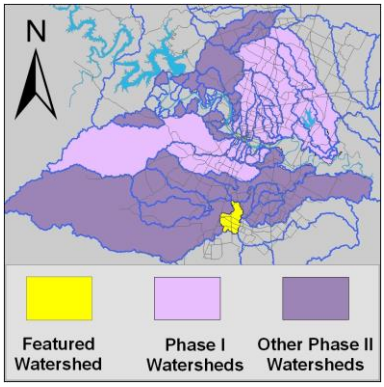
# Rinard Creek Watershed

## Summary Sheet

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Catchment | Total area | 8 sq. miles | | | | | |
| | Area in recharge | 0 | | | | | |
| | Creek length | 7 miles | | | | | |
| | Receiving water | Onion Creek | | | | | |
| Demographics | 2000 population | 284 | | | | | |
| | 2030 projected population | 6,940 | | | | | |
| | 30 year projected % increase | 2,344 % | | | | | |
| Land Use | Impervious cover (2003 estimate) | 2.8 % | | | | | |
| | Impervious cover (2013 estimate) | 3.2 % | | | | | |
| Overall EII Scores | 1999 | 2002 | 2005 | 2008 | 2010 | 2012 | 2014 |
| | 63 | 70 | 66 | 65 | 70 | 72 | 74 |




## Flow Regime* for Sample Sites on Rinard

| Site | Site Name | 2000 | | | 2002 | | | | | 2005 | | | | | 2008 | | | | | 2010 | | | | 2011 | 2012 | | | | 2014 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | May | Jun | Jun | Feb | Feb | May | Aug | Nov | Mar | Jun | Jun | Sep | Dec | Feb | May | Jun | Sep | Dec | Mar | May | May | Oct | Dec | Mar | May | Jul | Sep | Jan | Apr | May | Jun | Jul | Sep |
| | | Bio | WQ | Bio | WQ | Bio | WQ | WQ | WQ | WQ | WQ | Bio | WQ | WQ | WQ | WQ | Bio | WQ | WQ | WQ | WQ | Bio | WQ | WQ | WQ | Bio | WQ | WQ | WQ | WQ | Bio | Bio | WQ | WQ |
| 1220 | FM 1327 | | | | B | B | n | n | B | B | B | n | n | n | n | n | n | n | n | B | n | B | n | n | B | n | n | n | | | | | | |
| 1219 | Fm 1327 Bradshaw | | | | B | B | B | B | B | B | B | B | B | n | B | n | n | n | n | B | n | B | n | | | | | | | | | | | |
| 5398 | ds SH 45 | | | | | | | | | | | | | | | | | | | | | | | n | n | n | n | B | B | n | | n | n | n |
| 233 | Bradshaw | B | S | 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 | B | B | B | | B | B |

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

## Index Scores* for Rinard Watershed Sites by Year

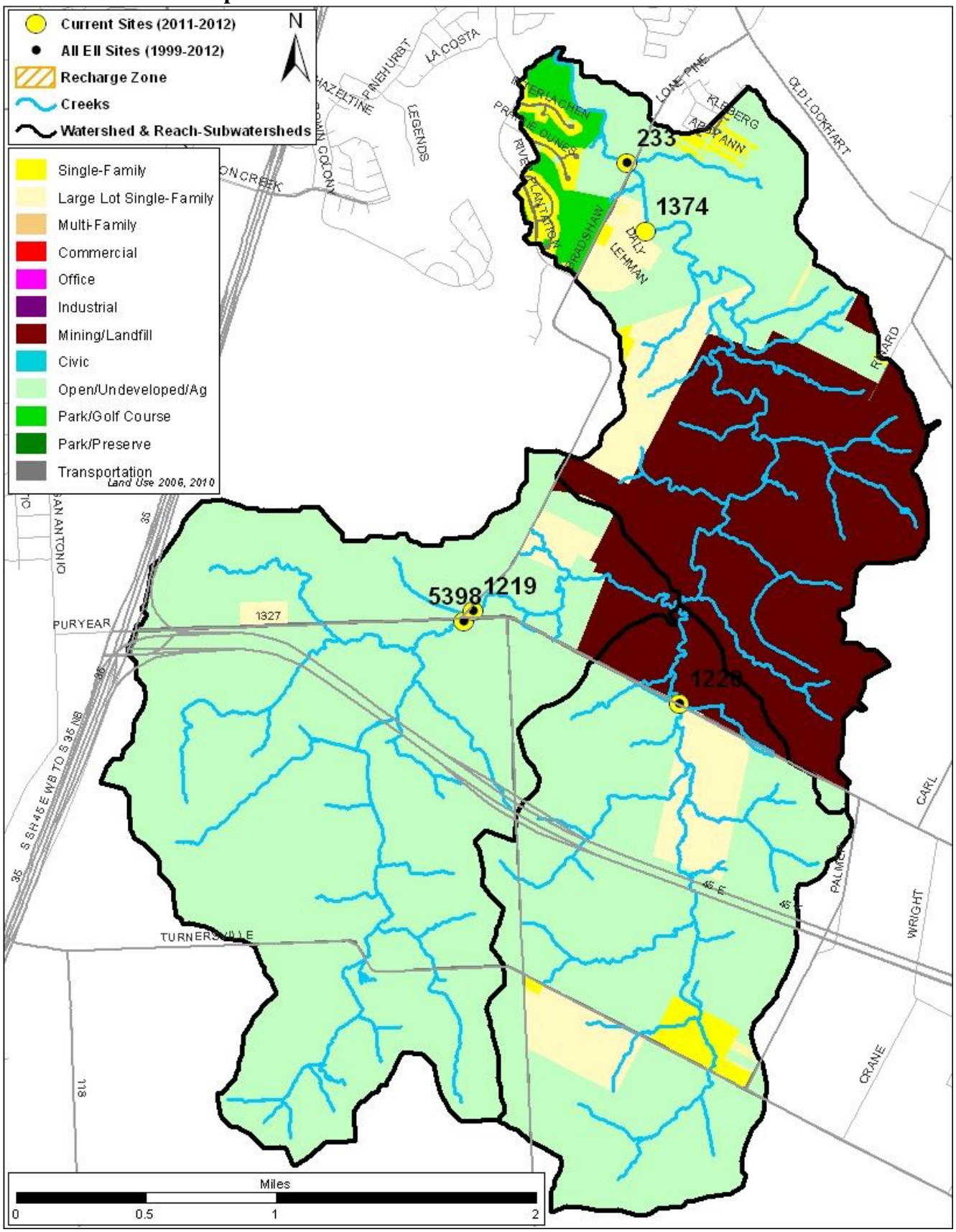
| Reach | Site | Site Name | Year | Water Quality | Sediment** | Contact Rec. | Non Contact Recreation | Physical Integrity | Aquatic Life | Benthic subindex | Diatom subindex | **Total Site Score** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RIN1 | 233 | Rinard Cr @ Bradshaw Road | 1999 | 60 | 80 | 93 | 73 | 54 | 56 | 73 | 39 | 69 |
| RIN2 | 1219 | Rinard Cr @ FM1327 and Bradshaw | 1999 | 72 | 80 | 98 | 70 | 66 | | | | 64 |
| RIN3 | 1220 | Rinard Cr @ FM1327 | 1999 | 64 | 80 | 97 | 63 | 39 | | | | 57 |
| RIN1 | 233 | Rinard Cr @ Bradshaw Road | 2002 | 59 | 81 | 93 | 73 | 63 | 61 | 45 | 76 | 72 |
| RIN2 | 1219 | Rinard Cr @ FM1327 and Bradshaw | 2002 | 66 | 81 | 95 | 80 | 29 | 65 | 49 | 80 | 69 |
| RIN3 | 1220 | Rinard Cr @ FM1327 | 2002 | 69 | 81 | 99 | 70 | 27 | 59 | 40 | 77 | 68 |
| RIN1 | 233 | Rinard Cr @ Bradshaw Road | 2005 | 69 | 76 | 64 | 73 | 69 | 81 | 68 | 93 | 72 |
| RIN2 | 1219 | Rinard Cr @ FM1327 and Bradshaw | 2005 | 69 | 76 | 81 | 79 | 65 | 74 | 80 | 68 | 74 |
| RIN3 | 1220 | Rinard Cr @ FM1327 | 2005 | 61 | 76 | 58 | 63 | 48 | | | | 51 |
| RIN1 | 233 | Rinard Cr @ Bradshaw Road | 2008 | 64 | 82 | 72 | 71 | 72 | 52 | 47 | 56 | 69 |
| RIN2 | 1219 | Rinard Cr @ FM1327 and Bradshaw | 2008 | 73 | 82 | 98 | 70 | 49 | | | | 62 |
| RIN3 | 1220 | Rinard Cr @ FM1327 | 2008 | | 82 | | 54 | 52 | 41 | 41 | | 57 |
| RIN1 | 233 | Rinard Cr @ Bradshaw Road | 2010 | 71 | 82 | 89 | 83 | 71 | 87 | 79 | 94 | 81 |
| RIN2 | 1219 | Rinard Cr @ FM1327 and Bradshaw | 2010 | 75 | 82 | 95 | | | | | | 63 |
| RIN3 | 1220 | Rinard Cr @ FM1327 | 2010 | 72 | 82 | 85 | 68 | 26 | 56 | 41 | 70 | 65 |
| RIN1 | 233 | Rinard Cr @ Bradshaw Road | 2012 | 69 | 82 | 51 | 81 | 70 | 82 | 90 | 74 | 73 |
| RIN2 | 5398 | Rinard Creek DS of State Highway 45 | 2012 | 78 | 82 | 94 | 68 | 49 | 69 | 70 | 68 | 73 |
| RIN3 | 1220 | Rinard Cr @ FM1327 | 2012 | 79 | 82 | 72 | 55 | 48 | 84 | 80 | 87 | 70 |
| RIN1 | 233 | Rinard Creek @ Bradshaw Road | 2014 | 71 | 83 | 63 | 59 | 56 | 80 | 68 | 92 | 69 |
| RIN2 | 5398 | Rinard Creek DS of State Highway 45 | 2014 | 85 | 83 | 100 | 71 | 56 | 76 | 78 | 73 | 79 |

