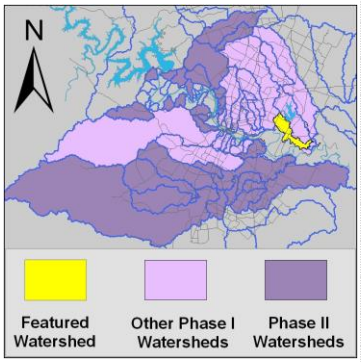
Elm Creek Watershed

Summary Sheet

Catchment	Total area	9 sq. miles
	Area in recharge	0
	Creek length	10 miles
	Receiving water	Gilleland Creek
Demographics	2000 population	3,136
	2030 projected population	5,643
	30 year projected % increase	180 %
Land Use	Impervious cover (2003 estimate)	7.2 %
	Impervious cover (2013 estimate)	12.8 %

Overall EII Scores	1999	2002	2005	2008	2009	2011	2013
	49	65	46	45	62	33	57



Flow Regime* for Sample Sites on Elm Creek

Site	Site Name	2002					2005					2008					2009					2010	2011				2013				
		Feb	Feb	May	Aug	Nov	Mar	Jun	Jun	Sep	Dec	Feb	May	Jun	Sep	Dec	Feb	May	Jun	Oct	Dec	Dec	Mar	Jun	Jun	Sep	Jan	Apr	May	Jun	Sep
		WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ	WQ	WQ	Bio	WQ	WQ	WQ	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ	WQ	Bio	WQ	WQ	WQ
1202	Blue Bluff	B	B	n	n	B	B	B	n	n	n																					
1203	Catherine	n																														
1204	FM 973	B	B	n	n	B	B	n	n	n	n	B	n	n	n	n	n	n	n	n	B	n	n	n	n	n	n	n	n	n	n	n
887	Milo	n		n																												
3614	Austins Colony						B	n	n	n	n	n	B	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n

* B = baseflow n = no flow S = storm flow blue = Samples were taken light blue = Samples were not taken blank = not visited

Index scores* for Elm Creek Sites by Year

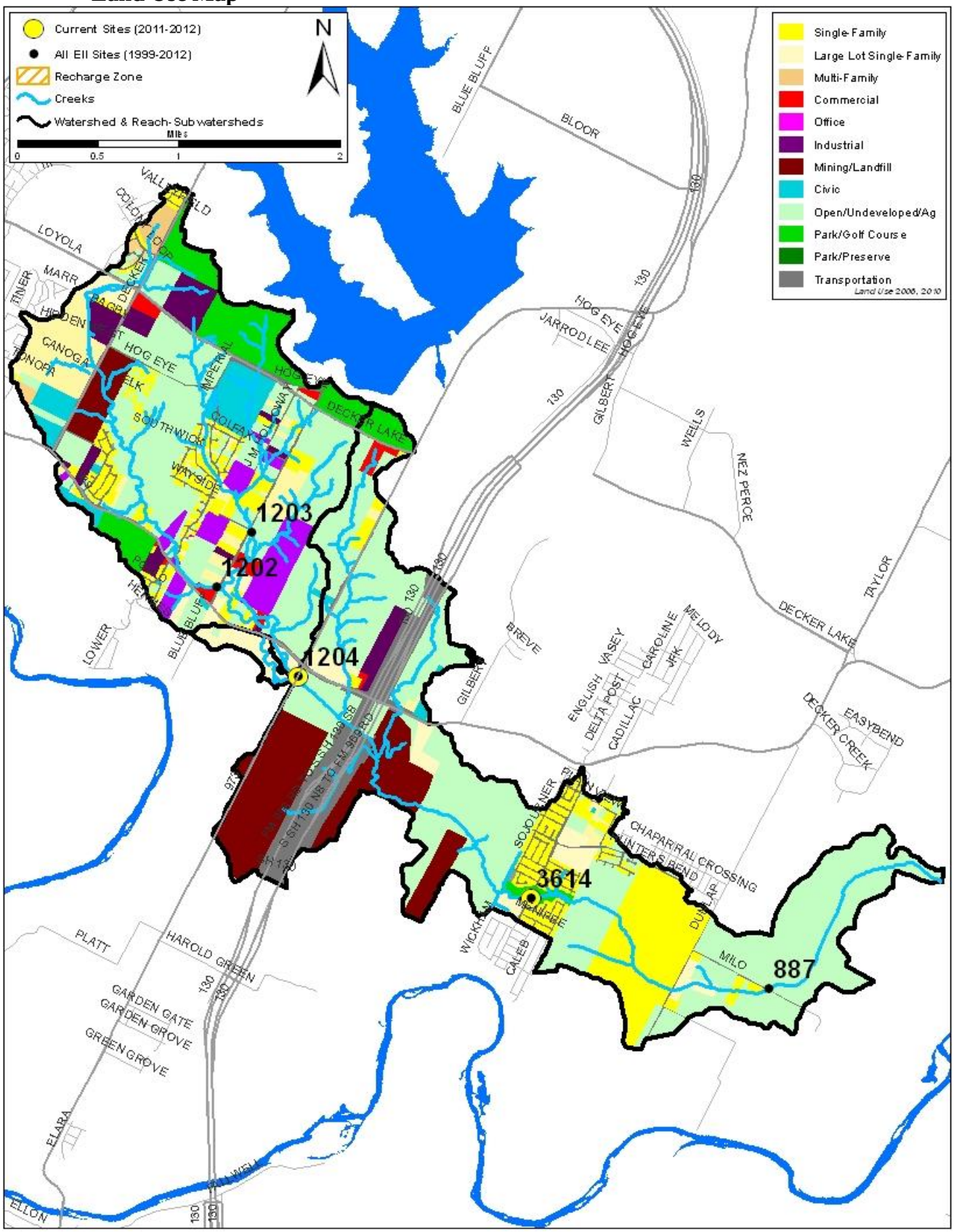
Reach	Site	Site Name	Year	Water Quality	Sediment**	Contact Recreation	Non-Contact Rec.	Physical Integrity	Aquatic Life	Benthic subindex	Diatom subindex	**Total EII Score**
ELM1	887	Elm Creek @ Milo Road	2002		91		60	44				49
ELM2	1202	West Elm Creek @ Blue Bluff Road	2002	62	91	99	57	58	41	41	40	68
ELM2	1204	Elm Creek @ FM 973	2002	57	91	92	77	51	44	50	37	69
ELM1	3614	Elm Creek @ Austins Colony	2005	46	71		56	50				45
ELM2	1202	West Elm Creek @ Blue Bluff Road	2005	39	71	32	49	56	50		50	50
ELM2	1204	Elm Creek @ FM 973	2005	51	71	47	52	54				46
ELM1	3614	Elm Creek @ Austins Colony	2008	39	67	42	43	37				38
ELM2	1204	Elm Creek @ FM 973	2008	50	67	97	48	47				52
ELM1	3614	Elm Creek @ Austins Colony	2009		66		56	60	68	68		63
ELM2	1204	Elm Creek @ FM 973	2009	69	66	94	47	55				55
ELM1	3614	Elm Creek @ Austins Colony	2011				55	40				32
ELM2	1204	Elm Creek @ FM 973	2011				40	61				34
ELM1	3614	Elm Creek @ Austins Colony	2013		64		64	64	54	54		62
ELM2	1204	Elm Creek @ FM 973	2013		64		45	46	51	51		52

