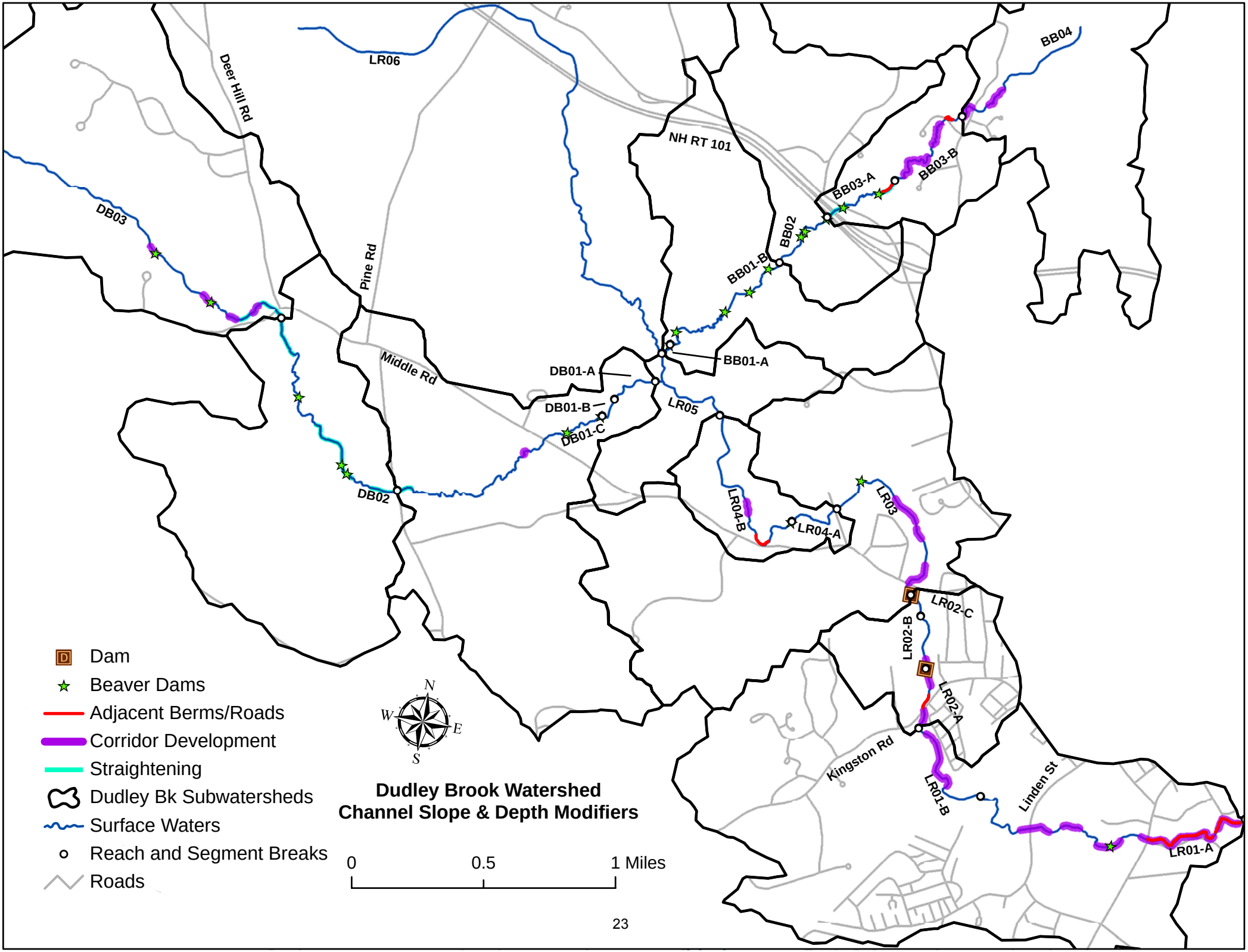
Stressor and Departure Maps



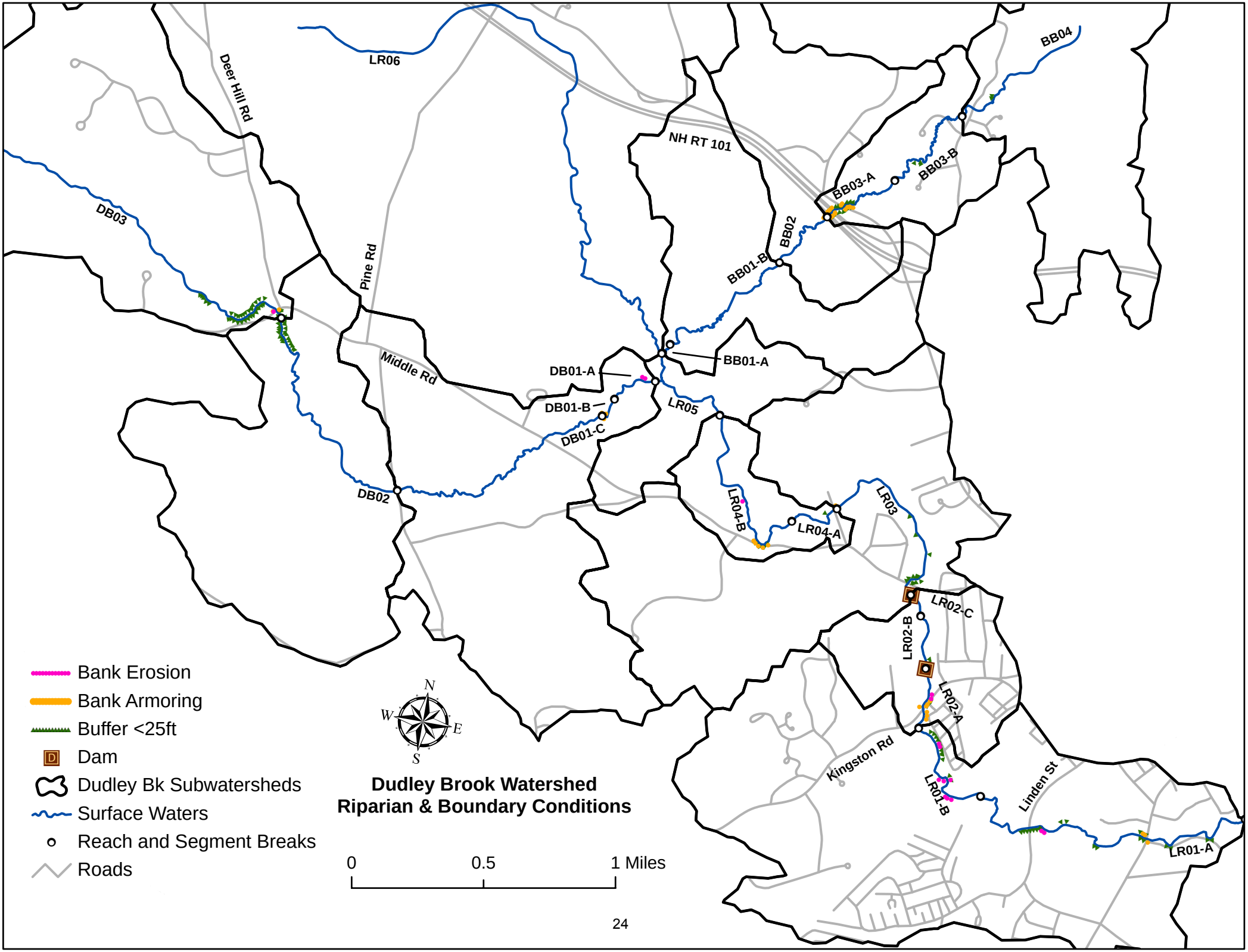

2006 Land Cover
Forest
Shrub/Scrub
Agriculture
Development
Open Water
Wetland
Dudley Bk Subwatersheds
Surface Waters
Reach and Segment Breaks
Roads
Dudley Brook
Watershed Land Cover Types
0
0.5
1 Miles
N
S
E
W
LR06
Deer Hill Rd
Pine Rd
Middle Rd
NH RT 101
DB03
DB02
DB01-A
DB01-B
DB01-C
BB01-A
BB01-B
BB02
BB03-A
BB03-B
BB04
LR05
LR04-A
LR04-B
LR03
LR02-A
LR02-B
LR02-C
LR01-A
LR01-B
Kingston Rd
Linden St


Subwatershed Road Density
0 - 1 Mi/Sq Mi
2 - 3 Mi/Sq Mi
4 - 5 Mi/Sq Mi
> 5 Mi/Sq Mi
Intact Wetland
Wetland Loss
Dam
Dudley Bk Subwatersheds
Surface Waters
Reach and Segment Breaks
Roads
Dudley Brook Watershed
Hydrologic Regime Stressors
0
0.5
1 Miles
N
S
E
W
LR06
Deer Hill Rd
Pine Rd
Middle Rd
NH RT 101
DB03
DB02
DB01-A
DB01-B
DB01-C
BB01-A
BB01-B
BB02
BB03-A
BB03-B
BB04
LR05
LR04-A
LR04-B
LR03
LR02-A
LR02-B
LR02-C
LR01-A
LR01-B
Kingston Rd
Linden St

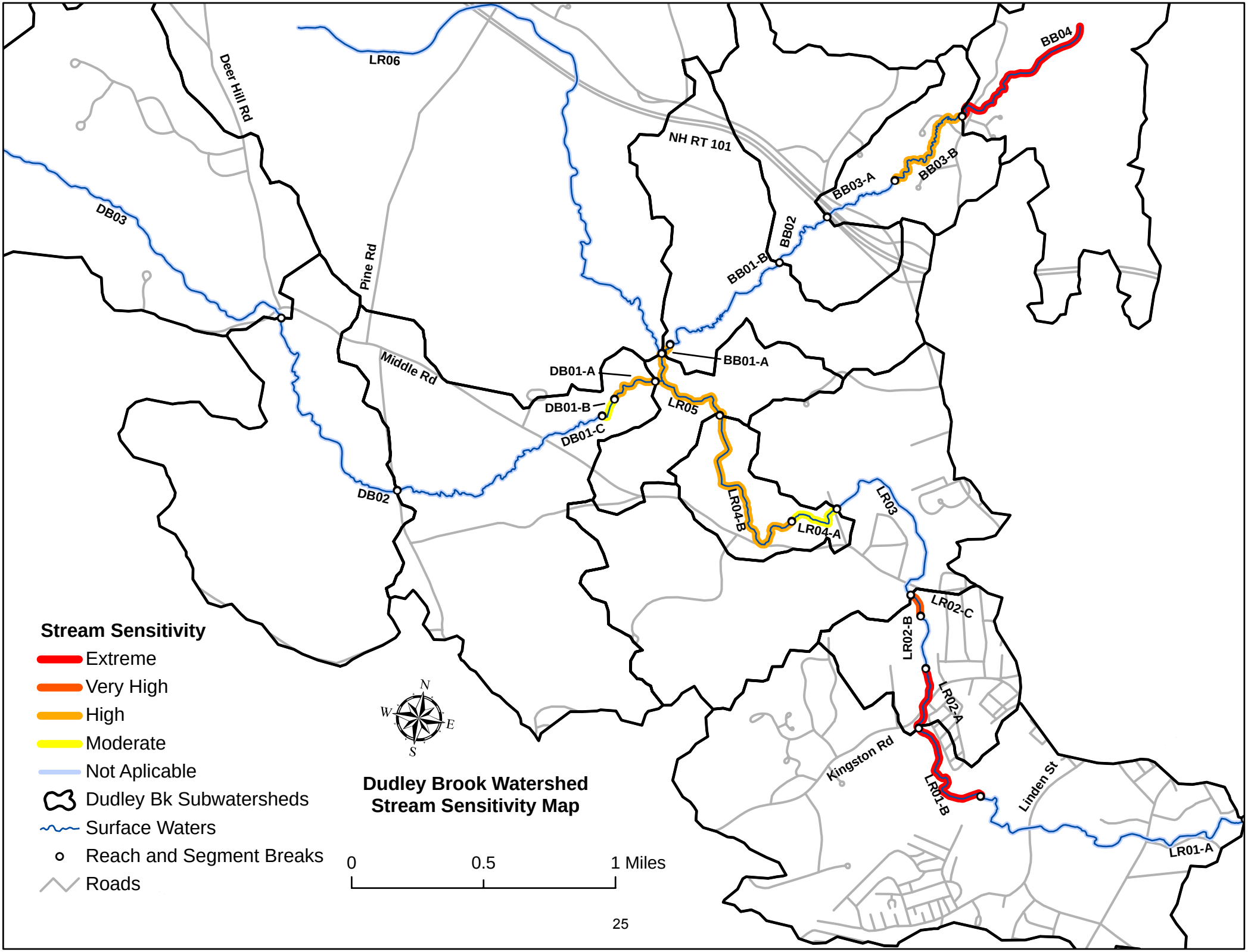

Dudley Brook Watershed
Sediment Load Indicators
Subwatershed Percent Agriculture
Low (<5%)
Moderate (5-10%)
High (11-20%)
Extreme (>20%)
Depositional Features Per Mile
0 - 5
6 - 10
> 10
Bank Erosion
Mass Failures
Gullies
Channel Migration Features
Dudley Bk Subwatersheds
Reach and Segment Breaks
Roads
0
0.5
1 Miles
22
N
S
E
W
LR06
Deer Hill Rd
Pine Rd
Middle Rd
Pickpocket Rd
NH RT 101
BB04
BB03-A
BB03-B
BB02
BB01-B
BB01-A
DB03
DB01-A
DB01-B
DB01-C
DB02
LR05
LR04-B
LR04-A
LR03
LR02-C
LR02-B
LR02-A
Kingston Rd
LR01-B
Linden St
LR01-A

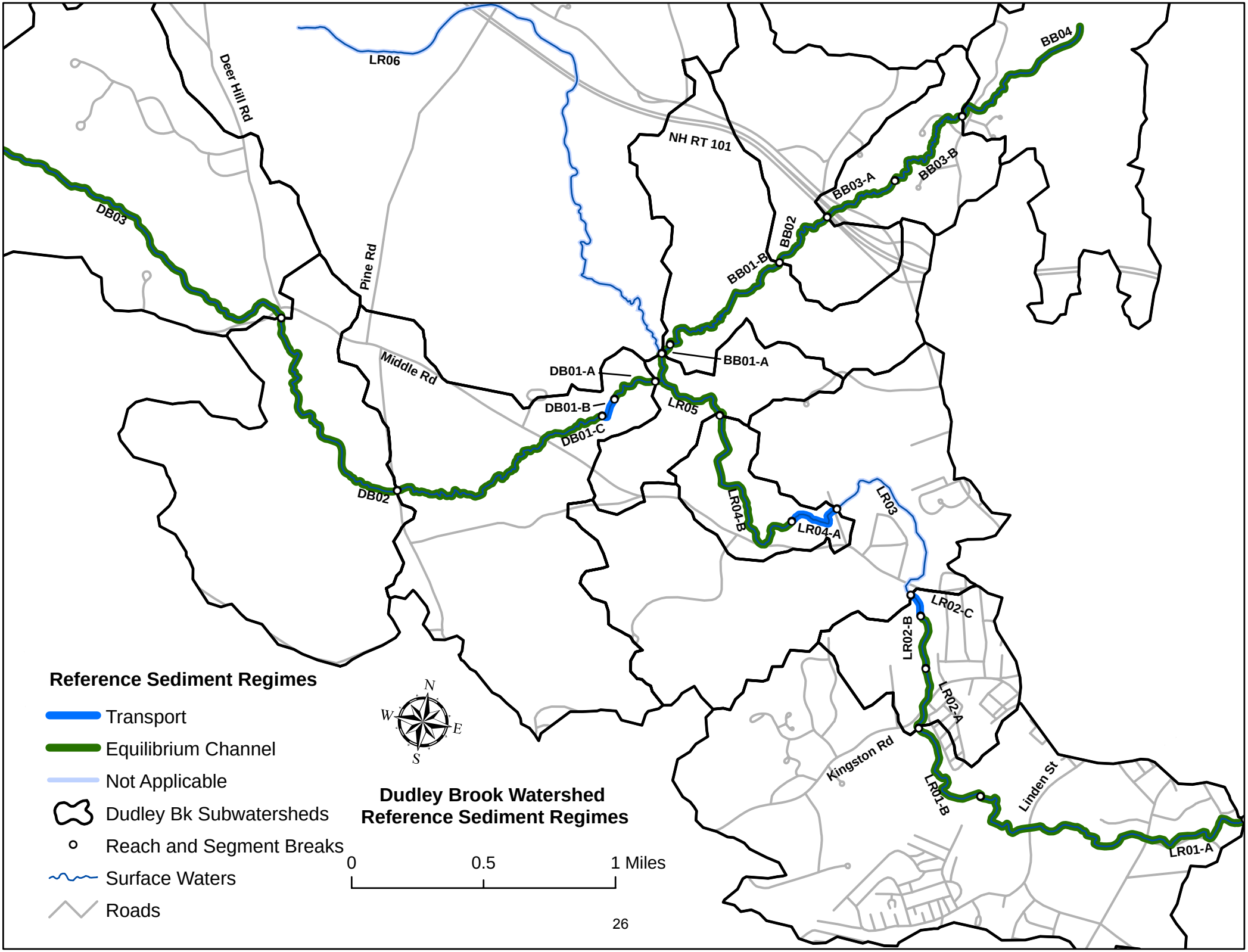


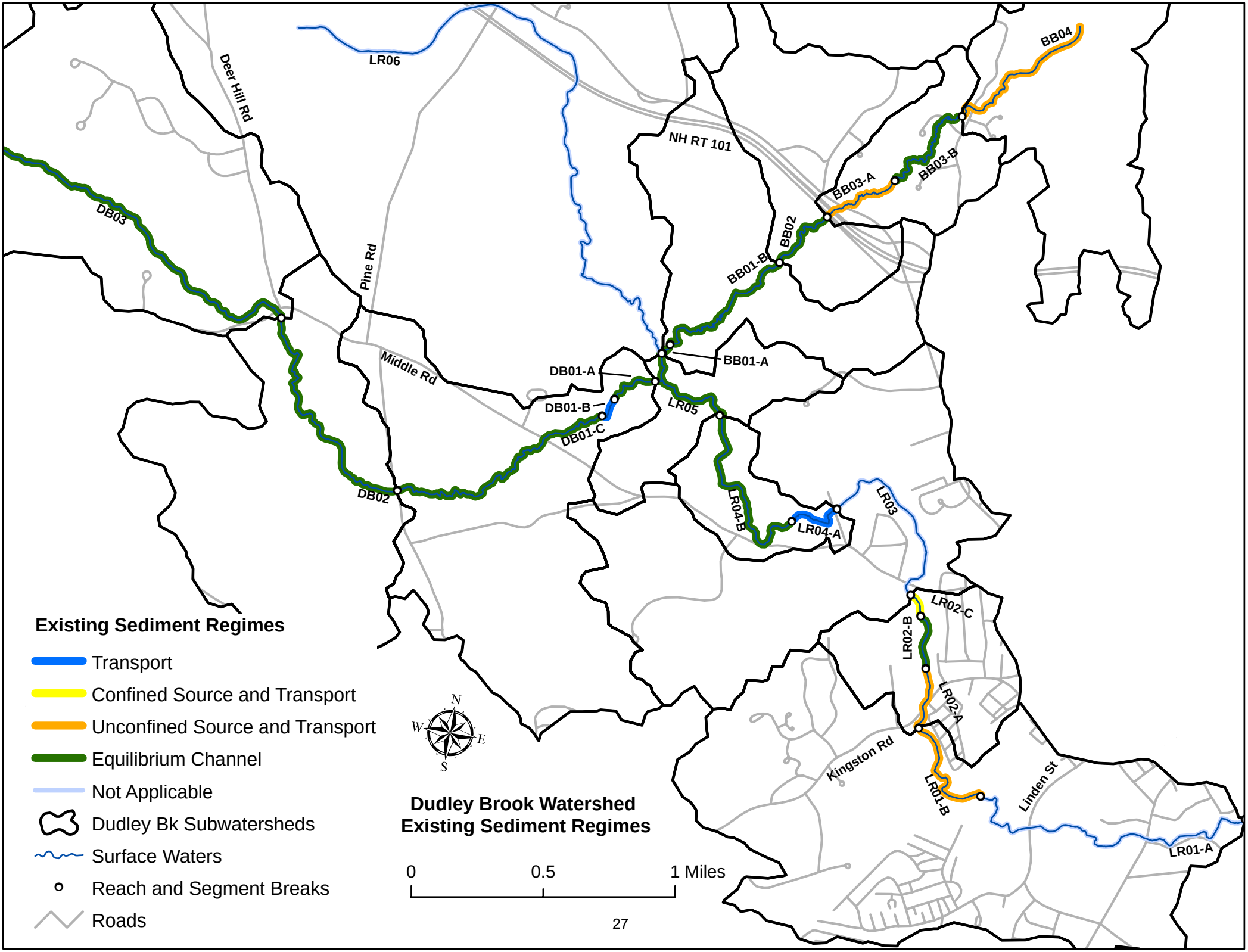
Dudley Brook Watershed
Channel Slope & Depth Modifiers