* 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

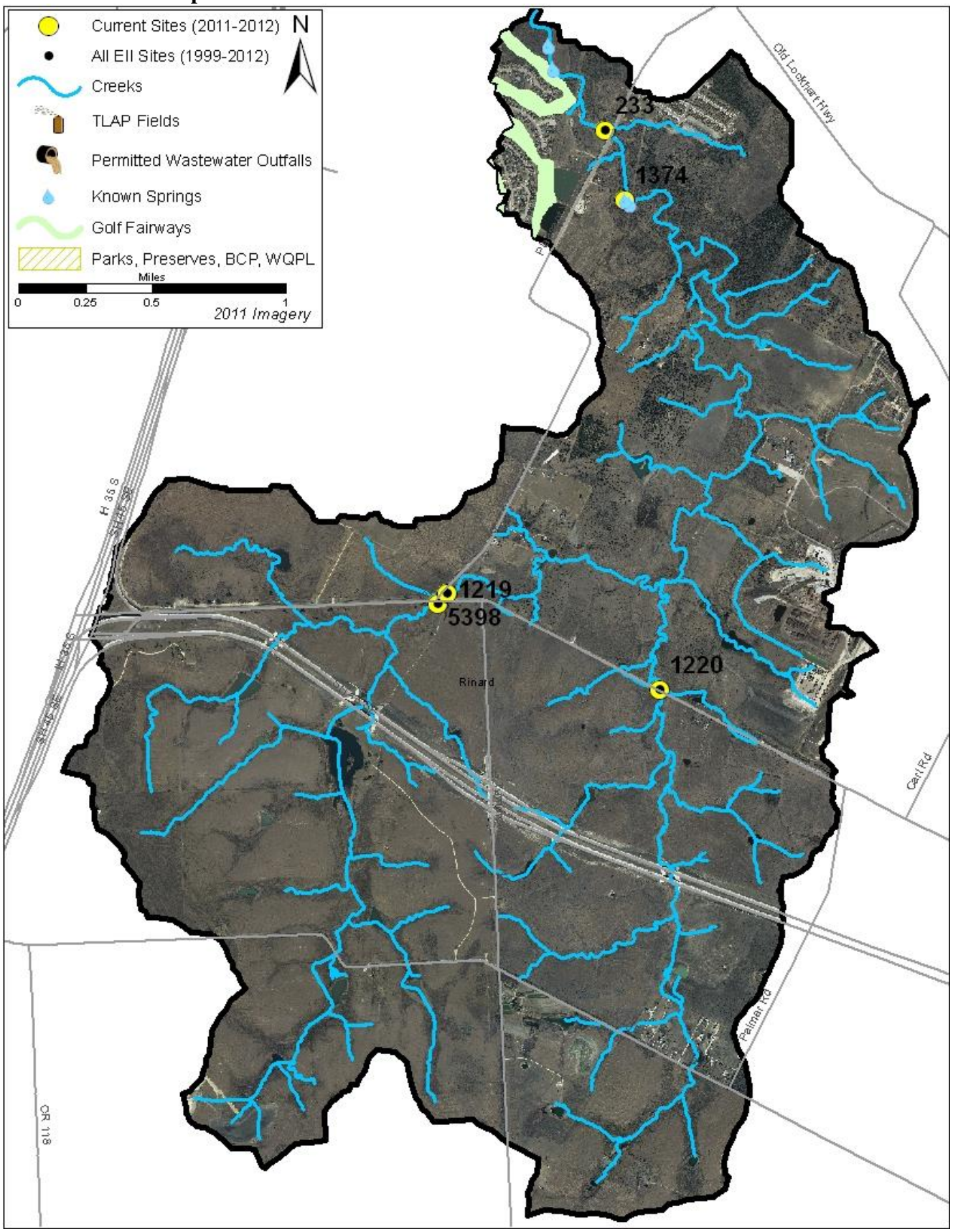
# Rinard Creek Watershed

**Land Use Map**



# Rinard Creek Watershed

**Aerial Map**



# Rinard 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: | | | Qualifiers to the right of value: | |
|---|---|---|---|---|
| | > | greater than | (*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. < > Value | flag | Cond. < > Value | flag | pH < > Value | flag | D.O. < > Value | flag | *E.coli* < > Value | flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rinard @ Bradshaw Rd | 233 | RIN1 | 01/15/2014 | 10.8 | | 631 | | 7.84 | | 10.3 | | 70.3 | |
| Rinard @ Bradshaw Rd | 233 | RIN1 | 04/17/2014 | 17.3 | | 750 | | 7.69 | | 9.3 | | 344.8 | |
| Rinard @ Bradshaw Rd | 233 | RIN1 | 05/12/2014 | 25.4 | | 664 | | 8.38 | | 6.5 | | | |
| Rinard @ Bradshaw Rd | 233 | RIN1 | 07/02/2014 | 30.0 | | 663 | | 7.63 | | 8.6 | | 38.1 | |
| Rinard @ Bradshaw Rd | 233 | RIN1 | 09/10/2014 | | | | | | | | | 15.6 | |
| **Site 233 Mean** | | | | 20.9 | | 677 | | 7.89 | | 8.7 | | 117.2 | |
| Rinard ds SH 45 | 5398 | RIN2 | 01/15/2014 | 15.1 | | 456 | | 8.35 | | 10.5 | | 1.0 | |
| **Site 5398 Mean** | | | | 15.1 | | 456 | | 8.35 | | 10.5 | | 1.0 | |
| **Watershed Mean** | | | | 19.7 | | 633 | | 7.98 | | 9.0 | | 94.0 | |