* blank cells indicate parameter was not collected, blank row indicate site was dropped **sediment samples only collected at the downstream site

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

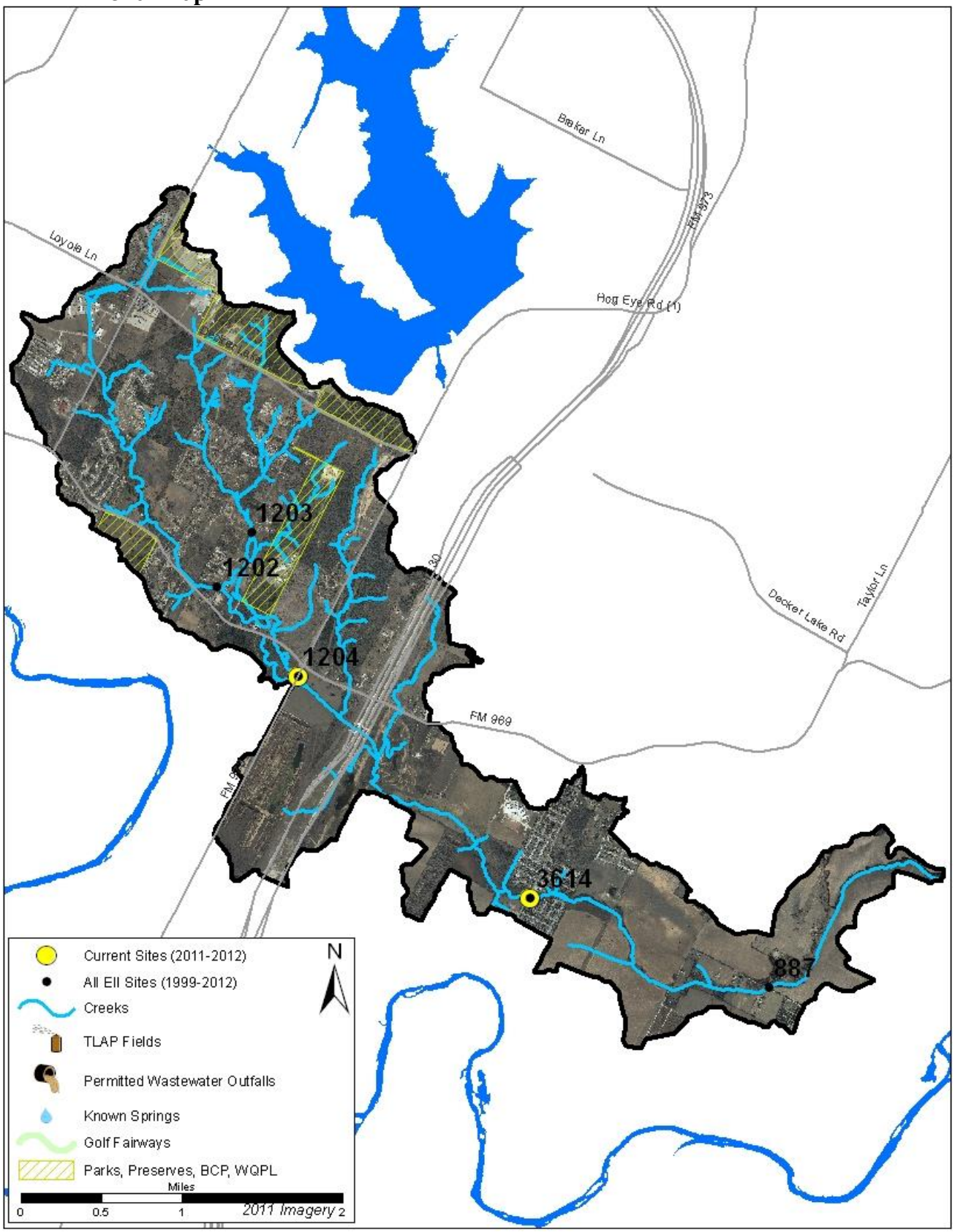
Elm Creek Watershed

Land Use Map



