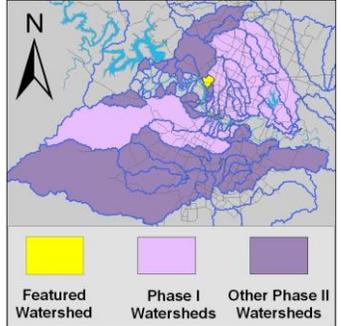


# Dry Creek (north) Watershed

## Summary Sheet

Catchment	Total area	2.1 sq. miles					
	Area in recharge	0.3 sq. miles					
	Creek length	2.4 miles					
Demographics	Receiving water	Lake Austin					
	2000 population	unknown					
	2030 projected population	unknown					
Land Use	30 year projected % increase	unknown					
	Impervious cover (2003 estimate)	22.1 %					
Overall EII Scores	Impervious cover (2013 estimate)	31.9 %					
		2001	2004	2007	2010	2012	2014
		69	64	63	68	72	72



### Flow Regime\* for Sample Sites on Dry Creek (North)

Site	Site Name	1999		2001				2004				2007				2010		2011		2012			2014											
		Jan	Jan	Mar	Mar	Jun	Sep	Dec	Mar	May	May	Jun	Oct	Dec	Feb	May	Jun	Sep	Dec	Mar	May	May	Oct	Dec	Mar	Apr	Jul	Sep	Jan	Apr	May	Jun	Jul	Sep
1109	FM 2222	B	B	B	B	n	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	n	n						
1110	Highland Pass	B	B	B	B	B	B	B	B	B	B	B	B																					
1108	Mt Bonnel Rd	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	n	B	B	B	B	B	B	

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

### Index scores\* for Dry Creek (North) 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
DRN1	1108	Dry Creek (North) @ Mt Bonnel Rd	1998	47	60	70	88	71	62	51	72	66
DRN2	1109	Dry Creek (North) @ FM 2222	1998	55	60	86	58	49	55	51	58	61
DRN2	1110	Dry Creek (North) @ Highland Pass	1998	46	60	64	68	59	56	44	68	59
DRN1	1108	Dry Creek (North) @ Mt Bonnel Rd	2001	47	90	73	88	77	49	33	64	67
DRN2	1109	Dry Creek (North) @ FM 2222	2001	54	90	80	76	61	37	25	49	63
DRN2	1110	Dry Creek (North) @ Highland Pass	2001	49	90	83	81	72	49	39	58	67
DRN1	1108	Dry Creek (North) @ Mt Bonnel Rd	2004	62	72	40	77	69	68	67	69	65
DRN2	1109	Dry Creek (North) @ FM 2222	2004	58	72	42	75	64	57	56	57	61
DRN2	1110	Dry Creek (North) @ Highland Pass	2004	49	72	41	98	72	62	53	70	66
DRN1	1108	Dry Creek (North) @ Mt Bonnel Rd	2007	60	60	45	86	71	86	77	95	68
DRN2	1109	Dry Creek (North) @ FM 2222	2007	58	60	40	82	60	49	27	70	58
DRN1	1108	Dry Creek (North) @ Mt Bonnel Rd	2010	58	66	46	84	74	80	74	85	68
DRN2	1109	Dry Creek (North) @ FM 2222	2010	59	66	38	93	71	74	73	75	67
DRN1	1108	Dry Creek (North) @ Mt Bonnel Rd	2012	64	63	49	98	79	88	93	83	74
DRN2	1109	Dry Creek (North) @ FM 2222	2012	61	63	54	82	71	87	100	74	70
DRN1	1108	Dry Creek (North) @ Mt Bonnel Rd	2014	70	61	53	83	81	86	81	90	72

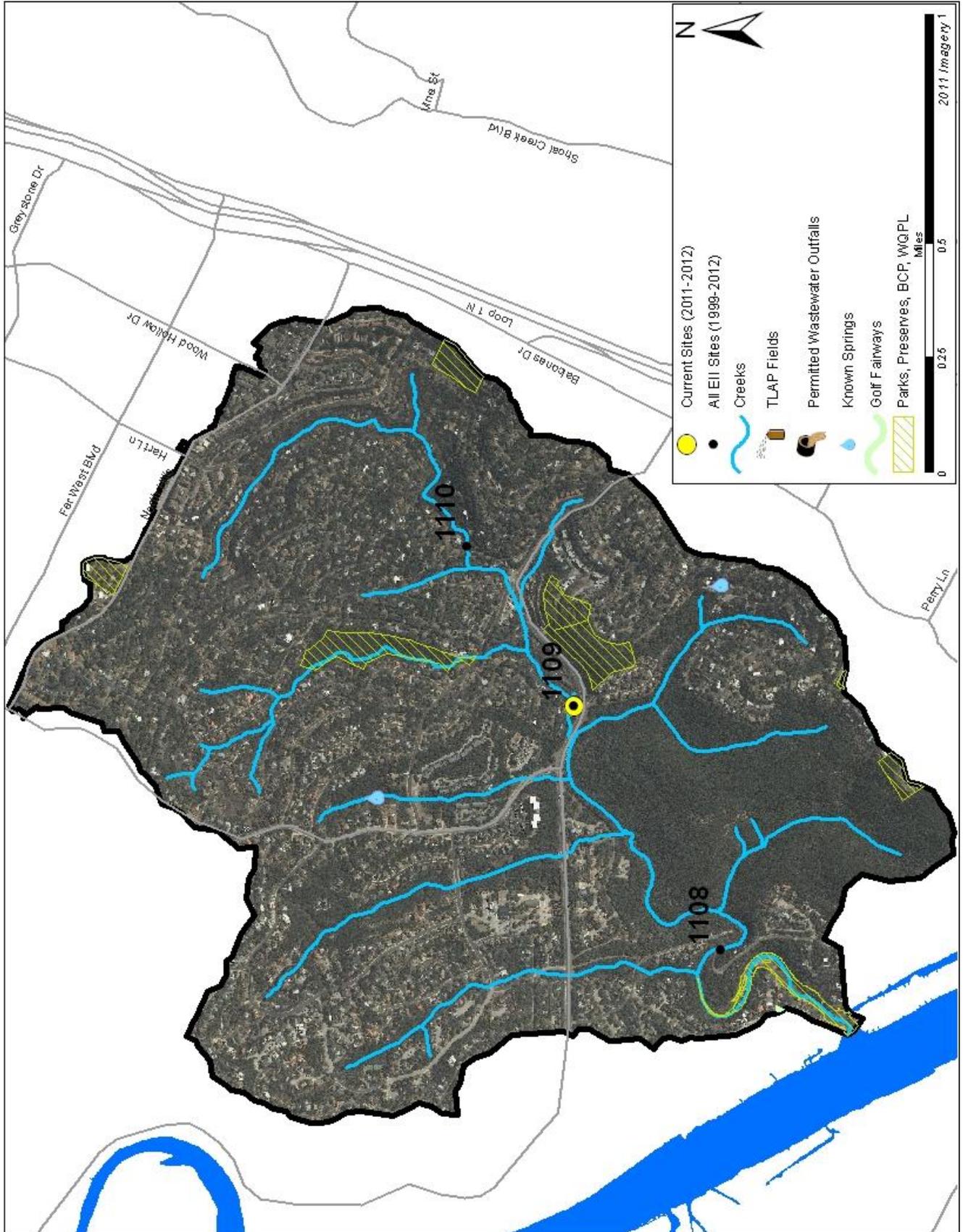
\* blank cells indicate parameter was not collected, blank row indicate site was dropped \*\*sediment samples only collected at the downstream site