**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 | |

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

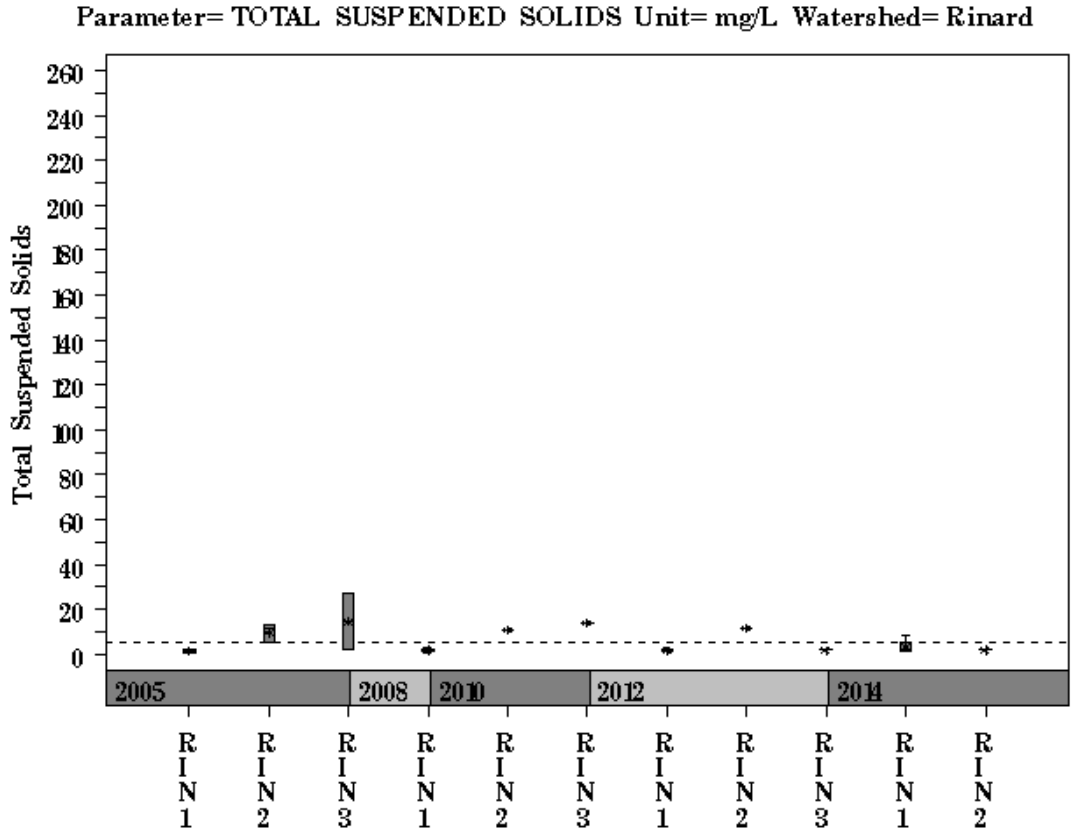
| | | | | NH3-N | | | NO3/NO2 | | | Ortho-P | | | T.S.S. | | | Turb. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site Name | Site # | Reach | Date | < > | Value | flag | < > | Value | flag | < > | Value | flag | < > | Value | flag | < > | Value | flag |
| Rinard @ Bradshaw Rd | 233 | RIN1 | 01/15/2014 | <J | 0.008 | | | 0.19 | | <J | 0.004 | | | 1.77 | | | 2.3 | R |
| Rinard @ Bradshaw Rd | 233 | RIN1 | 04/17/2014 | | 0.031 | | | 0.03 | | <J | 0.004 | | | 8.86 | | | 12.1 | R |
| Rinard @ Bradshaw Rd | 233 | RIN1 | 05/12/2014 | | | | | | | | | | | | | | | |
| Rinard @ Bradshaw Rd | 233 | RIN1 | 07/02/2014 | <J | 0.008 | | | 0.02 | | <J | 0.004 | | | 2.28 | | | 2.0 | |
| Rinard @ Bradshaw Rd | 233 | RIN1 | 09/10/2014 | <J | 0.008 | | <J | 0.01 | | <J | 0.004 | | | 1.30 | | | 2.1 | R |
| **Site 233 Mean** | | | | | 0.014 | | | 0.06 | | | 0.004 | | | 3.55 | | | 4.6 | |
| Rinard ds SH 45 | 5398 | RIN2 | 01/15/2014 | <J | 0.008 | | <J | 0.01 | | <J | 0.004 | | | 2.04 | | | 3.0 | R |
| **Site 5398 Mean** | | | | | 0.008 | | | 0.01 | | | 0.004 | | | 2.04 | | | 3.0 | |
| **Watershed Mean** | | | | | 0.013 | | | 0.05 | | | 0.004 | | | 3.25 | | | 4.3 | |

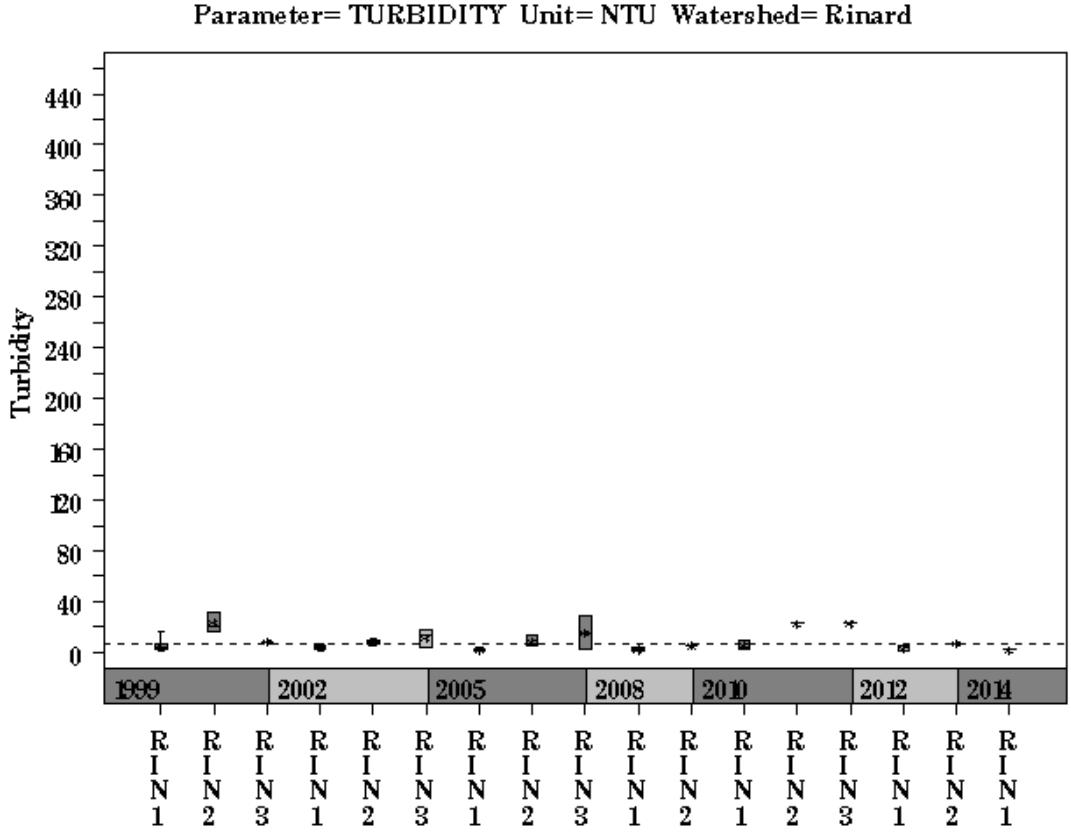
**Orange highlighting indicates that the value exceeds one standard deviation from the mean of all E.I.I. sites combined.**