Dudley Brook Watershed
Riparian & Boundary Conditions

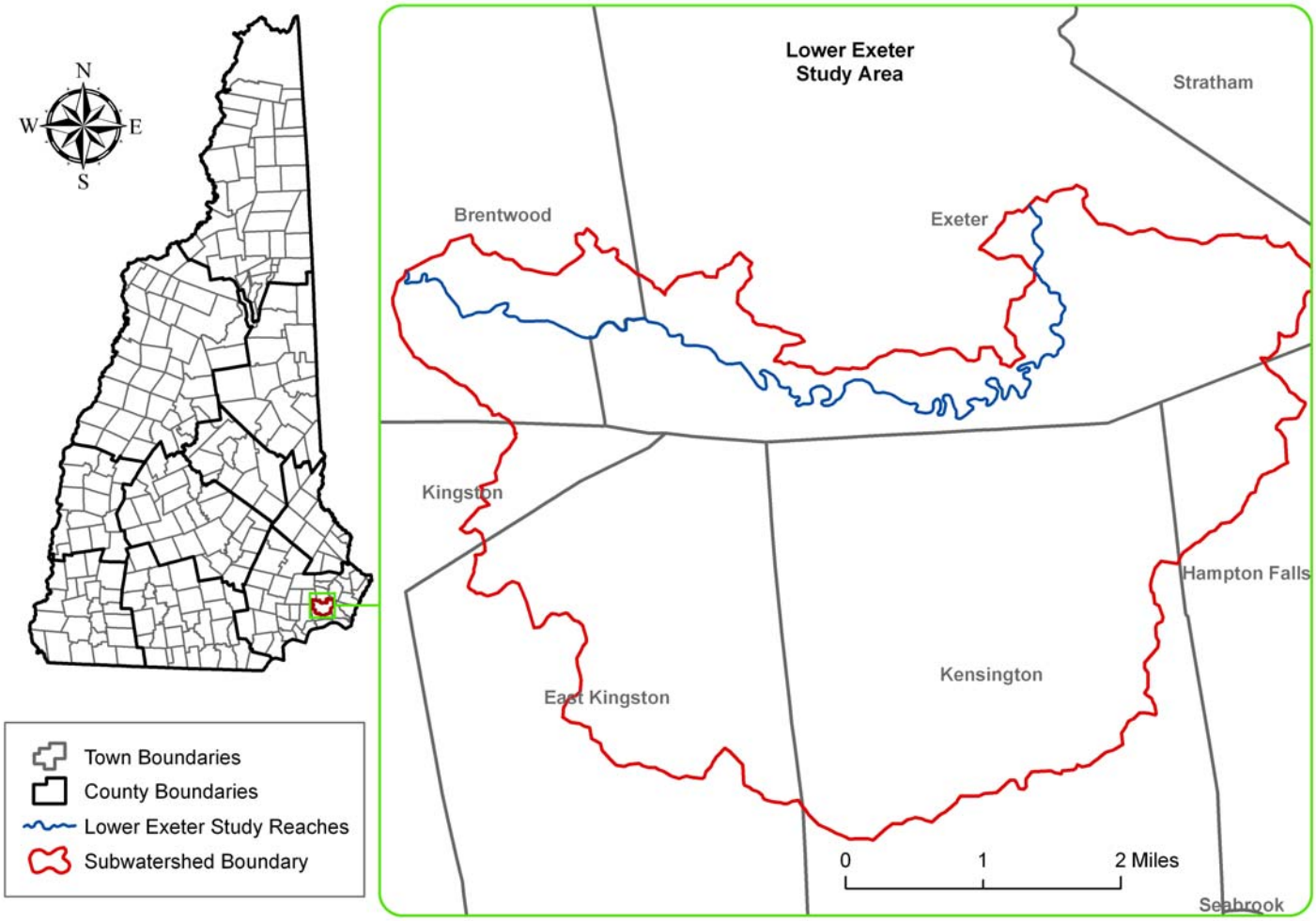

Stream Sensitivity
Extreme
Very High
High
Moderate
Not Aplicable
Dudley Bk Subwatersheds
Surface Waters
Reach and Segment Breaks
Roads
Dudley Brook Watershed
Stream Sensitivity Map
0
0.5
1 Miles
N
S
E
W
LR06
Deer Hill Rd
DB03
Pine Rd
Middle Rd
NH RT 101
BB04
BB03-A
BB03-B
BB02
BB01-B
BB01-A
DB01-A
DB01-B
DB01-C
LR05
DB02
LR04-B
LR04-A
LR03
LR02-C
LR02-B
LR02-A
LR01-B
Kingston Rd
Linden St
LR01-A

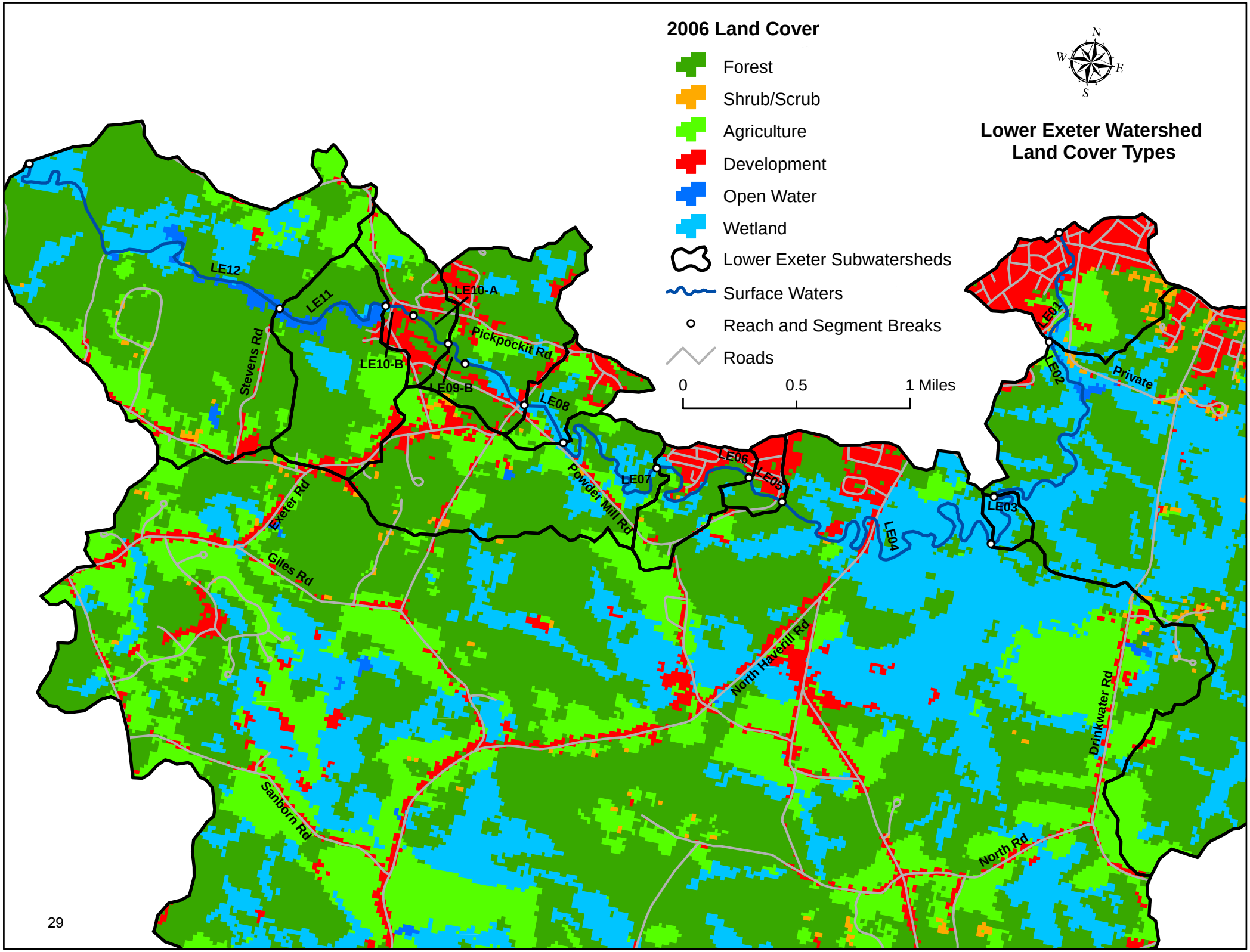

LR06
Deer Hill Rd
NH RT 101
BB04
BB03-B
BB03-A
BB02
BB01-B
DB03
Pine Rd
Middle Rd
BB01-A
DB01-A
DB01-B
DB01-C
LR05
DB02
LR04-B
LR04-A
LR03
LR02-C
LR02-B
LR02-A
Kingston Rd
LR01-B
Linden St
LR01-A
Reference Sediment Regimes
Transport
Equilibrium Channel
Not Applicable
Dudley Bk Subwatersheds
Reach and Segment Breaks
Surface Waters
Roads
N
W
E
S
Dudley Brook Watershed
Reference Sediment Regimes
0
0.5
1 Miles

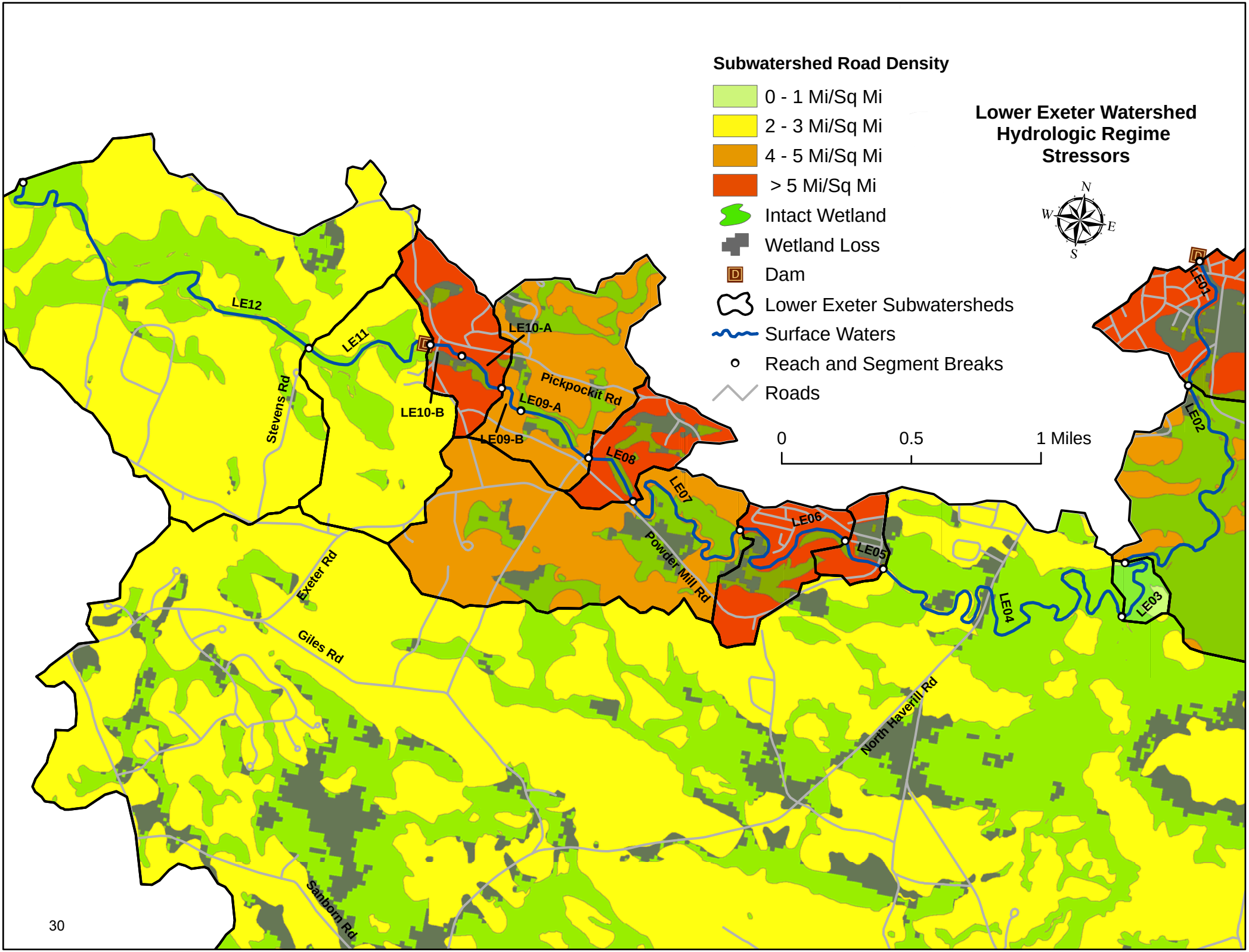

LR06
Deer Hill Rd
NH RT 101
BB04
BB03-B
BB03-A
BB02
BB01-B
DB03
Pine Rd
Middle Rd
BB01-A
DB01-A
DB01-B
DB01-C
LR05
DB02
LR04-B
LR04-A
LR03
LR02-C
LR02-B
LR02-A
Kingston Rd
LR01-B
Linden St
LR01-A
Existing Sediment Regimes
Transport
Confined Source and Transport
Unconfined Source and Transport
Equilibrium Channel
Not Applicable
Dudley Bk Subwatersheds
Surface Waters
Reach and Segment Breaks
Roads
N
W
E
S
Dudley Brook Watershed
Existing Sediment Regimes
0
0.5
1 Miles

