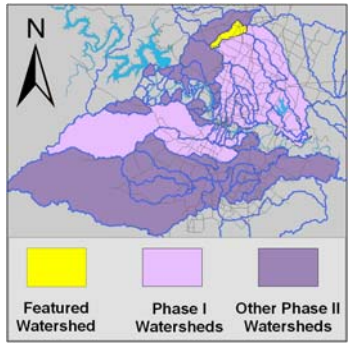


Rattan Creek Watershed

Watershed Overview

Catchment	Total area	7.2 sq. miles					
	Area in recharge	7 sq. miles					
	Creek length	8 miles					
	Receiving water	Lake Creek					
Demographics	2000 population	11,863					
	2030 projected population	33,506					
	30 year projected % increase	182					
Land Use	Impervious cover (2003 estimate)	10.1 %					
	Impervious cover (2013 estimate)	20.6 %					
Overall EII Scores	2001	2004	2007	2010	2012	2014	2016
	69	49	54	52	44	59	62



Flow Regime* for Sample Sites on Rattan Creek

Site	1999		2001					2004					2007					2010		2011		2012					2014					2016							
	Jan	Jan	Mar	Mar	Jun	Sep	Dec	Mar	May	Jun	Oct	Dec	Feb	May	Jun	Sep	Dec	Mar	May	May	Oct	Dec	Mar	Apr	May	Jul	Sep	Jan	Apr	Jun	Jul	Sep	Jan	Apr	May	Jul	Sep		
1009	n	n	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	n	B	n	n	B	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
1097	B	B	B	B	B	B	B	n	n	B	B	B	B	B	B	B	B	n	n	n	n	B	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 Rattan Creek Sites by Year

Reach	Site	Site Name	Year	Water Quality	Sediment**	Contact Rec.	Non-Contact Rec.	Physical Integrity	Aquatic Life	Benthic subindex	Diatom subindex	Total EII Score
RAT1	1097	Rattan Creek @ Shadowbrook Circle	1998	50	78	84	59	68	56	60	52	66
RAT2	1009	Rattan Creek US of Parmer Lane	1998	75	78	75	62	59				58
RAT1	1097	Rattan Creek @ Shadowbrook Circle	2001	50	90	74	73	63	59	60	58	65
RAT2	1009	Rattan Creek US of Parmer Lane	2001	51	90	84	73	46	69	75	63	67
RAT1	1097	Rattan Creek @ Shadowbrook Circle	2004	56	82	32	71	53				49
RAT2	1009	Rattan Creek US of Parmer Lane	2004	64	82	37	53	50				48
RAT1	1097	Rattan Creek @ Shadowbrook Circle	2007	69	76	74	51	30				50
RAT2	1009	Rattan Creek US of Parmer Lane	2007	49	76	50	62	41	61	61		57
RAT1	1097	Rattan Creek @ Shadowbrook Circle	2010	68		48	47	57				44
RAT2	1009	Rattan Creek US of Parmer Lane	2010	62		50	52	64	67	67		59
RAT1	1097	Rattan Creek @ Shadowbrook Circle	2012					48				16
RAT2	1009	Rattan Creek US of Parmer Lane	2012				65	74	78	63	92	72
RAT1	1097	Rattan Creek @ Shadowbrook Circle	2014		67		61	30	38	34	42	49
RAT2	1009	Rattan Creek US of Parmer Lane	2014		67		84	64	56	56	55	68
RAT1	1097	Rattan Creek @ Shadowbrook Circle	2016	66	67	30	90	52	68	75	61	62
RAT2	1009	Rattan Creek US of Parmer Lane	2016		67		73	62	67	73	60	67

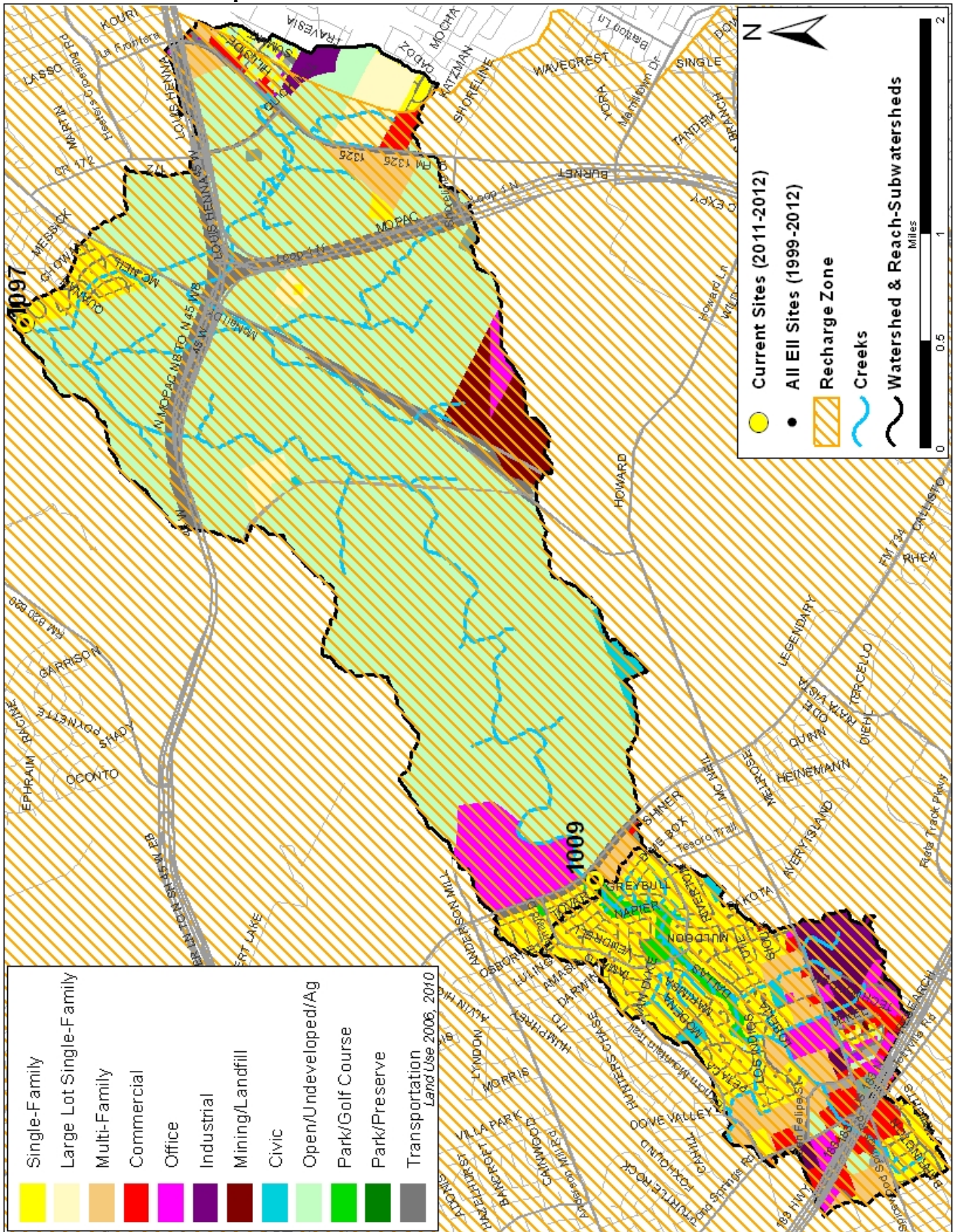
* blank cells indicate parameter was not collected, blank row indicate site was dropped