| 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 |

# Rinard Creek Watershed

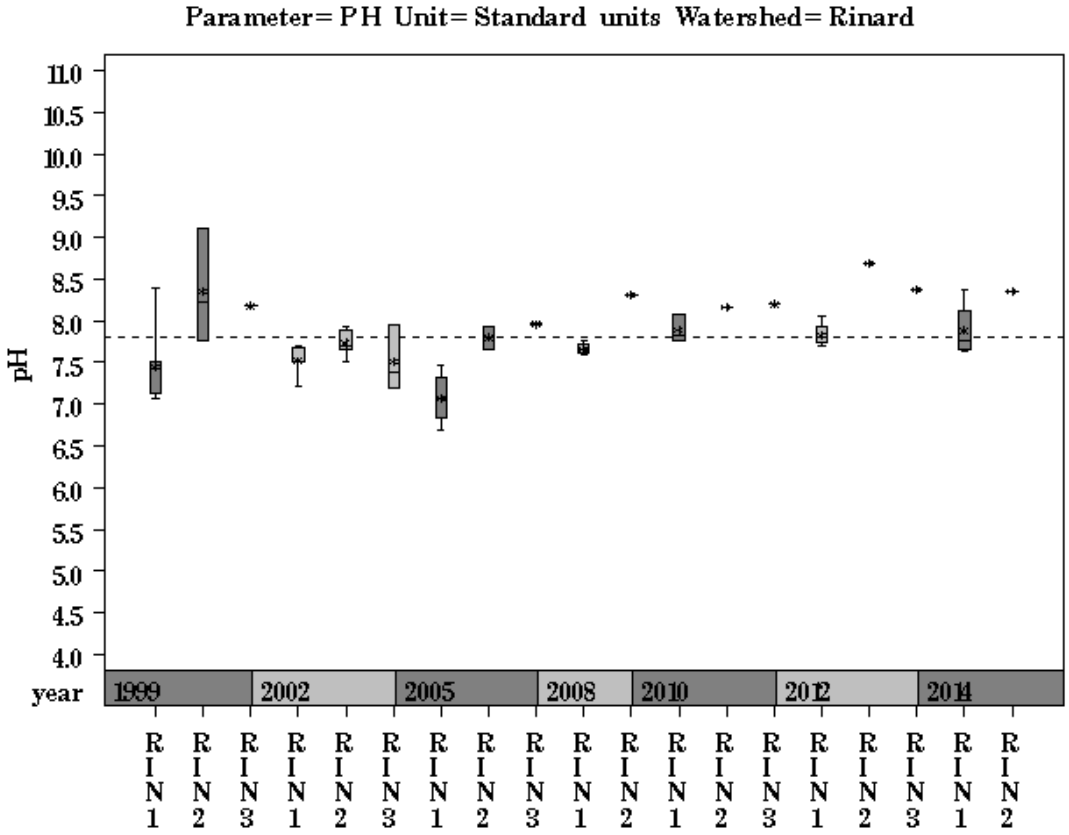
**Data Summary Graphs – Total Suspended Solids and Turbidity (Downstream to Upstream by Year)**