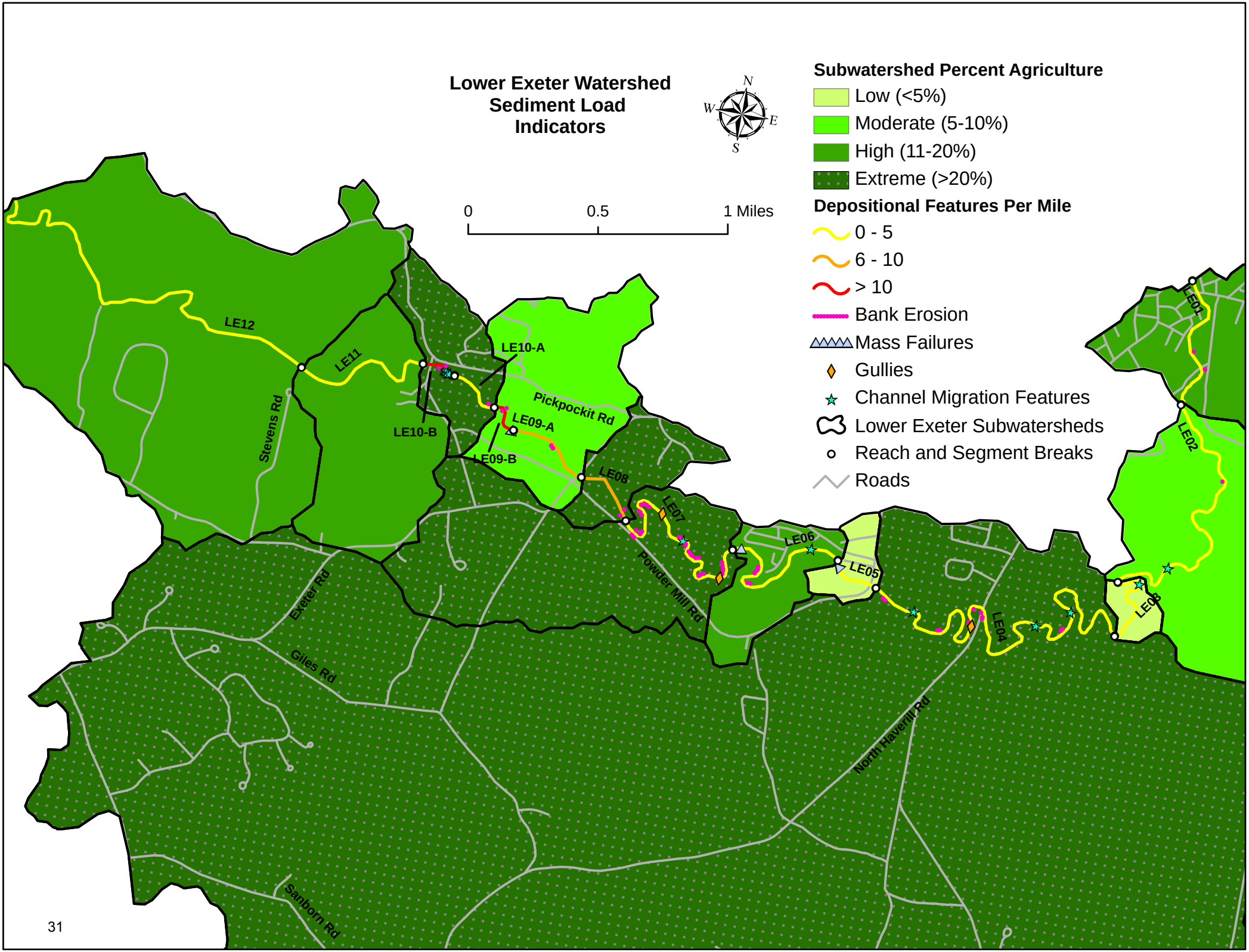
Lower Exeter River

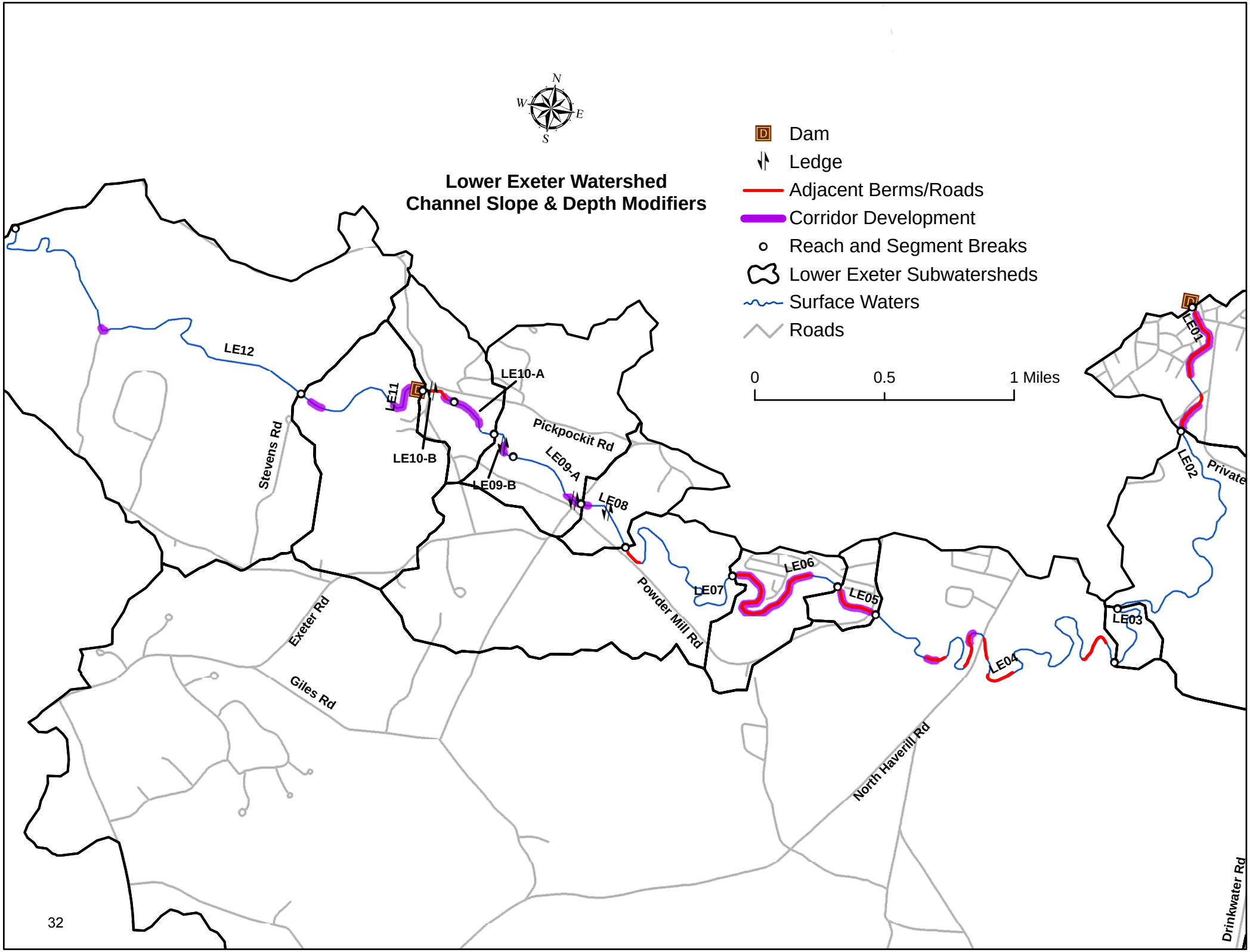
Stressor and Departure Maps

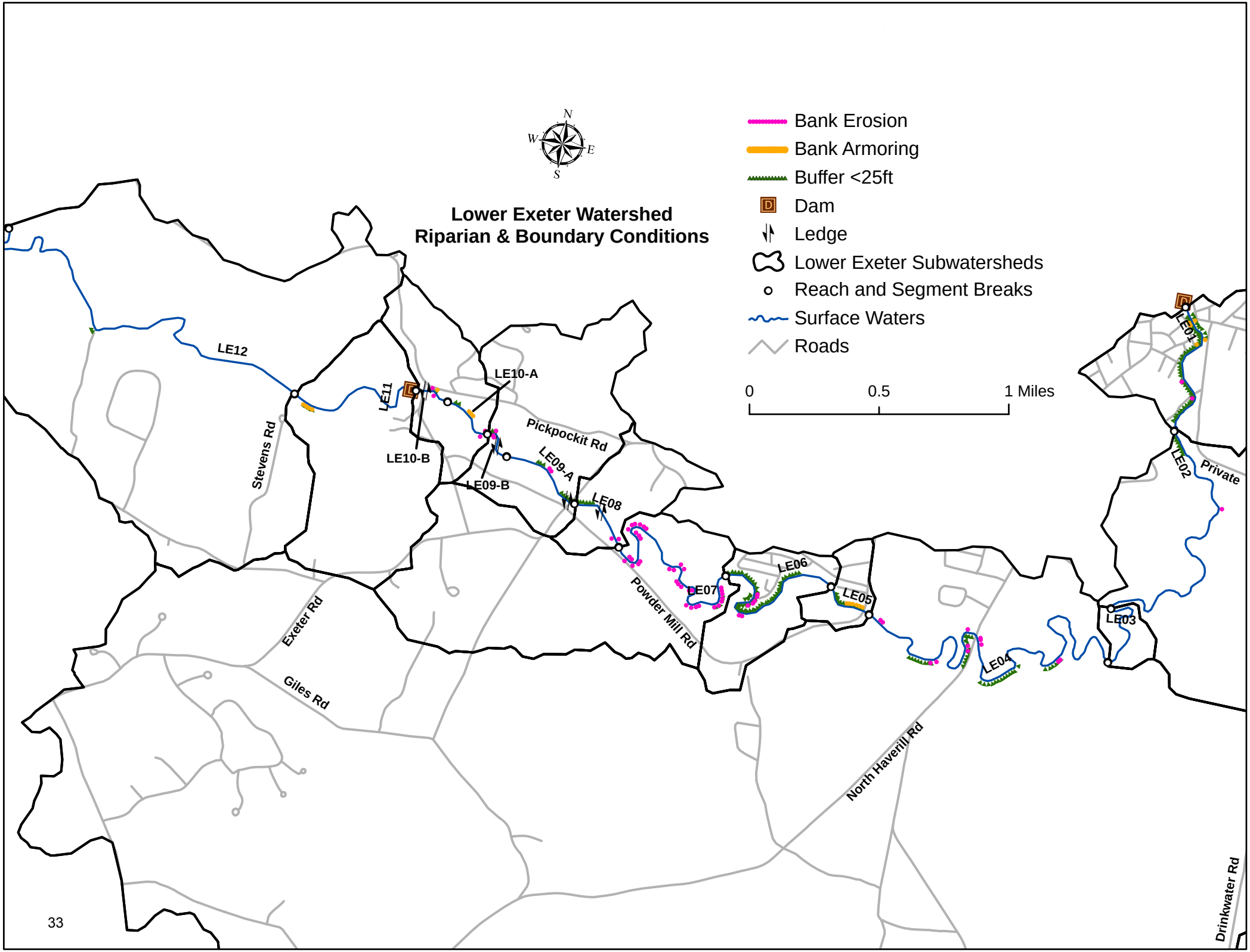


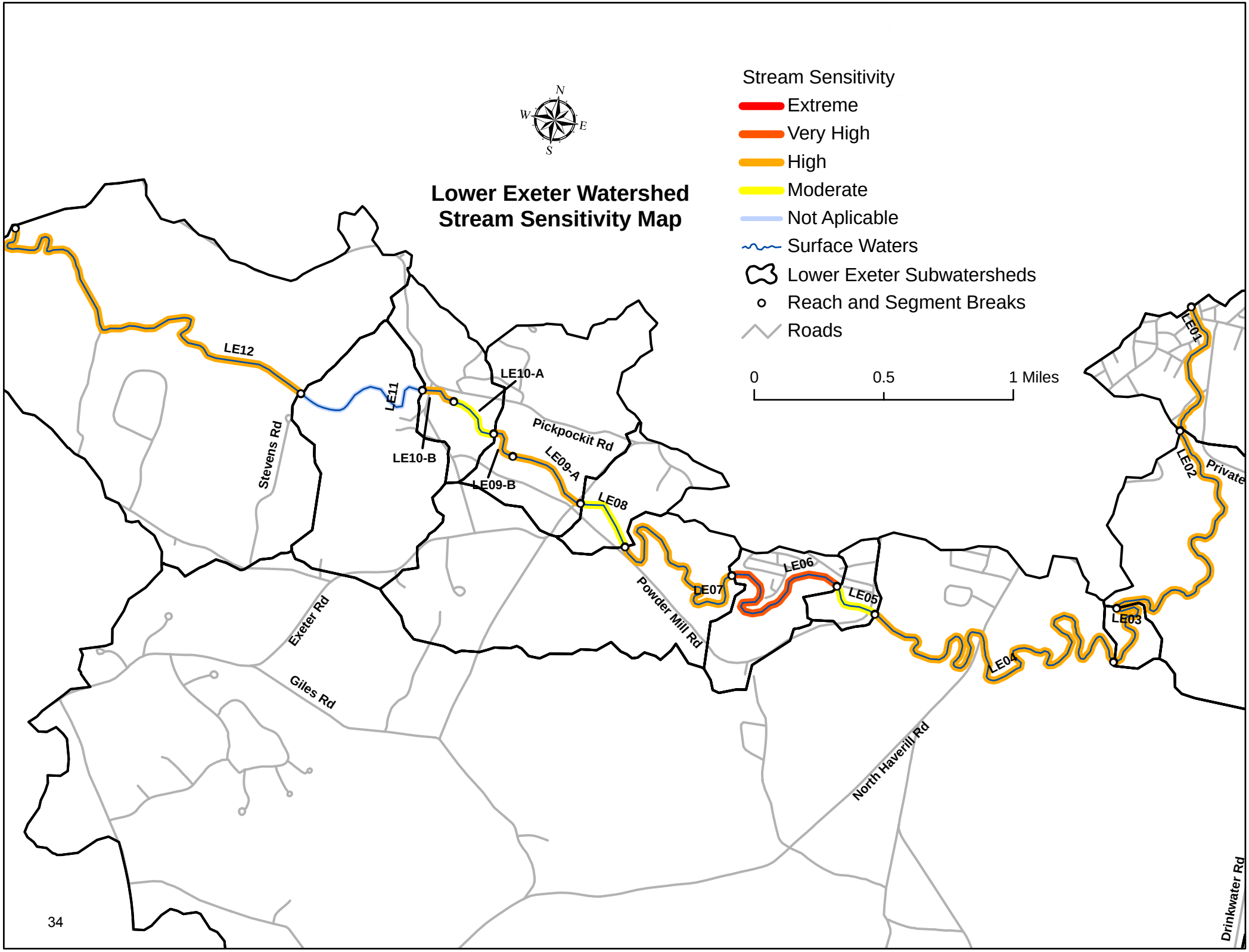

2006 Land Cover
Forest
Shrub/Scrub
Agriculture
Development
Open Water
Wetland
Lower Exeter Subwatersheds
Surface Waters
Reach and Segment Breaks
Roads
0
0.5
1 Miles
N
W
E
S
Lower Exeter Watershed
Land Cover Types
LE12
LE11
LE10-A
LE10-B
LE09-B
LE08
LE07
LE06
LE05
LE04
LE03
LE02
LE01
Stevens Rd
Pickpockit Rd
Powder Mill Rd
Exeter Rd
Giles Rd
Sanborn Rd
North Haverill Rd
Drinkwater Rd
North Rd
Private

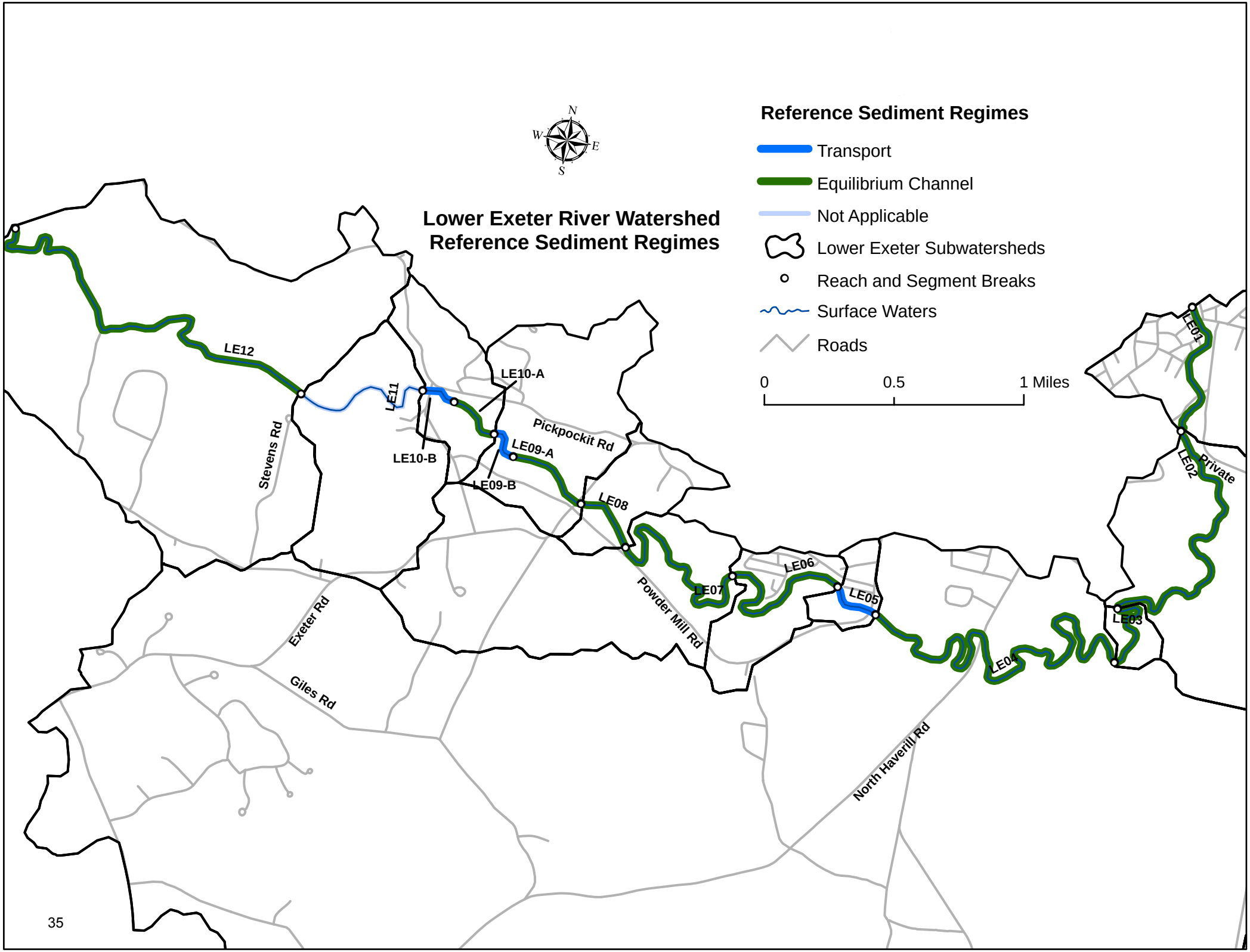

Lower Exeter Watershed
Hydrologic Regime
Stressors
Subwatershed Road Density
0 - 1 Mi/Sq Mi
2 - 3 Mi/Sq Mi
4 - 5 Mi/Sq Mi
> 5 Mi/Sq Mi
Intact Wetland
Wetland Loss
Dam
Lower Exeter Subwatersheds
Surface Waters
Reach and Segment Breaks
Roads
0
0.5
1 Miles
N
S
E
W
LE12
LE11
LE10-A
LE10-B
LE09-A
LE09-B
LE08
LE07
LE06
LE05
LE04
LE03
LE02
LE01
Stevens Rd
Pickpockit Rd
Powder Mill Rd
Exeter Rd
Giles Rd
North Haverill Rd
Sanborn Rd

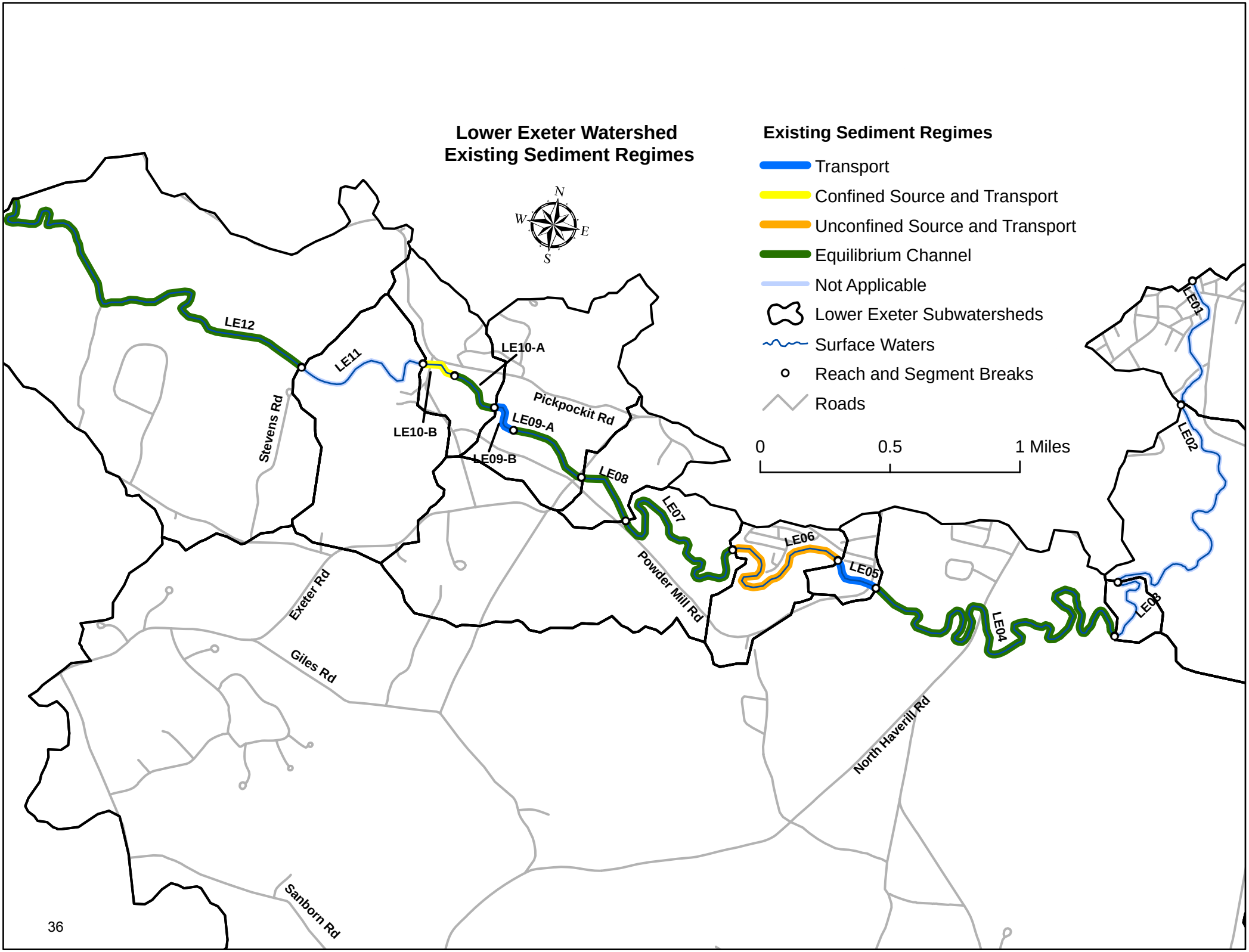

Lower Exeter Watershed
Sediment Load
Indicators
N
W
E
S
0
0.5
1 Miles
Subwatershed Percent Agriculture
Low (<5%)
Moderate (5-10%)
High (11-20%)
Extreme (>20%)
Depositional Features Per Mile
0 - 5
6 - 10
> 10
Bank Erosion
Mass Failures
Gullies
Channel Migration Features
Lower Exeter Subwatersheds
Reach and Segment Breaks
Roads
LE12
LE11
LE10-A
LE10-B
LE09-A
LE09-B
LE08
LE07
LE06
LE05
LE04
LE03
LE02
LE01
Stevens Rd
Pickpockit Rd
Powder Mill Rd
Exeter Rd
Giles Rd
North Haverhill Rd
Sanborn Rd


