SUMMARY OF AQUATIC INVERTEBRATE DATA FROM THE MONTANA STATEWIDE MONITORING NETWORK

2001-2005

A report to

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SUMMARY

Aquatic invertebrate samples and habitat assessment data were collected at 46 fixed stations from 2001 to 2005. Stations were part of the Montana statewide monitoring network, and were located in 3 ecoregions, as defined by Woods et al. (1999): the Montana Valley and Foothill Prairies (MVFP) ecoregion, the Mountain ecoregions, and the Plains ecoregions. Sampling procedures, sample processing and analysis, and habitat evaluation were conducted according to Montana Department of Environmental Quality (MDEQ) standard operating procedures (MDEQ 2005). Two hundred and forty-eight taxa of aquatic invertebrates were identified from the 199 samples included in this study. Metric measures of taxonomic and functional composition, tolerance and sensitivity, physiology and habitus were calculated based on invertebrate assemblages identified in each sample. Certain metrics were integrated into established bioassessment indices and the resulting index score for each sample was compared to values representative of reference condition in each ecoregion. Three such indices were used in this study: the MVFP index (Bollman 1998 and incorportated into MDEQ 2005), the MDEQ index for Mountain ecoregions (Bukantis 1998, MDEQ 2005), and the Plains indices (Bramblett et al. 2003) Comparisons were expressed as percent of maximum index score, and these were used to characterize biological integrity at each station. Mountain ecoregion sites were assessed with 2 indices (MVFP and MDEQ), and these results were compared. Geographic variation in index performance over ecoregions and watersheds was examined. When the MDEQ index was used, Mountain ecoregion sites yielded significantly lower scores than the Plains region or the MVFP. When the MVFP index was applied to the data, the Mountain region sites gave significantly higher scores than the other 2 regions. While there were no significant differences in mean assessment scores among ecoregions, watersheds did demonstrate differences. Watersheds also produced significantly different scores: the Columbia River basin produced the highest mean bioassessment score, and the Yellowstone River basin produced the lowest mean score. Temporal variation in index performance over the entire data set, as well as over each watershed and ecoregion, was also examined. There were no significant differences in mean bioassessment scores among years.

Sites were stratified by watershed and ecoregion, and ranked based on the characterizations of biologic integrity. Individual metric indicators of specific stressors (sediment, nutrient enrichment, dewatering and/or thermal stress, and metals contamination) were examined to determine probable causes of impairment at each station. Water quality and habitat issues suggested by the invertebrate assemblages were summarized for each river basin.

Only 5 sites in the statewide monitoring network did not exhibit definitive metric responses suggesting impairment by specific stressors. Two of these sites are located in the Missouri River basin: Big Hole River near Wise River and Judith River near mouth. The other 3 sites are located in the Yellowstone River basin: Boulder River near mouth, Stillwater River near Absarokee, and Tongue River near Brandenburg. Overall ranking of statewide stations placed North Fork Flathead River near Columbia Falls best among sites; Big Horn River near Hardin gave the worst result. Nutrient enrichment was the most frequently detected specific stressor (39 sites), followed by sediment deposition (18 sites). Effects associated with non-specific habitat disruption were noted at 45 sites.

Nutrient enrichment appeared to be the most common stressor of invertebrate assemblages in both the Missouri River and Columbia River basins. Sediment deposition appeared to be the most common stressor in the Yellowstone River basin. Evidence of stress which may have been due to dewatering and/or thermal extremes was commonly encountered among Yellowstone River basin sites. Metals contamination was detectable at a single site (Prickly Pear Creek near Clancy).

Habitat assessments were variable among years at each site; scores for Plains regions sites in both the Missouri and Yellowstone River drainages varied most from year to year. Scores for sites in the Columbia River basin were least variable among years. Montana Valley and Foothill Prairie (MVFP) ecoregion sites within the Yellowstone and Missouri River basins were more variable than MVFP sites in the Columbia River basin. Mean habitat assessment scores for all watersheds were significantly lower in 2003 than in other years. Similar to bioassessment results, the Columbia River basin produced the highest mean habitat assessment score, and the Yellowstone basin produced the lowest mean score.