**sediment samples only collected at the downstream site

00-87.5 Excellent 7.5-75 V. Good 75-62.5 Good 2.5-50 Fair 0-37.5 Marginal 7.5-25 Poor 5-12.5 Bad 0-5.0 V. Bad

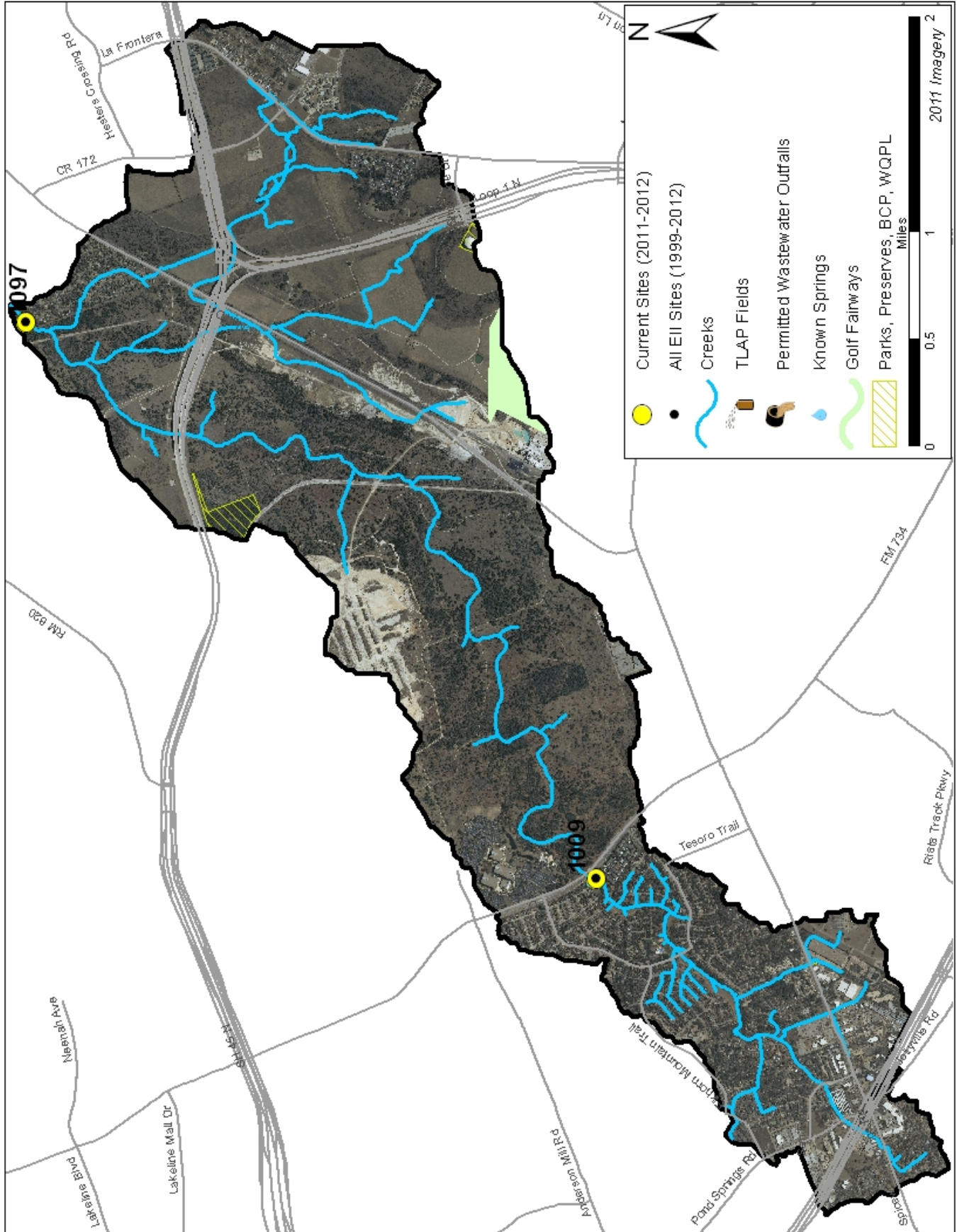
Rattan Creek Watershed

Land Use Map



Rattan Creek Watershed

Aerial Map



Rattan Creek Watershed

Water Quality Data – Temperature, Conductivity, pH, Dissolved Oxygen & *E. coli* for 2016 Sample Sites (Downstream to Upstream)

Qualifiers to the left of the value	>	Greater than	Qualifiers to the right of the value	(blank)	Useable
	<	Less than		S	Exceeds standard range
	<J	Less than detected limit		R	Rejected, failed QC
	J	Estimated			

Watershed	Site	EII Reach	Date	Temp. flag	Cond. flag	pH flag	D.O. flag	E. Coli flag
Rattan	1097	RAT1	01/12/2016	7.1	544	7.71	6.29	248.1
Rattan	1097	RAT1	05/09/2016	21.0	538	7.98	10.2	
Rattan	1097	RAT1	07/12/2016	25.0	516	8.01	6.1	488.4
Rattan	1097	RAT1	09/13/2016	24.0	522	7.42	5.4	613.1
RAT1 Mean				19.3	530	7.78	7.0	499.9
Rattan	1009	RAT2	05/09/2016	26.0	522	8.22	11.3	
RAT2 Mean				26.0	522	8.22	11.3	
Rattan Mean				20.6	528	7.87	7.8	499.9

Gray highlighting indicates that the value exceeds one standard deviation from the mean of all E.I.I. sites combined.