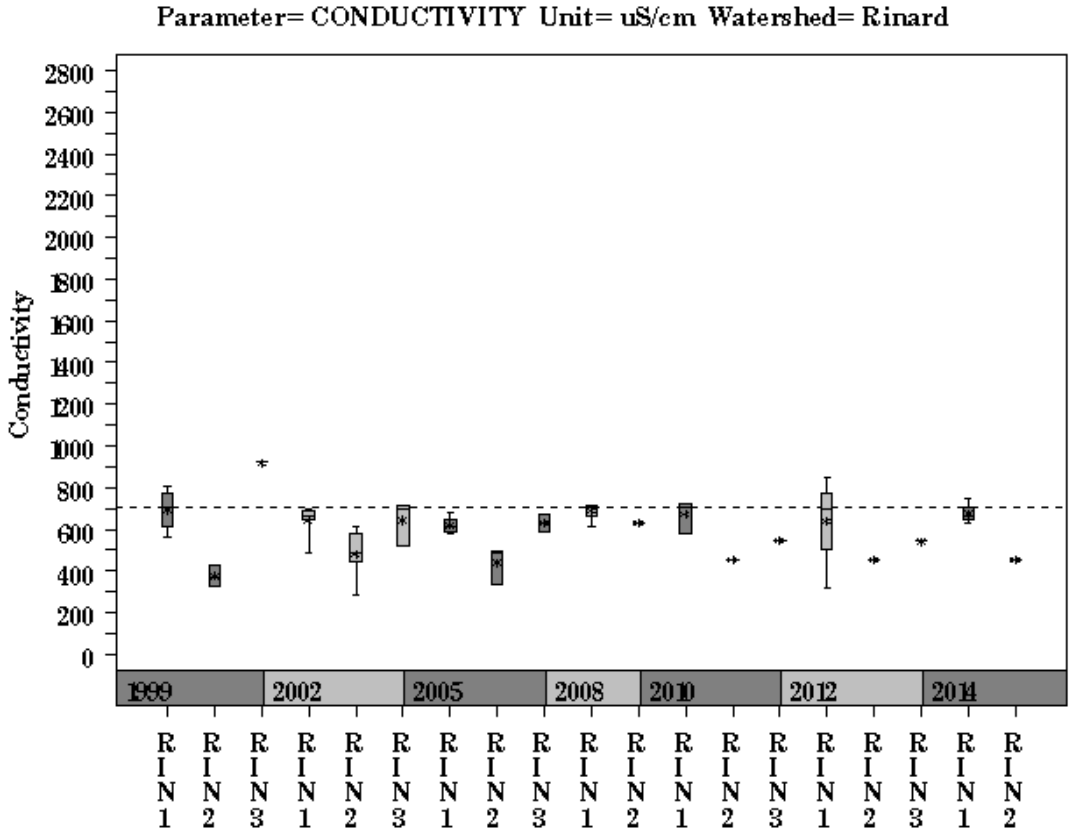


# Rinard Creek Watershed

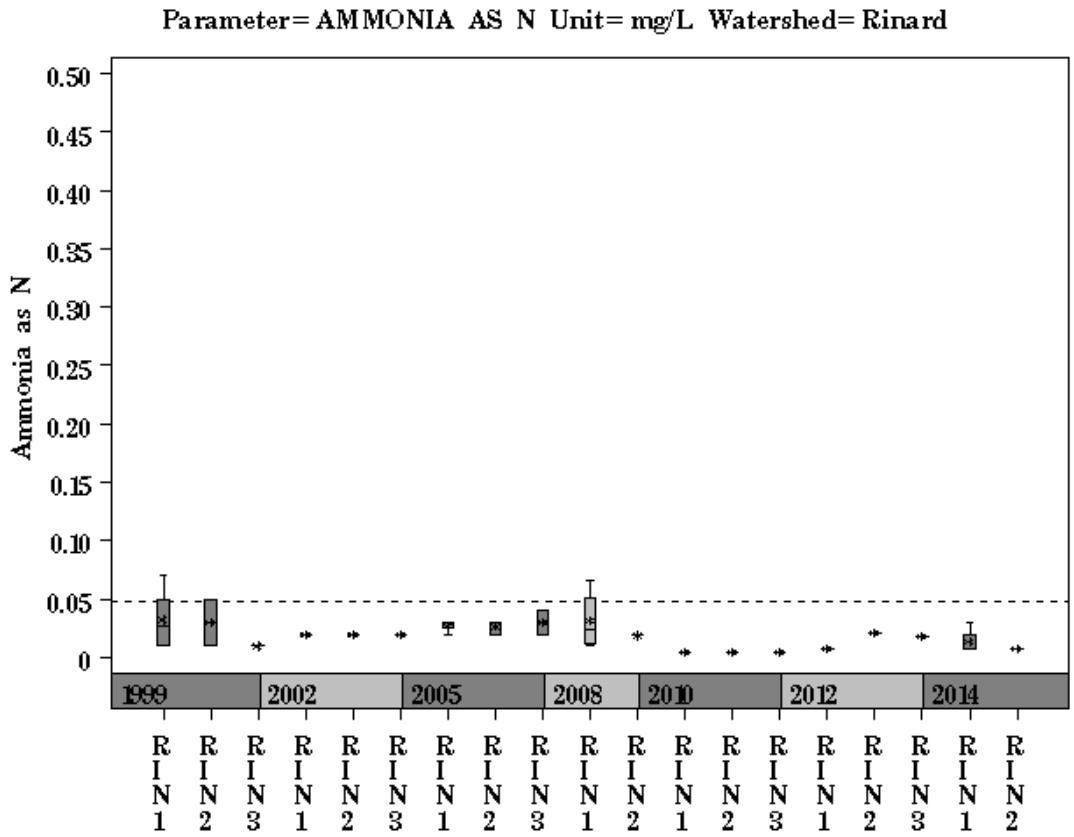
**Data Summary Graphs – pH and Conductivity (Downstream to Upstream by Year)**