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



# Dry Creek Watershed

## Aerial Map



# Dry Creek Watershed

## Water Quality Data – Temperature, Conductivity, pH, Dissolved Oxygen & E. coli for 2014 Sample Sites (Downstream to Upstream)

Qualifiers to the left of value:	>	greater than	Qualifiers to the right of value:	(blank)	Useable
	<	less than		S	Exceeds standard range
	< J	less than detection limit		R	Rejected, failed QC
	J	Estimated			

Site Name	Site #	Reach	Date	Temp.		Cond.		pH		D.O.		E.coli	
				<> Value	flag								
Dry Creek North @ Mt Bonnel Rd	1108	DRN1	01/15/2014	10.4		784		7.69		8.4		8.6	
Dry Creek North @ Mt Bonnel Rd	1108	DRN1	04/17/2014	15.0		672		7.53		6.2		108.1	
Dry Creek North @ Mt Bonnel Rd	1108	DRN1	06/11/2014	23.9		722		7.75		6.2			
Dry Creek North @ Mt Bonnel Rd	1108	DRN1	07/02/2014	24.2		707		7.67		6.1		198.9	
Dry Creek North @ Mt Bonnel Rd	1108	DRN1	09/10/2014	24.8		635		7.62		4.3		488.4	
<b>Site 1108 Mean</b>				19.7		704		7.65		6.2		201.0	
<b>Watershed Mean</b>				19.7		704		7.65		6.2		201.0	

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

Summary Statistics for all 2013 – 2014 E.I.I. Sites Combined.					
Parameter	2013-2014 Average	2013-2014 Minimum	2013-2014 Maximum	1 Standard Deviation Above	1 Standard Deviation Below
Temperature (C°)	19.6	8.6	34.0	25.8	
Conductivity (uS/cm)	711	107	1783	942	
pH (Standard units)	7.86	6.96	8.97	8.19	7.52
D.O. (mg/l)	8.1	1.2	30.5	11.4	4.8
E.coli. (col/100ml)	435	1	4840	1127	

# Dry Creek Watershed

## Water Quality Data – Ammonia, Nitrate / Nitrite, Ortho-Phosphorus, Total Suspended Solids & Turbidity for 2014 Sample Sites (Downstream to Upstream)

Qualifiers to the left of value:	>	greater than	Qualifiers to the right of value:	(blank)	Useable
	<	less than		S	Exceeds standard range
	< J	less than detection limit		R	Rejected, failed QC
	J	Estimated			