Summary Statistics for all 2015-2016 E.I.I. Sites Combined					
Parameter	2015-2016 Average	2015-2016 Minimum	2015-2016 Maximum	1 Standard Deviation Above	1 Standard Deviation Below
Temperature (C°)	20.7	5.8	34.2	27.5	
Conductivity (uS/cm)	722	160	3549	955	
pH (Standard units)	7.86	5.85	10.25	8.24	7.47
D.O. (mg/l)	7.9	0.1	18.7	10.4	5.5
<i>E. Coli</i> (col/100ml)	316.1	1.0	2420.0	883.7	

Rattan Creek Watershed

Water Quality Data – Ammonia, Nitrate / Nitrite, Ortho-Phosphorus, Total Suspended Solids & Turbidity for 2016 Sample Sites (Downstream to Upstream)

Qualifiers to the left of the value	>	Greater than	Qualifiers to the right of the value	(blank)	Useable
	<	Less than		S	Exceeds standard range
	<J	Less than detected limit		R	Rejected, failed QC
	J	Estimated			

Watershed	Site	EII Reach	Date	NH3-N		NO3/NO2		Ortho-P		T.S.S		Turb.	
				<>	flag	<>	flag	<>	flag	<>	flag		
Rattan	1097	RAT1	01/12/2016	<J	0.008	<J	0.01	<J	0.004	9.4		2.3	R
Rattan	1097	RAT1	05/09/2016										
Rattan	1097	RAT1	07/12/2016	<J	0.008	<J	0.01		0.021	2.4		3.0	R
Rattan	1097	RAT1	09/13/2016	<J	0.008	<J	0.01		0.015	9.2		3.3	
		RAT1 Mean			0.008		0.01		0.013	7.0		2.9	
Rattan	1009	RAT2	05/09/2016										
		RAT2 Mean											
		Rattan Mean			0.008		0.01		0.013	7.0		2.9	

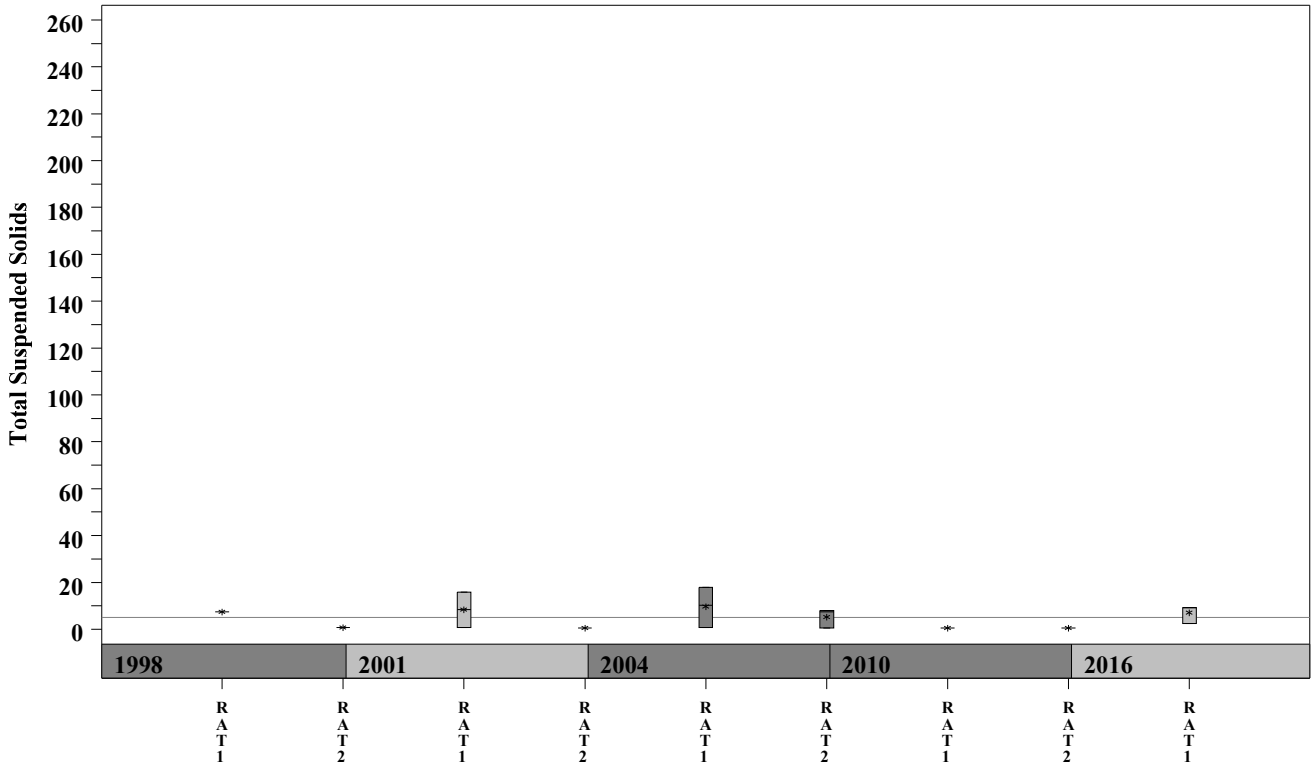
Gray highlighting indicates that the value exceeds one standard deviation from the mean of all E.I.I. sites combined.

Summary Statistics for all 2015-2016 E.I.I. Sites Combined				
Parameter	2015-2016 Average	2015-2016 Minimum	2015-2016 Maximum	1 Standard Deviation Above
NH3-N (mg/l)	0.018	0.008	0.881	0.085
NO3-N (mg/l)	1.14	0.01	12.0	3.16
Ortho-P (mg/l)	0.016	0.004	0.661	0.08
T.S.S. (mg/l)	3.7	1.0	58.2	9.7
Turbidity (NTU)	4.4	0.2	98.6	11.7