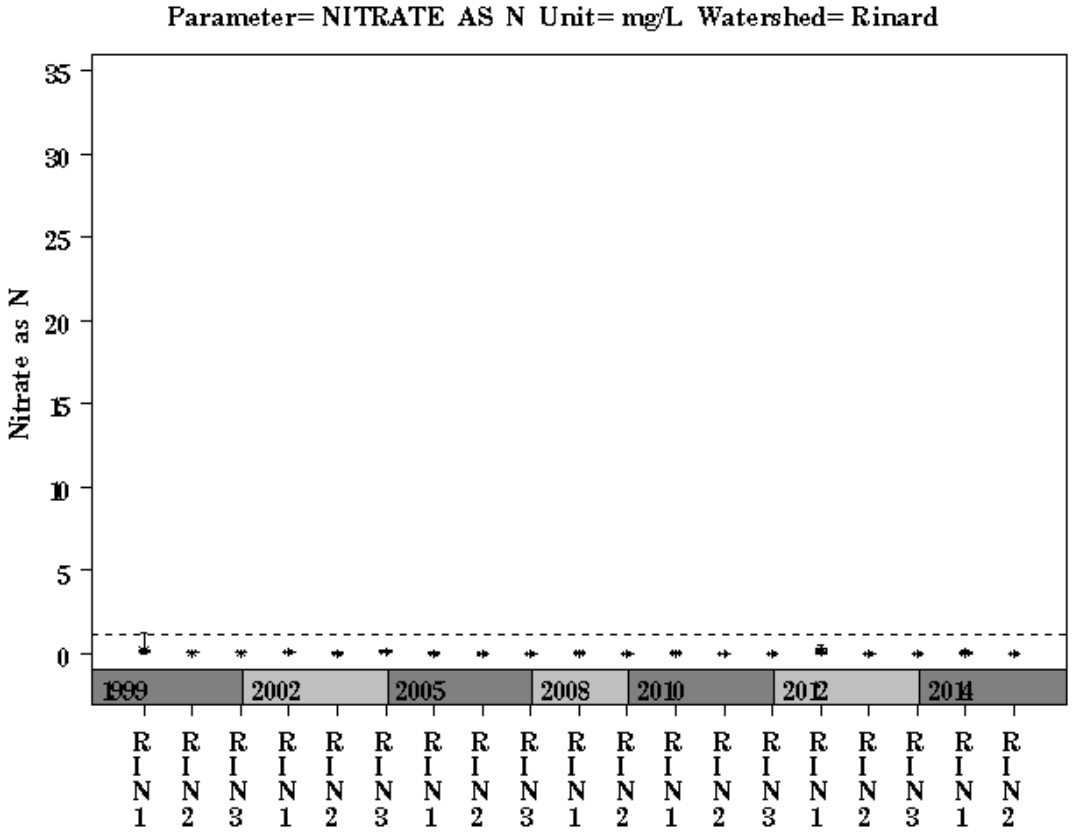


# Rinard Creek Watershed

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

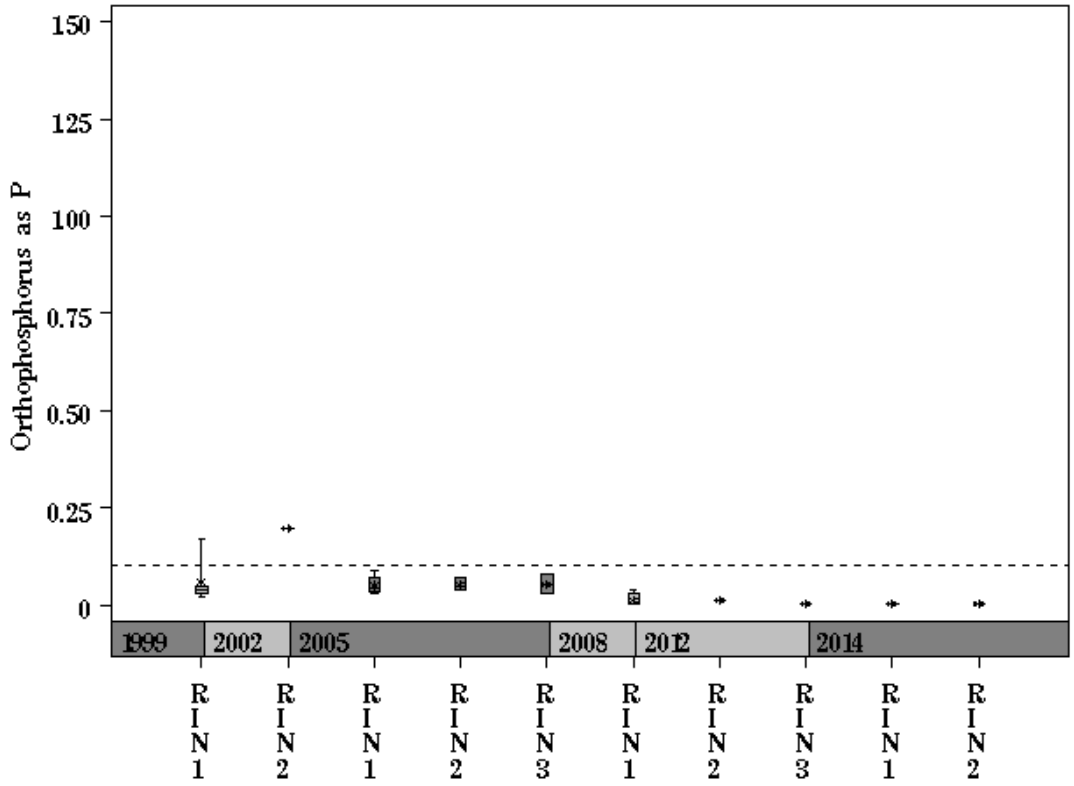


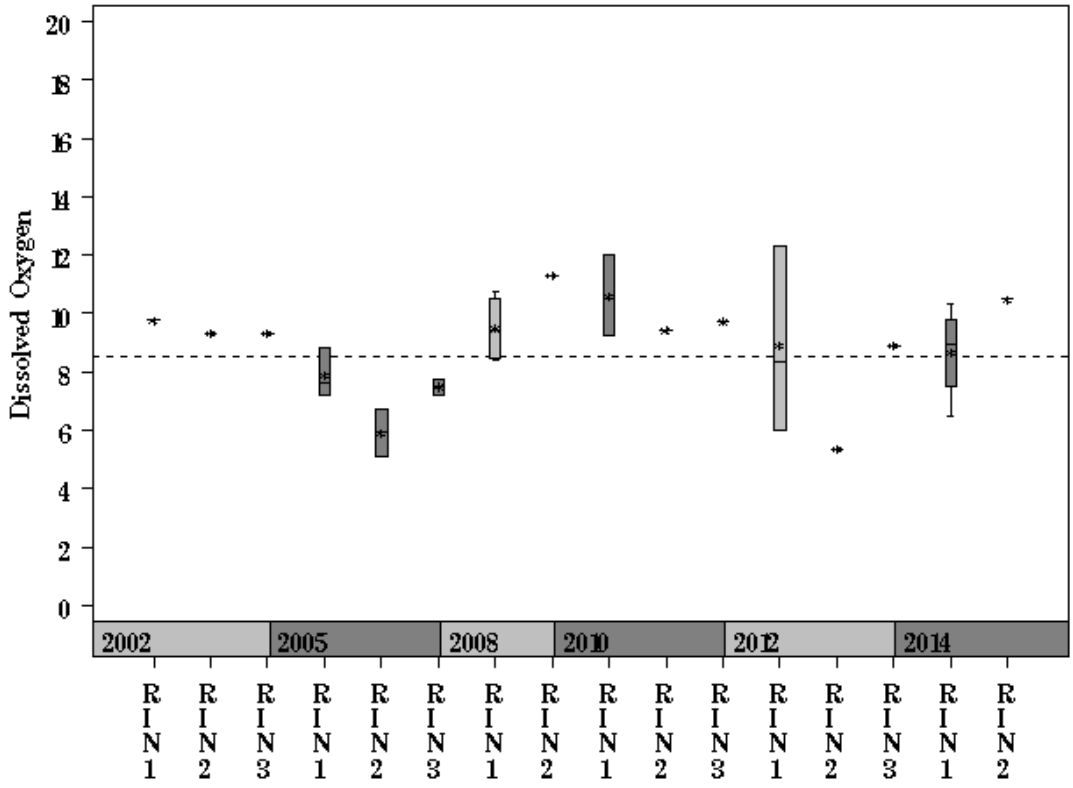
# Rinard Creek Watershed

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

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

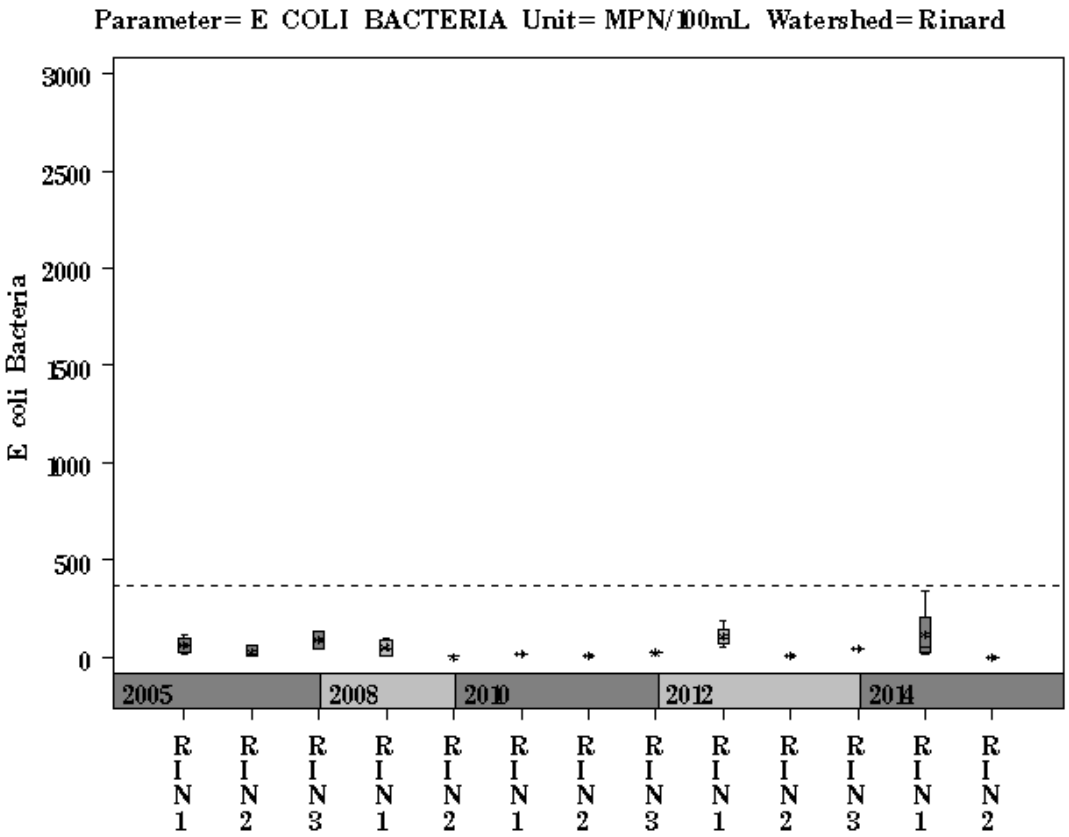



Parameter= DISSOLVED OXYGEN Unit= mg/L Watershed= Rinard



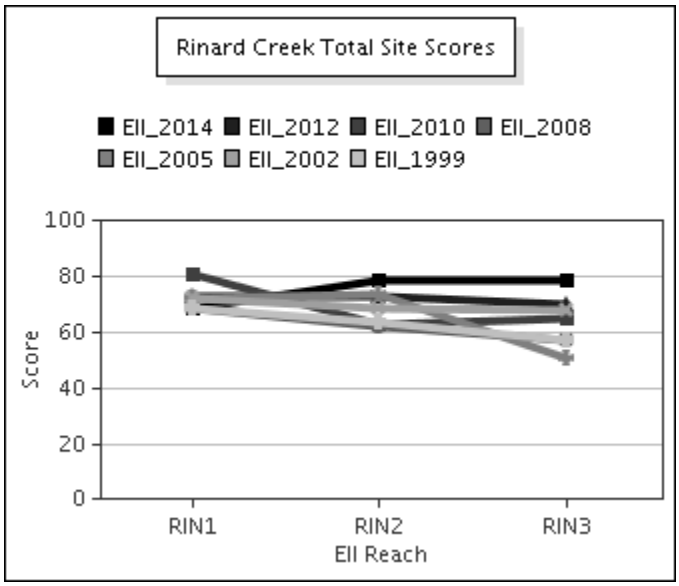
# Rinard Creek Watershed

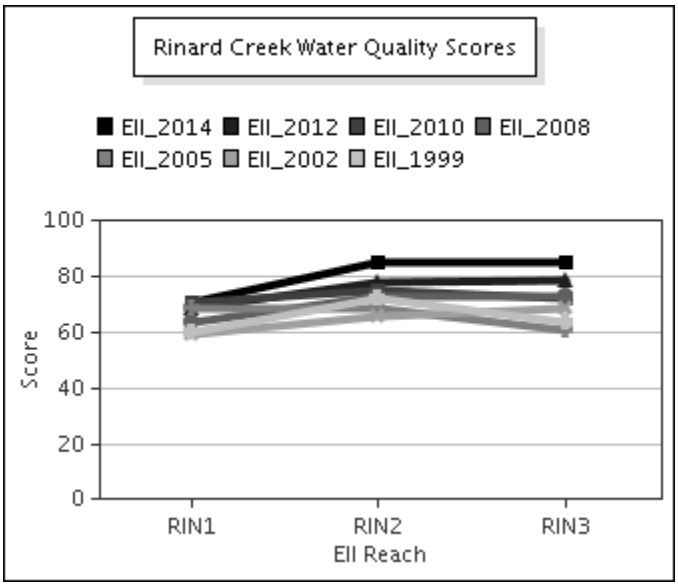
**Data Summary Graphs – *E.coli* (Downstream to Upstream by Year)**

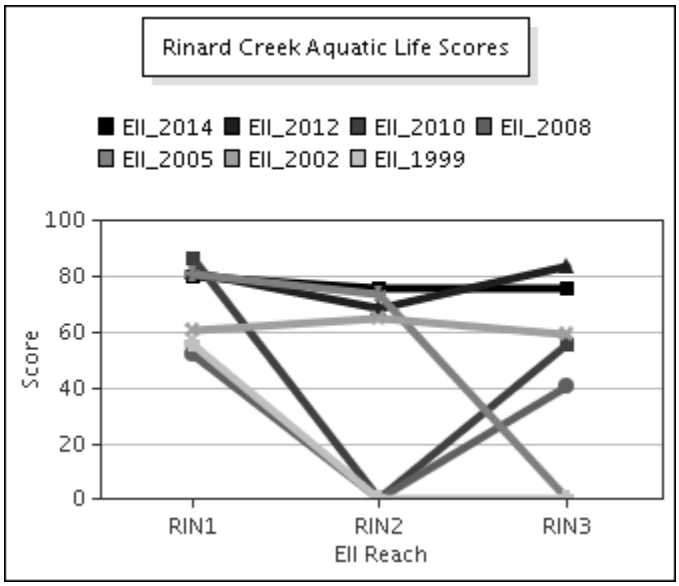


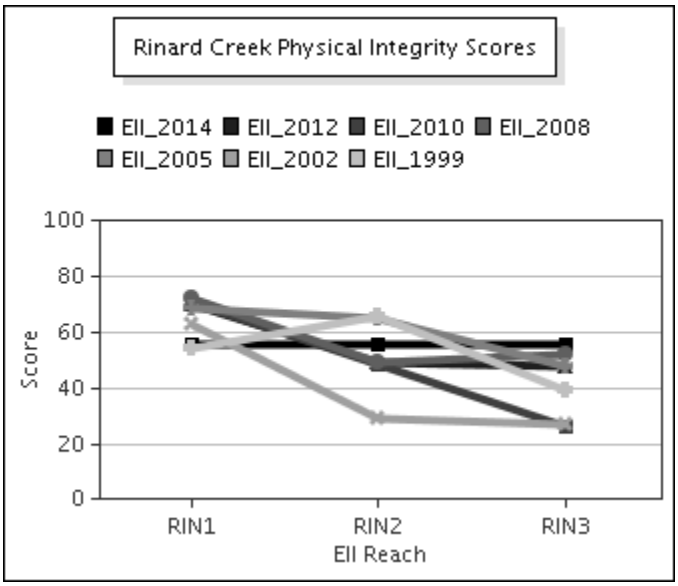
# Rinard Creek Watershed

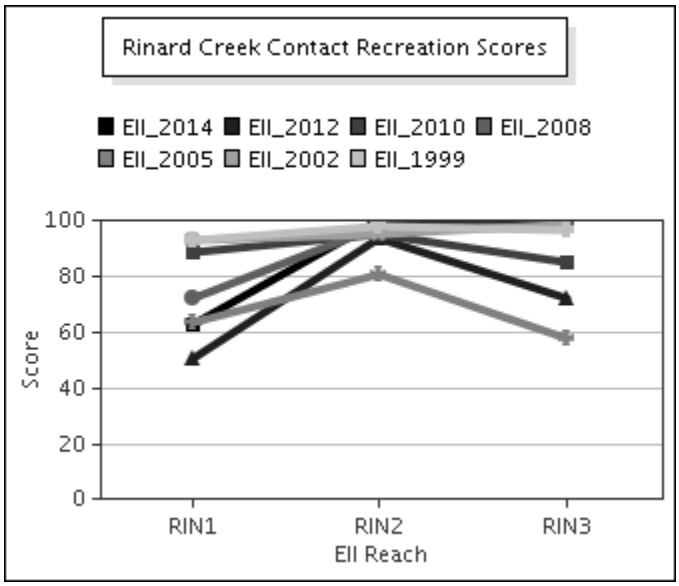
**Score Summary – Reach scores for each sample year**

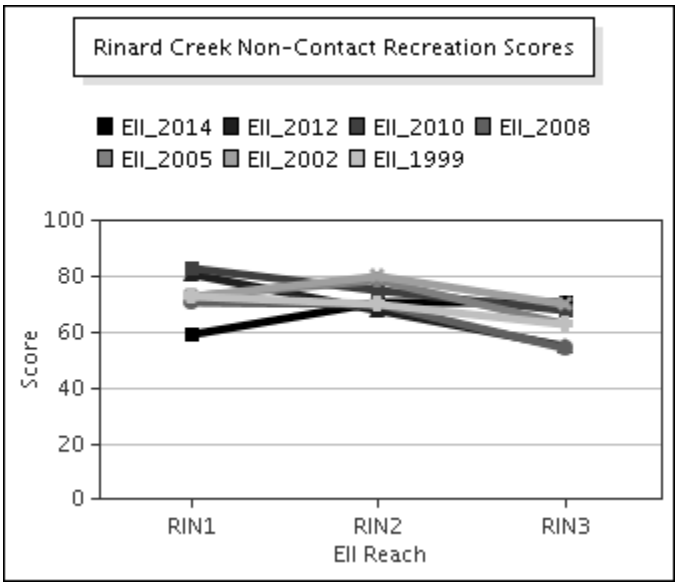


# Rinard Creek Watershed

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