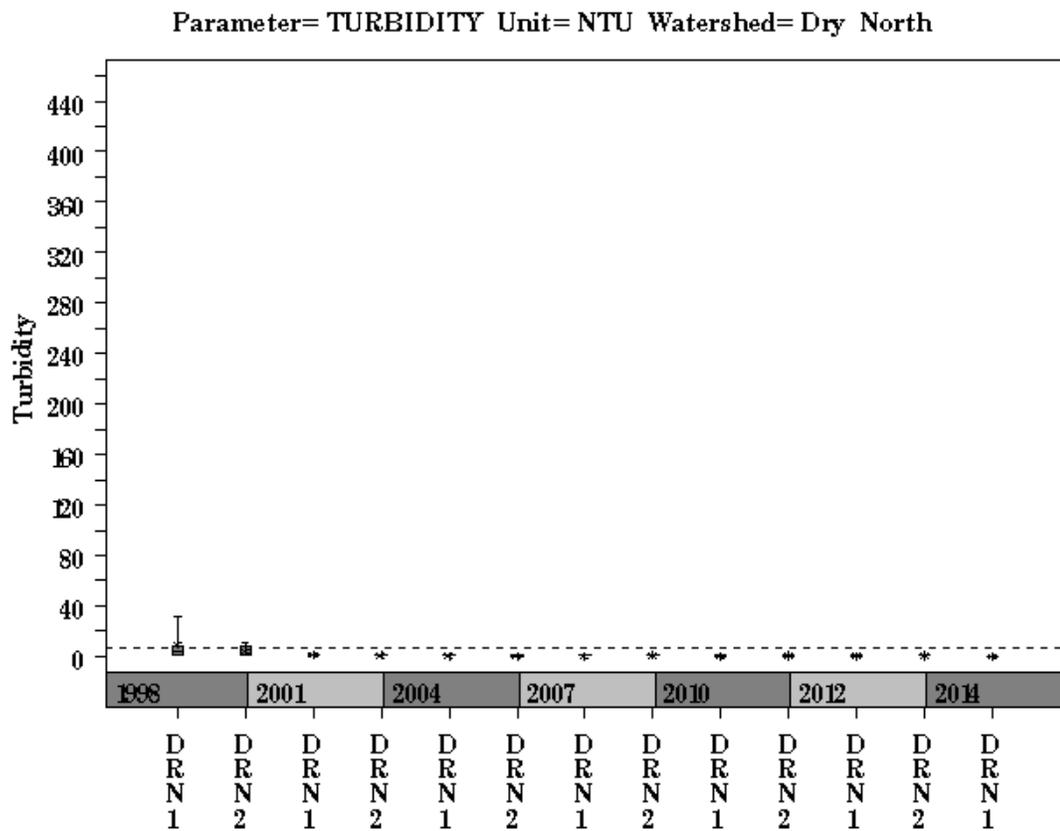
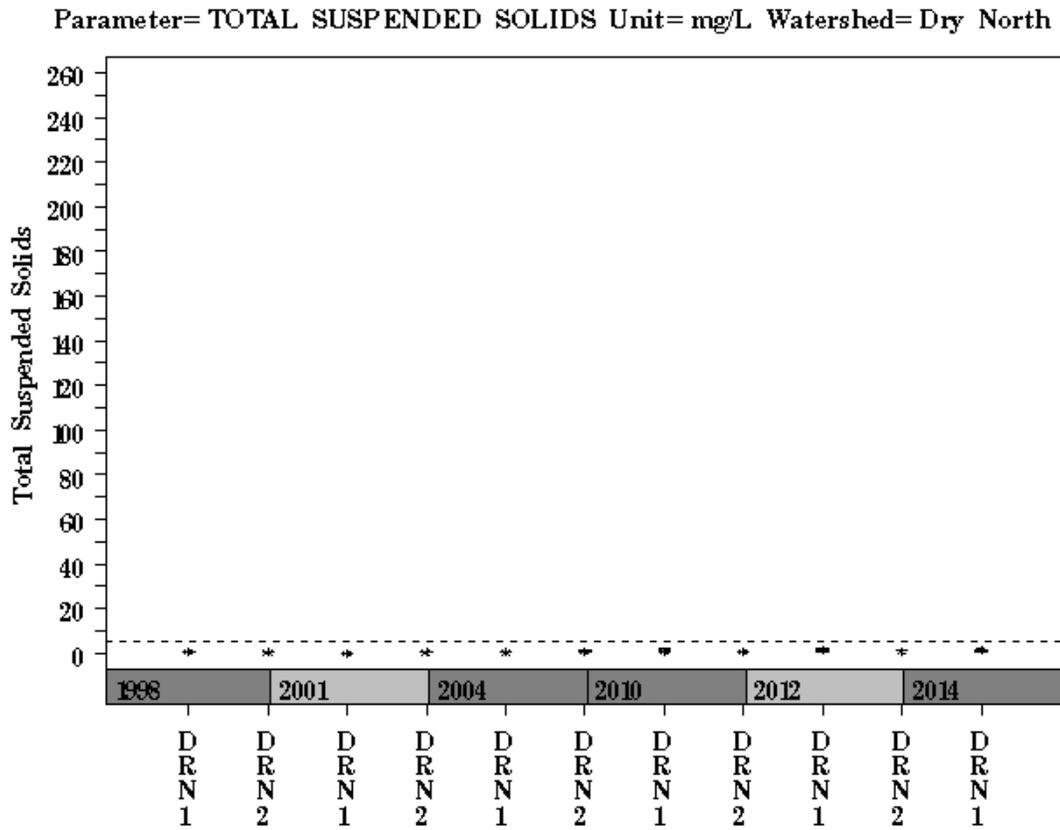
Site Name	Site #	Reach	Date	NH3-N		NO3/NO2		Ortho-P		T.S.S.		Turb.					
				<>	Value	flag	<>	Value	flag	<>	Value	flag	<>	Value	flag		
Dry Creek North @ Mt Bonnel Rd	1108	DRN1	01/15/2014	<J	0.008			0.10		<J	0.004			2.5		0.3	R
Dry Creek North @ Mt Bonnel Rd	1108	DRN1	04/17/2014		0.043		<J	0.01		<J	0.004		<J	1.1		0.4	R
Dry Creek North @ Mt Bonnel Rd	1108	DRN1	06/11/2014														
Dry Creek North @ Mt Bonnel Rd	1108	DRN1	07/02/2014	<J	0.008		<J	0.01		<J	0.004		<J	1.1		0.1	
Dry Creek North @ Mt Bonnel Rd	1108	DRN1	09/10/2014	<J	0.008		<J	0.01		<J	0.004		<J	1.0		0.6	R
<b>Site 1108 Mean</b>					<b>0.017</b>			<b>0.03</b>			<b>0.004</b>			<b>1.4</b>		<b>0.3</b>	
<b>Watershed Mean</b>					<b>0.017</b>			<b>0.03</b>			<b>0.004</b>			<b>1.4</b>		<b>0.3</b>	

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

Summary Statistics for all 2013 – 2014 E.I.I. Sites Combined.				
Parameter	2013-2014 Mean	2013-2014 Minimum	2013-2014 Maximum	1 Standard Deviation Above
NH3-M (mg/l)	0.031	0.008	2.250	0.150
NO3-N (mg/l)	1.16	0.01	16.30	4.02
Ortho-P (mg/l)	0.041	0.004	1.360	0.164
TSS (mg/l)	5.6	1.0	70.0	15.3
Turbidity (NTU)	4.5	0.0	97.1	13.2

# Dry Creek Watershed

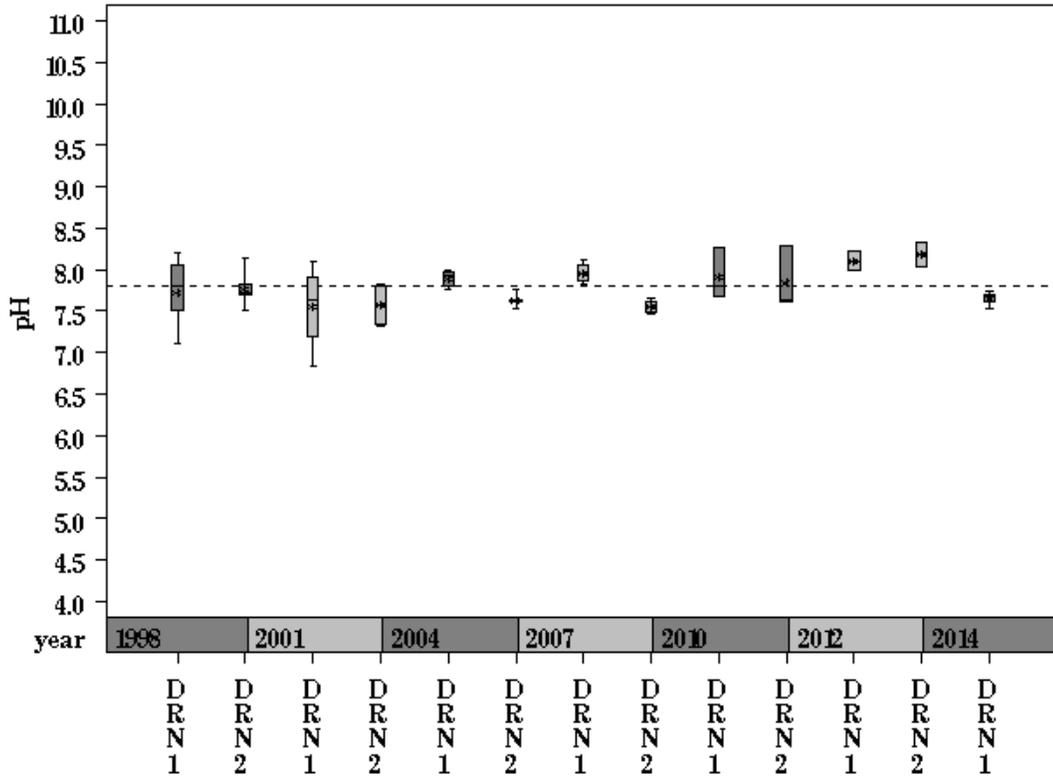
Data Summary Graphs – Total Suspended Solids and Turbidity (Downstream to Upstream by Year)