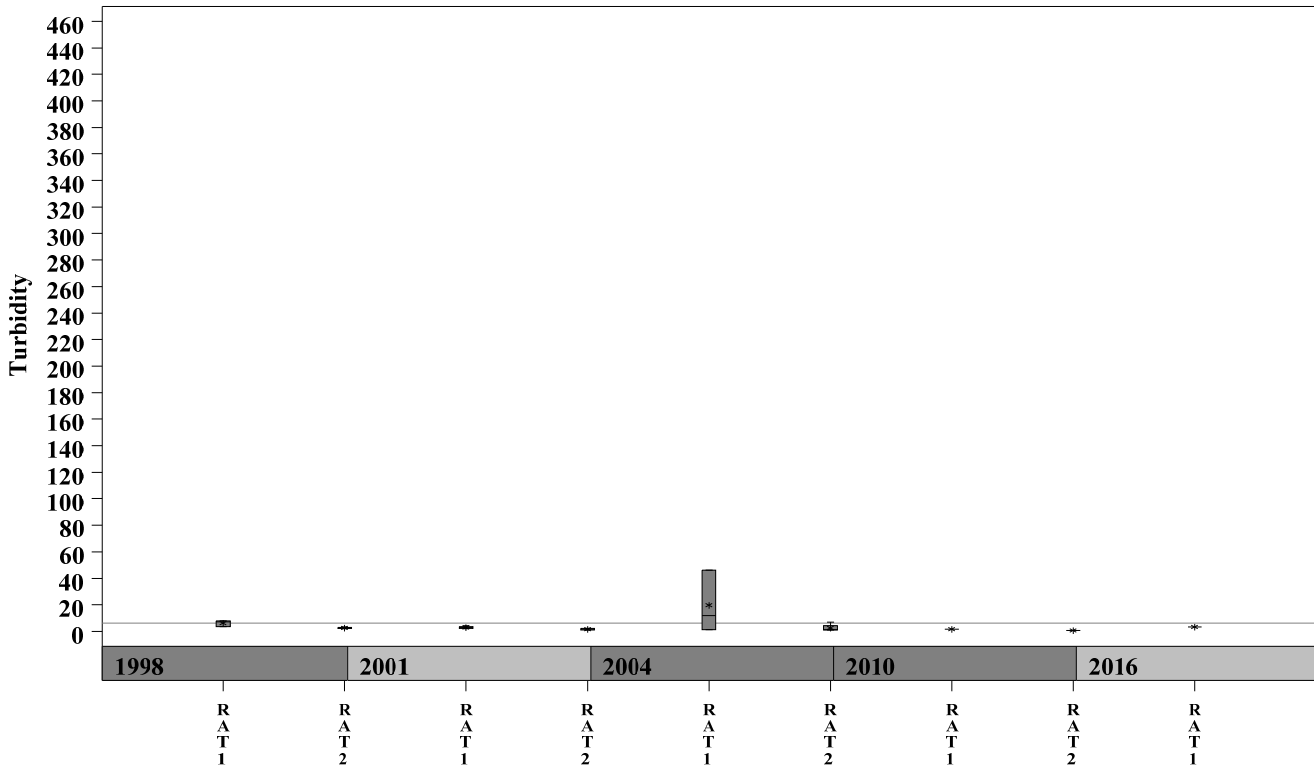
Rattan Creek Watershed

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

Parameter = TOTAL SUSPENDED SOLIDS Unit = mg/L Watershed = Rattan



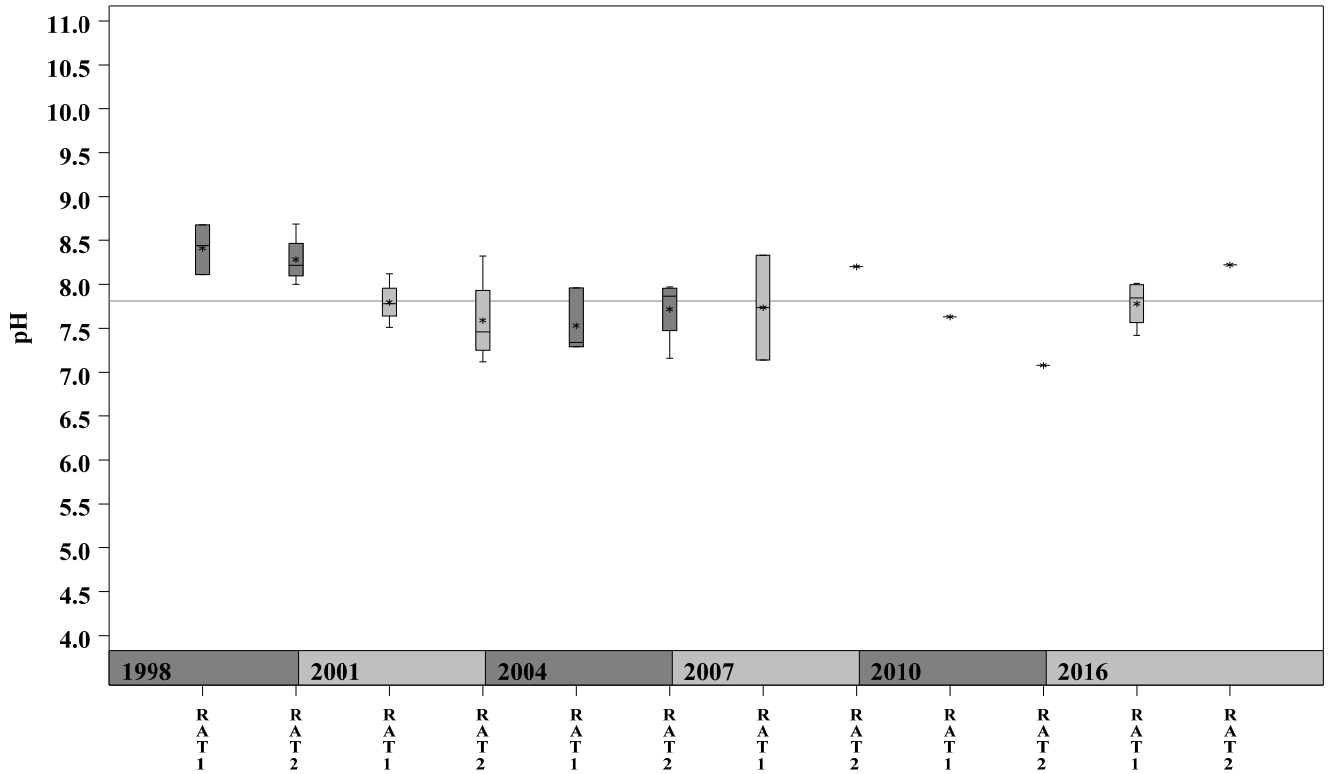
Parameter = TURBIDITY Unit = NTU Watershed = Rattan