Lower Exeter Watershed
Channel Slope & Depth Modifiers
N
S
E
W
Dam
Ledge
Adjacent Berms/Roads
Corridor Development
Reach and Segment Breaks
Lower Exeter Subwatersheds
Surface Waters
Roads
0
0.5
1 Miles
LE12
LE11
LE10-A
LE10-B
LE09-A
LE09-B
LE08
LE07
LE06
LE05
LE04
LE03
LE02
LE01
Stevens Rd
Pickpockit Rd
Powder Mill Rd
Exeter Rd
Giles Rd
North Haverill Rd
Private
Drinkwater Rd


Lower Exeter Watershed
Riparian & Boundary Conditions
N
W
E
S
Bank Erosion
Bank Armoring
Buffer <25ft
Dam
Ledge
Lower Exeter Subwatersheds
Reach and Segment Breaks
Surface Waters
Roads
0
0.5
1 Miles
LE12
LE11
LE10-A
LE10-B
LE09-A
LE09-B
LE08
LE07
LE06
LE05
LE04
LE03
LE02
LE01
Stevens Rd
Pickpockit Rd
Powder Mill Rd
Exeter Rd
Giles Rd
North Haverill Rd
Private
Drinkwater Rd


Lower Exeter Watershed
Stream Sensitivity Map
Stream Sensitivity
Extreme
Very High
High
Moderate
Not Aplicable
Surface Waters
Lower Exeter Subwatersheds
Reach and Segment Breaks
Roads
0
0.5
1 Miles
N
S
E
W
LE12
LE11
LE10-A
LE10-B
LE09-A
LE09-B
LE08
LE07
LE06
LE05
LE04
LE03
LE02
LE01
Stevens Rd
Pickpockit Rd
Powder Mill Rd
Exeter Rd
Giles Rd
North Haverill Rd
Private
Drinkwater Rd


Lower Exeter River Watershed
Reference Sediment Regimes
Reference Sediment Regimes
Transport
Equilibrium Channel
Not Applicable
Lower Exeter Subwatersheds
Reach and Segment Breaks
Surface Waters
Roads
0
0.5
1 Miles
N
S
E
W
LE12
LE11
LE10-A
LE10-B
LE09-A
LE09-B
LE08
LE07
LE06
LE05
LE04
LE03
LE02
LE01
Stevens Rd
Pickpockit Rd
Powder Mill Rd
Exeter Rd
Giles Rd
North Haverill Rd
Private


Lower Exeter Watershed
Existing Sediment Regimes
Existing Sediment Regimes
Transport
Confined Source and Transport
Unconfined Source and Transport
Equilibrium Channel
Not Applicable
Lower Exeter Subwatersheds
Surface Waters
Reach and Segment Breaks
Roads
0
0.5
1 Miles
N
S
E
W
LE12
LE11
LE10-A
LE10-B
LE09-A
LE09-B
LE08
LE07
LE06
LE05
LE04
LE03
LE02
LE01
Stevens Rd
Pickpockit Rd
Powder Mill Rd
Exeter Rd
Giles Rd
North Haverill Rd
Sanborn Rd

Appendix E

Fluvial Erosion Hazard (FEH)

Analysis & Maps

Exeter River Fluvial Erosion Hazard Corridor Analysis

Introduction

One component of the Exeter River Watershed Restoration Plan is the development of the Fluvial Erosion Hazard (FEH) corridors for fluvial reaches surveyed in the four study subwatersheds. The Stream Geomorphic Assessment Tool (SGAT) was used by New Hampshire Geological Survey (NHGS) to develop Phase 1 data for the Lower Exeter, Dudley River, Fordway Brook, and Upper Exeter subwatersheds. Bear Creek Environmental, LLC and Fitzgerald Environmental Associates, LLC (Project Team) used the data developed from this tool in conjunction with the Phase 2 Stream Geomorphic Assessment (SGA) data to determine appropriate FEH corridor widths for fluvial reaches. The FEH corridor represents the estimated area surrounding the channel needed to accommodate fluvial geomorphic equilibrium conditions.

FEH Corridor Development

Using the SGAT projects and Phase 2 reach sensitivities, the Project Team developed FEH corridors following the Vermont Department of Environmental Conservation FEH approach found in the document titled "River Corridor Protection – A Vermont Technical Guide" (VTDEC, 2008). The FEH corridor width is determined by the inherent sensitivity of the reach to adjustments and the current condition of reach stability as determined through the Phase 2 field surveys (Table 1). The reach-specific ratings determine the corridor width needed to accommodate fluvial geomorphic equilibrium conditions (Table 2). The FEH corridor may then be used by municipalities to develop strategies that will reduce property loss and infrastructure damage from flooding and erosion. Further background information about the FEH approach is provided in the DEC publication "Municipal Guide to Fluvial Erosion Hazard Mitigation" (VTDEC, 2007).

Table 1. Stream Sensitivity Ratings Based on Geomorphic Stream Type and Condition.

Existing Geomorphic Stream Type[1]	Stream Sensitivity		
	Reference or Good Condition	Fair-Poor Condition in Major Adjustment	Poor Condition, Stream Type Departure
A1, A2, B1, B2,	Very Low	Very Low	Low
C1, C2	Very Low	Low	Moderate
G1, G2	Low	Moderate	High
F1, F2	Low	Moderate	High
B3, B4, B5	Moderate	High	High
B3c, C3, E3	Moderate	High	High
C4, C5, B4c, B5c	High	Very High	Very High
A3, A4, A5, G3, F3	High	Very High	Extreme
G4, G5, F4, F5	Very High	Very High	Extreme
D3, D4, D5	Extreme	Extreme	Extreme
C6, E4, E5, E6	High	Extreme	Extreme

Table 2. FEH Ratings and Corridor Widths Based on Typical Setting and Impact

Sensitivity Rating	Corridor Width in Relation to Reference Channel Width	Typical Setting & Impact
Very Low	Equal	Steep, bedrock or boulder-bottomed stream with no impacts
Low	Two (2) channel widths	Steep, bedrock or boulder-bottomed stream with limited human impacts
Moderate	Four (4) channel widths	Moderate gradient stream with limited human impacts
High	Six (6) channel widths Eight (8) channel widths for E-type streams	Low to moderate gradient stream with limited to moderate human impacts
Very High	Six (6) channel widths Eight (8) channel widths for E-type streams	Low to moderate gradient stream with high human impacts
Extreme	Six (6) channel widths Eight (8) channel widths for D and E-type streams	Severe departure from reference conditions; Stream types with high natural sensitivity

[1] Geomorphic stream types from the Rosgen (1994) Classification System.

Additional assumptions specific to the Exeter River watershed were used during the development of the FEH corridors, including:

1. The reference channel width was calculated using the following equation developed by the New Hampshire Stream Team (2005):

$$\text{Bankfull Channel Width (ft)} = 12.469 * \text{Drainage Area (sqmi)}^{0.4892}$$

2. The reference channel width developed from the SGA Phase 1 analysis and the Phase 2 stream sensitivity rating multipliers (see Table 2) were used to determine FEH corridor widths. This approach, consistent with the VTDEC methods, best estimates the meander belt width that a river at a given drainage area would require to redevelop or maintain fluvial geomorphic equilibrium conditions.

3. Reaches characterized as wetlands without evidence of current or historical channel formation were deemed non-fluvial, and no FEH corridor was developed.

4. Reaches characterized as wetlands that were not surveyed due to temporary ponding (e.g., beaver activity) were given an administrative judgment for stream type and condition. This allowed for a stream sensitivity classification and FEH corridor development.

5. Reaches in the Lower Exeter and Dudley Brook subwatersheds influenced by the Great Dam were characterized as non-fluvial and given an administrative judgment for stream type and condition. This allowed for a stream sensitivity classification and FEH corridor development. Although these river reaches are currently impounded, the possibility of dam removal in the future warrants the development of FEH corridors for these areas.

FEH Risk Assessments

The Project Team used the FEH corridor to analyze the implications of an FEH Overlay Zoning District within the towns of Brentwood, Candia, Chester, Danville, Exeter, Fremont, Raymond and Sandown. The purpose of this analysis is to provide the towns and NHDES with a summary of the built and natural capital within the corridor, and highlight areas of potential conflict and opportunities for

corridor protection. The analysis also assesses each town's planning and zoning districts and other protected parcels within the corridor (e.g., conserved lands).

ArcGIS software was used to summarize the land cover and zoning acreages within the FEH corridor at the reach-scale. A reach-scale approach to analyzing and managing fluvial erosion hazards is imperative given the varying sensitivities to adjustment exhibited by different stream types under the influence of human impacts. A summary of the GIS data utilized in the analysis is provided below in Table 3. Base data for the state of New Hampshire were acquired through the New Hampshire Geographically Referenced Analysis and Information Transfer System (GRANIT). Data for the towns in the study area were provided by the Rockingham Planning Commission (RPC) and the Southern New Hampshire Planning Commission (SNHPC). Data tables summarizing the results of the analysis by subwatershed and reach are included in the Attachment. Maps of the FEH corridor and sensitivity ratings by subwatershed are also included in the Attachment.

Table 3. GIS Data Utilized in Exeter River FEH Risk Assessments

Data Layer	Description	Source
FEH Corridor	Corridor based on VTDEC FEH approach	Phase 1 & 2 SGA
Town Zoning	Zoning Districts adopted by Towns for future growth	RPC & SNHPC
Town Parcels	Parcels boundaries and property owners	RPC & SNHPC
Roads	Public road locations for the state of New Hampshire	GRANIT
Conserved Parcels	Parcels conserved by Towns, Land Trusts, or other partnerships	GRANIT
Wetland Boundaries	National Wetland Inventory (NWI) data for State of NH	GRANIT
100 Year Floodway/Floodzone	Digital Flood Insurance Rate Mapping (DFIRM)	GRANIT

- Town Zoning Districts were summarized based on the area (acreage) and percent coverage of the FEH corridor. This summary aids in understanding the potential for future conflicts where lands zoned for future growth fall within the FEH corridor. The towns within the study area have different zoning designations, depending on the level of development. For this

analysis, the zoning districts were categorized into the following groups: residential, mixed use, commercial, and industrial.

- Building locations discerned from 2005 high resolution color photographs were used to identify the number of adjacent structures within the FEH corridor. The number of stream crossings (e.g., bridges and culverts) tallied during the Phase 2 surveys are also summarized by reach. This summary aids in understanding the potential for future erosion conflicts within the FEH corridor.

- The conserved lands database maintained by GRANIT (updated February 2008) was used to summarize the amount of acreage (and percent coverage) of lands protected against future development within the FEH corridor for each reach.

- Wetlands mapping from the US Fish and Wildlife Service's National Wetland Inventory was included in the analysis to represent areas within the FEH corridor where land is unsuitable for structural development.

References

New Hampshire Stream Team, 2005, New Hampshire 2005 Regional Hydraulic Geometry Curves (Provisional). The New Hampshire Stream Team, Concord, NH.

VTDEC (Vermont Department of Environmental Conservation), 2007, Municipal Guide to Fluvial Erosion Hazard Mitigation. Vermont Agency of Natural Resources Publication.

VTDEC (Vermont Department of Environmental Conservation), 2008, River Corridor Protection – A Vermont Technical Guide. Vermont River Management Program Draft Publication.

ATTACHMENT

FEH SUMMARY TABLES & MAPS

Fordway Brook Fluvial Erosion Hazard Summary Tables

Table 1. Summary of Fluvial Erosion Hazard (FEH) Corridor Assets and Liabilities

Segment	FEH Rating	Town	Total FEH Zone Land (acres)	Town Zoning District: Residential (acres)	Town Zoning District: Commercial (acres)	Town Zoning District: Industrial (acres)	Conserved Lands (acres)	Wetlands (acres)	Structures: Adjacent Buidlings (#)	Structures: Stream Crossings** (#)
FW01-A*	Very High	Raymond	1.3	1.3	0.0	0.0	0.0	0.6	2	0
FW03	Moderate	Raymond	2.0	0.0	0.0	2.0	1.5	0.0	0	0
FW07-A	Moderate	Raymond	1.8	1.8	0.0	0.0	0.0	0.0	0	0
FW07-B	Moderate	Raymond	1.4	1.4	0.0	0.0	0.0	0.0	0	0
FW07-C	Extreme	Raymond	2.4	2.4	0.0	0.0	0.0	0.0	0	0
FW07-D	Moderate	Raymond	1.0	1.0	0.0	0.0	0.0	0.0	0	1
FW09	Very High	Raymond	9.1	9.1	0.0	0.0	0.0	0.2	2	1
FW10-A	Very High	Raymond	1.5	1.5	0.0	0.0	0.0	0.4	0	0
FW10-C*	High	Raymond	2.2	2.2	0.0	0.0	0.0	0.1	1	1
FW10-E*	High	Raymond	4.5	4.5	0.0	0.0	0.1	1.3	0	1
FW11-B	Very High	Raymond	1.8	1.8	0.0	0.0	0.2	0.4	0	1
FW12-A	High	Raymond	1.0	1.0	0.0	0.0	0.0	0.4	0	0
FW14*	High	Candia	6.1	6.1	0.0	0.0	0.0	0.5	0	0

* Provisional rating (no Phase 2 data collected due to wetland/ponding)

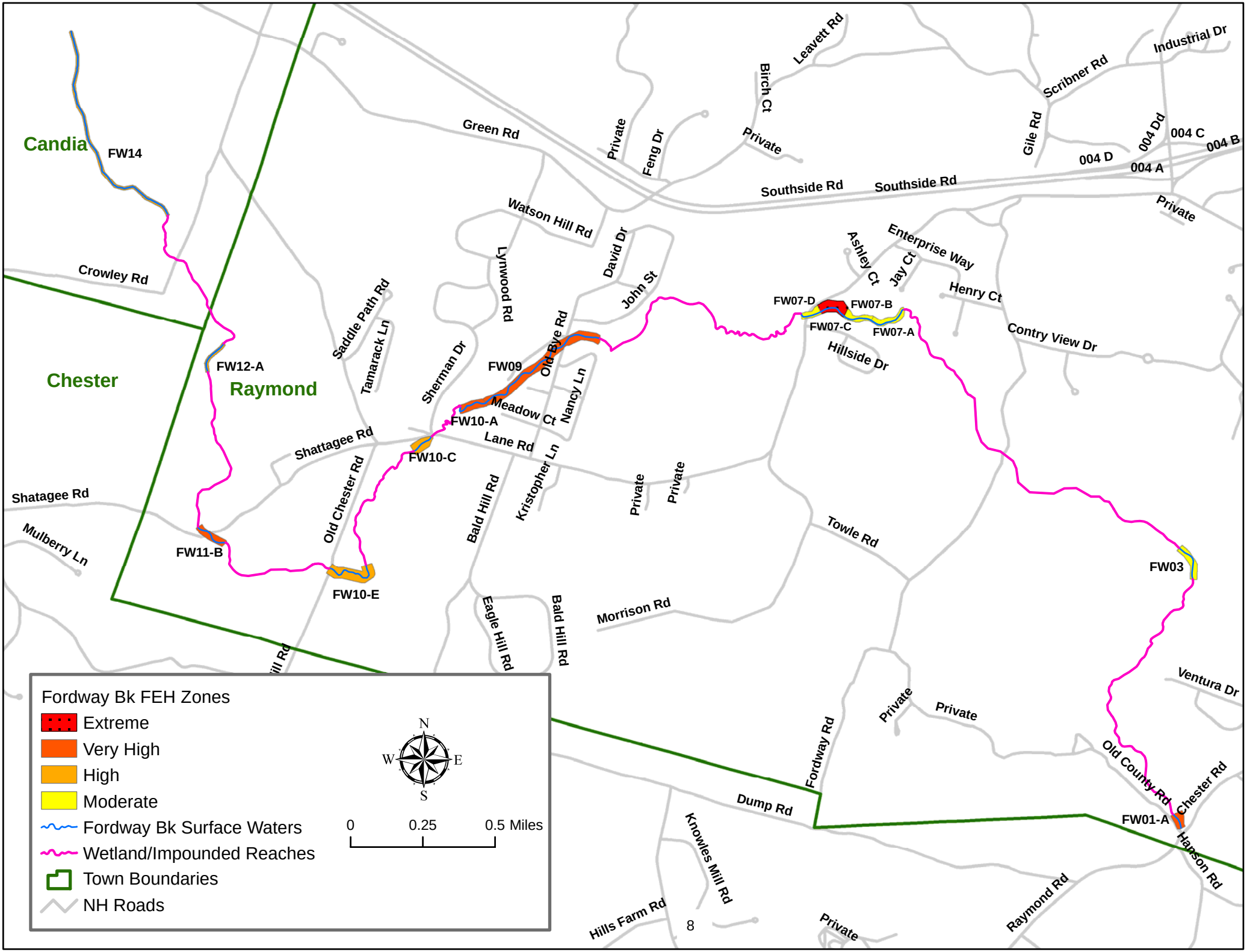
** Includes bridges and culverts

Table 2. Percent of FEH Corridor Occupied by Zoning Type, Conserved Lands and Wetlands

Segment	FEH Rating	Town	Town Zoning District: Residential	Town Zoning District: Commercial	Town Zoning District: Industrial	Conserved Lands	Wetlands	Total Protected Lands†
FW01-A*	Very High	Raymond	100.0%	0.0%	0.0%	0.0%	46.9%	46.9%
FW03	Moderate	Raymond	0.0%	0.0%	100.0%	76.1%	1.5%	77.6%
FW07-A	Moderate	Raymond	100.0%	0.0%	0.0%	0.0%	1.7%	1.7%
FW07-B	Moderate	Raymond	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
FW07-C	Extreme	Raymond	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
FW07-D	Moderate	Raymond	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
FW09	Very High	Raymond	100.0%	0.0%	0.0%	0.0%	2.2%	2.2%
FW10-A	Very High	Raymond	100.0%	0.0%	0.0%	0.0%	29.5%	29.5%
FW10-C*	High	Raymond	100.0%	0.0%	0.0%	0.0%	5.0%	5.0%
FW10-E*	High	Raymond	100.0%	0.0%	0.0%	1.6%	28.9%	30.4%
FW11-B	Very High	Raymond	100.0%	0.0%	0.0%	8.9%	23.9%	24.4%
FW12-A	High	Raymond	100.0%	0.0%	0.0%	0.0%	40.4%	40.4%
FW14*	High	Candia	100.0%	0.0%	0.0%	0.0%	7.9%	7.9%
	Percent of Total FEH Zone:		94.4%	0.0%	5.6%	4.9%	11.2%	15.6%