INTRODUCTION

In 2001, the Montana Department of Environmental Quality (MDEQ) began annual collections of benthic macroinvertebrate samples from a network of sites established for a statewide water quality monitoring program. The program seeks to document water quality and aquatic habitat conditions in the 3 major river basins in Montana by periodically sampling water chemistry, benthic macroinvertebrates, and periphyton, and evaluating habitat characteristics and physical properties at 46 sites on the tributaries of the major rivers. Other project goals are to track annual variation in water quality, identify instances where water quality standards are exceeded, and establish a reference database for detecting long-term trends in water quality. This report summarizes and analyzes bioassessment and habitat assessment results from data collected over 5 years (2001-2005).

Purpose and Scope

One purpose of this report is to describe and rank the biologic condition of statewide monitoring sites in Montana as suggested by faunal characteristics of benthic assemblages collected over 5 years. These characteristics are specified by multimetric bioassessment indices and certain additional metric expressions of the taxonomic composition of the assemblages. Indices and metrics are compared to expectations for reference conditions, defined as "natural condition" or "minimally impacted condition" specific to each ecoregion (Suplee et al. 2005) in the State. Comparisons provide an indication of the condition of statewide monitoring sites relative to that of least impaired sites; conditions are expressed as aquatic life use-support designations (Table 3A) and as impairment classifications (Table 3B).

Significant correlation between certain bioassessment metrics and habitat assessment measures and physical and chemical measures of water quality have been demonstrated (Bollman 1998) in the Montana Valley and Foothill Prairie (MVFP) ecoregion. These associations provide a basis for analyzing probable stressors at statewide monitoring sites in this study. Among the stressors suggested by metric performance are sediment, nutrient enrichment, dewatering or thermal stress, metals contamination, and non-specific stressors to habitat and/or water quality. Probable occurrence and intensity of stressors in each watershed and within each ecoregion are described. Sites in the Mountain ecoregions were evaluated with both the MVFP index and an index developed by MDEQ for montane sites, and a comparison of the performance of the 2 indices was thus possible. The long-term nature of the statewide monitoring program allows the variability of index and metric performance over time to be described, which is another purpose of this study.

Habitat assessments were performed by field personnel at each site in each year of sampling. Variation in total habitat scores among watersheds and among years was examined.

Description of Study Area

Statewide monitoring sites considered in this report lie in 3 major river basins: the Missouri, the Yellowstone, and the Columbia River basins. (Neither the St. Mary River basin nor the Little Missouri River basin were represented by any sites in the statewide monitoring network.) Tributaries of the Columbia River flow west of the Continental Divide to the Pacific Ocean. East of the Continental Divide, the Yellowstone and Missouri Rivers and their tributaries drain the State's waters toward the Mississippi River and on to the Gulf of Mexico.

Seven Level III ecoregions (Woods et al. 2002 and Woods et al. 1999) are represented in Montana; statewide monitoring stations are located in 5 of these: the Northern Rockies (NR) ecoregion, the Canadian Rockies (CR) ecoregion, the Montana Valley and Foothill Prairie ecoregion (MVFP), the Northwestern Glaciated Plains ecoregion (GLPL), and the Northwestern Great Plains ecoregion (GRPL). In this study, the NR and CR ecoregions are referred to as the Mountain ecoregion, and the GLPL and GRPL are collectively referred to as the Plains ecoregion, to adhere to the regional stratification employed by MDEQ (MDEQ 2005). Sites are stratified by the major river basins, and by the ecoregions within those basins.

Both the Plains ecoregion as well as the MVFP region are represented in the Missouri River drainage. The headwater tributaries of the Missouri which join the mainstem above Great Falls, as the River courses northward, all lie in the MVFP ecoregion. Below Great Falls, tributaries flowing southward to the Missouri River from northern areas of the State, including the "Hi-Line", and those flowing northward from landscapes to the south of the River, lie in the Plains region.

Tributaries of the Yellowstone River west of the Bighorn River are located in the MVFP ecoregion. The Yellowstone tributaries east of, and including the Bighorn River, are located in the Plains ecoregion: these are Rosebud Creek, Tongue River, and Powder River. The Yellowstone River mainstem was sampled only in 2001; those sites are not included in this report.