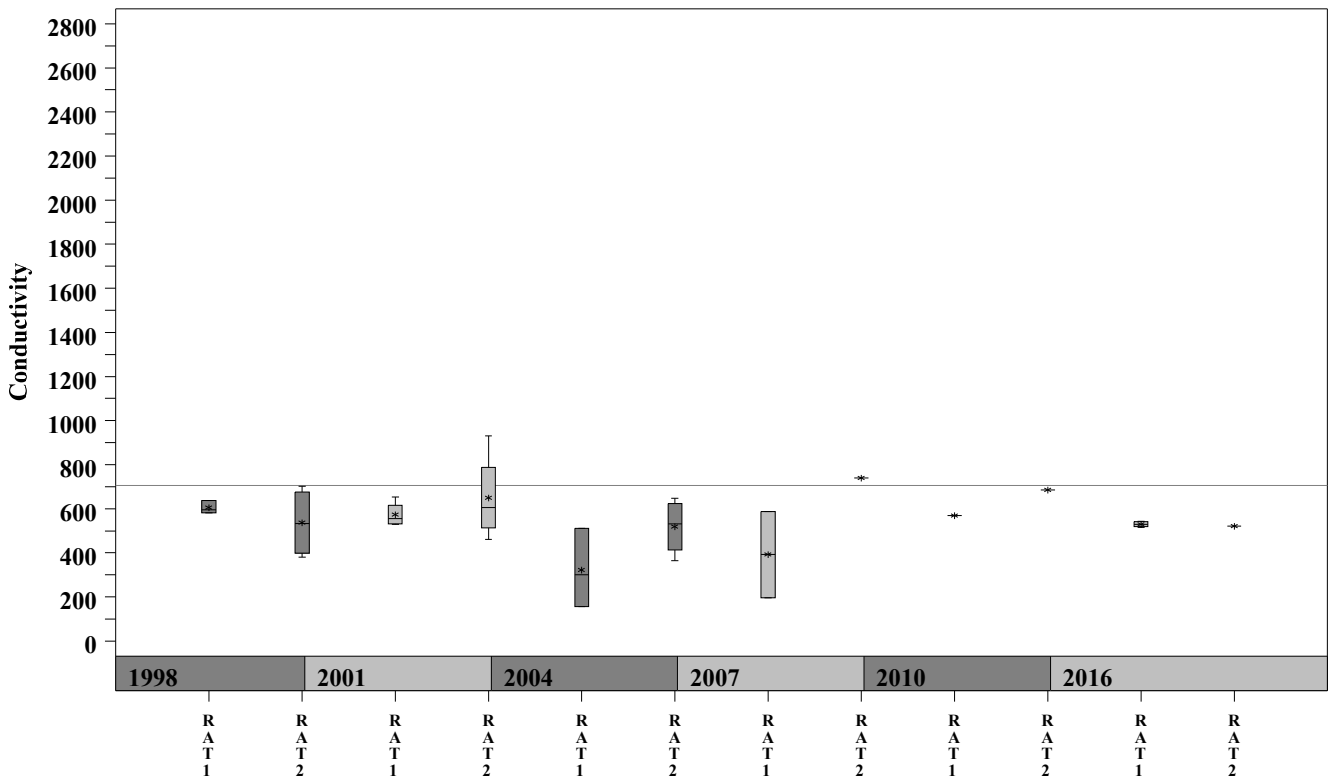
Rattan Creek Watershed

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

Parameter = pH Unit = Standard Units Watershed = Rattan



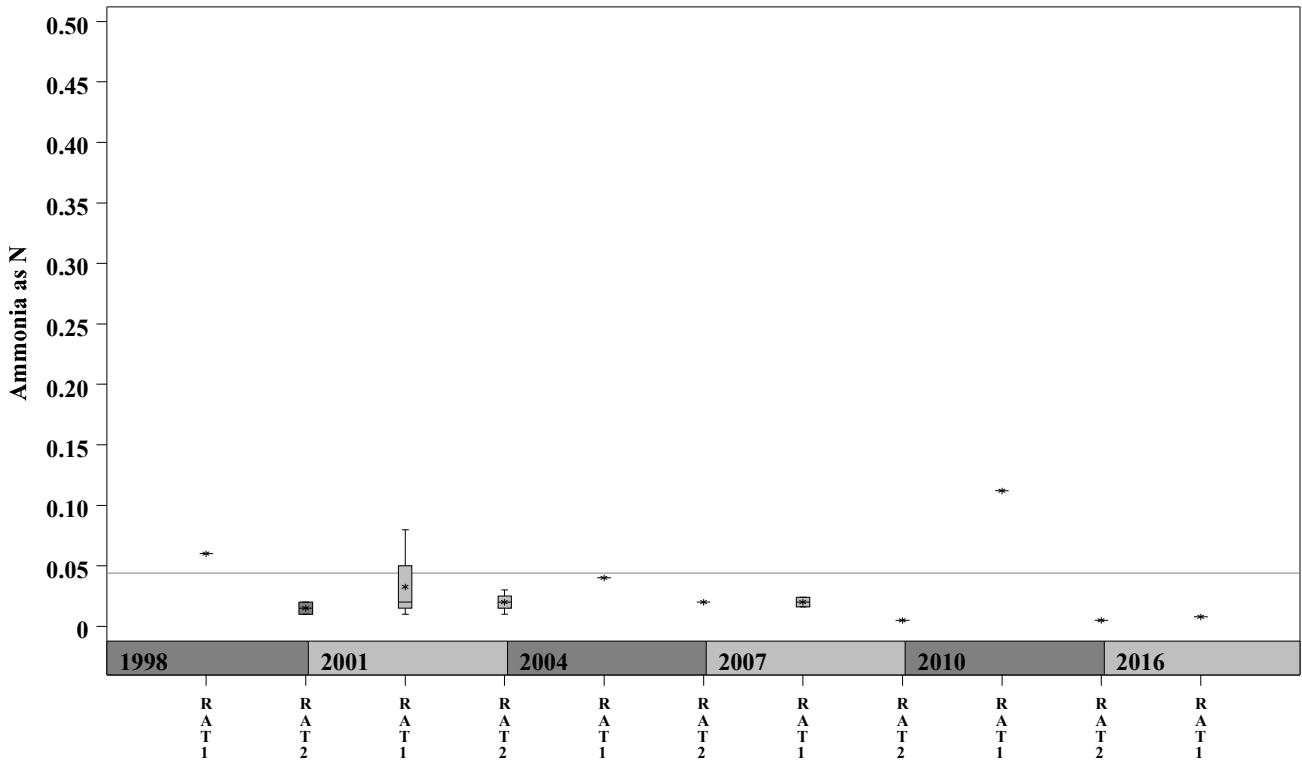
Parameter = CONDUCTIVITY Unit = uS/cm Watershed = Rattan