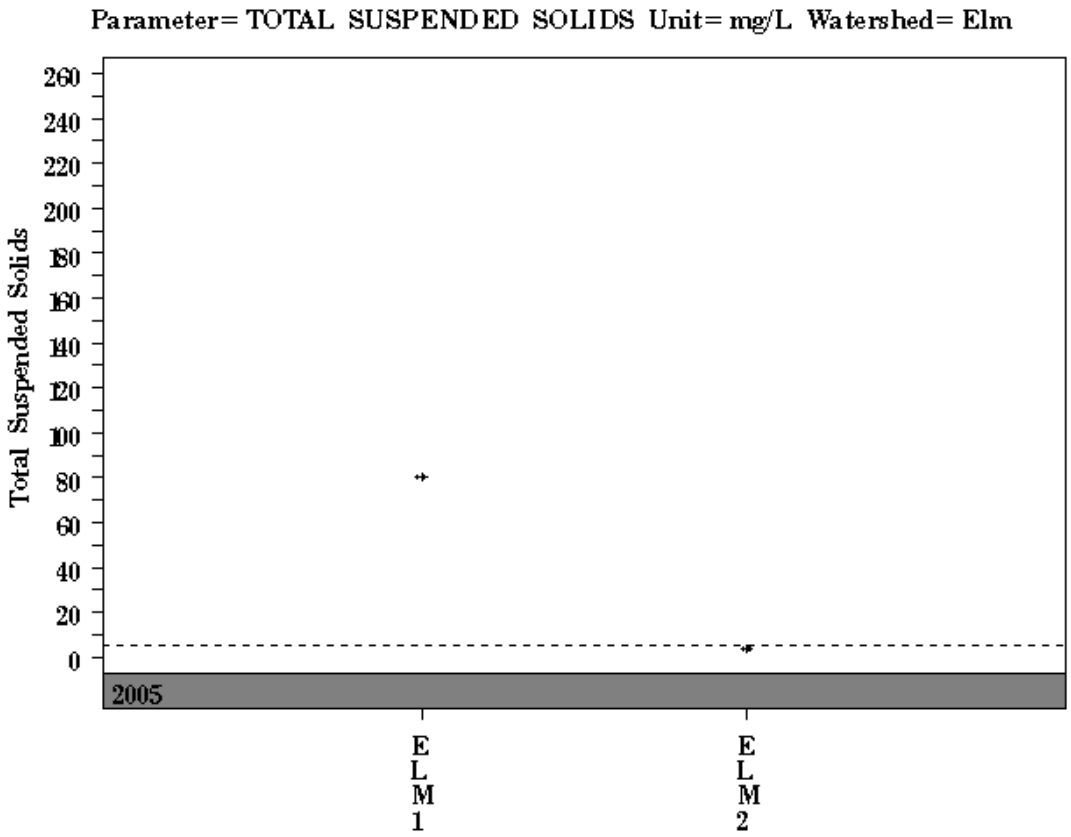
Elm Creek Watershed

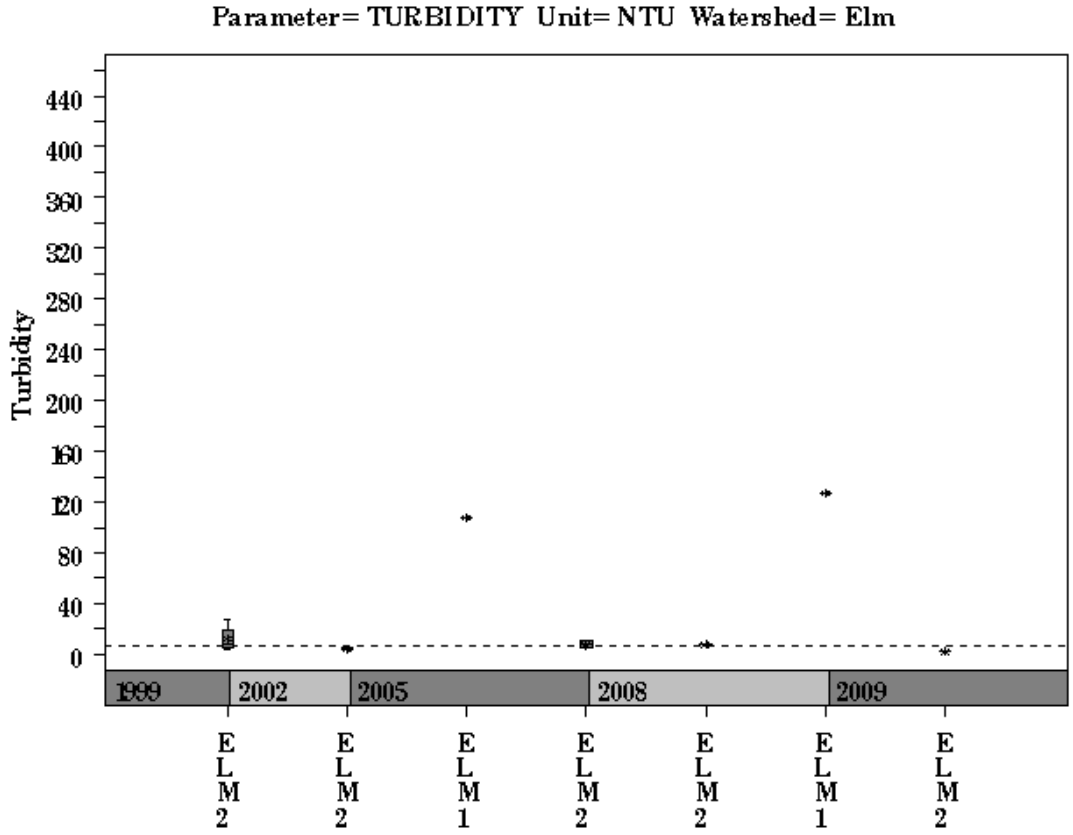
Aerial Map



Elm Creek Watershed

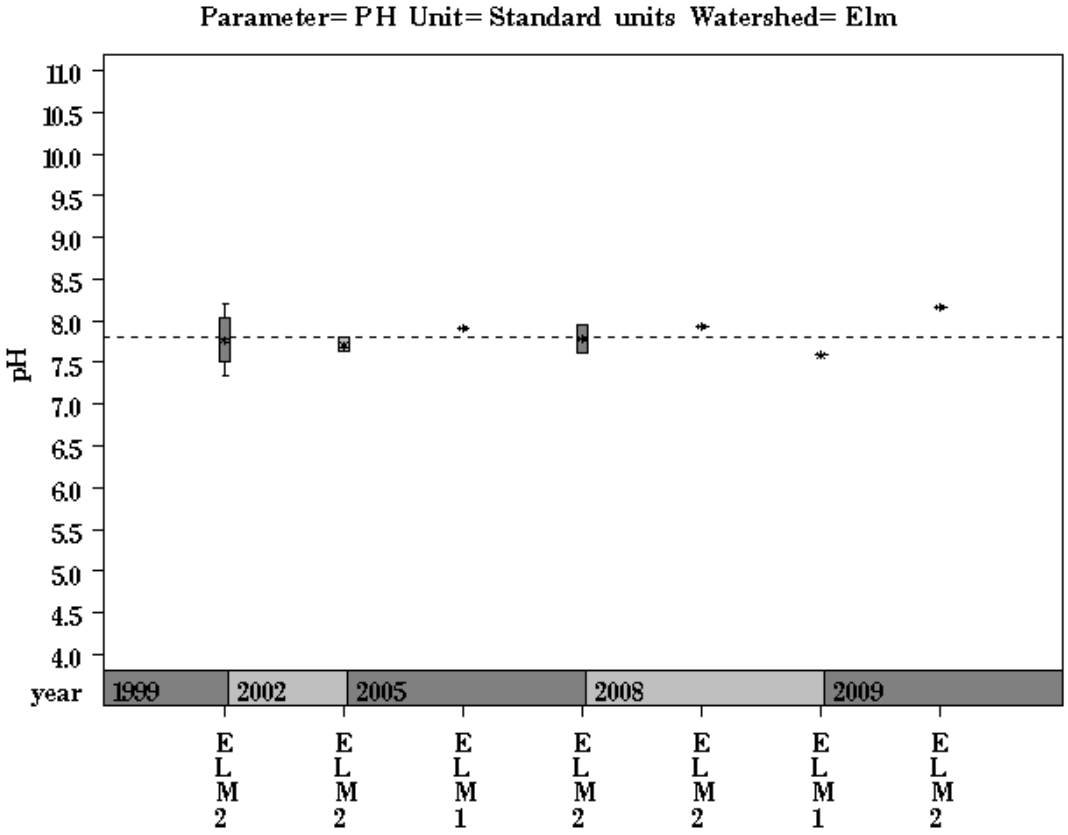
Data Summary Graphs – Total Suspended Solids and Turbidity (Downstream to Upstream by Year)