Three major sub-basins of the Columbia River drain the west slope of the Continental Divide in Montana: the Kootenai River, Clark Fork River, and Flathead River basins. Some of the higher elevation sites in Columbia River sub-basins (Fisher River, Yaak River, Swan River, Middle Fork Flathead River, South Fork Flathead River, North Fork Flathead River, and Clark Fork River at St. Regis) are located in the

Mountain ecoregion; all other sites are located in the MVFP ecoregion. The Kootenai River was sampled below Libby Dam, but only in 2001; the site is not included in this analysis. Tributaries of the Kootenai included in this study were the Fisher River and Yaak River. The Clark Fork River mainstem was sampled in the upper basin at Turah and in the lower basin at St. Regis. Major tributaries of the Clark Fork that were sampled include the Little Blackfoot River, Rock Creek, Blackfoot River, and the Bitterroot River. Below St. Regis, the Clark Fork River receives the waters of the Flathead River basin. The mainstem of the Flathead was sampled near this confluence at Perma, but only in 2001. The site is not included in this study. Major tributaries to the Flathead River that were sampled for this study include the North Fork Flathead River, Middle Fork Flathead River, Whitefish River, and Swan River.

METHODS

Sample Collection, Processing, and Analysis

Aquatic invertebrate samples were collected by MDEQ personnel using techniques described in MDEQ Standard Operating Procedures (MDEQ 2005). More than 200 samples were collected from 2001 through 2005; this report analyzes data from 199 samples taken at 46 sites. Not all sites were visited in each year; sampling episodes at individual sites ranged from a single visit to 5 visits. Replicate samples were taken at 3 sites in 2005. Habitat assessments, including ratings of quality or integrity of various habitat features, were conducted at every visit. Habitat assessments were provided electronically to Rhithron as copies of field forms.

Samples were delivered to Rhithron's laboratory, where random sorting procedures and taxonomic identification of aquatic invertebrates was accomplished using MDEQ Standard Operating Procedures (MDEQ 2005).

Data Analysis and Bioassessment

Sample data consists of taxonomic information and counts for each sample. Using Rhithron's customized software, these data were translated into 130 metrics; these were calculated based on the presence and relative abundance of benthic taxa and their attributes. Metrics included expressions of richness, composition, sensitivity or tolerance, habitus, function, physiology, and other measures. Some of these metrics are integrated into bioassessment indices; others are useful in providing information about the sensitivity and function of invertebrate assemblages. Development of biocriteria based upon numeric thresholds for aquatic invertebrate metrics is an on-going process at MDEQ, with development projects under way at the time of this writing. Biocriteria are based on distributions of metric values measured in reference

streams and streams known to be impaired due to the effects of various stressors and pollutants, and are specific to each of the various ecoregions in the state. For this report, biologic integrity was characterized with the use of indices developed for the Mountain ecoregions (Bukantis 1998), the Montana Valley and Foothill Prairies (MVFP) ecoregion (Bollman 1998) and for the Plains ecoregions (Bramblett et al. 2003). These indices are compiled in Table 1 (Mountain), Table 2 (MVFP), and Tables 4a and 5a (Plains). (It should be noted that while these indices formed the basis for MDEQ assessments in the past, they are currently being replaced by other methods.) To evaluate the potential use of the MVFP index for montane sites in Western Montana, all Mountain ecoregion sites were assessed with 2 indices: the Mountain index (Bukantis 1998) and the MVFP index (Bollman 1998). For each site, the total score of the appropriate index was expressed as a percent of the maximum possible score. When multimetric bioassessment indices are used, maximum index scores are considered approximations of reference condition.

Index scores were translated into 3 aquatic life use-support categories (full support, partial support, and non-support) according to threshold criteria listed in Table 3A (MDEQ 2005). For MVFP and Mountain ecoregions, 4 impairment classifications were distinguished (no impairment, slight impairment, moderate impairment, and severe impairment); threshold criteria for these classes are listed in Table 3B (Plafkin et al. 1989). Plains region indices (Tables 4A and 5A) were scored using criteria determined by Bramblett et al.; these thresholds are given in Tables 4B and 5B.

Ranges, median values, and distributions of total bioassessment scores over 5 years, in each ecoregion and watershed, and in each individual year were examined by constructing boxplots (Figures 1-10). Geographic variation in bioassessment scores, by ecoregion and by watershed, was examined by analysis of variance (ANOVA). Temporal variability in scores was similarly studied. A comparison of the performance of the MDEQ index for the Mountain ecoregions versus the MVFP index when applied to mountain sites was made by comparing score ranges and site rankings with each respective index. Thus, figures (e.g. Figures 1A and 1B, Figures 2A and 2B, etc.) are placed together to illustrate the contrasting results. Additionally, sites were evaluated for the following potential stressors: sediment, nutrient enrichment, dewatering and thermal stress, and metals. Non-specific habitat disruptions and the presence of cold water temperatures were also evaluated. These probable stressor evaluations are offered tentatively; more study will be needed to confirm them. In the meantime, they are offered as hypotheses that await further testing. Probable stressors are predicted by metrics which have been demonstrated to have strong correlative associations with