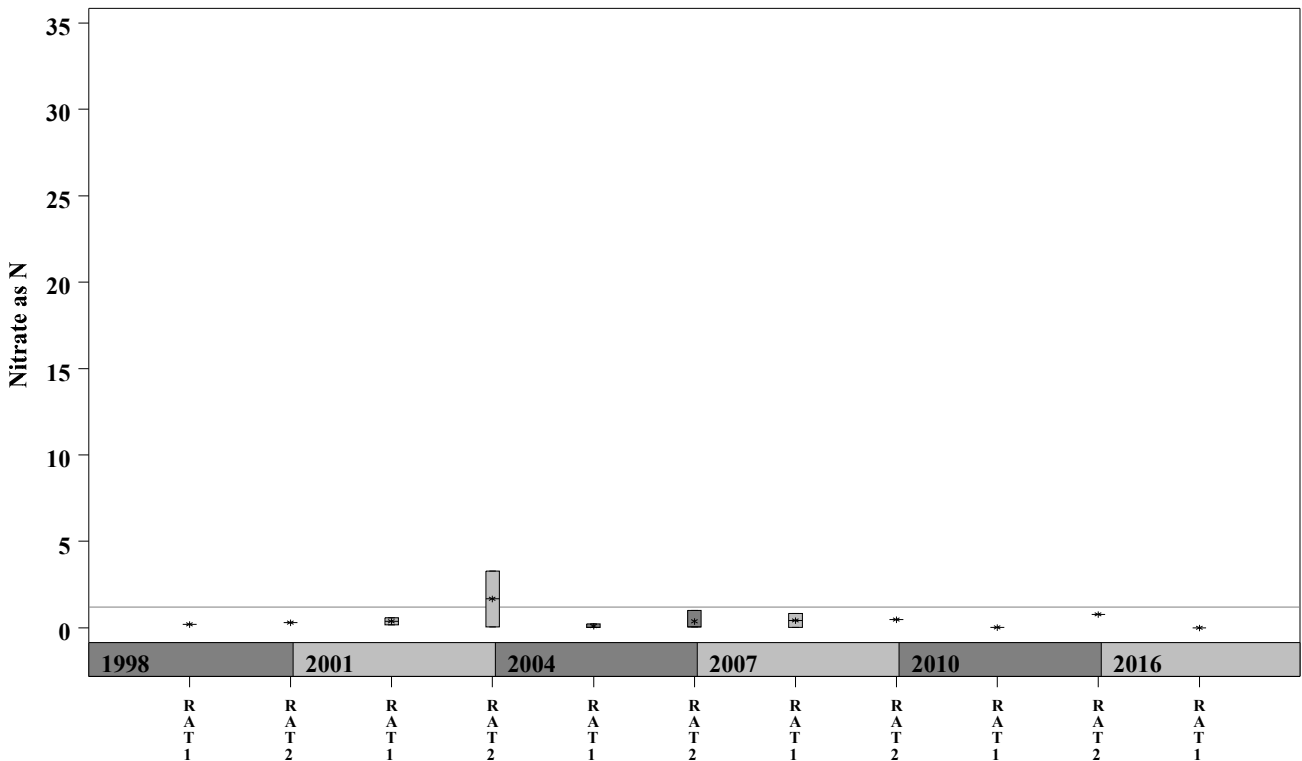
Rattan Creek Watershed

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

Parameter = AMMONIA AS N Unit = mg/L Watershed = Rattan



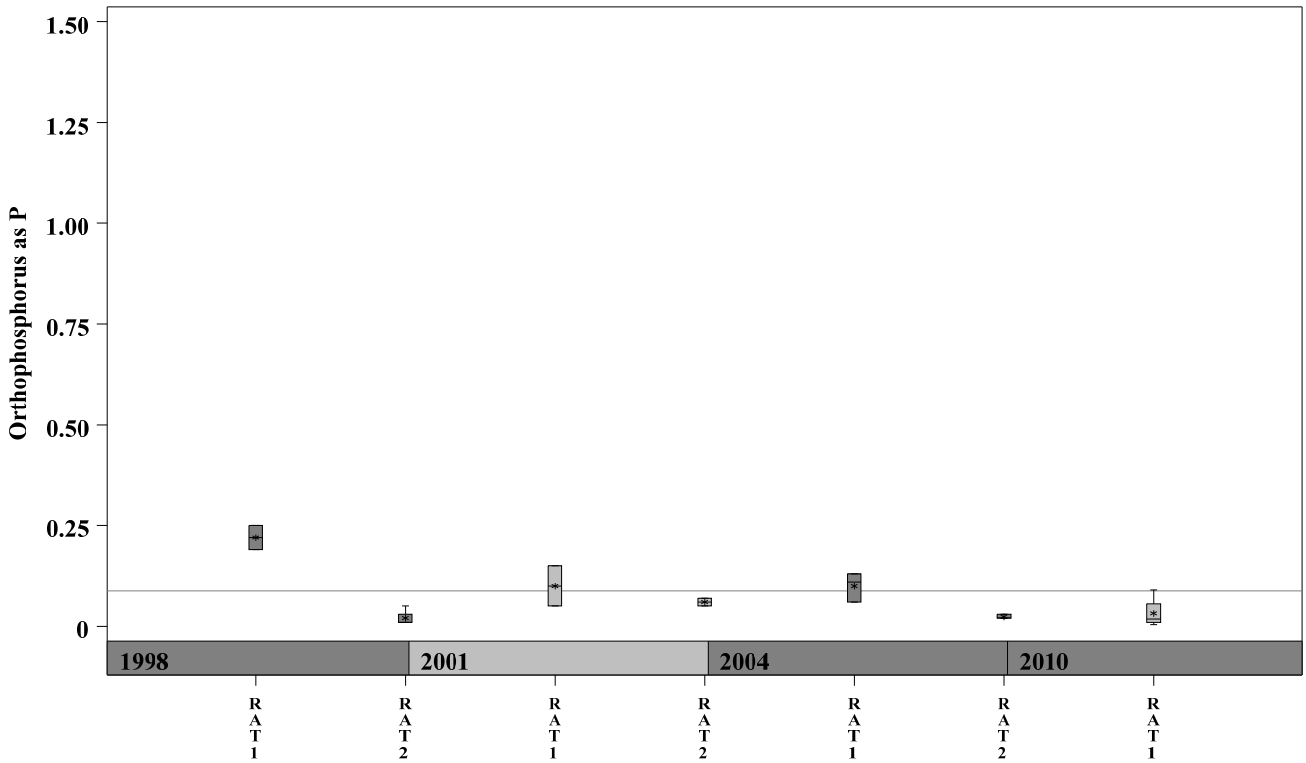
Parameter = NITRATE AS N Unit = mg/L Watershed = Rattan