† Accounts for areas where conserved lands and wetlands overlap

** Provisional rating (no Phase 2 data collected due to wetland/ponding)


Candia
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Raymond
FW14
FW12-A
FW11-B
FW10-E
FW10-C
FW10-A
FW09
FW07-D
FW07-B
FW07-C
FW07-A
FW03
FW01-A
Crowley Rd
Green Rd
Watson Hill Rd
Southside Rd
Private
Feng Dr
Birch Ct
Leavett Rd
Scribner Rd
Industrial Dr
Gile Rd
004 Dd
004 C
004 B
004 D
004 A
Enterprise Way
Ashley Ct
Jay Ct
Henry Ct
Contry View Dr
Hillside Dr
David Dr
John St
Lynwood Rd
Old Bye Rd
Nancy Ln
Meadow Ct
Lane Rd
Kristopher Ln
Saddle Path Rd
Tamarack Ln
Sherman Dr
Shattagee Rd
Shatagee Rd
Mulberry Ln
Old Chester Rd
Bald Hill Rd
Eagle Hill Rd
Morrison Rd
Towle Rd
Fordway Rd
Dump Rd
Knowles Mill Rd
Hills Farm Rd
Raymond Rd
Old County Rd
Chester Rd
Hanson Rd
Ventura Dr
Fordway Bk FEH Zones
Extreme
Very High
High
Moderate
Fordway Bk Surface Waters
Wetland/Impounded Reaches
Town Boundaries
NH Roads
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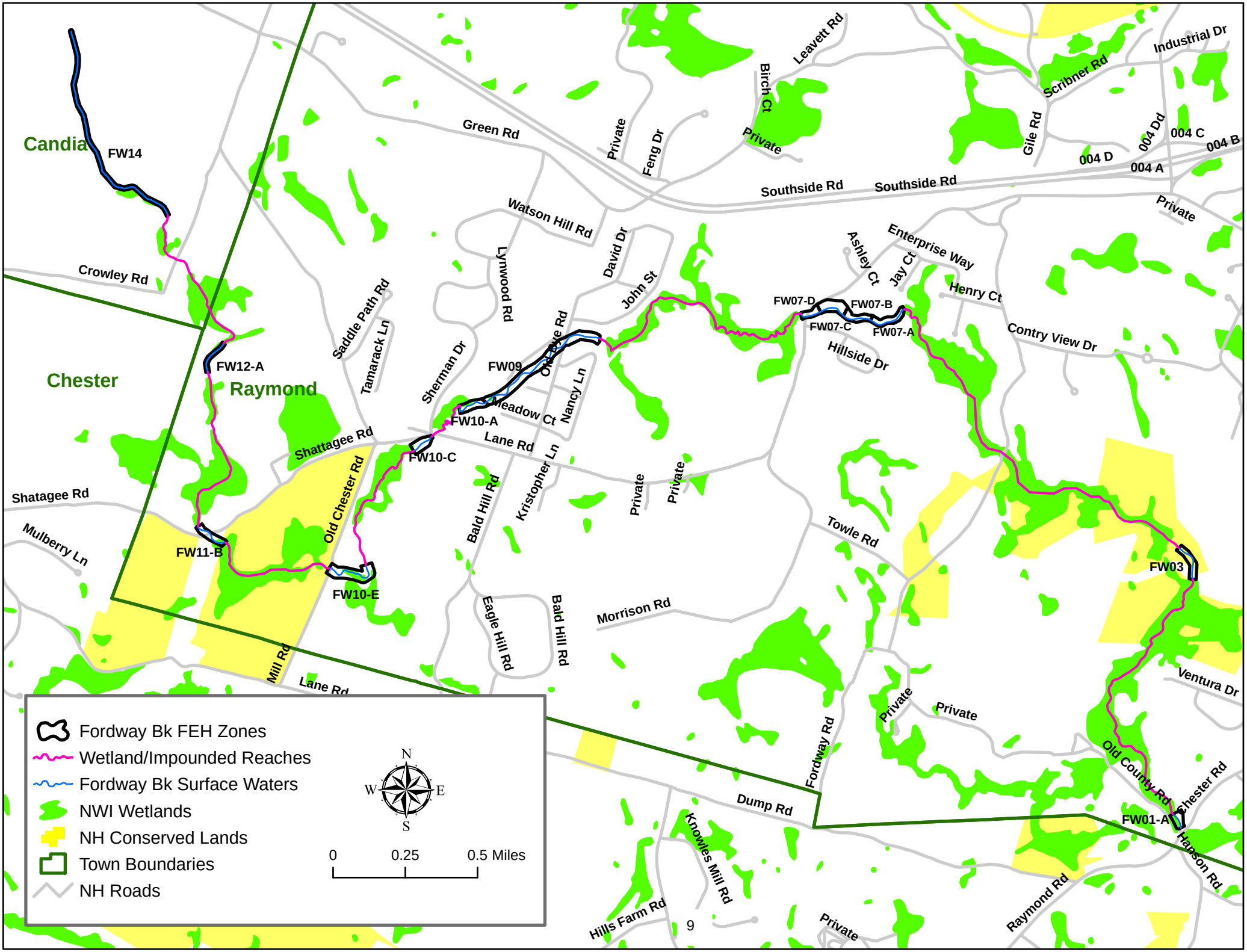
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Raymond
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FW10-C
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FW09
FW07-D
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FW07-C
FW07-A
FW03
FW01-A
Crowley Rd
Green Rd
Watson Hill Rd
Saddle Path Rd
Tamarack Ln
Lynwood Rd
Sherman Dr
David Dr
John St
Old Chester Rd
Nancy Ln
Meadow Ct
Shattagee Rd
Lane Rd
Kristopher Ln
Bald Hill Rd
Shatagee Rd
Mulberry Ln
Mill Rd
Eagle Hill Rd
Morrison Rd
Private
Feng Dr
Birch Ct
Leavett Rd
Southside Rd
Ashley Ct
Jay Ct
Enterprise Way
Henry Ct
Hillside Dr
Contry View Dr
Towle Rd
Fordway Rd
Dump Rd
Knowles Mill Rd
Hills Farm Rd
Raymond Rd
Gile Rd
Scribner Rd
Industrial Dr
004 D
004 A
004 Dd
004 C
004 B
Ventura Dr
Old County Rd
Chester Rd
Hanson Rd
Fordway Bk FEH Zones
Wetland/Impounded Reaches
Fordway Bk Surface Waters
NWI Wetlands
NH Conserved Lands
Town Boundaries
NH Roads
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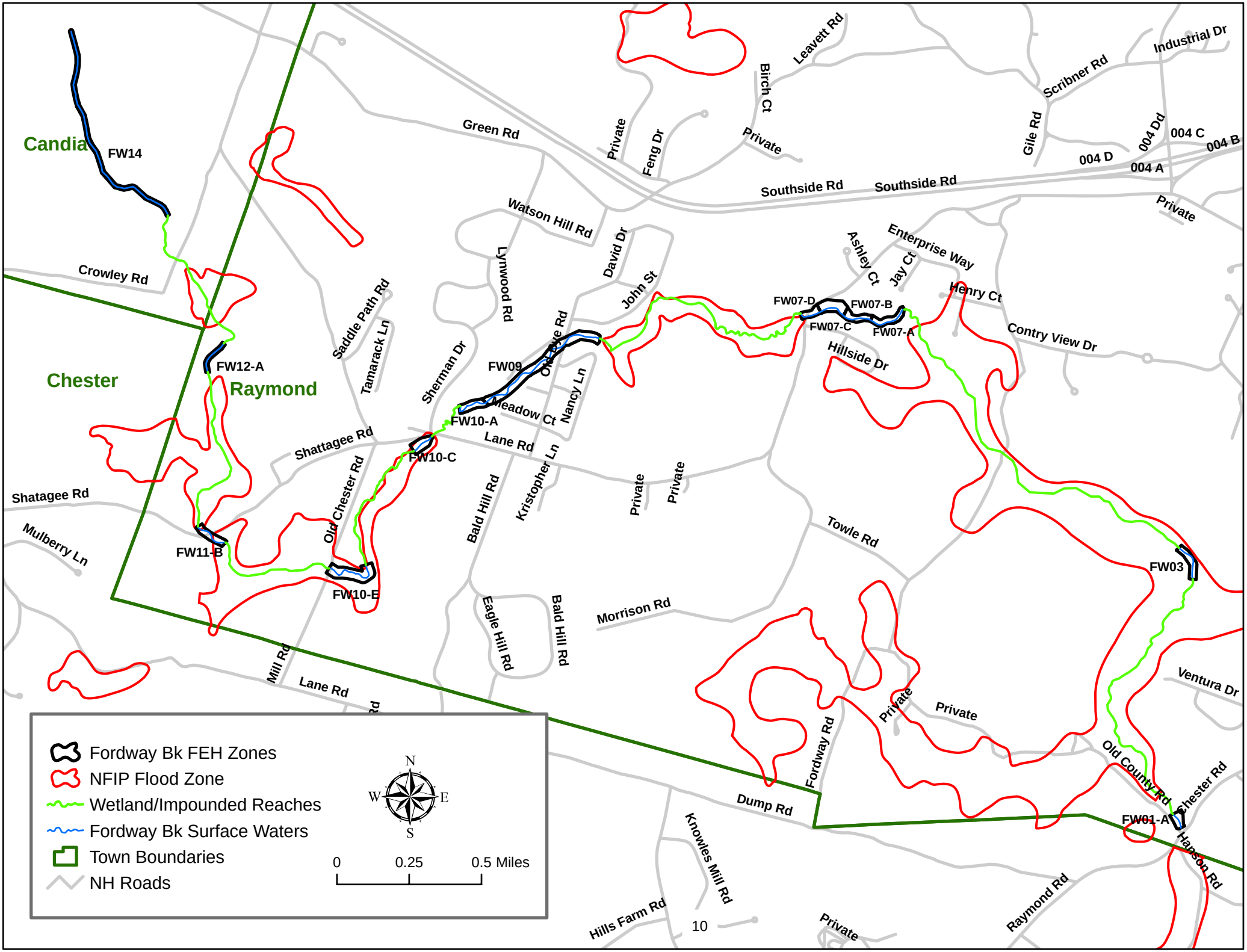
0.5 Miles


Candia
Chester
Raymond
FW14
FW12-A
FW11-B
FW10-E
FW10-C
FW10-A
FW09
FW07-D
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FW07-C
FW07-A
FW03
FW01-A
Fordway Bk FEH Zones
NFIP Flood Zone
Wetland/Impounded Reaches
Fordway Bk Surface Waters
Town Boundaries
NH Roads
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0.5 Miles
Crowley Rd
Green Rd
Private
Feng Dr
Private
Birch Ct
Leavett Rd
Gile Rd
Scribner Rd
Industrial Dr
004 D
004 Dd
004 C
004 B
004 A
Southside Rd
Southside Rd
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Watson Hill Rd
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Lynwood Rd
Saddle Path Rd
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Sherman Dr
Old Chester Rd
Nancy Ln
Meadow Ct
Lane Rd
Shattagee Rd
Shatagee Rd
Mulberry Ln
Old Chester Rd
Bald Hill Rd
Kristopher Ln
Private
Private
Ashley Ct
Jay Ct
Enterprise Way
Henry Ct
Contry View Dr
Hillside Dr
Towle Rd
Morrison Rd
Eagle Hill Rd
Bald Hill Rd
Mill Rd
Lane Rd
Fordway Rd
Private
Private
Ventura Dr
Old County Rd
Chester Rd
Hanson Rd
Dump Rd
Knowles Mill Rd
Hills Farm Rd
Private
Raymond Rd

Upper Exeter River Fluvial Erosion Hazard Summary Tables

Table 1. Summary of Fluvial Erosion Hazard (FEH) Corridor Assets and Liabilities

				Town Zoning District					Structures	
Segment	FEH Rating	Town	Total FEH Zone Land (acres)	Residential (acres)	Commercial (acres)	Industrial (acres)	Conserved Lands (acres)	Wetlands (acres)	Adjacent Buidlings (#)	Stream Crossings** (#)
UE01*	High	Raymond	66.7	66.7	0.0	0.0	1.5	37.9	16	0
UE02*	High	Raymond/Chester	87.1	81.2	5.9	0.0	0.0	25.6	15	1
UE03	High	Chester	33.8	33.8	0.0	0.0	7.9	1.9	5	1
UE04-A*	High	Chester	3.0	3.0	0.0	0.0	0.0	0.2	0	1
UE06-A*	Very High	Sandown	4.8	4.8	0.0	0.0	0.0	0.0	0	1
UE06-C	Moderate	Sandown	4.7	4.7	0.0	0.0	2.3	1.0	0	1
UE08-A	Extreme	Sandown	1.3	1.3	0.0	0.0	0.0	0.0	0	1
UE08-C	Moderate	Sandown	4.2	4.2	0.0	0.0	0.1	0.0	0	0
UE11-B*	High	Sandown	10.2	10.2	0.0	0.0	1.3	5.7	0	0
UE12-A	High	Sandown/Chester	20.2	20.2	0.0	0.0	1.2	0.0	2	1
UE12-B	High	Chester	12.7	12.7	0.0	0.0	0.0	5.1	0	0
UE12-C*	High	Chester	12.0	12.0	0.0	0.0	0.0	5.5	0	0
UE12-D*	Low	Chester	1.6	1.6	0.0	0.0	0.0	0.3	0	0
UE14-B*	High	Chester	0.6	0.6	0.0	0.0	0.0	0.1	0	0
UE14-C	High	Chester	4.4	4.4	0.0	0.0	0.0	0.1	0	1
UE15-A	Moderate	Chester	0.7	0.7	0.0	0.0	0.0	0.0	0	0
UE15-B	High	Chester	2.0	2.0	0.0	0.0	0.0	0.5	2	2
UE15-C	Extreme	Chester	1.9	1.9	0.0	0.0	0.0	1.8	0	0
UE15-D	Extreme	Chester	4.0	4.0	0.0	0.0	0.0	1.1	0	1

* Sensitivity rating based on administrative judgment for RGA condition

** Includes bridges and culverts

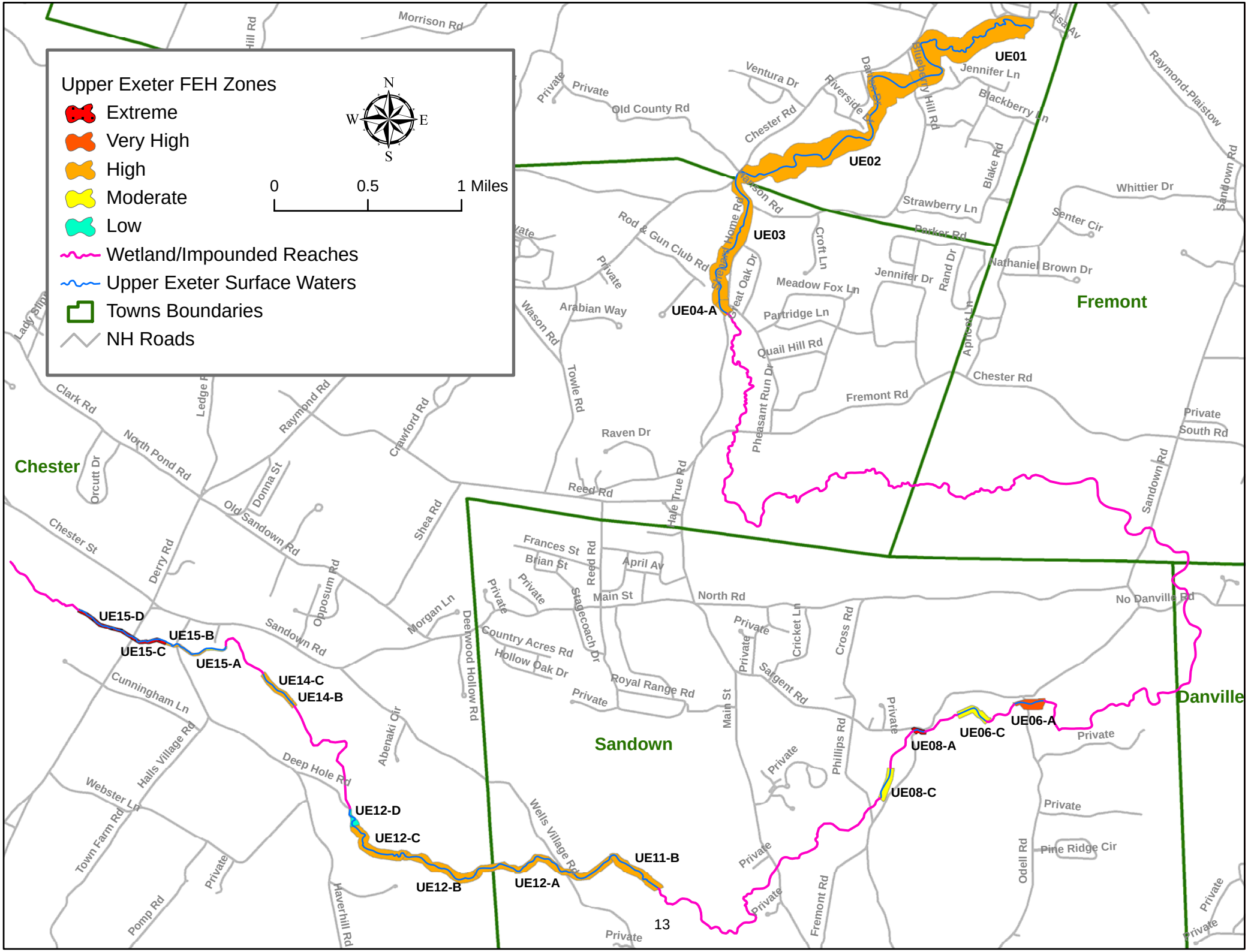
Upper Exeter River Fluvial Erosion Hazard Summary Tables

Table 2. Percent of FEH Corridor Occupied by Zoning Type, Conserved Lands and Wetlands

Segment	FEH Rating	Town	Town Zoning District			Conserved Lands	Wetlands	Total Protected Lands†
			Residential	Commercial	Industrial			
UE01*	High	Raymond	100.0%	0.0%	0.0%	2.2%	56.8%	57.4%
UE02*	High	Raymond/Chester	93.3%	6.7%	0.0%	0.0%	29.4%	29.4%
UE03	High	Chester	100.0%	0.0%	0.0%	23.5%	5.7%	29.0%
UE04-A*	High	Chester	100.0%	0.0%	0.0%	0.0%	7.6%	7.6%
UE06-A*	Very High	Sandown	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
UE06-C	Moderate	Sandown	100.0%	0.0%	0.0%	49.9%	20.3%	64.8%
UE08-A	Extreme	Sandown	100.0%	0.0%	0.0%	0.0%	1.6%	1.6%
UE08-C	Moderate	Sandown	100.0%	0.0%	0.0%	1.9%	0.0%	1.9%
UE11-B*	High	Sandown	100.0%	0.0%	0.0%	12.9%	55.9%	68.8%
UE12-A	High	Sandown/Chester	100.0%	0.0%	0.0%	6.0%	0.0%	6.0%
UE12-B	High	Chester	100.0%	0.0%	0.0%	0.0%	39.9%	39.9%
UE12-C*	High	Chester	100.0%	0.0%	0.0%	0.0%	46.1%	46.1%
UE12-D*	Low	Chester	100.0%	0.0%	0.0%	0.0%	20.6%	20.6%
UE14-B*	High	Chester	100.0%	0.0%	0.0%	0.0%	21.7%	21.7%
UE14-C	High	Chester	100.0%	0.0%	0.0%	0.0%	1.4%	1.4%
UE15-A	Moderate	Chester	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
UE15-B	High	Chester	100.0%	0.0%	0.0%	0.0%	26.2%	26.2%
UE15-C	Extreme	Chester	100.0%	0.0%	0.0%	0.0%	91.7%	91.7%
UE15-D	Extreme	Chester	100.0%	0.0%	0.0%	0.0%	26.6%	26.6%
		Percent of Total FEH Zone:	97.9%	2.1%	0.0%	5.2%	31.5%	36.2%