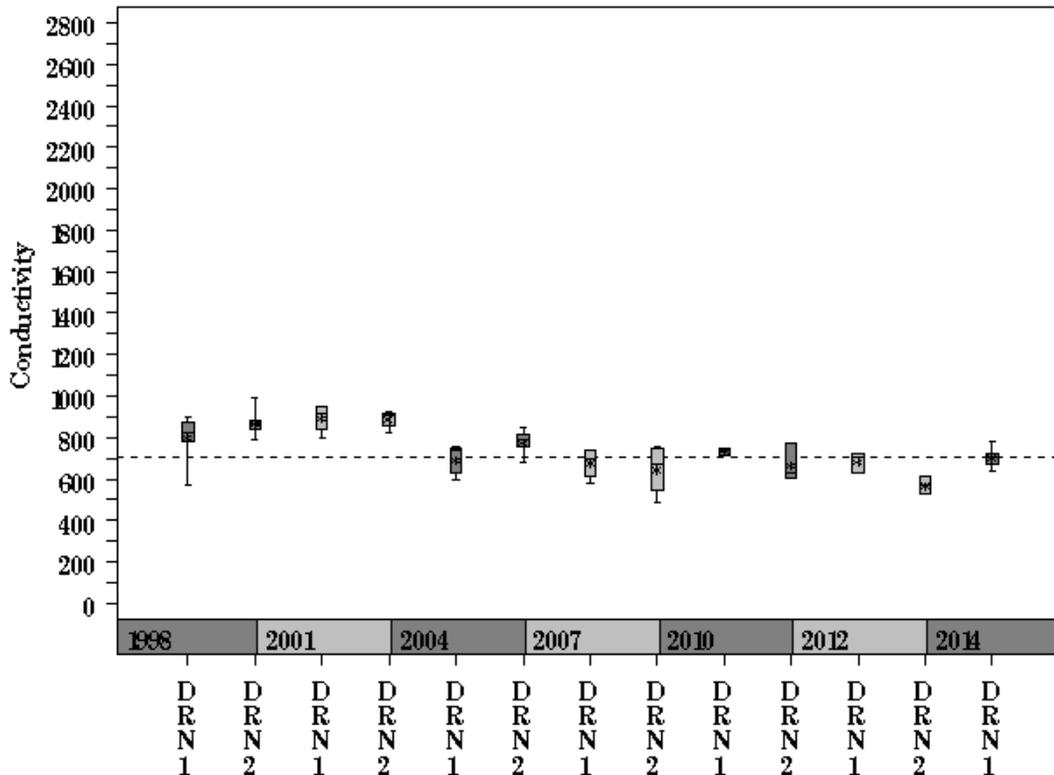
# Dry Creek Watershed

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

Parameter= PH Unit= Standard units Watershed= Dry North



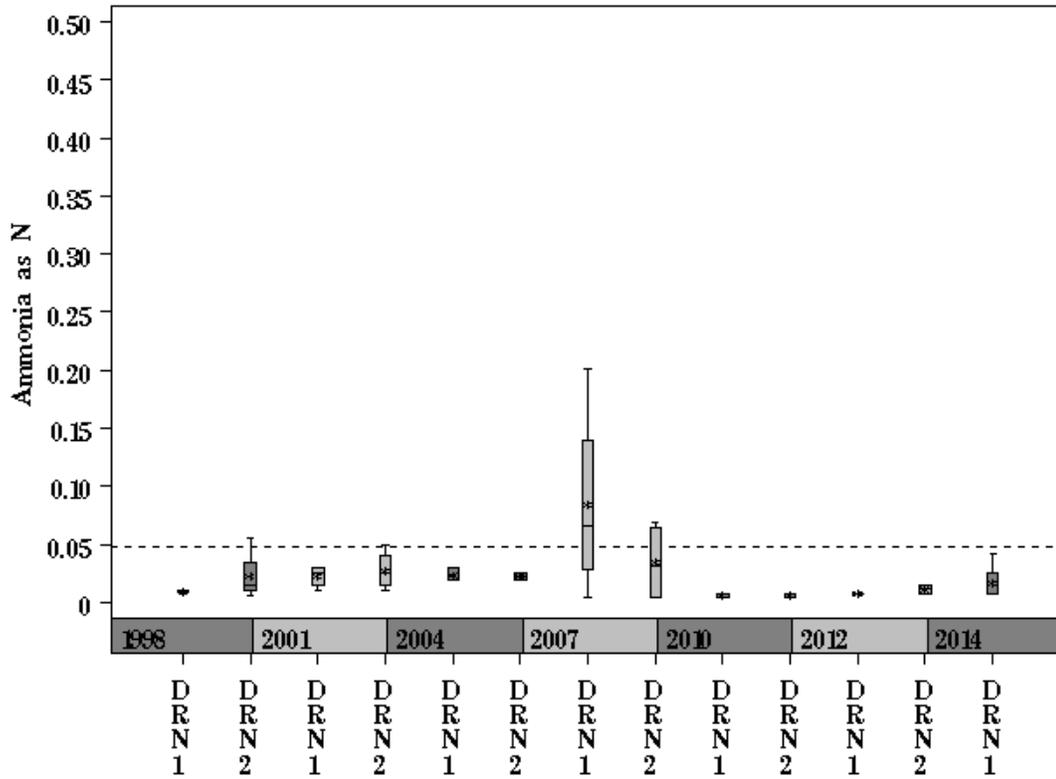
Parameter= CONDUCTIVITY Unit= uS/cm Watershed= Dry North