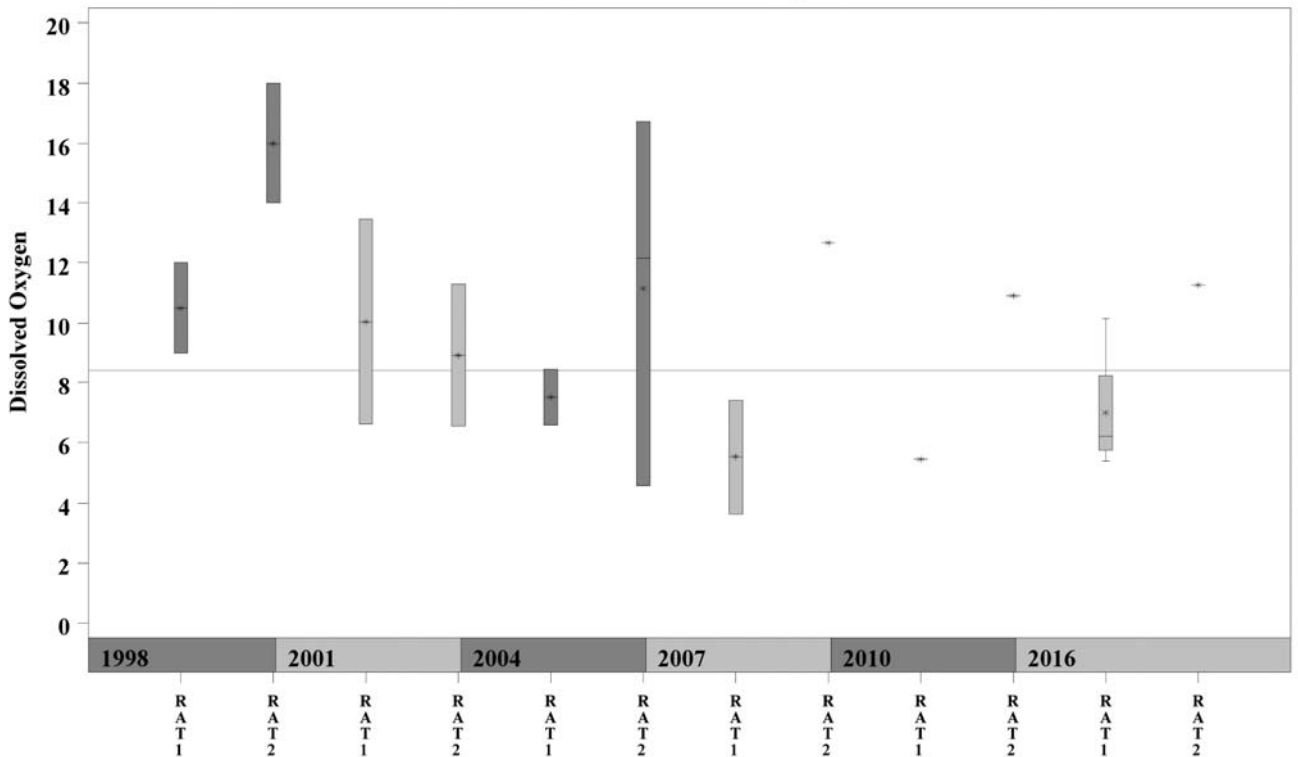
Rattan Creek Watershed

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

Parameter=ORTHOPHOSPHORUS AS P Unit=mg/L Watershed=Rattan



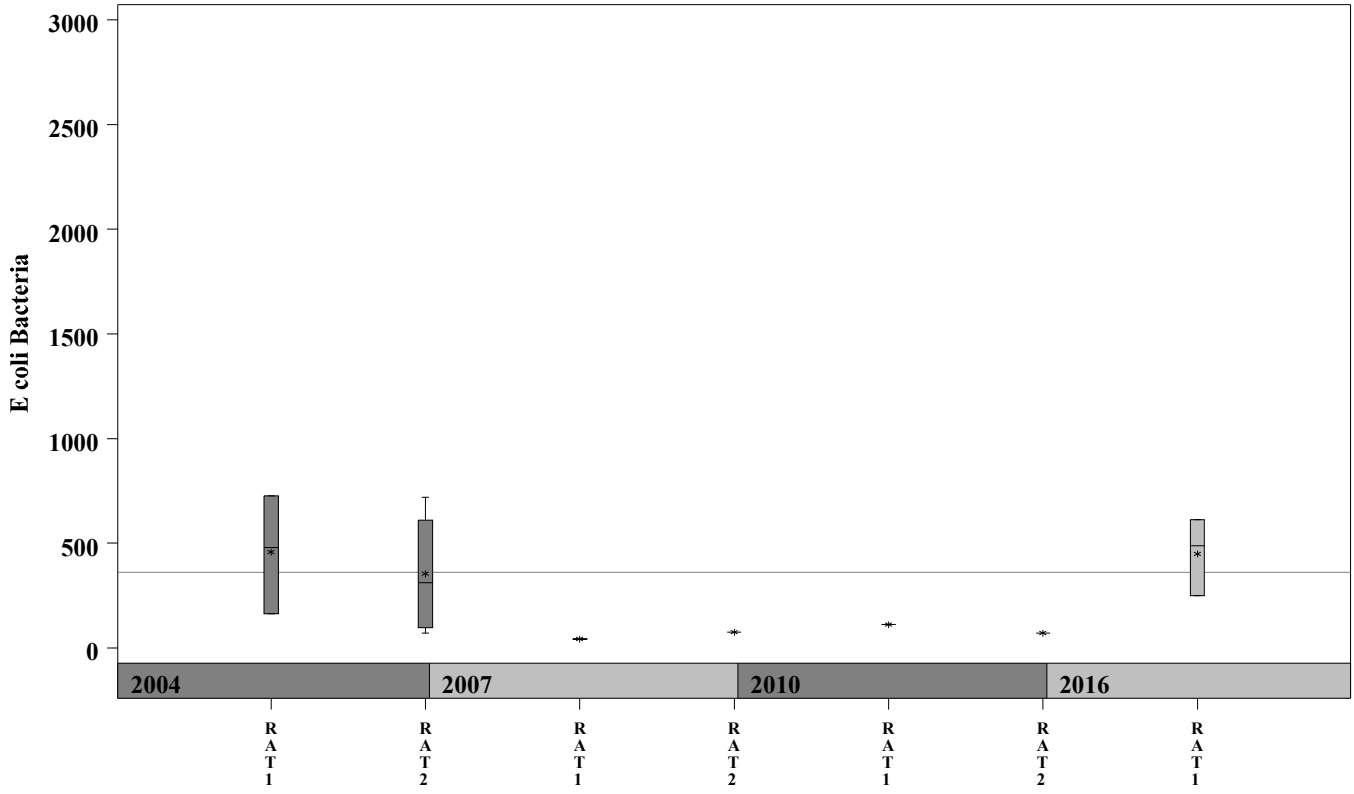
Parameter= DISSOLVED OXYGEN Unit= mg/L Watershed= Rattan