† Accounts for areas where conserved lands and wetlands overlap

* Sensitivity rating based on administrative judgment for RGA condition


Upper Exeter FEH Zones
Extreme
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Upper Exeter Surface Waters
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UE06-A
UE06-C
UE08-A
UE08-C
UE11-B
UE12-A
UE12-B
UE12-C
UE12-D
UE14-B
UE14-C
UE15-A
UE15-B
UE15-C
UE15-D
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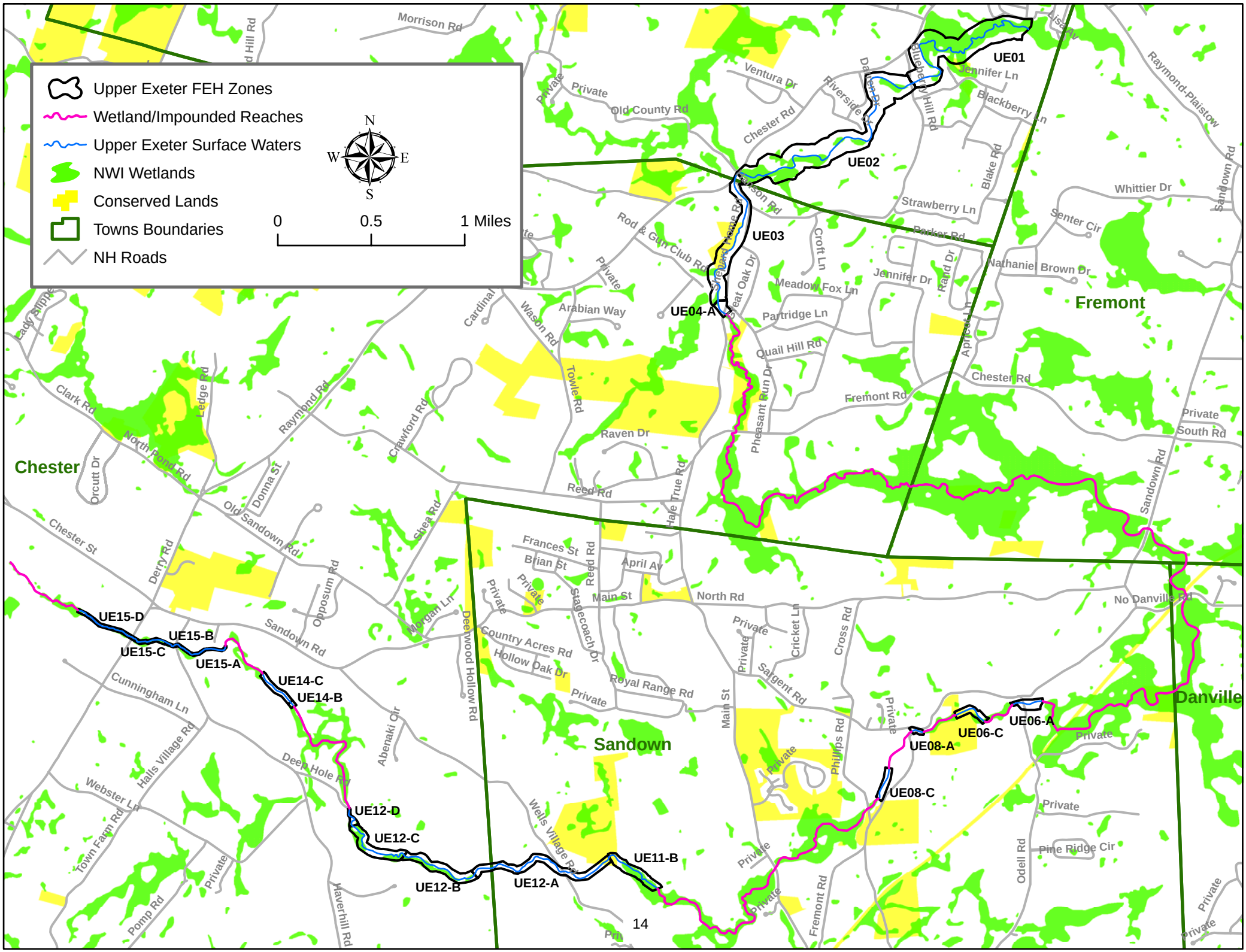
Sandown
Danville
Morrison Rd
Ventura Dr
Riverside Dr
Blueberry Hill Rd
Jennifer Ln
Blackberry Ln
Raymond-Plaistow
Sandown Rd
Old County Rd
Chester Rd
Blake Rd
Strawberry Ln
Whittier Dr
Senter Cir
Parker Rd
Nathaniel Brown Dr
Rod & Gun Club Rd
Great Oak Dr
Croft Ln
Meadow Fox Ln
Jennifer Dr
Rand Dr
Partridge Ln
Quail Hill Rd
Apricot Ln
Wason Rd
Arabian Way
Towle Rd
Pheasant Run Dr
Fremont Rd
Raven Dr
Private South Rd
Clark Rd
North Pond Rd
Raymond Rd
Crawford Rd
Orcutt Dr
Donna St
Old Sandown Rd
Shea Rd
Reed Rd
Hale True Rd
Chester St
Derry Rd
Opposum Rd
Frances St
Brian St
April Av
Main St
North Rd
No Danville Rd
Morgan Ln
Deerwood Hollow Rd
Country Acres Rd
Hollow Oak Dr
Stagecoach Dr
Cricket Ln
Cross Rd
Royal Range Rd
Sargent Rd
Phillips Rd
Cunningham Ln
Halls Village Rd
Abenaki Cir
Deep Hole Rd
Webster Ln
Town Farm Rd
Wells Village Rd
Odell Rd
Pine Ridge Cir
Pomp Rd
Haverhill Rd
Fremont Rd
Private
13


Upper Exeter FEH Zones
Wetland/Impounded Reaches
Upper Exeter Surface Waters
NWI Wetlands
Conserved Lands
Towns Boundaries
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UE02
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UE04-A
UE06-A
UE06-C
UE08-A
UE08-C
UE11-B
UE12-A
UE12-B
UE12-C
UE12-D
UE14-B
UE14-C
UE15-A
UE15-B
UE15-C
UE15-D
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Sandown
Danville
Morrison Rd
Ventura Dr
Riverside Dr
Blueberry Hill Rd
Jennifer Ln
Blackberry Ln
Raymond-Plaistow
Old County Rd
Chester Rd
Strawberry Ln
Blake Rd
Whittier Dr
Senter Cir
Sandown Rd
Rod & Gun Club Rd
Wason Rd
Croft Ln
Parker Rd
Nathaniel Brown Dr
Meadow Fox Ln
Jennifer Dr
Rand Dr
Arabian Way
Partridge Ln
Quail Hill Rd
Cardinal
Towle Rd
Pheasant Run Dr
Fremont Rd
Chester Rd
Private
South Rd
Clark Rd
Ledge Rd
Raymond Rd
Crawford Rd
Raven Dr
North Pond Rd
Orcutt Dr
Donna St
Old Sandown Rd
Reed Rd
Hale True Rd
Chester St
Derry Rd
Shea Rd
Frances St
Brian St
April Av
Main St
North Rd
No Danville Rd
Opposum Rd
Morgan Ln
Deerwood Hollow Rd
Stagecoach Dr
Cricket Ln
Cross Rd
Country Acres Rd
Hollow Oak Dr
Royal Range Rd
Sargent Rd
Cunningham Ln
Abenaki Cir
Phillips Rd
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Pomp Rd
Fremont Rd
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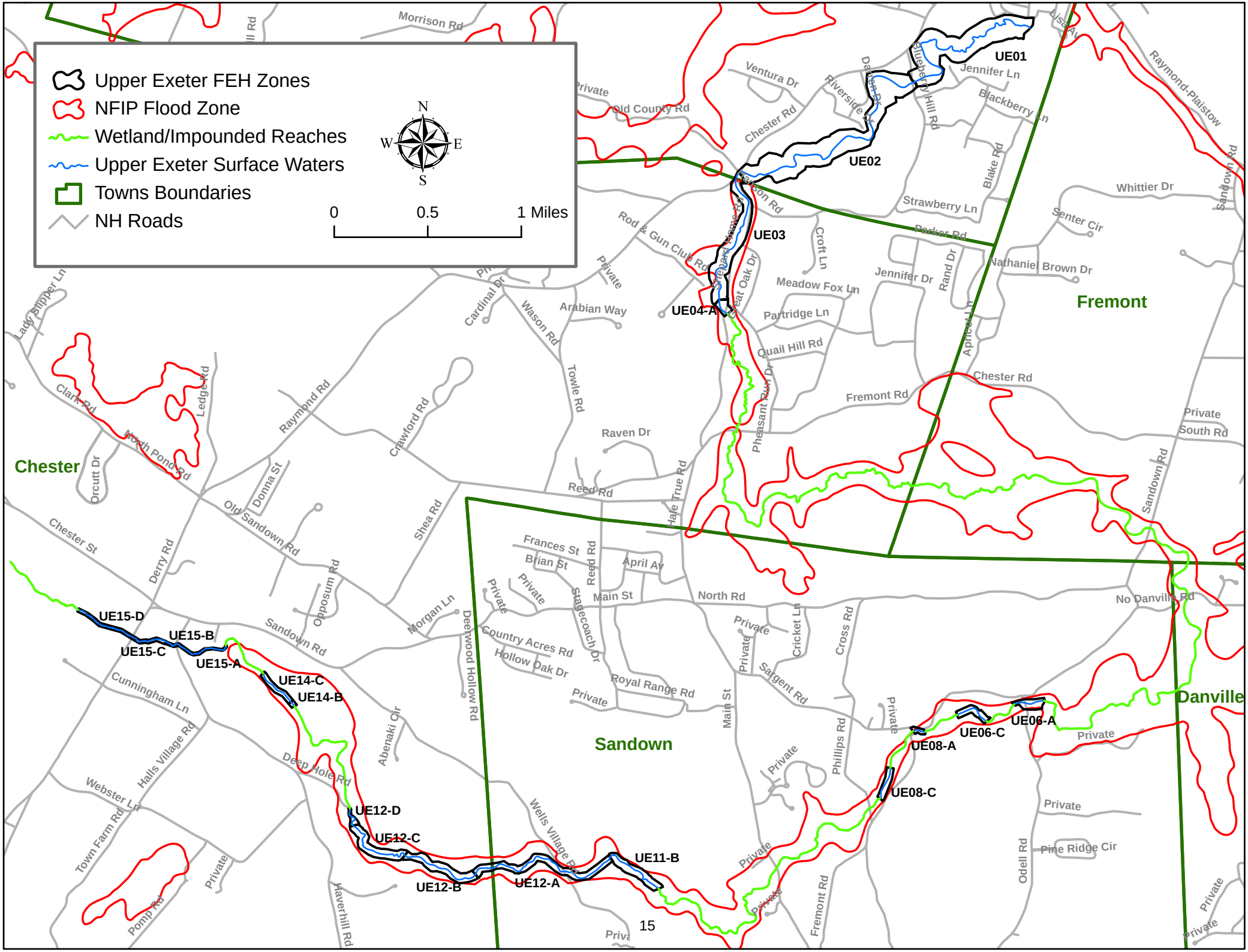
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NFIP Flood Zone
Wetland/Impounded Reaches
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Towns Boundaries
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UE03
UE04-A
UE06-A
UE06-C
UE08-A
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UE11-B
UE12-A
UE12-B
UE12-C
UE12-D
UE14-B
UE14-C
UE15-A
UE15-B
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UE15-D
Fremont
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Danville
Morrison Rd
Old County Rd
Ventura Dr
Chester Rd
Riverside Dr
Blueberry Hill Rd
Jennifer Ln
Blackberry Ln
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Whittier Dr
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Sandown Rd
Parker Rd
Nathaniel Brown Dr
Rod & Gun Club Rd
Croft Ln
Meadow Fox Ln
Jennifer Dr
Rand Dr
Apricot Ln
Partridge Ln
Quail Hill Rd
Fremont Rd
Pheasant Run Dr
Cardinal Dr
Wason Rd
Arabian Way
Towle Rd
Raven Dr
Hale True Rd
Reed Rd
Lady Slipper Ln
Clark Rd
North Pond Rd
Ledge Rd
Raymond Rd
Crawford Rd
Orcutt Dr
Donna St
Old Sandown Rd
Shea Rd
Chester St
Derry Rd
Opposum Rd
Morgan Ln
Deetwood Hollow Rd
Frances St
Brian St
April Av
Main St
North Rd
Stagecoach Dr
Country Acres Rd
Hollow Oak Dr
Royal Range Rd
Cricket Ln
Cross Rd
Sargent Rd
Phillips Rd
No Danville Rd
South Rd
Cunningham Ln
Halls Village Rd
Webster Ln
Town Farm Rd
Deep Hole Rd
Abenaki Cir
Wells Village Rd
Haverhill Rd
Pomp Rd
Odell Rd
Pine Ridge Cir
Fremont Rd
Private

Dudley Brook Fluvial Erosion Hazard Summary Tables

Table 1. Summary of Fluvial Erosion Hazard (FEH) Corridor Assets and Liabilities

Segment	Surface Water	FEH Rating	Town	Total FEH Zone Land (acres)	Town Zoning District: Residential (acres)	Town Zoning District: Mixed Use (acres)	Town Zoning District: Commercial (acres)	Town Zoning District: Industrial (acres)	Conserved Lands (acres)	Wetlands (acres)	Structures: Adjacent Buidlings (#)	Structures: Stream Crossings** (#)
LR01-A	Little River	Extreme*	Exeter	45.5	45.5	0.0	0.0	0.0	1.4	27.0	4	4
LR01-B	Little River	Extreme	Exeter	15.7	8.3	0.0	7.4	0.0	0.0	13.3	0	1
LR02-A	Little River	Extreme	Exeter	4.7	4.3	0.0	0.3	0.0	0.0	3.3	0	1
LR02-B	Little River	High*	Exeter	7.9	7.9	0.0	0.0	0.0	0.0	3.4	2	0
LR02-C	Little River	Very High	Exeter	2.4	2.4	0.0	0.0	0.0	0.0	1.2	0	0
LR04-A	Little River	Moderate	Exeter	2.7	2.7	0.0	0.0	0.0	0.4	0.0	0	1
LR04-B	Little River	High	Exeter	26.5	22.4	0.0	4.2	0.0	15.8	7.0	1	0
LR05	Little River	High	Exeter	15.0	6.1	0.0	8.9	0.0	15.0	8.7	0	0
BB01-A	Bloody Brook	High	Exeter	0.8	0.0	0.0	0.8	0.0	0.8	0.8	0	0
BB01-B	Bloody Brook	High*	Exeter	11.4	0.0	0.0	11.4	0.0	11.4	9.0	0	0
BB02	Bloody Brook	High*	Exeter	4.8	0.0	0.0	0.1	4.8	0.0	4.2	0	0
BB03-A	Bloody Brook	Extreme*	Exeter	3.7	1.7	0.0	1.4	0.6	0.1	1.7	0	4
BB03-B	Bloody Brook	High	Exeter	5.8	5.8	0.0	0.0	0.0	1.2	0.0	0	1
BB04	Bloody Brook	Extreme	Exeter	6.5	6.5	0.0	0.0	0.0	2.0	3.8	1	2
DB01-A	Dudley Brook	High	Exeter	5.8	4.4	0.0	1.4	0.0	5.8	4.0	0	0
DB01-B	Dudley Brook	Moderate	Exeter	1.5	1.5	0.0	0.0	0.0	1.4	0.4	0	0
DB01-C	Dudley Brook	High*	Exeter/Brentwood	29.5	29.5	0.0	0.0	0.0	2.4	25.6	1	1
DB02	Dudley Brook	Extreme*	Brentwood	30.0	30.0	0.0	0.0	0.0	11.7	25.2	0	1
DB03	Dudley Brook	High*	Brentwood	47.8	47.8	0.0	0.0	0.0	10.1	37.7	0	1

* Sensitivity rating based on administrative judgment for RGA condition

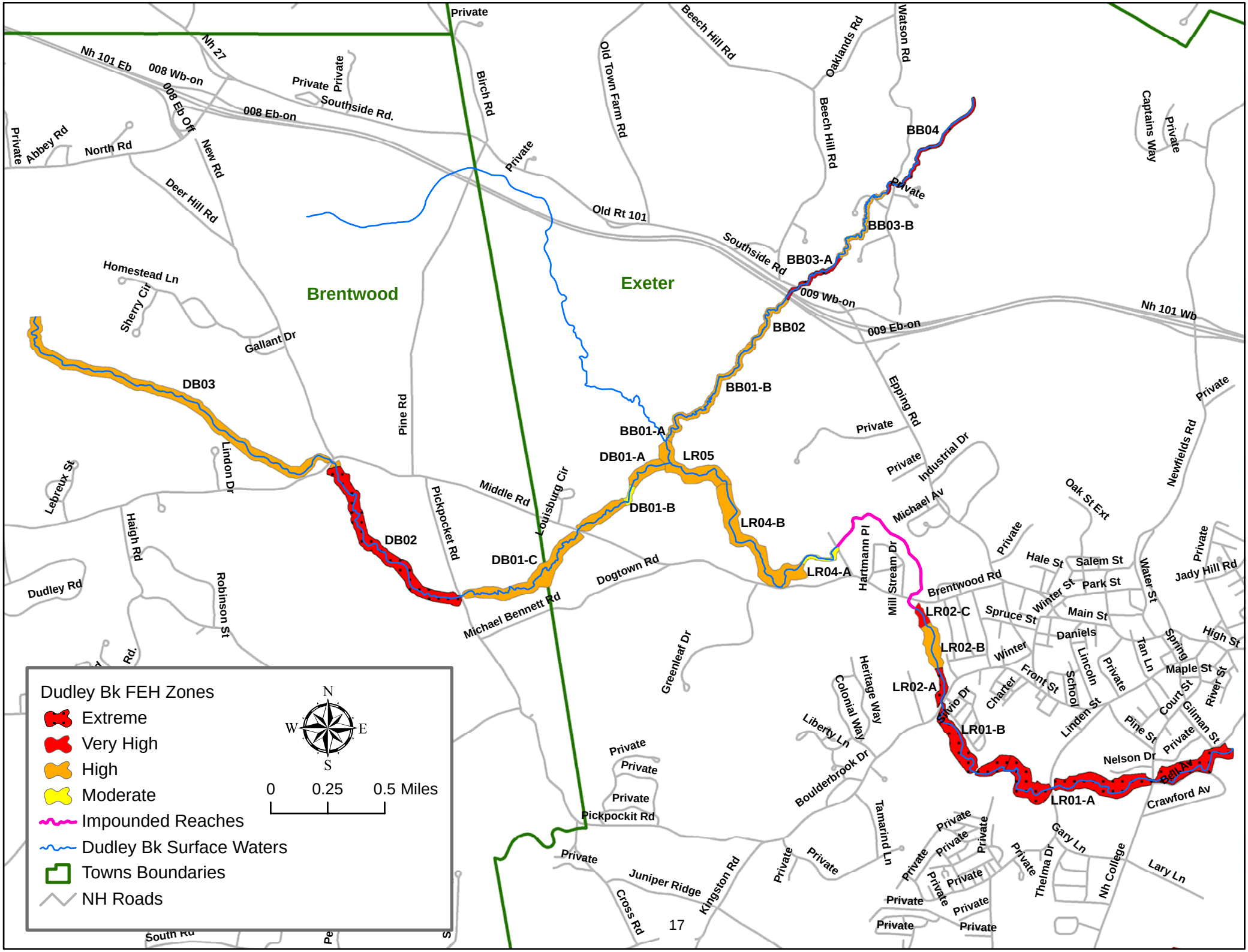
** Includes bridges and culverts

Table 2. Percent of FEH Corridor Occupied by Zoning Type, Conserved Lands and Wetlands