certain stressors (e.g. Bollman 1998). Values for these metrics were graphed to show their variability over the 5 years of the study (Figures 11-21). Sediment, in particular, fine sediment deposited on benthic substrates, is suggested by low richness among caddisflies (Bollman 1998) and "clinger" taxa (e.g. Fore 1996, Kleindl 1995, Patterson 1996). Recently, the taxa in these groups were demonstrated to have distributions that are strongly related to sediment measures (Relyea et al. 2000). Nutrient enrichment may be indicated by low mayfly taxa richness (Bollman 1998), elevated biotic index values (Hilsenhoff 1987), the presence of sensitive taxa, and large proportions of hemoglobin-bearing taxa. Absence of long-lived, or semivoltine taxa at a site may be associated with periodic dewatering, thermal stress, or toxic pollutants (Fore, unpublished); in valley and foothill sites, scouring sediment pulses may also compromise these taxa. Contamination by metals is suggested by elevated metals tolerance index (McGuire 1993) relative to the biotic index value. Since the metals tolerance index is strongly correlated with biotic index values and may thus give false positive results, the presence or absence of heptageniid mayflies is also considered in the evaluation of stress by metals. Mayflies in the family Heptageniidae are bellwethers of heavy metals (Clements 1994, Kiffney and Clements 1994); they reliably disappear when contamination occurs. Non-specific habitat disruptions may include instream or reach-scale disturbances, limited instream habitat, salinity, or other stressors. These are suggested by low stonefly taxa richness (Bollman 1998) or low overall taxa richness (Wisseman 2002). The presence of cold-stenotherm taxa (Clark 1997) suggests persistently low water temperatures. Long-lived or semivoltine taxa are not expected to survive in locations where catastrophic disturbances such as thermal stress, dewatering, or scouring sediment pulses occur periodically (Wisseman 2002). Since metric associations with water quality and habitat measures have not yet been studied for the Plains ecoregions, stressors suggested by invertebrate assemblages in these regions are offered cautiously.

Total habitat assessment scores, expressed as percent of maximum possible score, were transcribed from habitat assessment forms and entered into a spreadsheet for analysis. Ranges, median values, and distributions of total habitat assessment scores over 5 years, in each watershed and in each individual year were examined by constructing boxplots (Figures 22-27). Geographic and temporal variation was described.

Quality Assurance

Quality assurance protocols were applied at every step of sample processing, taxonomic identification, and data management according to Rhithron's standard

operating procedures (Bollman 2001). Sample sorting efficiency was evaluated by an independent re-examination of a random sample of 20% of the sorted substrate from 100% of samples. Ninety percent sorting efficiency was maintained throughout all years of sample processing for the statewide monitoring project.

The accuracy and precision of taxonomic determinations and enumerations were maintained by an independent re-identification of all organisms in 10% of samples and a subsequent evaluation of a Bray-Curtis similarity statistic. Comparability of at least 95% in identifications and counts were achieved throughout the project.

The integrity of data entry was evaluated by an independent comparison between laboratory bench sheets and database print-outs for 10% of samples. One hundred percent accuracy of taxonomic, life stage, numeric, and qualification data was assured throughout all years of the statewide monitoring project. Sample metadata were entered at the time of sample receipt at the Rhithron laboratory; correspondence between bench sheets and entered metadata is facilitated by extensive customized database functions.

RESULTS

Variability of Bioassessment Scores

Geographic variation over 5 years

The distribution of total bioassessment scores, expressed as percent of maximum score, for all sites over all years is plotted in Figure 1A, in which the MDEQ index for Mountain ecoregions was used to evaluate montane sites, and in Figure 1B, where the MVFP index was used. The Kolmogorov-Smirnov test for goodness-of-fit indicates that the 2 distributions of scores do not violate criteria for normality ($d = 0.0888$, $p = 0.1000$ for Figure 1A and $d = 0.0866$, $p = 0.1500$ for Figure 1B). The mean scores for all sites in all years (47.5% of maximum for Figure 1A, 51% of maximum for Figure 1B) indicate moderate impairment and partial support of aquatic life uses. Table 6 gives summary statistics for the distribution of scores over all sites in all years.