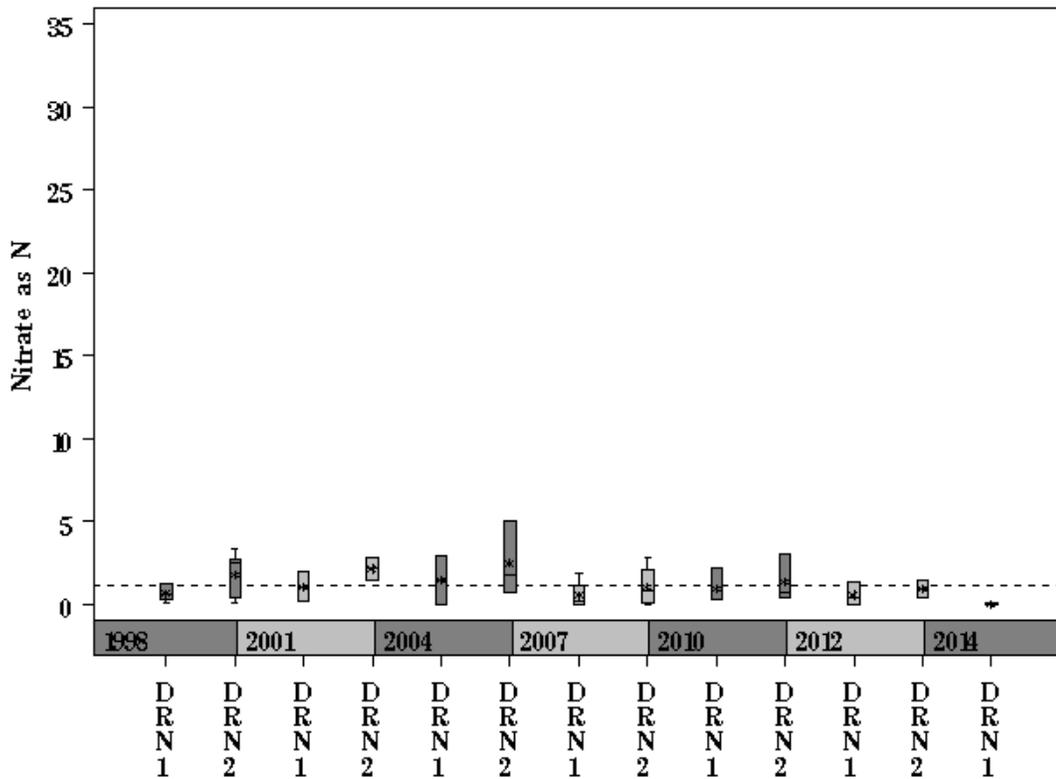
# Dry Creek Watershed

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

Parameter= AMMONIA AS N Unit= mg/L Watershed= Dry North



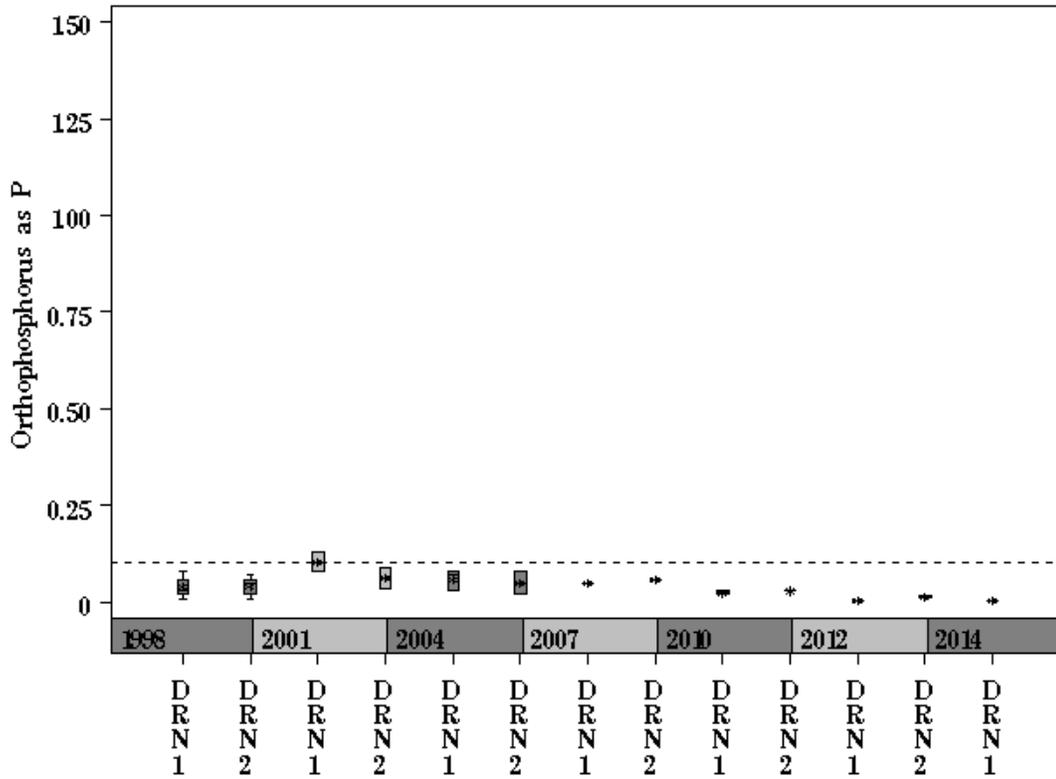
Parameter= NITRATE AS N Unit= mg/L Watershed= Dry North