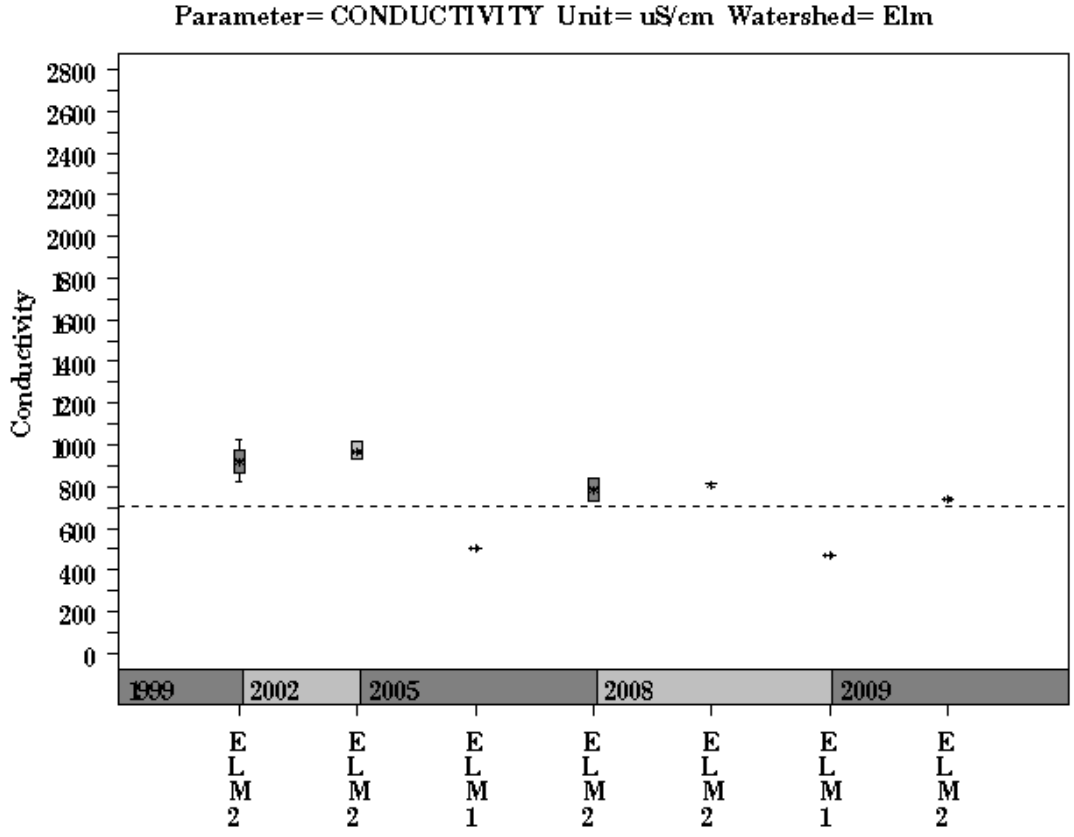




Elm Creek Watershed

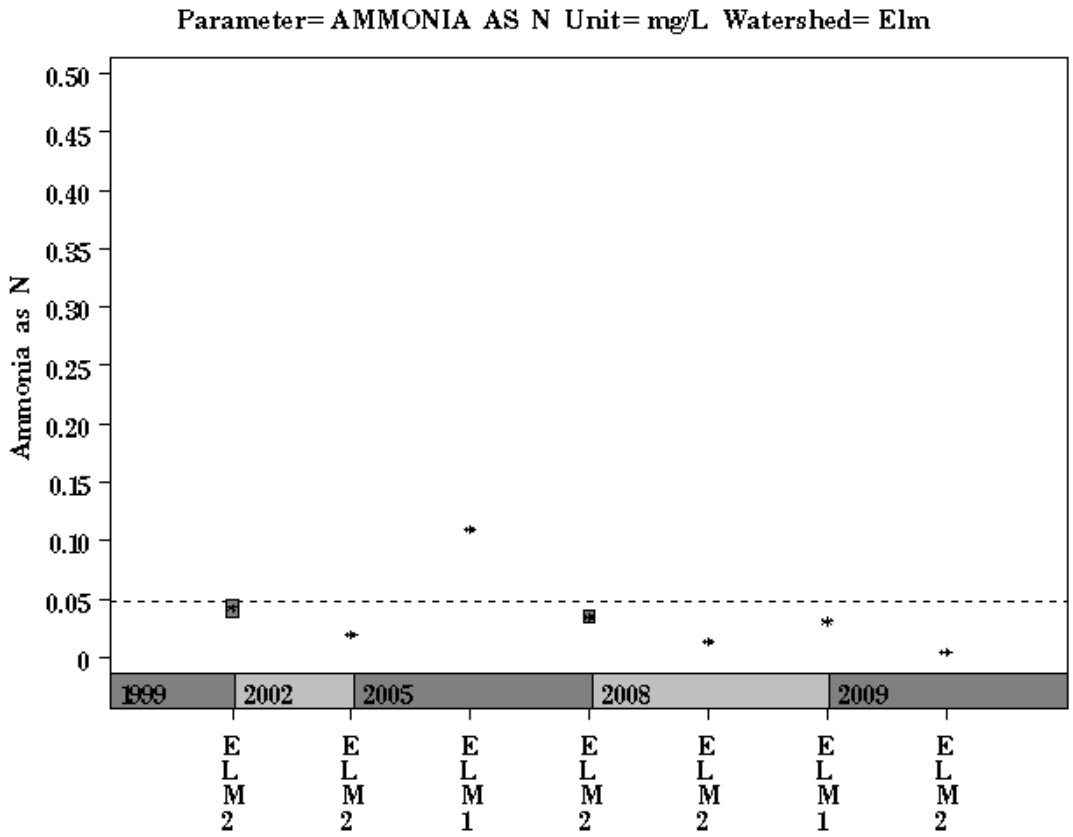
Data Summary Graphs – pH and Conductivity (Downstream to Upstream by Year)