| Benthic Macroinvertebrate ID | PTI | FFG | Rinard @ Bradshaw Rd (Site 233) | Rinard ds SH 45 (Site 5398) |
|---|---|---|---|---|
| *Chimarra* sp. | 2 | FC | 9 | |
| *Callibaetis* sp. | 4 | CG | 1 | 2 |
| *Chaoborus* sp. | 4 | | | 1 |
| *Fallceon quilleri* | 4 | SC,CG | 9 | |
| Gomphidae | 4 | P | | 1 |
| Gerridae | 5 | P | | 1 |
| *Oecetis* sp. | 5 | SH,P | | 1 |
| *Sphaeromias* sp. | 5 | | | 1 |
| *Argia* sp. | 6 | P | 6 | |
| *Cheumatopsyche* sp. | 6 | FC | 263 | |
| Chironomidae | 6 | P,FC | 35 | 8 |
| *Enallagma* sp. | 6 | P | | 7 |
| Hydracarina | 6 | | | 14 |
| *Microvelia* sp. | 6 | P | | 1 |
| *Probezzia* sp. | 6 | P | 1 | |
| *Stenonema femoratum* | 6 | SC,CG | | 18 |
| Tanypodinae | 6 | P | | 4 |
| *Caenis* sp. | 7 | SC,CG | | 323 |
| *Gyraulus* sp. | 7 | SC | 1 | |
| *Helisoma trivolvis* | 7 | SC | | 6 |
| *Pisidium* sp. | 7 | FC | 1 | |
| *Hyalella* sp. | 8 | SH,CG | | 17 |
| Oligochaeta | 8 | CG | 1 | |
| *Physella* sp. | 9 | SC | 4 | 18 |
| Cambaridae | | CG | 3 | |
| *Dugesia* sp. | | P,CG | 88 | |