Segment	Surface Water	FEH Rating	Town	Town Zoning District: Residential	Town Zoning District: Mixed Use	Town Zoning District: Commercial	Town Zoning District: Industrial	Conserved Lands	Wetlands	Total Protected Lands†
LR01-A	Little River	Extreme*	Exeter	100.0%	0.0%	0.0%	0.0%	3.0%	59.3%	60.6%
LR01-B	Little River	Extreme	Exeter	52.8%	0.0%	47.2%	0.0%	0.0%	84.5%	84.5%
LR02-A	Little River	Extreme	Exeter	92.9%	0.0%	7.1%	0.0%	0.0%	71.1%	71.1%
LR02-B	Little River	High*	Exeter	100.0%	0.0%	0.0%	0.0%	0.0%	43.1%	43.1%
LR02-C	Little River	Very High	Exeter	100.0%	0.0%	0.0%	0.0%	0.0%	49.4%	49.4%
LR04-A	Little River	Moderate	Exeter	99.6%	0.0%	0.4%	0.0%	14.2%	0.0%	14.2%
LR04-B	Little River	High	Exeter	84.3%	0.0%	15.7%	0.0%	59.7%	26.3%	72.8%
LR05	Little River	High	Exeter	40.5%	0.0%	59.5%	0.0%	100.0%	58.1%	100.0%
BB01-A	Bloody Brook	High	Exeter	0.0%	0.0%	100.0%	0.0%	100.0%	89.3%	100.0%
BB01-B	Bloody Brook	High*	Exeter	0.0%	0.0%	99.7%	0.3%	99.6%	79.0%	99.7%
BB02	Bloody Brook	High*	Exeter	0.0%	0.0%	1.7%	98.3%	0.2%	86.8%	86.8%
BB03-A	Bloody Brook	Extreme*	Exeter	46.3%	0.0%	37.9%	15.7%	1.6%	46.9%	48.5%
BB03-B	Bloody Brook	High	Exeter	100.0%	0.0%	0.0%	0.0%	20.7%	0.0%	20.7%
BB04	Bloody Brook	Extreme	Exeter	100.0%	0.0%	0.0%	0.0%	31.4%	58.1%	67.3%
DB01-A	Dudley Brook	High	Exeter	75.3%	0.0%	24.7%	0.0%	100.0%	68.9%	100.0%
DB01-B	Dudley Brook	Moderate	Exeter	100.0%	0.0%	0.0%	0.0%	97.3%	25.2%	97.3%
DB01-C	Dudley Brook	High*	Exeter/Brentwood	100.0%	0.0%	0.0%	0.0%	8.1%	86.5%	87.0%
DB02	Dudley Brook	Extreme*	Brentwood	100.0%	0.0%	0.0%	0.0%	39.2%	84.1%	89.1%
DB03	Dudley Brook	High*	Brentwood	100.0%	0.0%	0.0%	0.0%	21.0%	78.8%	81.9%
			Percent of Total FEH Zone:	84.6%	0.0%	13.4%	2.0%	29.6%	65.7%	76.8%

† Accounts for areas where conserved lands and wetlands overlap

* Sensitivity rating based on administrative judgment for RGA condition


Dudley Bk FEH Zones
Extreme
Very High
High
Moderate
Impounded Reaches
Dudley Bk Surface Waters
Towns Boundaries
NH Roads
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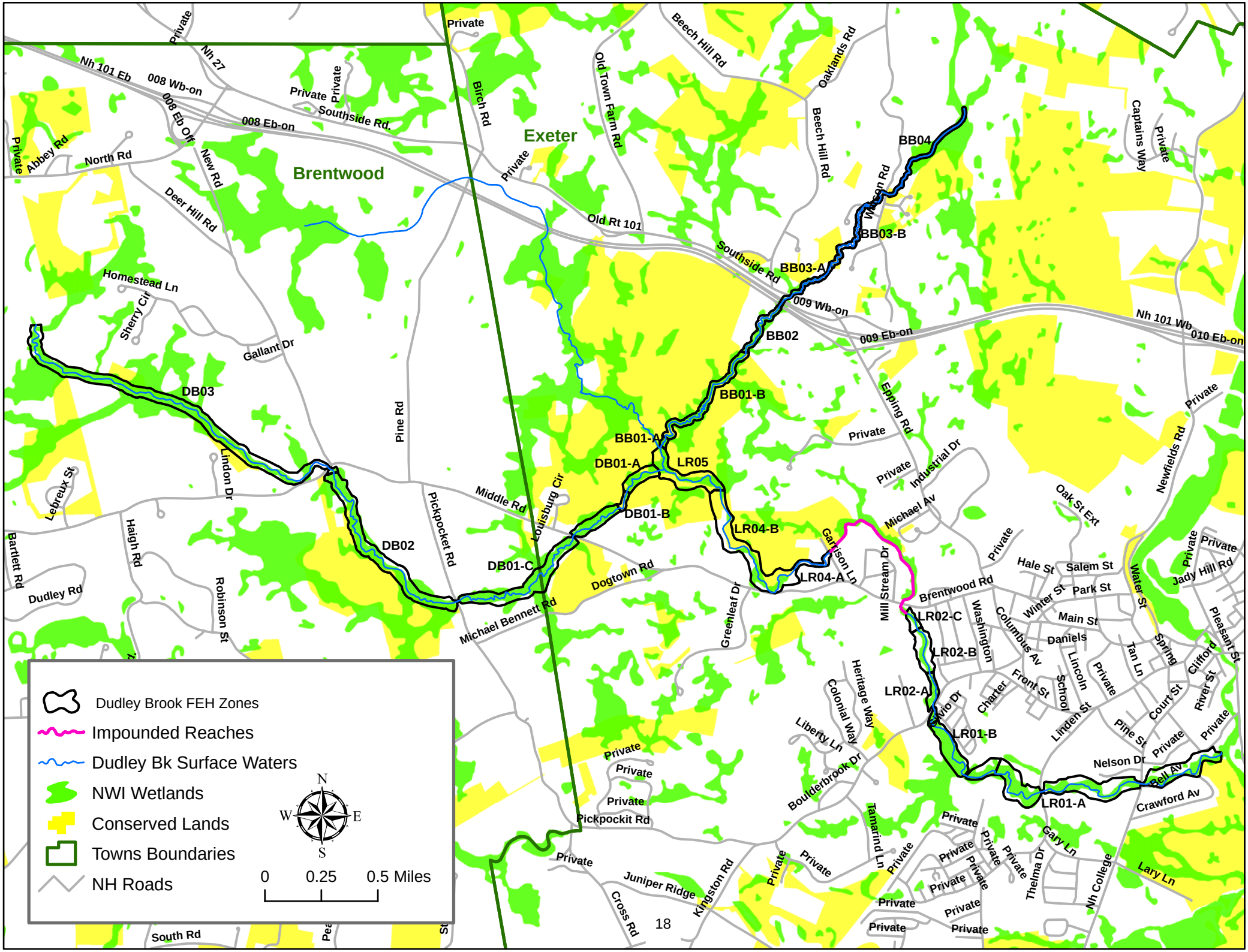
0.25
0.5 Miles
Brentwood
Exeter
DB03
DB02
DB01-A
DB01-B
DB01-C
BB01-A
BB01-B
BB02
BB03-A
BB03-B
BB04
LR05
LR04-A
LR04-B
LR02-A
LR02-B
LR02-C
LR01-A
LR01-B
Nh 101 Eb
008 Wb-on
008 Eb Off
008 Eb-on
Nh 27
Private
Southside Rd.
Abbey Rd
North Rd
New Rd
Deer Hill Rd
Birch Rd
Old Town Farm Rd
Beech Hill Rd
Oaklands Rd
Watson Rd
Captains Way
Old Rt 101
Southside Rd
009 Wb-on
009 Eb-on
Nh 101 Wb
Homestead Ln
Sherry Cir
Gallant Dr
Lindon Dr
Lebreux St
Haigh Rd
Dudley Rd
Robinson St
Pine Rd
Pickpocket Rd
Middle Rd
Louisburg Cir
Dogtown Rd
Michael Bennett Rd
Greenleaf Dr
Epping Rd
Industrial Dr
Michael Av
Hartmann Pl
Mill Stream Dr
Brentwood Rd
Newfields Rd
Oak St Ext
Hale St
Salem St
Winter St
Park St
Water St
Jady Hill Rd
Spruce St
Main St
Daniels
Winter
Lincoln
Tan Ln
Spring
High St
Maple St
Front St
School
Charter
Silvio Dr
Linden St
Court St
River St
Pine St
Gilman St
Nelson Dr
Bell Av
Crawford Av
Heritage Way
Colonial Way
Liberty Ln
Boulderbrook Dr
Tamarind Ln
Gary Ln
Thelma Dr
Nh College
Lary Ln
Juniper Ridge
Kingston Rd
Cross Rd
South Rd


Dudley Brook FEH Zones
Impounded Reaches
Dudley Bk Surface Waters
NWI Wetlands
Conserved Lands
Towns Boundaries
NH Roads
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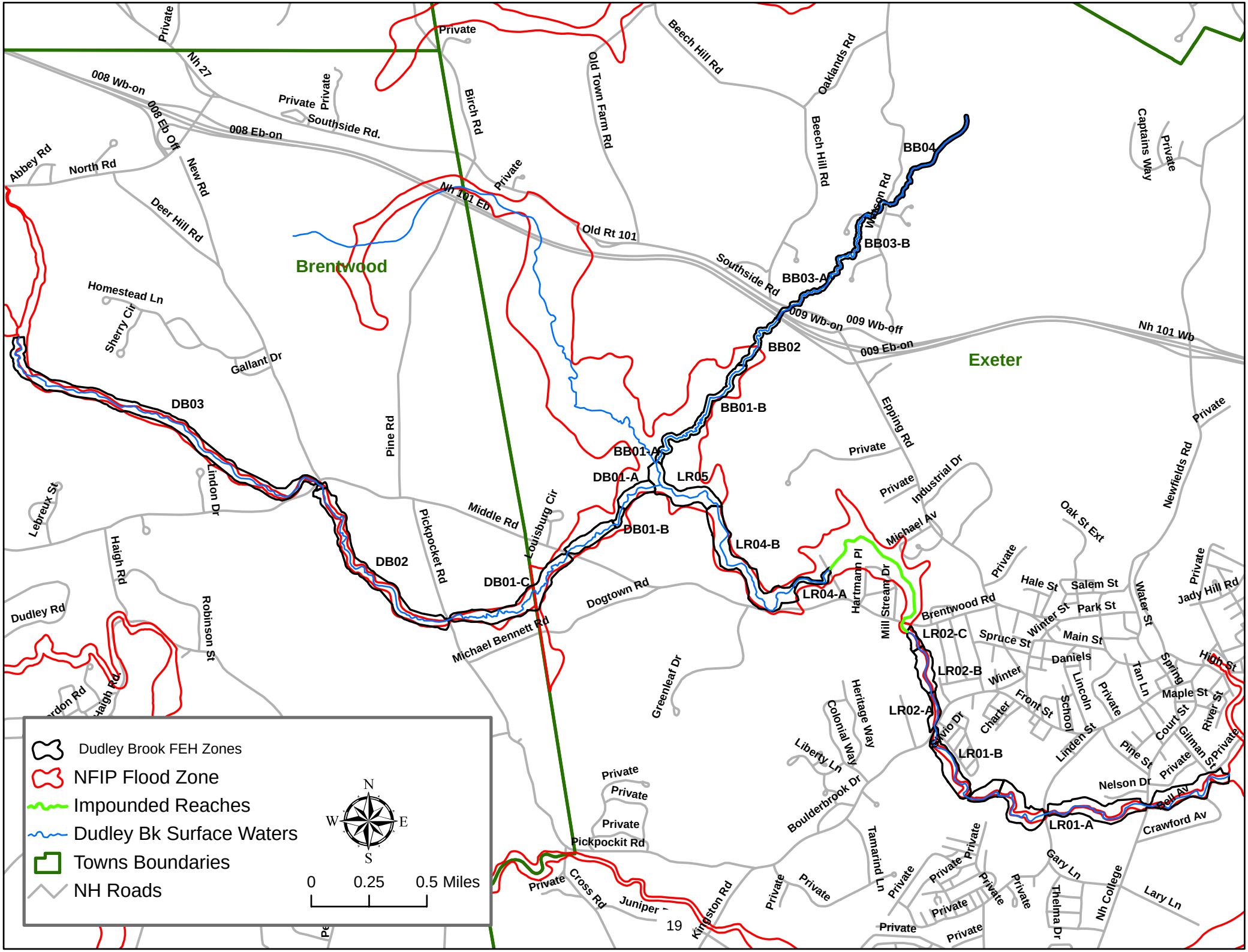
0
0.25
0.5 Miles
Brentwood
Exeter
BB04
BB03-B
BB03-A
BB02
BB01-B
BB01-A
DB01-A
LR05
DB01-B
LR04-B
LR04-A
DB03
DB02
DB01-C
LR02-C
LR02-B
LR02-A
LR01-B
LR01-A
Nh 101 Eb
008 Wb-on
008 Eb Off
008 Eb-on
Nh 27
Old Rt 101
Southside Rd
009 Wb-on
009 Eb-on
Nh 101 Wb
010 Eb-on
Beech Hill Rd
Oaklands Rd
Old Town Farm Rd
Birch Rd
Wilson Rd
Captains Way
Abbey Rd
North Rd
New Rd
Deer Hill Rd
Homestead Ln
Sherry Cir
Gallant Dr
Pine Rd
Lindon Dr
Lebreux St
Haigh Rd
Bartlett Rd
Dudley Rd
Robinson St
Pickpocket Rd
Middle Rd
Louisburg Cir
Dogtown Rd
Michael Bennett Rd
Greenleaf Dr
Garrison Ln
Mill Stream Dr
Epping Rd
Industrial Dr
Michael Av
Brentwood Rd
Hale St
Salem St
Winter St
Park St
Main St
Daniels
Washington
Columbus Av
Lincoln
Charter
Front St
School
Linden St
Heritage Way
Colonial Way
Liberty Ln
Boulderbrook Dr
Tamarind Ln
Pickpockit Rd
Juniper Ridge
Kingston Rd
Cross Rd
Oak St Ext
Newfields Rd
Water St
Jady Hill Rd
Pleasant St
Clifford
River St
Court St
Spring
Tan Ln
Pine St
Nelson Dr
Bell Av
Crawford Av
Gary Ln
Thelma Dr
Nh College
Lary Ln
South Rd
Private


Dudley Brook FEH Zones
NFIP Flood Zone
Impounded Reaches
Dudley Bk Surface Waters
Towns Boundaries
NH Roads
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W
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0
0.25
0.5 Miles
Brentwood
Exeter
DB03
DB02
DB01-C
DB01-B
DB01-A
BB01-A
BB01-B
BB02
BB03-A
BB03-B
BB04
LR05
LR04-B
LR04-A
LR02-C
LR02-B
LR02-A
LR01-B
LR01-A
008 Wb-on
008 Eb Off
008 Eb-on
Nh 27
Nh 101 Eb
Nh 101 Wb
Old Rt 101
Southside Rd
Southside Rd.
009 Wb-on
009 Wb-off
009 Eb-on
Private
Abbey Rd
North Rd
New Rd
Deer Hill Rd
Homestead Ln
Sherry Cir
Gallant Dr
Lebreux St
Lindon Dr
Haigh Rd
Dudley Rd
Robinson St
Pine Rd
Pickpocket Rd
Middle Rd
Louisburg Cir
Dogtown Rd
Michael Bennett Rd
Greenleaf Dr
Pickpockit Rd
Cross Rd
Juniper
Kingston Rd
Birch Rd
Old Town Farm Rd
Beech Hill Rd
Oaklands Rd
Wilson Rd
Epping Rd
Industrial Dr
Michael Av
Hartmann Pl
Mill Stream Dr
Brentwood Rd
Hale St
Salem St
Winter St
Park St
Spruce St
Main St
Daniels
Winter
Front St
Charter
Lincoln
School
Linden St
Heritage Way
Colonial Way
Liberty Ln
Boulderbrook Dr
Tamarind Ln
Nelson Dr
Gary Ln
Thelma Dr
Nh College
Lary Ln
Crawford Av
Bell Av
Pine St
Gilman St
Court St
River St
Maple St
High St
Spring
Tan Ln
Water St
Oak St Ext
Newfields Rd
Jady Hill Rd
Captains Way

Lower Exeter River Fluvial Erosion Hazard Summary Tables

Table 1. Summary of Fluvial Erosion Hazard (FEH) Corridor Assets and Liabilities

				Town Zoning District						Structures	
Segment	FEH Rating	Town	Total FEH Zone Land (acres)	Residential (acres)	Mixed Use (acres)	Commercial (acres)	Industrial (acres)	Conserved Lands (acres)	Wetlands (acres)	Adjacent Buidlings (#)	Stream Crossings** (#)
LE01	High*	Exeter	27.2	23.8	0.0	3.3	0.0	0.0	10.9	24	2
LE02	High*	Exeter	84.7	84.7	0.0	0.0	0.0	67.0	40.1	2	0
LE03	High*	Exeter	22.3	22.3	0.0	0.0	0.0	9.6	18.2	0	0
LE04	High	Exeter	119.7	119.7	0.0	0.0	0.0	28.1	63.1	11	1
LE05	Moderate	Exeter	6.2	6.2	0.0	0.0	0.0	0.4	0.0	5	1
LE06	Very High	Exeter	36.4	36.4	0.0	0.0	0.0	13.8	2.8	26	0
LE07	High	Exeter	44.0	44.0	0.0	0.0	0.0	20.7	3.0	1	1
LE08	Moderate	Exeter	8.5	8.5	0.0	0.0	0.0	5.4	4.1	0	0
LE09-A	Very High	Exeter	11.2	11.2	0.0	0.0	0.0	0.4	5.2	0	1
LE09-B	High	Exeter	3.3	3.3	0.0	0.0	0.0	0.0	0.0	1	0
LE10-A	Moderate	Exeter	7.3	7.3	0.0	0.0	0.0	0.0	0.0	3	0
LE10-B	High	Exeter/Brentwood	3.5	3.5	0.0	0.0	0.0	0.0	0.1	1	1
LE12	High*	Brentwood	147.1	147.1	0.0	0.0	0.0	72.8	57.4	1	0

* Sensitivity rating based on administrative judgment for RGA condition

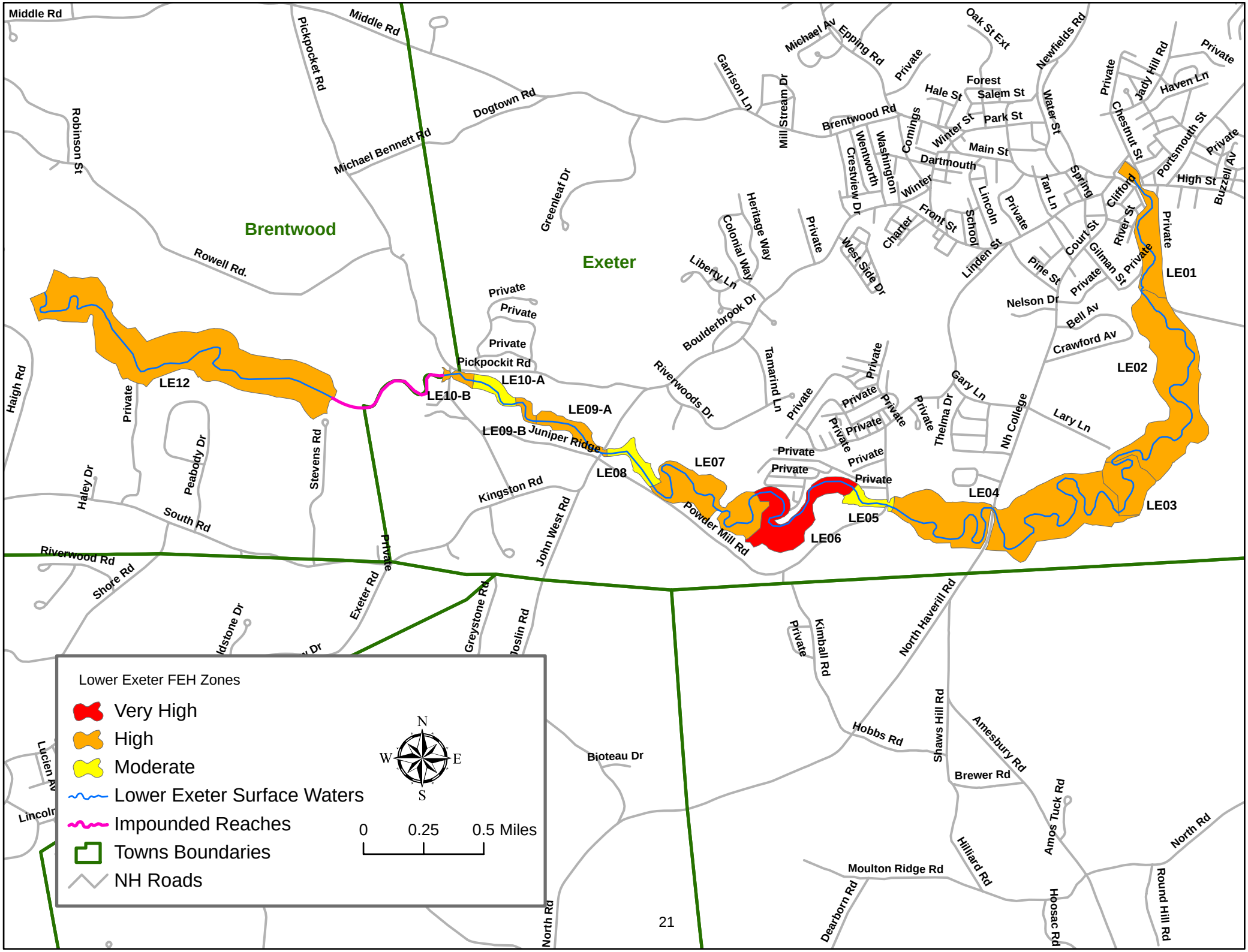
** Includes bridges and culverts

Table 2. Percent of FEH Corridor Occupied by Zoning Type, Conserved Lands and Wetlands