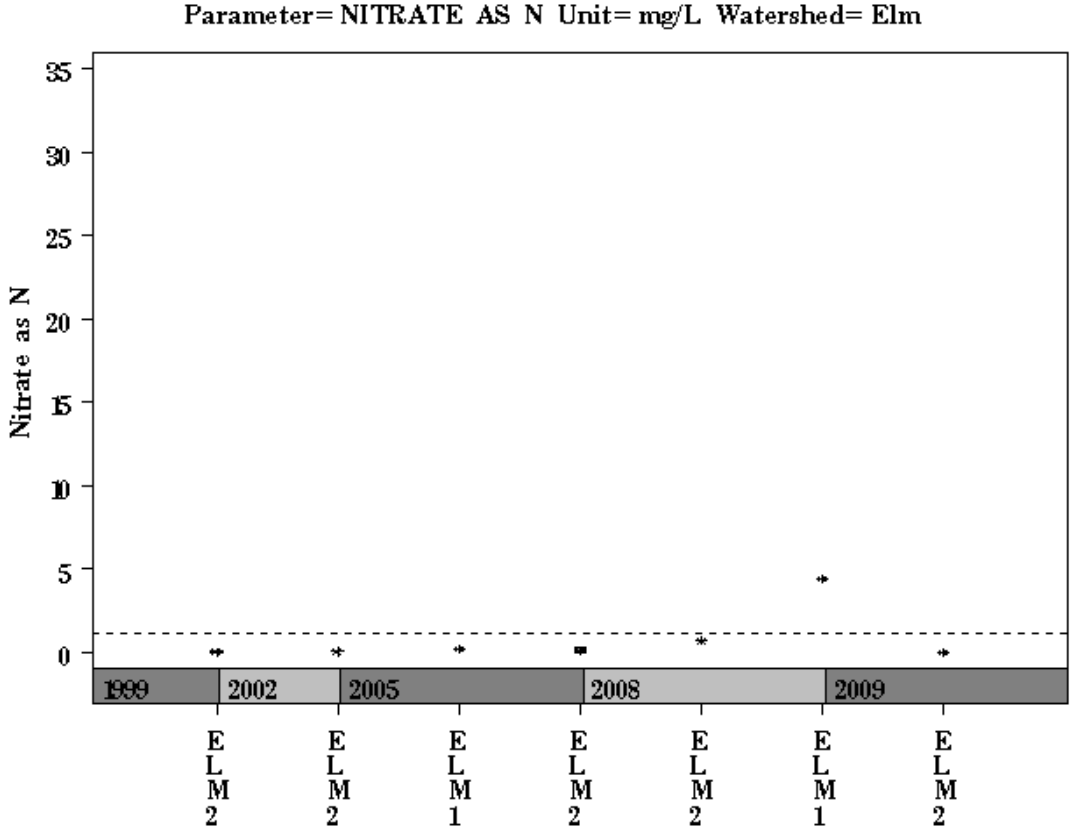




Elm Creek Watershed

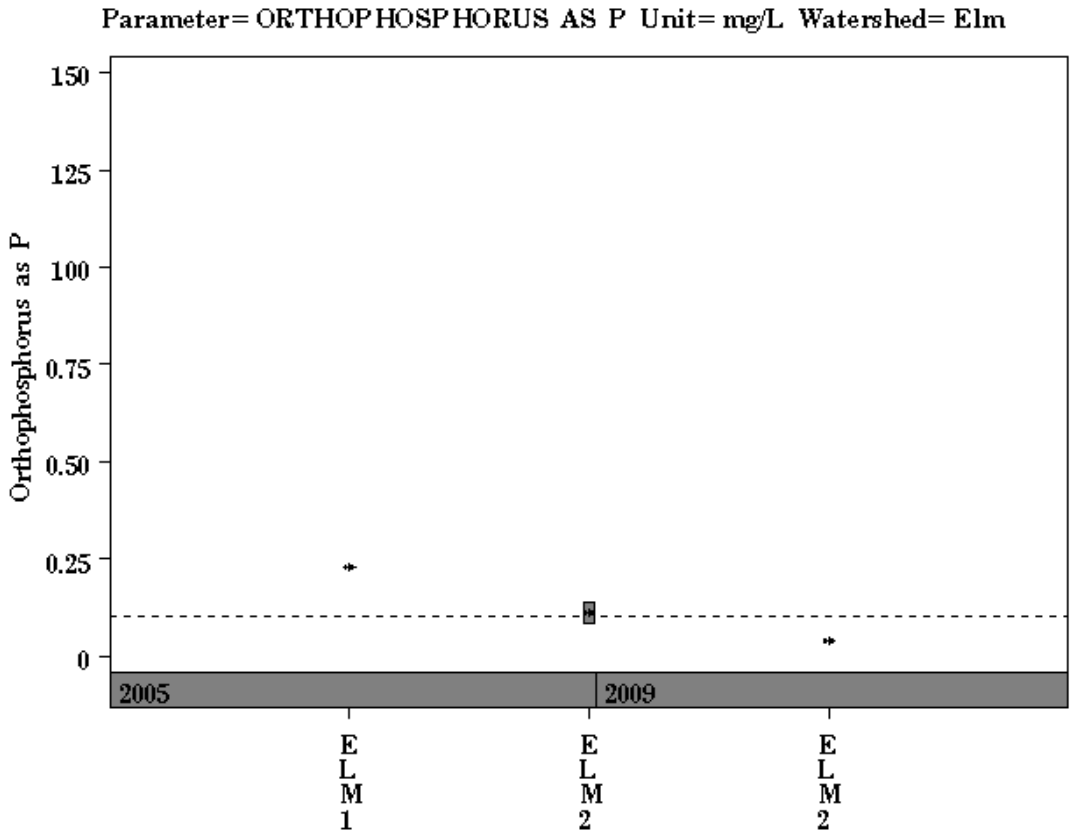
Data Summary Graphs – Ammonia and Nitrate/Nitrite (Downstream to Upstream by Year)