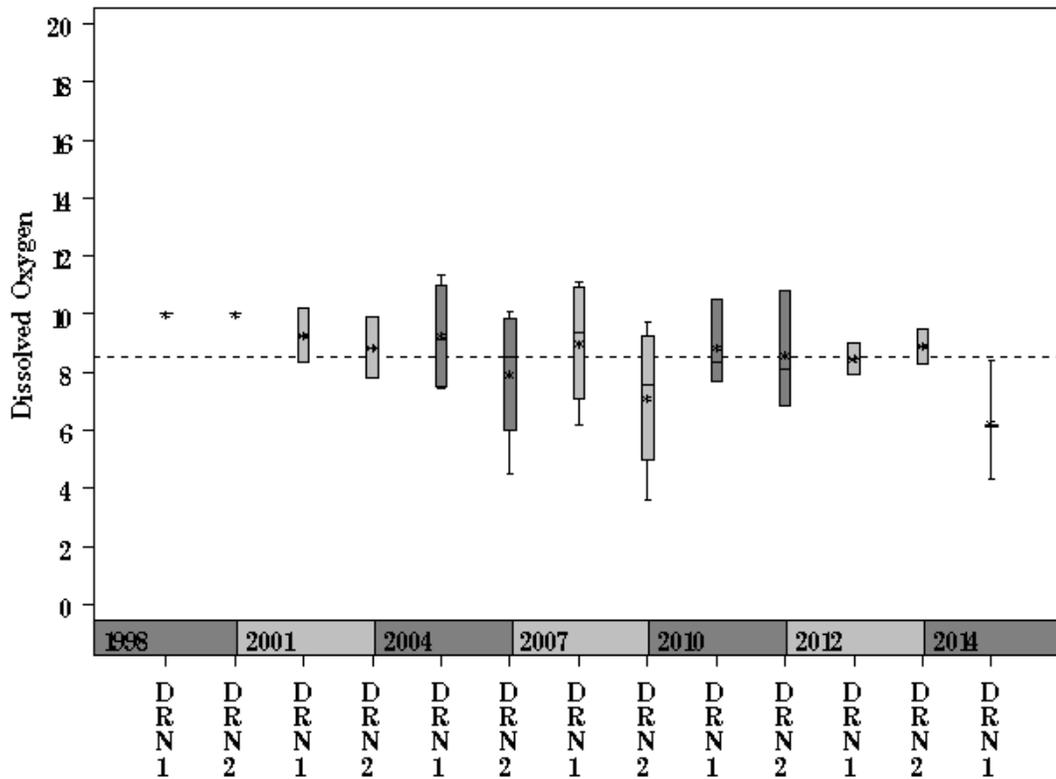
# Dry Creek Watershed

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

Parameter= ORTHOPHOSPHORUS AS P Unit= mg/L Watershed= Dry North

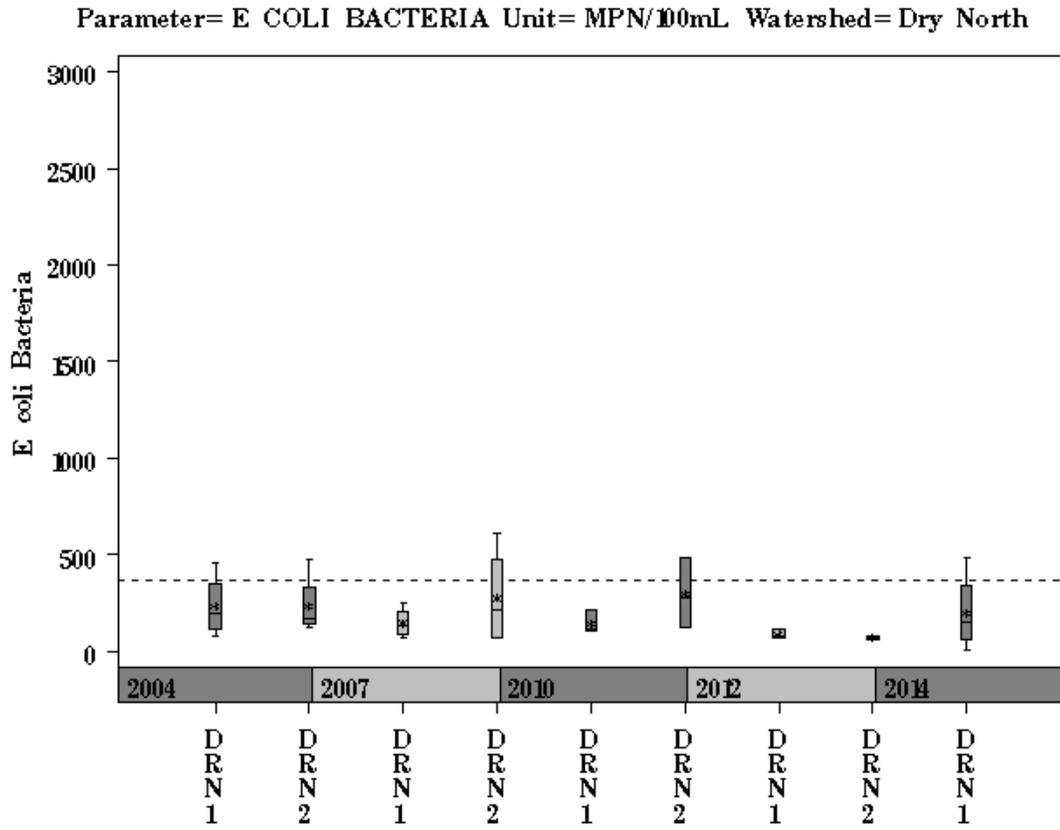


Parameter= DISSOLVED OXYGEN Unit= mg/L Watershed= Dry North



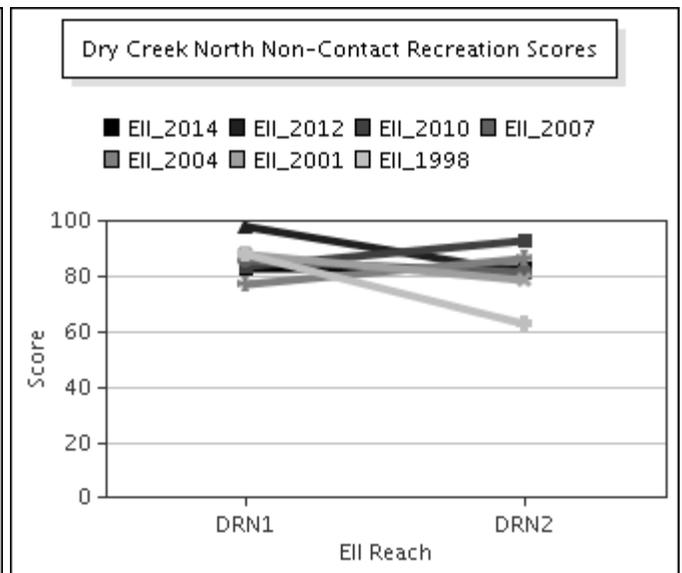
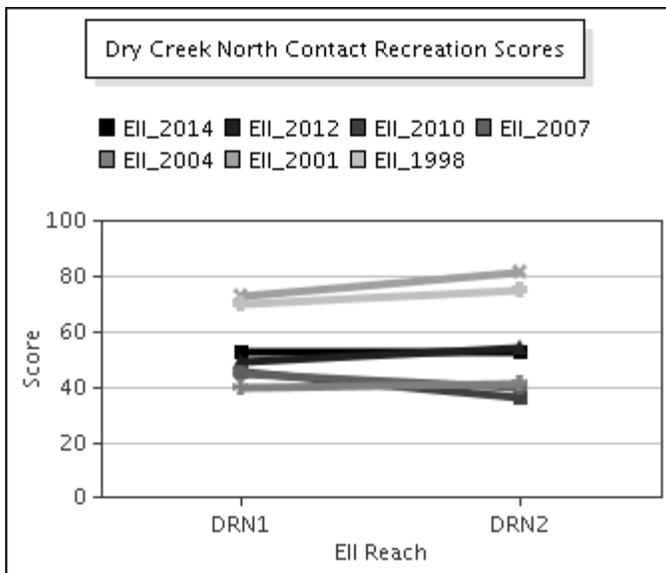
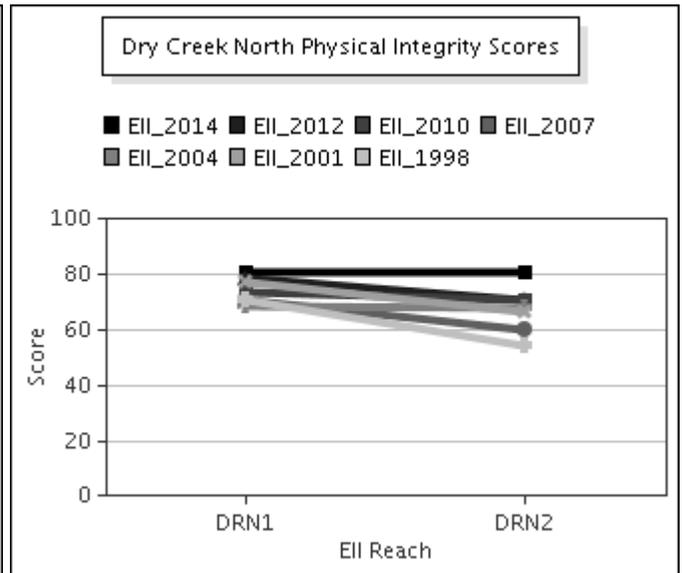