Figures 2A and 2B are plots of bioassessment scores over all years broken down by ecoregion. Table 7 gives summary statistics for comparison of ecoregions. An analysis of variance (ANOVA) indicated significant difference among mean scores for ecoregions ($p = .0005$ for Figure 2A and $p = .0000$ for Figure 2B). (While ANOVA detects differences in means, the boxplots in Figures 1 - 10 indicate median values.) Figure 2A demonstrates that when the MDEQ index (Bukantis 1998) is applied, the Mountain ecoregion produces significantly lower scores than the other 2 regions. A ranking, high to low, of ecoregions by mean bioassessment scores derived with the use of the MDEQ index for Mountain sites places the MVFP ($\mu = .51$) first, with the Plains ($\mu = .46$) and

the Mountains (μ = .39) second and third respectively. T-method *a posteriori* comparisons (Sokal and Rohlf 1995), depicted in Table 8A indicate that mean scores for Mountain region sites are significantly lower than mean scores for MVFP sites. Mean scores for all 3 ecoregions indicated moderate impairment and partial use support when the MDEQ index was applied. On the other hand, when the MVFP index is used, the analysis results in significantly higher scores for the Mountain region. Ordering of sites when the MVFP index is used for Mountain region sites places the Mountain ecoregion first (μ = .62) and the MVFP (μ = .51) and Plains (μ = .46) respectively. T-method *a posteriori* comparisons, illustrated in Table 8B indicate that the Mountain ecoregion was significantly different from the Plains or MVFP in terms of bioassessment scores. Mean scores for the MVFP and Plains regions indicate moderate impairment and partial use support; the mean score for Mountain regions indicates slight impairment and partial use support.

When scores were broken down by watershed, differences in index performance again became apparent (Figures 3A and 3B). When the MDEQ index was used to assess Mountain ecoregion sites, which occurred only in the Columbia River watershed, mean bioassessment scores among the basins were not significantly different (p = .4453). Table 9 gives summary statistics for this comparison. In the Missouri River basin, the Musselshell River at Mosby 2004 was a low-scoring outlier, and the Dearborn River near Craig 2003 was a high-scoring outlier. Mean scores indicate moderate impairment and partial use support in all 3 watersheds. When the MVFP index was used to evaluate Mountain sites, a significant difference in mean scores was detected (p = .0000). *A posteriori* T-method comparisons (Table 10) showed that mean values for the Missouri and Yellowstone drainages were similar, but mean score for Columbia drainage sites was significantly higher than the Missouri or Yellowstone. In addition, the range of scores for this watershed was smaller than ranges recorded for the other 2 drainages. In a ranking of watersheds from highest to lowest scores, the Columbia basin (μ = .60) placed first, the Missouri (μ = .48) second, and the Yellowstone third (μ = .45). The mean score for the Columbia drainage sites indicates slight impairment and partial support of aquatic life uses; mean scores for the Missouri and Yellowstone drainages indicate moderate impairment and partial use support in both cases.

Temporal variation within ecoregions and within watersheds

When scores from all sites were compared, means and ranges of scores did not vary significantly among years (Figures 4A and 4B) no matter which bioassessment index was used to evaluate Mountain region sites. (p = .9740 for Figure 4A and p = .9439 for Figure 4B). When the MDEQ index was used, Rosebud Creek near Rosebud

was a low-scoring outlier in 2003; Middle Fork Flathead River near West Glacier was a low-scoring outlier in both 2003 and 2005. When the MVFP index was used, Big Horn River near Hardin and Rosebud Creek near Rosebud were low-scoring outliers in 2003. Table 11 gives summary statistics for the among-years comparison.

Mean bioassessment scores among years (Figures 5A, 5B, 6 and 7) were also not significantly different when sites were grouped by ecoregion. Scores for sites in the Mountain ecoregion exhibited different means and ranges depending on the bioassessment index used (Figures 5A and 5B). When the MDEQ index was used, score ranges were more variable than when the MVFP index was used. Interestingly, North Fork Flathead River near Columbia Falls was a low-scoring outlier in 2002 when the MDEQ index was applied; the MVFP index ranked this site second highest among Mountain sites in that year. While the MVFP index ranked Clark Fork River at St. Regis lowest in 2001, the MDEQ index ranked it third highest among Mountain region sites in that year. Although the ANOVA tests did not indicate significant differences in any ecoregion, ranges and mean scores appeared to be most variable among years for Plains sites (Figure 6) and for Mountain region sites when the MDEQ index was used (Figure 5A). The MVFP index, applied to either MVFP (Figure 7) or Mountain region sites (Figure 5B), gave the most consistent mean scores and score ranges. Summary statistics for among year comparisons by ecoregion are given in Table 12.