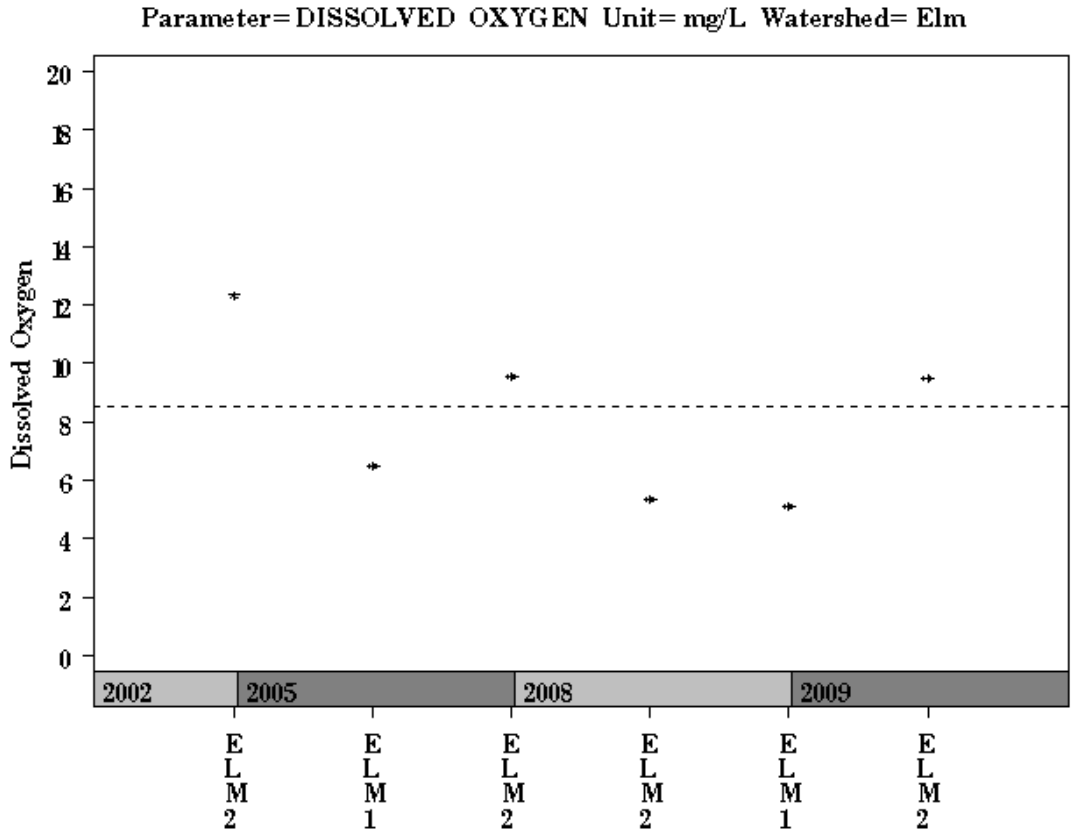




Elm Creek Watershed

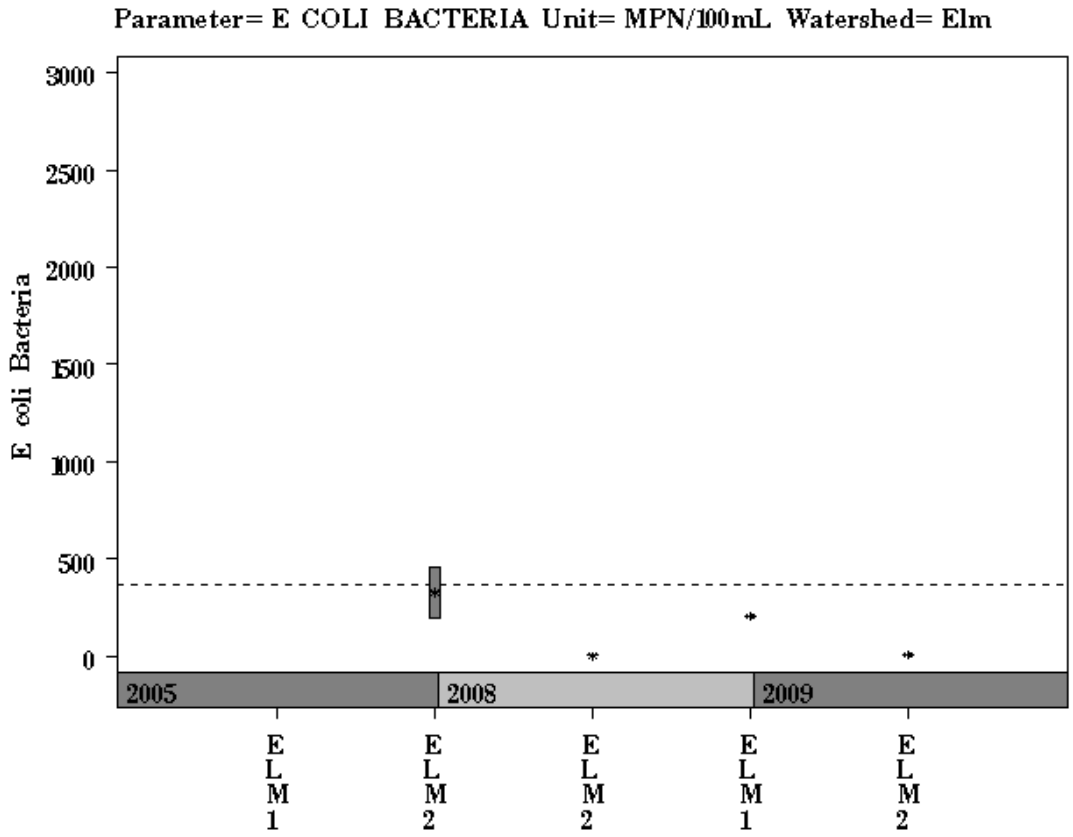
Data Summary Graphs – Orthophosphate and Dissolved Oxygen (Downstream to Upstream by Year)