# Rinard Creek Watershed

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

| Scoring Metric | Rinard @ Bradshaw Rd (Site 233) | Rinard ds SH 45 (Site 5398) |
|---|---|---|
| Number of Taxa * | 12 | 15 |
| Hilsenhoff Biotic Index * | 5.9 | 7.0 |
| Number of Ephemeroptera Taxa * | 2 | 3 |
| Percent of Total as Chironomidae * | 8 | 3 |
| Number of EPT Taxa * | 4 | 4 |
| Percent of Total as EPT * | 67 | 81 |
| Percent of Total as Predator * | 31 | 5 |
| Number of Intolerant Taxa * | 3 | 3 |
| Percent Dominance (Top 3 Taxa) * | 92 | 85 |
| EPT / EPT + Chironomidae | 1 | 1 |
| Number of Diptera Taxa | 2 | 3 |
| Number of Non-Insect Taxa | 5 | 4 |
| Number of Organisms | 421 | 423 |
| Percent Dominance (Top 1 Taxa) | 62 | 76 |
| Percent of Total as Collector / Gatherer | 24 | 85 |
| Percent of Total as Dominant Guild (FFG) | 73 | 86 |
| Percent of Total as Elmidae | 0 | 0 |
| Percent of Total as Filterers | 73 | 3 |
| Percent of Total as Grazers (PI & SC) | 3 | 86 |
| Percent of Total as Tolerant Organisms | 1 | 4 |
| Percent of Trichoptera as Hydropsychidae | 97 | 0 |
| Ratio of Intolerant : Tolerant Organisms | 0.06 | 0.01 |
| TCEQ Qualitative Aquatic Life Use Score | 21 | 23 |
| TCEQ Quantitative Aquatic Life Use Score | 25 | 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%.

# Rinard Creek Watershed

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

| Diatom Species Name | PTI | Rinard @ Bradshaw Rd (Site 233) | Rinard ds SH 45 (Site 5398) |
|---|---|---|---|
| *Diploneis oblongella* | 4 | 4 | |
| *Achnanthidium alteragracillimum* | 3 | 10 | |
| *Achnanthidium minutissimum* | 3 | 288 | |
| *Caloneis bacillum* | 3 | | 14 |
| *Caloneis schumanniana* | 3 | | 49 |
| *Caloneis ventricosa* | 3 | 2 | 22 |
| *Cymatopleura elliptica* | 3 | | 1 |
| *Cymbella laevis* | 3 | 6 | |
| *Cymbella neocistula* | 3 | | 4 |
| *Denticula kuetzingii* | 3 | 10 | 8 |
| *Diploneis parma* | 3 | 2 | |
| *Diploneis puella* | 3 | 26 | 123 |
| *Encyonema evergladianum* | 3 | 14 | |
| *Encyonema silesiacum* | 3 | 4 | 129 |
| *Encyonema triangulum* | 3 | | 22 |
| *Encyonopsis microcephala* | 3 | 14 | |
| *Epithemia adnata* | 3 | | 1 |
| *Gomphonema gracile* | 3 | | 2 |
| *Navicula cryptotenella* | 3 | 22 | |
| *Navicula radiosa* | 3 | 33 | 46 |
| *Nitzschia linearis* | 3 | 1 | |
| *Reimeria sinuata* | 3 | 8 | |
| *Rhopalodia gibba* | 3 | | 52 |
| *Tryblionella angustata* | 3 | | 2 |
| *Achnantheiopsis lanceolata* | 2 | 2 | |
| *Cymatopleura solea* | 2 | | 1 |
| *Fragilaria capucina* var. *mesolepta* | 2 | 4 | |
| *Navicula recens* | 2 | 4 | 3 |
| *Navicula symmetrica* | 2 | 4 | |
| *Navicula trivialis* | 2 | | 2 |
| *Nitzschia amphibia* | 2 | 2 | 4 |
| *Nitzschia amphibioides* | 2 | 6 | |
| *Tryblionella acuminata* | 2 | | 1 |
| *Tryblionella apiculata* | 2 | 2 | |
| *Gomphonema parvulum* | 1 | 4 | |
| *Cocconeis placentula* var. *euglypta* | | 6 | |
| *Cymbella cistula* | | 2 | |
| *Delicata delicatula* | | | 4 |
| *Eolimna minima* | | 2 | |
| *Navicula cryptotenelloides* | | 12 | |
| *Sellaphora stroemii* | | 2 | |
| *Ulnaria acus* | | 2 | 10 |
| *Ulnaria ulna* | | 2 | |

# Rinard Creek Watershed

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

| Scoring Metric | Rinard @ Bradshaw Rd (Site 233) | Rinard ds SH 45 (Site 5398) |
|---|---|---|
| *Cymbella* Richness | 5 | 3 |
| Number of organisms | 500 | 500 |
| Number of taxa | 30 | 21 |
| Percent motile taxa | 15 | 12 |
| Percent similarity to reference condition | 34 | 7 |
| Pollution tolerance index | 2.94 | 2.98 |

*** 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.**

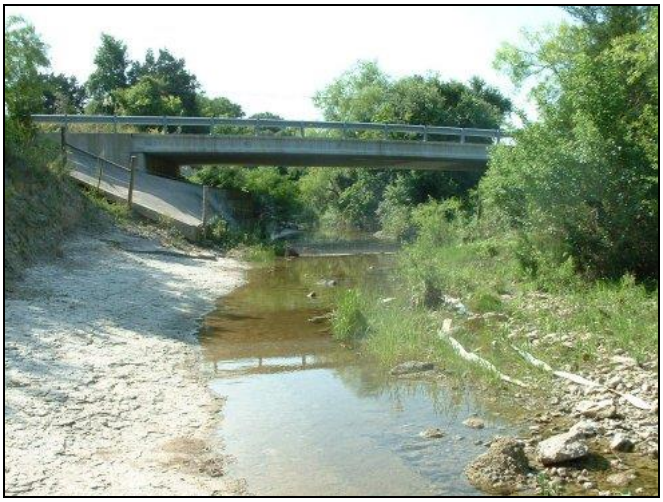
1. *Cymbella* Richness: The Cymbelloid taxa include species in the genus *Cymbella*, in addition to some species belonging to the genera *Cymbellopsis*, *Cymbopleura*, *Encyonema*, *Encyonemopsis*, *Navicymbula* and *Reimeria*. Their presence highlights the presence of sensitive species, especially with 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.

# Rinard Creek Watershed

**Site Photographs**

233_t00-ds-06_20_2000

233_t00-us-03_28_2002



233_t00-ds-06_15_2005

233_t0-na-06_16_2008

233_00-ds-05_19_2010

233_00-us-05_19_2010

# Rinard Creek Watershed

**Site Photographs**

1219_00-us-05_19_2010

1219_00-ds-05_19_2010

1219_t00-ur-06_15_2005

1220_t00-ur-06_15_2005

1220_00-us-05_19_2010

1220_00-ds-05_19_2010

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