When sites were grouped by watershed (Figures 8, 9, 10A and 10B), mean scores among years did not differ significantly. This was true for the Columbia River basin regardless of whether the MDEQ index or the MVFP index was used to assess Mountain region sites (Figures 10A and 10B). Table 13 summarizes the descriptive statistics for the distribution of scores among years by watershed.

Bioassessments and Site Rankings

Table 14 summarizes bioassessment results and ranks statewide monitoring network sites; an average bioassessment score over all years of data, expressed as percent of maximum possible score (reference condition), is reported for each site. Average scores are compared to reference conditions for the appropriate ecoregion, and an impairment classification based on this comparison is given. Sites are ranked within each watershed/ecoregion combination. Rankings for sites in the Mountain ecoregion are given for both the MDEQ and MVFP index.

MVFP sites were classified as either slightly or moderately impaired. All MVFP sites were designated as partially supportive of aquatic life uses. Plains region site classifications ranged from good to very poor. Two sites were rated non-supportive of aquatic life uses: these were Big Muddy Creek near Culbertson (which was sampled

only in 2002), and Big Horn River near Hardin. Mountain sites were classified as slightly impaired or moderately impaired; all were partially supportive of aquatic life uses. Application of the 2 indices for Mountain region sites resulted in different impairment classifications for 5 of the 7 sites.

Among MVFP stations in the Missouri River basin, Big Hole River near Wise River had the highest bioassessment score (61% of maximum); this site and the Dearborn River near Craig were both slightly impaired according to the criteria used in this study. All other MVFP sites in the Missouri River basin were moderately impaired; the lowest scores were calculated for Beaverhead River near Dillon and Beaverhead River at Twin Bridges (34.7% and 35.6% respectively). Among Plains streams in the Missouri River basin, Judith River near mouth scored the highest (69.7%: good condition) and Big Muddy Creek near Culbertson scored lowest (23.3%: very poor condition).

In the MVFP region of the Yellowstone River basin, Boulder River near mouth ranked highest (63.3%) and was slightly impaired. Tongue River near Stateline, sampled only once (2002) scored lowest (33.3%) and was moderately impaired. In the Plains region of the Yellowstone basin, Tongue River near Brandenberg ranked first with 68.5% (good condition) and Big Horn River near Hardin ranked last with 14.0% (very poor condition, non-supportive); this was the lowest mean score calculated among all sites in the study.

Among Columbia River basin sites, Bitterroot River near Darby scored highest (67.7%, slightly impaired) among the MVFP sites. Whitefish River near Kalispell scored lowest (45.5%, moderately impaired). Among Mountain region sites, when the MDEQ index was used, Fisher River near mouth ranked highest with 55%, indicating slight impairment, and Middle Fork Flathead River near West Glacier ranked lowest with 28%, indicating moderate impairment. When the MVFP index was used to assess Mountain region sites, North Fork Flathead River near Columbia Falls had the highest bioassessment score (75.6%; slight impairment); this was also the highest score of all sites in this study. Clark Fork River at St. Regis ranked lowest in this group (40.0%: moderate impairment).

Using the 5-year average bioassessment score to characterize and rank sites, as shown in Table 14, may mask changes in integrity over the years of the study for some of the sites. Notable shifts in condition appeared to have occurred at the Big Horn River at mouth site, where indicators suggest that both sediment and nutrient stress increased beginning in 2003 and persisted through 2004 and 2005. The Fisher River near mouth may have had increasing stress due to nutrient enrichment later in the study period. Rock Creek near Clinton shows evidence of increasing nutrient stress as

well as non-specific habitat disruption in 2004 and 2005. Evidence of non-specific stress could be detected in the earlier study years at Little Blackfoot River at Garrison, but was apparently mitigated in the later years.

Other stressors detectable by bioassessment metrics may occur in some, but not all of the study years without apparent trends. It is reasonable to expect dewatering and thermal stress, sediment, and nutrient enrichment to be more problematic in some years and less so at other times; for example, each of these stressors may be exacerbated in years when drought results in low flow. Dewatering and thermal stress, or other insults that interrupt long semivoltine life cycles left evidence in the performance of metrics in some years at Teton River near Loma, Big Horn River at mouth, Clarks Fork River at Edgar, Powder River near Moorhead, Rosebud Creek near Rosebud, and Tongue River at Miles City. Similarly, sediment effects were detectable in some years at 3 sites: Beaverhead River at Twin Bridges, Tongue River near Brandenberg, and Swan River near Bigfork. Nutrient enrichment was apparently periodic at 3 sites: Big Hole River near Wise River, Teton River near Loma, and Boulder River near mouth.