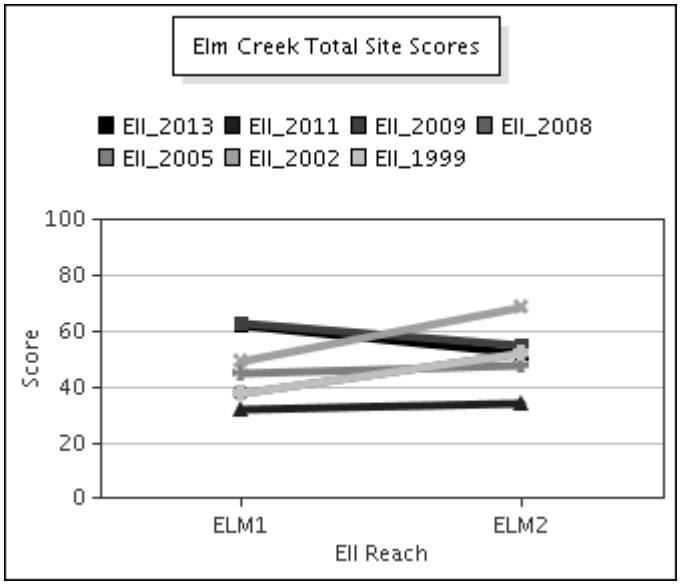
Elm Creek Watershed

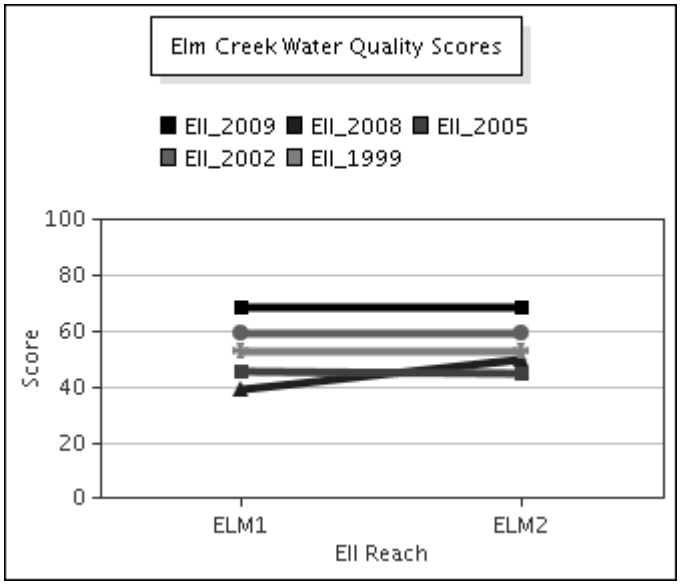
Data Summary Graphs – *E.coli* (Downstream to Upstream by Year)

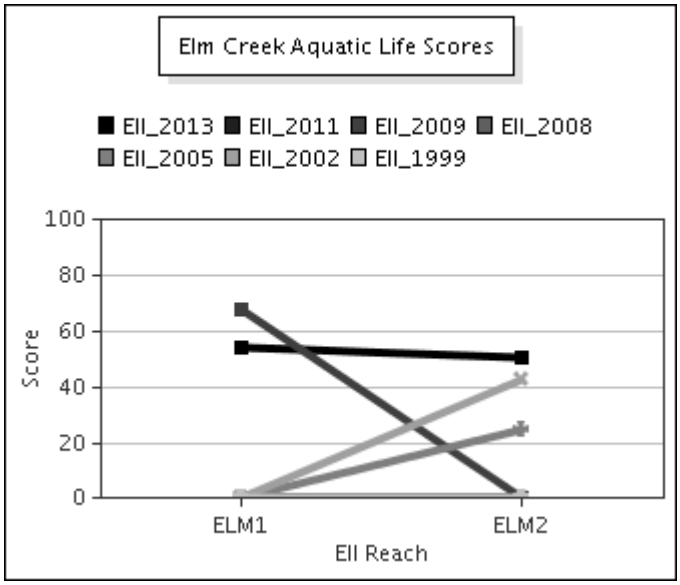


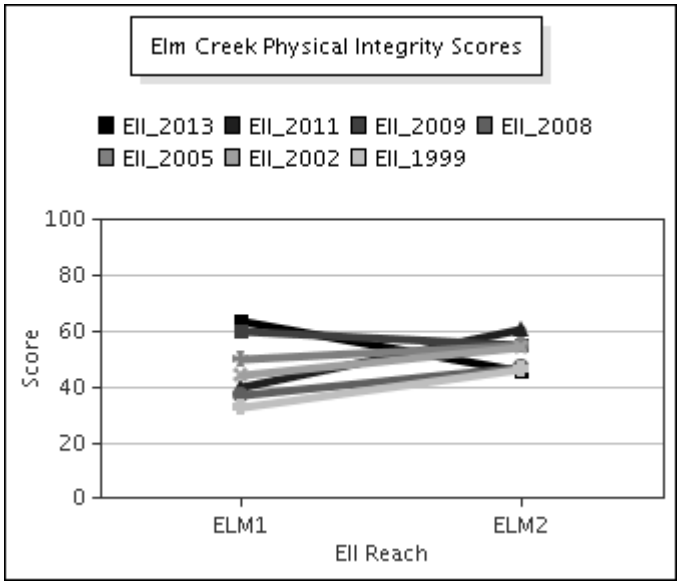
Elm Creek Watershed

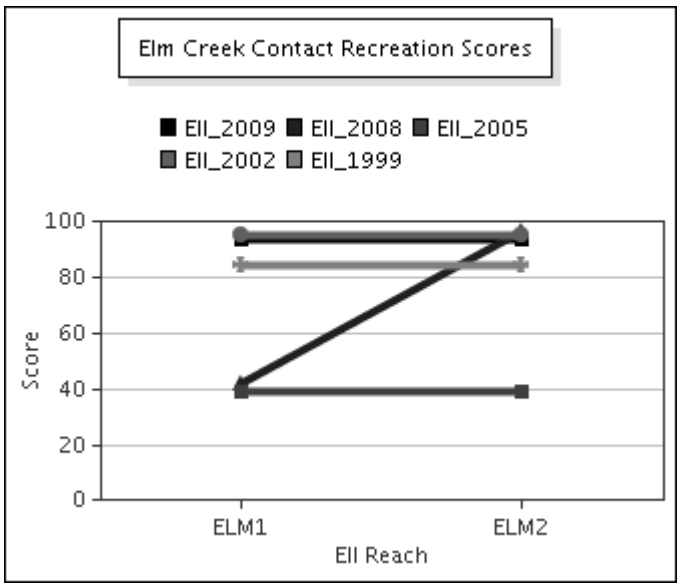
Score Summary – Reach scores for each sample year

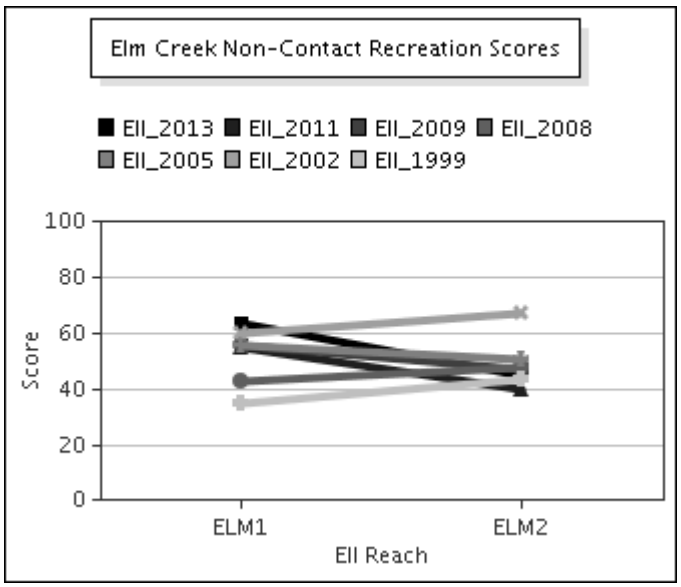












Benthic Macroinvertebrates – Taxa List, Pollution Tolerance Index & Functional Feeding Group for 2013 Sample Sites (Downstream to Upstream)