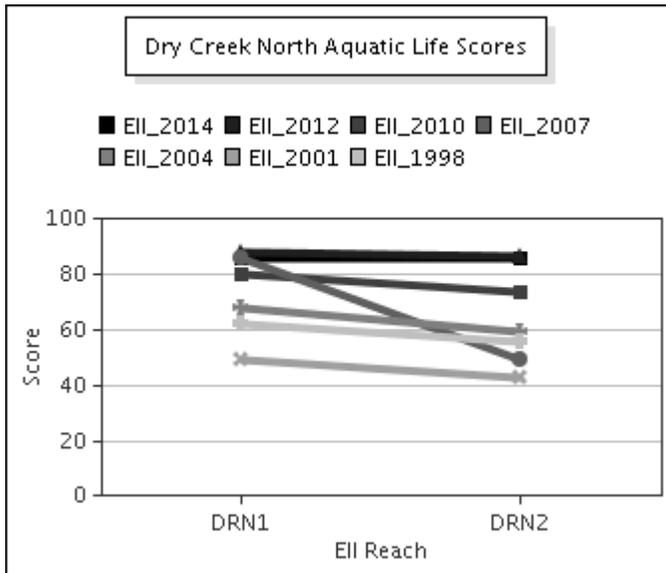
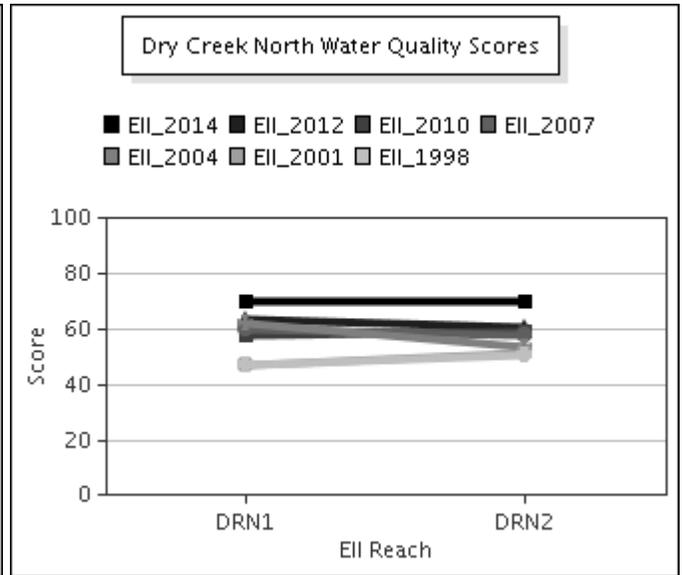
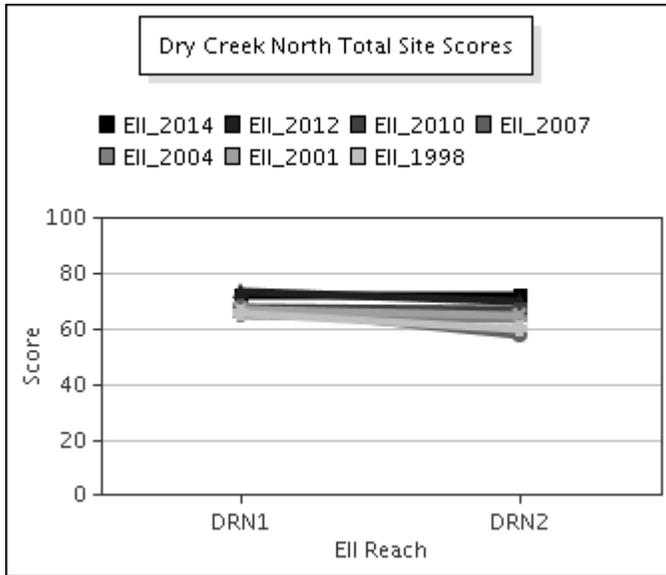
# Dry Creek Watershed

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



# Dry Creek Watershed

## Score Summary – Reach scores for each sample year



# Dry Creek Watershed

## Benthic Macroinvertebrates – Taxa List, Pollution Tolerance Index & Functional Feeding Group for 2014 Sample Sites (Downstream to Upstream)