Sample replicates were collected at 1 site in each of the 3 major river basins in 2005. Bioassessment index scores resulted in equivalent impairment classifications for each replicate pair, however, scores differed by 11% for Shields River near mouth, and by 6% for Clark Fork River at Turah. Replicate scores were identical for Sun River at Sun River. All 3 sites were assessed using the MVFP index.

Comparison of MDEQ index and MVFP index results for mountain sites

The mean bioassessment score of all statewide monitoring sites in all years (Figures 1A and 1B) did not differ significantly regardless of whether Mountain ecoregion sites were evaluated with the MDEQ index or the MVFP index. In either case, distributions did not violate assumptions of normality. Figure 12 compares the results of scores for Mountain ecoregion sites when they are evaluated with each of the 2 indices. ANOVA indicated that mean scores over all years for these indices were significantly different from one another (p = .0000). Summary statistics for this comparison can be found in Table 7. The MDEQ produced lower scores for all but one site; Clark Fork River at St. Regis scored slightly higher when the MDEQ index was used. The MDEQ produced a wider distribution of scores, with Fisher River near mouth 2005 widely outlying with respect to the remaining scores.

Table 14 compares ranking of Mountain ecoregion sites based on mean scores derived from both indices. The indices demonstrated particularly divergent results with respect to the ranking of Clark Fork River at St. Regis, which was ranked lowest by the

MVFP index but third highest by the MDEQ index, and North Fork Flathead River near Columbia Falls which was ranked highest by the MVFP index. This site ranked at the middle of the group when the MDEQ index was used.

Other differences in the performance of these 2 indices have been noted elsewhere in this paper.

Metric Indicators of Specific Stressors

The analysis of metric indicators of specific stressors is summarized in Table 15. The table shows the number of positive responses to indicative metrics by crosses in columns associated with each stressor. Probable stress due to sediment influence was evaluated by the responses of 2 metrics: "clinger" taxa richness and caddisfly (Trichoptera) taxa richness. The average value of each metric was calculated over all years of data; when the invertebrate assemblage site demonstrated low richness in one of these groups, a single cross appears in the "Sediment" column. Low average richness in both groups results in 2 crosses. Often a metric would give a positive response in most years, but the average value over 5 years would fall within the threshold value, representing no response. In such cases, a cross inside parentheses appears. Metric values for each site in each year for all of the indicators represented by crosses in Table 15 are plotted in Figures 13 through 20, showing the variation in values of these metrics over the years of study.

There were no indications of specific stressors for 2 sites: Judith River near mouth and Stillwater River near Absarokee. The most common stressors at the remaining sites were nutrient enrichment (39 sites) and sediment (18 sites). Non-specific indicators of stress were noted at 33 sites. Metric indications of periodic dewatering or thermal stress were detected at 5 sites, and a single site (Prickly Pear Creek near Clancy) exhibited probable metals contamination.

Cold stenotherm taxa were present at 7 sites: Blackfoot River near mouth, Fisher River near mouth, Middle Fork Flathead River near West Glacier, North Fork Flathead River near Columbia Falls, South Fork Flathead River at Spotted Bear, and Swan River near Bigfork. They were also present in several, but not all study years at Rock Creek near Clinton.

Major Water Quality and Habitat Issues

The Missouri River basin

Metrics suggested that most sites (85%) in the Missouri River basin supported invertebrate assemblages that were influenced by nutrient enrichment. Only 3 stations did not produce definitively positive response to at least 1 indicator metric value

averaged over 5 years. These were: Judith River near mouth, Teton River near Loma, and Big Hole River near Wise River. Non-specific habitat disruptions ranked next in frequency (80%) among Missouri River basin sites. Sediment appeared to influence assemblages at 40% of stations. Evidence for periodic dewatering or thermal stress could be detected at 3 stations (15%); these were Milk River at Nashua, Milk River near Saco, and Musselshell River at Mosby. One station (Prickly Pear at Clancy) may have been impaired by heavy metals.