Benthic Macroinvertebrate ID	PTI	FFG	Elm @ Austins Colony (Site 3614)	Elm @ FM 973 (Site 1204)
Callibaetis sp.	4	CG	3	5
Chaoborus sp.	4			1
Copepoda	4	SC	1	7
Anax sp.	5	P	1	
Buenoa sp.	5	P	7	
Dytiscus sp.	5	P		5
Mesovelia sp.	5	P	2	
Neobidessus sp.	5	P	1	
Notonecta sp.	5	P		1
Thermonectus sp.	5	P		1
Trichocorixa sp.	5	P,CG	2	5
Chironomidae	6	P,FC	2	13
Fossaria sp.	6	SC	4	2
Microvelia sp.	6	P	1	
Sepedon sp. / *Sepedomerus* sp.	6	P	1	
Tanypodinae	6	P	7	
Bezzia sp. / *Palpomyia* sp.	7	P,CG		1
Caenis sp.	7	SC,CG	2	
Curculionidae	7	SH	1	
Gyraulus sp.	7	SC		4
Helisoma trivolvis	7	SC	8	
Aedes sp.	8			11
Haemagogus sp.	8	FC	1	
Hirudinea	8	P	1	
Hyalella sp.	8	SH,CG		1
Oligochaeta	8	CG	10	2
Peltodytes sp.	8	SH,PI,P		1
Berosus sp.	9	CG		1
Enochrus sp.	9	CG	1	
Lestes sp.	9	P		2
Physella sp.	9	SC	11	10
Belostoma sp.	10	P	5	
Collembola	10	CG	5	
Laccophilus sp.	10	P	1	
Tropisternus sp.	10	P		2
Cambaridae		CG	1	
Dibolocelus sp.		CG	1	

Elm Creek Watershed

Benthic Macroinvertebrates – Metric Summary for 2013 Sample Sites (Downstream to Upstream)

Scoring Metric	Elm @ Austins Colony (Site 3614)	Elm @ FM 973 (Site 1204)
Number of Taxa *	23	19
Hilsenhoff Biotic Index *	7.0	6.6
Number of Ephemeroptera Taxa *	2	1
Percent of Total as Chironomidae *	12	17
Number of EPT Taxa *	2	1
Percent of Total as EPT *	7	7
Percent of Total as Predator *	41	41
Number of Intolerant Taxa *	2	3
Percent Dominance (Top 3 Taxa) *	39	45
EPT / EPT + Chironomidae	0	0
Number of Diptera Taxa	3	4
Number of Non-Insect Taxa	7	6
Number of Organisms	75	75
Percent Dominance (Top 1 Taxa)	15	17
Percent of Total as Collector / Gatherer	27	20
Percent of Total as Dominant Guild (FFG)	41	41
Percent of Total as Elmidae	0	0
Percent of Total as Filterers	13	17
Percent of Total as Grazers (PI & SC)	35	31
Percent of Total as Tolerant Organisms	24	20
Percent of Trichoptera as Hydropsychidae	0	0
Ratio of Intolerant : Tolerant Organisms	0.30	0.50
TCEQ Qualitative Aquatic Life Use Score	26	24
TCEQ Quantitative Aquatic Life Use Score	27	27

*** EII scoring parameter: Nine metric parameters are used in the calculation of the EII Benthic Subindex score. Other metrics are shown to supplement evaluation.**

1. # of Taxa: Higher diversity (number of taxa) correlates with greater biological integrity. The average number of taxa per site for 2013/2014 samples was 15; the lowest value was 5 and the highest value was 30.
2. Hilsenhoff Biotic Index (HBI): HBI values range from 0 to 10. Low HBI values reflect a higher abundance of taxa that are sensitive to organic (nutrient) pollution, thus a lower level of this type of pollution. The average HBI per site for 2013/2014 samples was 5.4; the lowest value was 3.7 and the highest value was 8.1.
3. # of Ephemeroptera taxa: A higher number of Ephemeroptera (mayfly) taxa correlates with greater biological integrity. The average number of taxa per site for 2013/2014 samples was 2; the lowest value was 0 and the highest value was 7.
4. % of total as Chironomidae: The percentage of the sample represented by the Dipteran family Chironomidae will increase with a decrease in biological integrity. The average percent Chironomidae per site for 2013/2014 samples was 16%; the lowest value was 0% and the highest value was 77%.
5. # of EPT Taxa: A higher number of Ephemeroptera (mayfly), Plecoptera (stonefly) and Trichoptera (caddisfly) taxa correlates with greater biological integrity. The average number of EPT taxa per site for 2013/2014 samples was 4; the lowest value was 0 and the highest value was 12.
6. % of total as EPT: The percentage of the sample represented by the insect orders Ephemeroptera (mayfly), Plecoptera (stonefly) and Trichoptera (caddisfly) will decrease with a decrease in biological integrity. The average percent EPT taxa per site for 2013/2014 samples was 46%; the lowest value was 0% and the highest value was 89%.
7. % of total as Predator: The percentage of the sample represented by predators is variable with regard to biological integrity. The average percent predator per site for 2013/2014 samples was 31%; the lowest value was 3% and the highest value was 82%.
8. # of Intolerant Taxa: A higher number of pollution intolerant taxa correlates with greater biological integrity. The average number of intolerant taxa per site for 2013/2014 samples was 5; the lowest value was 0 and the highest value was 15.
9. % Dominance (top 3 taxa): The percentage of the sample represented by the three most abundant taxa will increase with a decrease in biological integrity. The average percent of sample dominated by the top three taxa per site for 2013/2014 samples was 72%; the lowest value was 39% and the highest value was 96%.

1202_t00-us-03_27_2002

1202_t00-ds-06_17_2005

3614_t00-us-06_17_2005

3614_t00-ur-06_17_2005

3614_t00-ur-06_18_2008

3614_t00-us-06_03_2009

Elm Creek Watershed

Site Photographs

1204_t00-ds-03_27_2002

1204_t00-ur-03_27_2002

1204_t00-us-06_17_2005

1204_t00-ds-06_17_2005

1204_t0-us06_18_2008

1204_t00-ds-06_03_2009

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