Rattan Creek Watershed

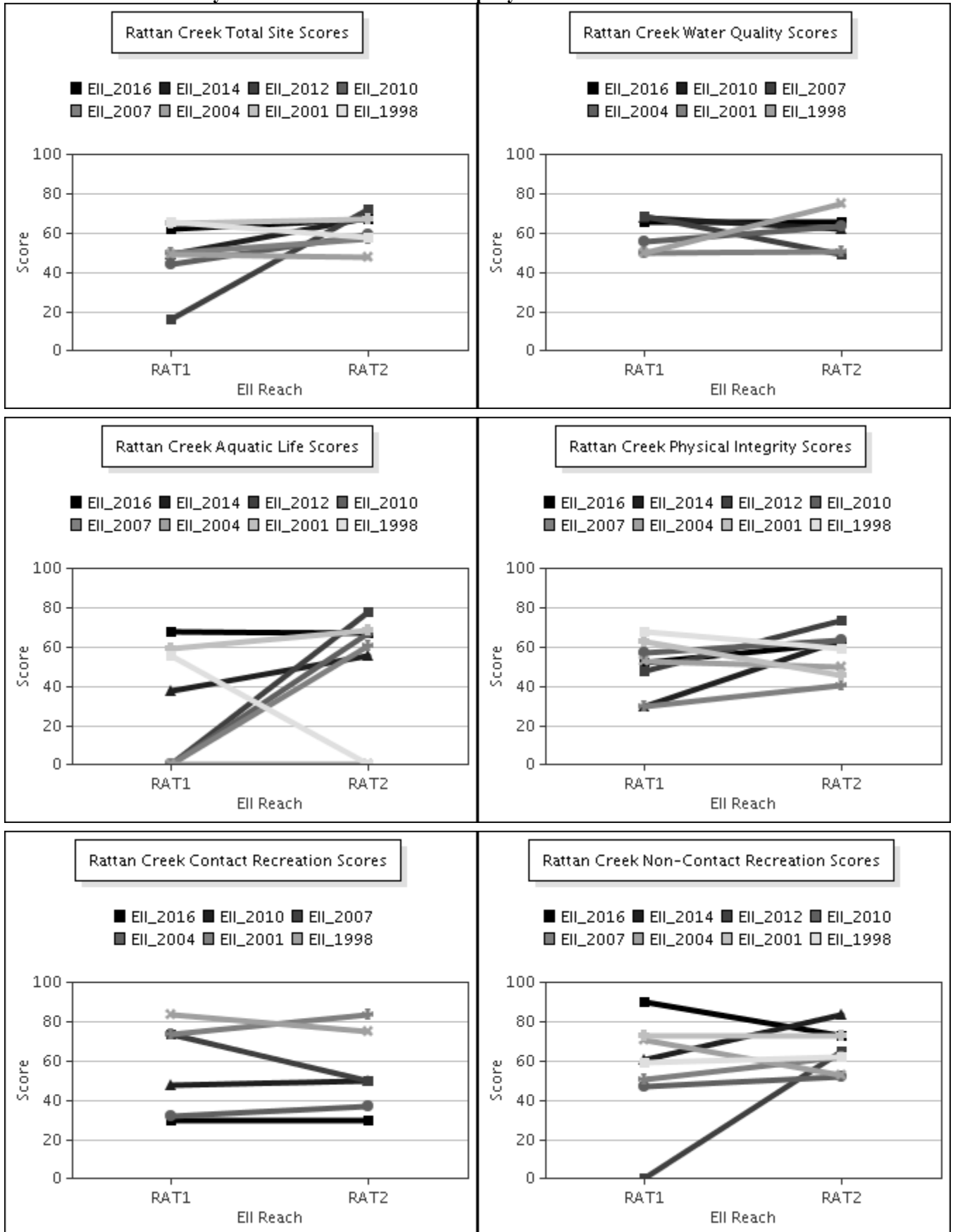
Data Summary Graphs – *E.coli* (Downstream to Upstream by Year)

Parameter = E COLI BACTERIA Unit = MPN/100mL Watershed = Rattan



Rattan Creek Watershed

Score Summary – Reach scores for each sample year



Rattan Creek Watershed

Benthic Macroinvertebrates – Taxa List, Pollution Tolerance Index & Functional Feeding Group for 2016 Sample Sites (Downstream to Upstream)

Benthic Macroinvertebrates - Rattan Creek			RAT us Parmer (1009)	RAT @ Shadowbrook (1097)
Benthic Macroinvertebrate ID	PTI	FFG	05/09/2016 (WRE)	05/09/2016 (WRE)
Chimarra	2	FC		5
Baetodes	4	SC		3
Callibaetis	4	CG	39	3
Copepoda	4	SC	300	1
Fallceon	4	CG,SC	55	1
Ostracoda	4	CG,FC	2	
Simulium	4	FC		23
Agabus	5	P		1
Anax	5	P	2	1
Buena	5	P	1	
Cybister	5	P	1	
Liodessus Obscurellus	5	P	2	1
Sphaerium (Clam)	5	FC	3	
Paracymus	5	CG	6	
Archilestes	6	P	6	
Branchiobdellidae	6	CG	6	
Brechmorhoga Mendax	6	P		1
Cheumatopsyche	6	FC	2	11
Chironomidae	6	FC,P	51	14
Fossaria	6	SC		11
Hydracarina	6		150	
Tanypodinae	6	P	7	10
Helisoma	7	SC	1	
Pelocoris	7	P	1	
Anopheles	8	FC		4
Cladocera	8	FC	23	
Hirudinea	8	P		5
Hyaella	8	CG,SH	4	
Oligochaeta	8	CG	6	4
Berosus	9	CG		2
Corixidae	9	CG,P	6	
Enochrus	9	CG		1
Ischnura	9	P	6	
Physella	9	SC	25	72
Laccophilus	10	P	4	1
Tropisternus	10	P		1
Cambaridae		CG	3	

Rattan Creek Watershed

Site Photographs



1009_us_06_19_2007



1009_ur_06_19_2007



1009_00-ds-05_24_2010



1009_00-ur-05_24_2010



1009_00-us-05_24_2010



1009_00-us-05_17_2010

Rattan Creek Watershed
Site Photographs



1097_us_06_19_2007



1097_ds_06_19_2007



1097_pool_06_19_2007



1097_ur_06_19_2007



1097_00-us-05_24_2010



1097_00-ds-05_24_2010