Benthic Macroinvertebrate ID	PTI	FFG	Dry Creek North @ Mt Bonnel Rd (Site 1108)
<i>Chimarra</i> sp.	2	FC	129
<i>Helicopsyche</i> sp.	2	SC	4
<i>Fallceon quilleri</i>	4	SC,CG	52
<i>Psephenus</i> sp.	4	SC	1
<i>Aqabinus</i> sp.	5	P	1
<i>Argia</i> sp.	6	P	9
<i>Cheumatopsyche</i> sp.	6	FC	17
Chironomidae	6	P,FC	48
<i>Hemerodromia</i> sp.	6	P,CG	1
<i>Bezzia</i> sp. / <i>Palpomyia</i> sp.	7	P,CG	1
<i>Stenelmis</i> sp.	7	SC,CG	19
<i>Caloparyphus</i> sp. / <i>Euparyphus</i> sp.	8	SC,CG	4
<i>Tipula</i> sp.	8	SH,CG	2
<i>Physella</i> sp.	9	SC	23
<i>Dugesia</i> sp.		P,CG	20

# Dry Creek Watershed

## Benthic Macroinvertebrates – Metric Summary for 2014 Sample Sites (Downstream to Upstream)

Scoring Metric	Dry Creek North @ Mt Bonnel Rd (Site 1108)
Number of Taxa *	15
Hilsenhoff Biotic Index *	4.3
Number of Ephemeroptera Taxa *	1
Percent of Total as Chironomidae *	15
Number of EPT Taxa *	4
Percent of Total as EPT *	61
Percent of Total as Predator *	24
Number of Intolerant Taxa *	4
Percent Dominance (Top 3 Taxa) *	69
EPT / EPT + Chironomidae	1
Number of Diptera Taxa	5
Number of Non-Insect Taxa	2
Number of Organisms	331
Percent Dominance (Top 1 Taxa)	39
Percent of Total as Collector / Gatherer	30
Percent of Total as Dominant Guild (FFG)	59
Percent of Total as Elmidae	6
Percent of Total as Filterers	59
Percent of Total as Grazers (PI & SC)	31
Percent of Total as Tolerant Organisms	7
Percent of Trichoptera as Hydropsychidae	11
Ratio of Intolerant : Tolerant Organisms	1.50
TCEQ Qualitative Aquatic Life Use Score	30
TCEQ Quantitative Aquatic Life Use Score	29

\* **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%.

# Dry Creek Watershed

## Diatoms – Taxa List & Pollution Tolerance Index for 2014 Sample Sites (Downstream to Upstream)

Diatom Species Name	PTI	Dry Creek North @ Mt Bonnel Rd (Site 1108)
<i>Amphora inariensis</i>	4	17
<i>Brachysira neoexilis (serians)</i>	4	2
<i>Achnantheidium minutissimum</i>	3	76
<i>Amphora pediculus</i>	3	165
<i>Cocconeis pediculus</i>	3	12
<i>Denticula kuetzingii</i>	3	14
<i>Diploneis puella</i>	3	2
<i>Encyonema evergladianum</i>	3	2
<i>Encyonema silesiacum</i>	3	3
<i>Encyonopsis microcephala</i>	3	2
<i>Gomphonema affine</i>	3	2
<i>Gomphonema pumilum</i>	3	6
<i>Halamphora montana</i>	3	1
<i>Nitzschia dissipata</i>	3	1
<i>Reimeria sinuata</i>	3	118
<i>Achnantheiopsis lanceolata</i>	2	2
<i>Cyclotella meneghiniana</i>	2	1
<i>Eolimna subminuscula</i>	2	1
<i>Nitzschia amphibia</i>	2	39
<i>Nitzschia frustulum</i>	2	1
<i>Nitzschia inconspicua</i>	2	2
<i>Gomphonema parvulum</i>	1	6
<i>Cocconeis placentula</i> var. <i>euglypta</i>		12
<i>Delicata delicatula</i>		4
<i>Encyonema semilanceolatum</i>		4
<i>Gomphonema lagenula</i>		4
<i>Ulnaria ulna</i>		1

# Dry Creek Watershed

## Diatoms – Metric Summary for 2014 Sample Sites (Downstream to Upstream)

Scoring Metric	Dry Creek North @ Mt Bonnel Rd (Site 1108)
<i>Cymbella</i> Richness	4
Number of organisms	500
Number of taxa	27
Percent motile taxa	9
Percent similarity to reference condition	33
Pollution tolerance index	2.92

\* **EII scoring parameter: Four metric parameters are used in the calculation of the EII Diatom Subindex score: *Cymbella* richness, percent motile taxa, percent similarity to reference condition and pollution tolerance index. Number of taxa is non-scoring, but is shown to supplement evaluation. The number of organisms is typically a sample of 500, but occasionally differs due to sample conditions.**

1. *Cymbella* Richness: The Cymbelloid taxa include species in the genus *Cymbella*, in addition to some species belonging to the genera *Cymbellopsis*, *Cymbopleura*, *Encyonema*, *Encyonemopsis*, *Navicymbula* and *Reimeria*. Their presence highlights the presence of sensitive species, especially with regard to impervious cover, and this value increases with an increase in overall water quality. The average number of Cymbelloid taxa per site for 2013/2014 samples was 3; the lowest value was 0 and the highest value was 7.
2. % Motile Taxa: This is a siltation index showing the relative abundance of genera that are able to move towards the surface if covered by silt. A higher percentage is indicative of a degraded condition caused by increased silt pollution. The average percent motile taxa per site for 2013/2014 samples was 16%; the lowest value was 0% and the highest value was 77%.
3. % similarity to reference condition: This percentage compares a site to reference sites that are selected based on having low percent impervious cover. A higher percentage reflects greater biological integrity. The average percent similarity per site for 2013/2014 samples was 31%; the lowest value was 6% and the highest value was 57%.
4. Pollution Tolerance Index (PTI): This is a total value for a sample, which is a function of the abundance of each taxon (usually species) in a sample and the individual PTI's for each of those taxa. Individual PTI's for each taxon range from 1 (most pollution tolerant) to 4 (most pollution sensitive), thus higher total PTI's for a site reflect greater biological integrity. The average PTI per site for 2013/2014 samples was 2.76; the lowest value was 1.70 and the highest value was 3.45.

# Dry Creek Watershed

## Site Photographs



1110\_t00-us-05\_17\_2004



1110\_t00-ds-05\_17\_2004



1109\_t00-us-05\_17\_2004



1109\_t00-ds-05\_17\_2004



1109\_ur\_06\_18\_2007



1109\_ds\_06\_18\_2007

---

# Dry Creek Watershed

## Site Photographs

---



1108\_t00-ds-05\_17\_2004



1108\_t00-us-05\_17\_2004



1108\_ds\_06\_18\_2007



1108\_ur\_06\_18\_2007



1108\_00-ds-05\_17\_2010



1108\_00-us-05\_17\_2010

This page left intentionally blank