			Town Zoning District						
Segment	FEH Rating	Town	Residential (acres)	Mixed Use (acres)	Commercial (acres)	Industrial (acres)	Conserved Lands	Wetlands	Protected Lands†
LE01	High*	Exeter	87.7%	0.0%	12.3%	0.0%	0.0%	40.0%	40.0%
LE02	High*	Exeter	100.0%	0.0%	0.0%	0.0%	79.1%	47.4%	92.4%
LE03	High*	Exeter	100.0%	0.0%	0.0%	0.0%	43.3%	81.5%	98.5%
LE04	High	Exeter	100.0%	0.0%	0.0%	0.0%	23.5%	52.7%	69.1%
LE05	Moderate	Exeter	100.0%	0.0%	0.0%	0.0%	6.7%	0.0%	6.7%
LE06	Very High	Exeter	100.0%	0.0%	0.0%	0.0%	37.8%	7.6%	42.8%
LE07	High	Exeter	100.0%	0.0%	0.0%	0.0%	47.0%	6.9%	50.5%
LE08	Moderate	Exeter	100.0%	0.0%	0.0%	0.0%	63.3%	48.4%	81.9%
LE09-A	Very High	Exeter	100.0%	0.0%	0.0%	0.0%	3.7%	46.4%	49.8%
LE09-B	High	Exeter	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
LE10-A	Moderate	Exeter	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
LE10-B	High	Exeter/Brentwood	100.0%	0.0%	0.0%	0.0%	0.0%	2.3%	2.3%
LE12	High*	Brentwood	100.0%	0.0%	0.0%	0.0%	49.5%	39.0%	70.8%
		Percent of Total FEH Zone:	99.4%	0.0%	0.6%	0.0%	41.9%	39.3%	66.9%

† Accounts for areas where conserved lands and wetlands overlap

* Sensitivity rating based on administrative judgment for RGA condition


Lower Exeter FEH Zones
Very High
High
Moderate
Lower Exeter Surface Waters
Impounded Reaches
Towns Boundaries
NH Roads
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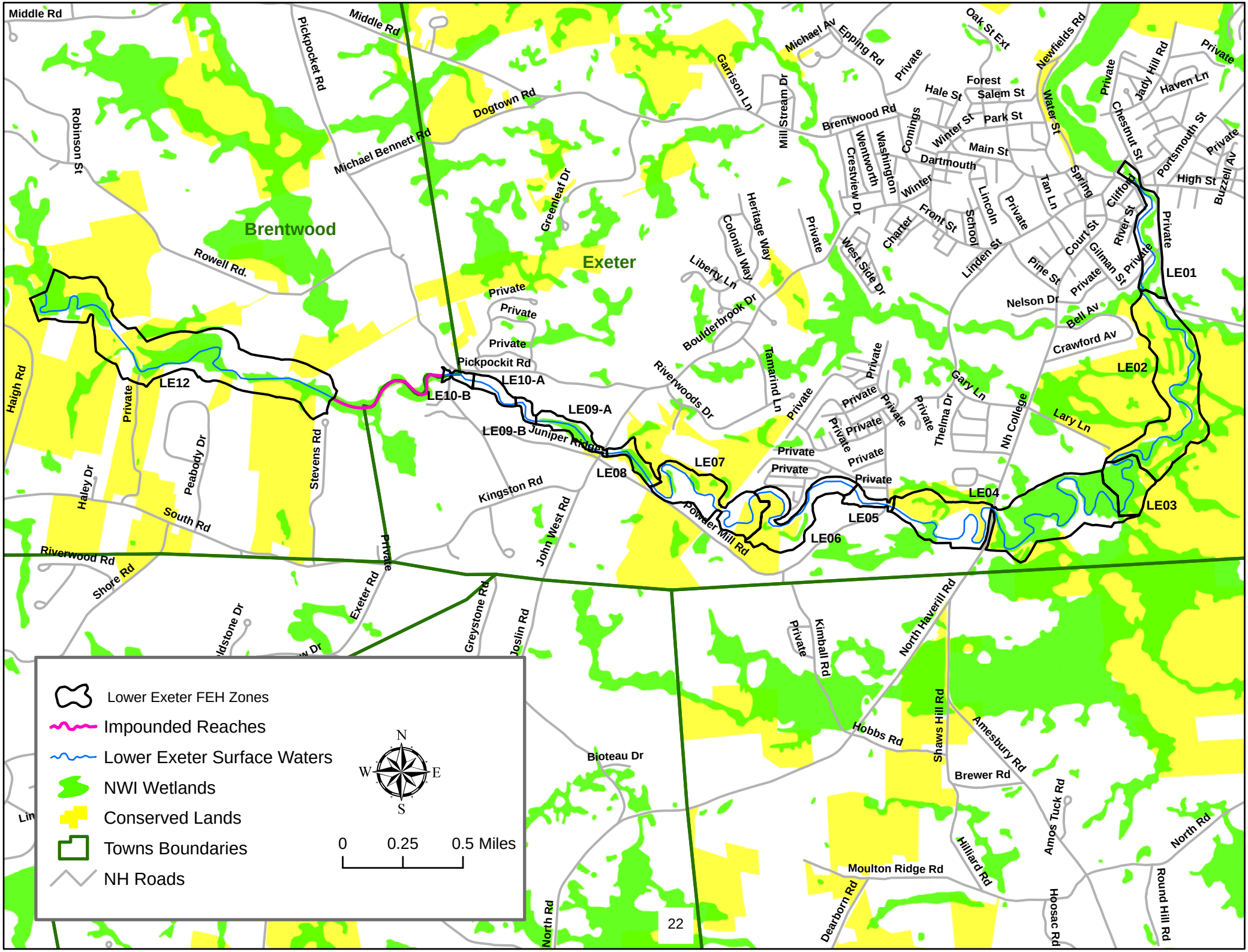
0.25
0.5 Miles
Brentwood
Exeter
LE01
LE02
LE03
LE04
LE05
LE06
LE07
LE08
LE09-A
LE09-B
LE10-A
LE10-B
LE12
Middle Rd
Pickpocket Rd
Dogtown Rd
Michael Bennett Rd
Robinson St
Rowell Rd.
Greenleaf Dr
Haigh Rd
Haley Dr
Peabody Dr
Stevens Rd
South Rd
Riverwood Rd
Shore Rd
Exeter Rd
Greystone Rd
Joslin Rd
John West Rd
Kingston Rd
Pickpocket Rd
Juniper Ridge
Powder Mill Rd
Riverwoods Dr
Boulderbrook Dr
Liberty Ln
Colonial Way
Heritage Way
Garrison Ln
Mill Stream Dr
Michael Av
Epping Rd
Brentwood Rd
Crestview Dr
Wentworth
Washington
Comings
Winter
Winter St
Hale St
Forest
Salem St
Park St
Main St
Dartmouth
Oak St Ext
Newfields Rd
Water St
Chestnut St
Jady Hill Rd
Haven Ln
Portsmouth St
High St
Buzzell Av
Clifford
River St
Spring
Tan Ln
Lincoln
Linden St
Front St
Charter
West Side Dr
School
Court St
Gilman St
Pine St
Nelson Dr
Bell Av
Crawford Av
Tamarind Ln
Thelma Dr
Gary Ln
Nh College
Lary Ln
Kimball Rd
North Haverill Rd
Hobbs Rd
Shaws Hill Rd
Amesbury Rd
Brewer Rd
Amos Tuck Rd
Hilliard Rd
Moulton Ridge Rd
Dearborn Rd
Hoosac Rd
Round Hill Rd
North Rd
Bioteau Dr
Lucien Av
Lincoln
Private


Lower Exeter FEH Zones
Impounded Reaches
Lower Exeter Surface Waters
NWI Wetlands
Conserved Lands
Towns Boundaries
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Exeter
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LE09-A
LE09-B
LE10-A
LE10-B
LE12
Middle Rd
Pickpocket Rd
Dogtown Rd
Michael Bennett Rd
Robinson St
Rowell Rd.
Haigh Rd
Haley Dr
Peabody Dr
Stevens Rd
South Rd
Riverwood Rd
Shore Rd
Exeter Rd
Greenleaf Dr
Kingston Rd
John West Rd
Juniper Ridge
Pickpockit Rd
Riverwoods Dr
Boulderbrook Dr
Liberty Ln
Colonial Way
Heritage Way
Garrison Ln
Mill Stream Dr
Michael Av
Epping Rd
Brentwood Rd
Crestview Dr
Wentworth
Washington
Comings
Winter
Winter St
Hale St
Forest
Salem St
Park St
Main St
Dartmouth
Oak St Ext
Newfields Rd
Water St
Chestnut St
Jady Hill Rd
Haven Ln
Portsmouth St
High St
Buzzell Av
Spring
Tan Ln
Lincoln
Linden St
Front St
Charter
School
West Side Dr
Court St
Gilman St
Pine St
Nelson Dr
Bell Av
Crawford Av
River St
Clifford
Tamarind Ln
Thelma Dr
Cary Ln
Nh College
Lary Ln
Powder Mill Rd
Kimball Rd
North Haverill Rd
Hobbs Rd
Shaws Hill Rd
Amesbury Rd
Brewer Rd
Bioteau Dr
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Hilliard Rd
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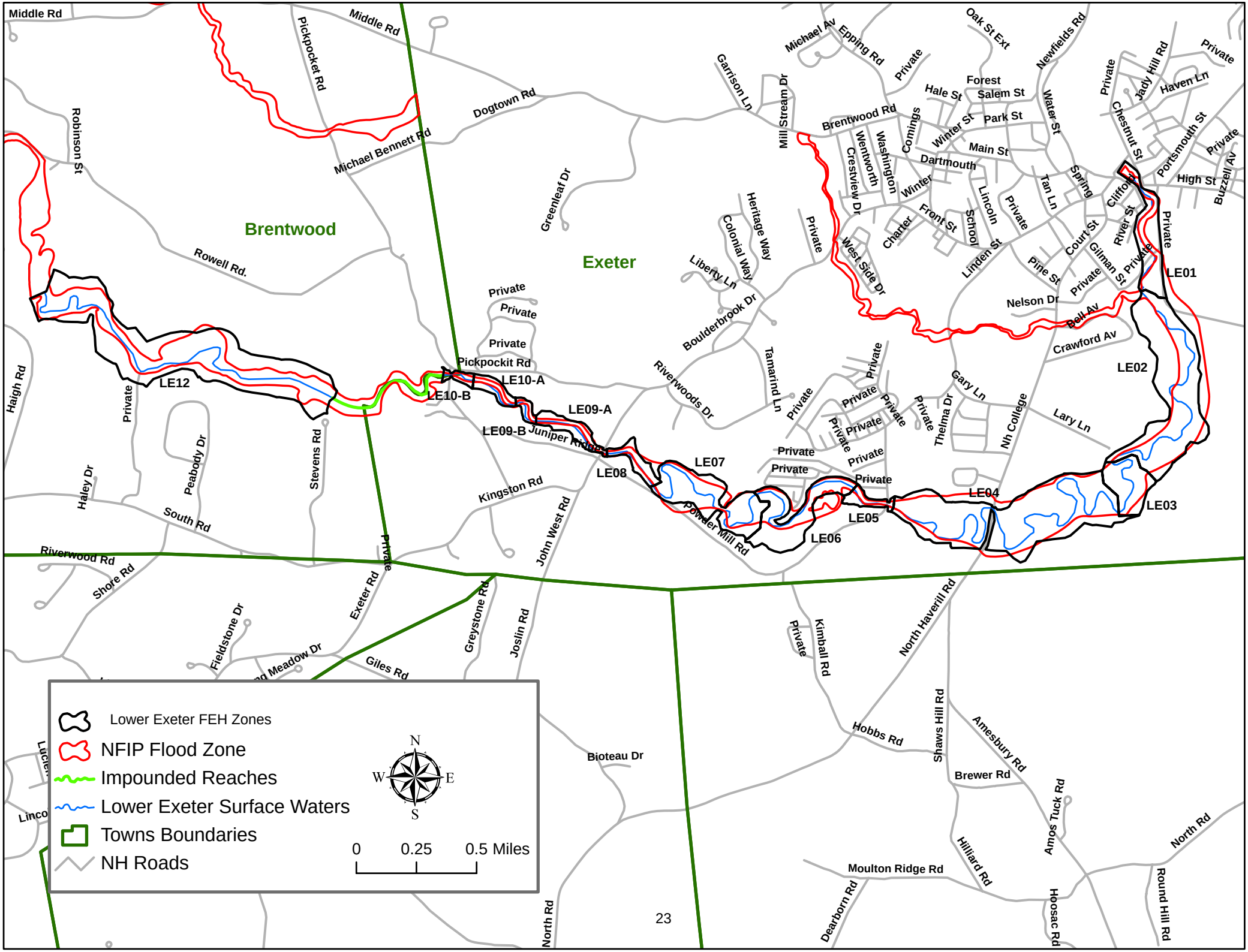
Hoosac Rd
North Rd
Round Hill Rd
Greystone Rd
Joslin Rd
Private


Brentwood
Exeter
LE01
LE02
LE03
LE04
LE05
LE06
LE07
LE08
LE09-A
LE09-B
LE10-A
LE10-B
LE12
Lower Exeter FEH Zones
NFIP Flood Zone
Impounded Reaches
Lower Exeter Surface Waters
Towns Boundaries
NH Roads
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Middle Rd
Pickpocket Rd
Dogtown Rd
Michael Bennett Rd
Robinson St
Rowell Rd.
Haigh Rd
Haley Dr
Peabody Dr
South Rd
Stevens Rd
Riverwood Rd
Shore Rd
Fieldstone Dr
Exeter Rd
Giles Rd
Greystone Rd
Joslin Rd
John West Rd
Kingston Rd
Juniper Ridge Rd
Powder Mill Rd
Riverwoods Dr
Boulderbrook Dr
Liberty Ln
Colonial Way
Heritage Way
Greenleaf Dr
Garrison Ln
Mill Stream Dr
Michael Av
Epping Rd
Brentwood Rd
Hale St
Forest
Salem St
Oak St Ext
Newfields Rd
Water St
Winter St
Park St
Main St
Dartmouth
Wentworth
Washington
Comings
Crestview Dr
Winter
Front St
Charter
West Side Dr
Lincoln
School
Linden St
Tan Ln
Spring
Clifford
Court St
Pine St
Gilman St
River St
Chestnut St
Jady Hill Rd
Haven Ln
Portsmouth St
High St
Buzzell Av
Nelson Dr
Bell Av
Crawford Av
Gary Ln
Lary Ln
Thelma Dr
NH College
Tamarind Ln
Kimball Rd
North Haverill Rd
Hobbs Rd
Shaws Hill Rd
Amesbury Rd
Brewer Rd
Amos Tuck Rd
Hilliard Rd
Moulton Ridge Rd
Dearborn Rd
Hoosac Rd
Round Hill Rd
North Rd
Bioteau Dr
Linco
Lucie
Meadow Dr
Private

Appendix F

Photos of Proposed

Project Locations

Fordway Brook Project #1

Fordway Brook Project #2

Fordway Brook Project #3

Fordway Brook Project #4

Fordway Brook Project #5

Fordway Brook Project #6

Fordway Brook Project #7

Fordway Brook Project #8

Fordway Brook Project #9

Fordway Brook Project #10

Fordway Brook Project #11

Fordway Brook Project #12

Fordway Brook Project #13

Fordway Brook Project #14

Fordway Brook Project #15

Fordway Brook Project #16

Fordway Brook Project #17

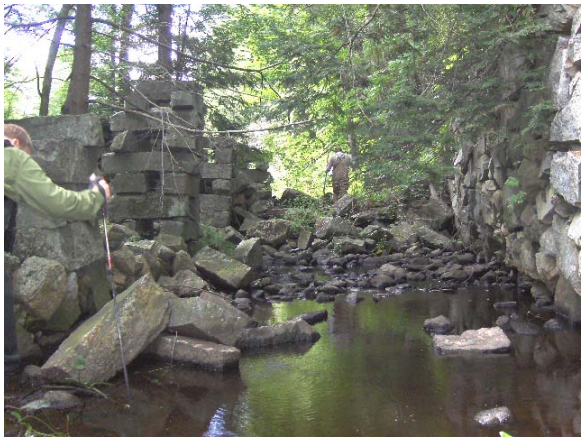
Fordway Brook Project #18

Fordway Brook Project #19

Upper Exeter River Project #1

Upper Exeter River Project #2

Upper Exeter River Project #3



Upper Exeter River Project #4

Upper Exeter River Project #5

Upper Exeter River Project #6

Upper Exeter River Project #7

Upper Exeter River Project #8

Upper Exeter River Project #9

Upper Exeter River Project #10

Upper Exeter River Project #11

Upper Exeter River Project #12

Upper Exeter River Project #13

Upper Exeter River Project #14

Upper Exeter River Project #15

Upper Exeter River Project #16

Upper Exeter River Project #17

Upper Exeter River Project #18

Upper Exeter River Project #19

Upper Exeter River Project #20

Upper Exeter River Project #21

Upper Exeter River Project #22

Dudley-Bloody Brook Project #1

Dudley-Bloody Brook Project #3

Dudley-Bloody Brook Project #5

Dudley-Bloody Brook Project #2

Dudley-Bloody Brook Project #4

Dudley-Bloody Brook Project #6

Dudley-Bloody Brook Project #7

Dudley-Bloody Brook Project #8

Dudley-Bloody Brook Project #9

Dudley-Bloody Brook Project #10

Dudley-Bloody Brook Project #11

Dudley-Bloody Brook Project #12

Dudley-Bloody Brook Project #13

Dudley-Bloody Brook Project #14

Dudley-Bloody Brook Project #15

Dudley-Bloody Brook Project #16 & 17

Dudley-Bloody Brook Project #18

Lower Exeter River Project #1

Lower Exeter River Project #2

Lower Exeter River Projects #3, 5, 6

Lower Exeter River Project #4

Lower Exeter River Project #7

Lower Exeter River Project #8

Lower Exeter River Project #9

Lower Exeter River Project #10

Lower Exeter River Project #12

Lower Exeter River Project #11

Lower Exeter River Project #13

Lower Exeter River Project #14

Lower Exeter River Project #15

Lower Exeter River Project #16