The Yellowstone River basin

Non-specific habitat disruptions were the most common stressors among sites in the Yellowstone River basin. All but 1 station (Shields River near mouth) demonstrated positive responses to metrics associated with these disturbances. Sediment influence was more prevalent in the Yellowstone basin than in the Missouri River basin; impairment due to sediment deposition was detectable at 67% of stations. Nutrient enrichment was equally frequent (67%). Evidence of dewatering and/or thermal stress was apparent in average metric values calculated for 2 stations (Big Horn River near Hardin and Powder River near Locate), but positive metric responses were recorded for an additional 5 stations (Big Horn River at mouth, Clarks Fork River at Edgar, Powder River near Moorhead, Rosebud Creek near Rosebud, and Tongue River at Miles City) in most years of the study. These findings imply that 58% of the Yellowstone River basin monitoring stations may have been influenced by dewatering, thermal stress, or other stressors in most years between 2001 and 2005.

The Columbia River basin

Evidence for the influence of nutrient enrichment could be detected at 93% of Columbia River basin stations, making this stressor the most common probable cause of impairment in that basin. South Fork Flathead River at Spotted Bear was the only Columbia River basin site that did not give a positive response to any metric indicator of nutrient enrichment. Non-specific habitat disruptions were suggested by metric performance at 6 sites (43%); these were Bitterroot River near mouth, Middle Fork Flathead River near West Glacier, North Fork Flathead River near Columbia Falls, South Fork Flathead River at Spotted Bear, Yaak River at mouth, and Clark Fork River at St. Regis. Stress due to sediment deposition was relatively rare in this watershed; it was detected at only 2 sites (14%); these were Middle Fork Flathead River near West Glacier and South Fork Flathead River at Spotted Bear. None of the Columbia River basin stations appeared to suffer from periodic dewatering or thermal stress.

Variability of Habitat Assessment Scores

Figure 21 plots the results of individual habitat assessments for each station over all years of the study. The graph clearly demonstrates that total habitat scores varied widely among years at most sites.

Geographic variation over 5 years

The distribution of total habitat assessment scores, expressed as percent of maximum score, for all sites over all years is plotted in Figure 22. Habitat assessment scores ranged from a high of 100% of maximum score to a low of 17%. Figure 23 illustrates distributions and ranges of total habitat assessment scores in each of the major river basins. ANOVA demonstrated that mean scores were significantly different among watersheds ($p < 0.001$). Summary statistics for this comparison are given in Table 16. *A posteriori* comparisons (Table 17) show that all 5 groups were statistically distinguishable in terms of habitat assessment scores. Ranking the watersheds from highest to lowest mean habitat score places the Columbia River basin first ($\mu = .80$), followed by the Missouri ($\mu = .66$) and the Yellowstone ($\mu = .60$) basins.

Temporal variation within watersheds

Habitat assessment scores differed significantly among years ($p < 0.001$); ranges and distributions of scores in each year are graphed in Figure 24, and summary statistics are given in Table 18. *A posteriori* comparisons using the T-method (Sokal and Rohlf 1995) indicate that habitat assessment scores were significantly lower in both 2003 and 2004 compared to the other years studied (Table 19). The pattern of lower habitat assessment scores in 2003 compared to all other years was not unique to any single river basin; this is evident in Figures 25, 26 and 27, which plot habitat assessment scores in each major watershed. The plots show that these scores were lower in that year in all 3 watersheds. Summary statistics for these plots are given in Table 20. Habitat assessment scores exhibited the greatest variability among years in the Yellowstone River watershed, and the least variability in the Columbia River basin.

DISCUSSION

Although the ordering of sites by bioassessment scores gave intuitively satisfying results, especially when the MVFP index was used to evaluate Mountain ecoregion sites, some limitations and biases of the methodologies ought to be examined. Since it was developed to assess smaller streams, three of the metrics employed in the MVFP index are probably not appropriate for assessing the type of sites studied here, and scoring

criteria for all metrics have not been investigated for use in rivers. Table 1 lists the metrics specific to the MVFP index and gives the scoring thresholds for each. Sensitive taxa as defined for the MVFP index are generally not expected to exhibit as much diversity in riverine conditions compared to lower-linkage systems. Filter-feeders are negatively associated with habitat and water quality in second and third order streams, but their abundance is expected to increase as stream order increases. According to the River Continuum Concept (Vannote et al. 1980), energy resources in rivers of the size studied here are dominated by fine particulate organic matter, fostering abundant populations of filter-feeders. Thus, this index is likely to produce biased scores that imply more impairment than may actually exist. The MDEQ index may also result in overly-conservative evaluations of water and habitat quality, since it also incorporates metrics that are more appropriate to lower-order stream systems. Table 2 lists the metrics specific to the MDEQ index and gives the scoring thresholds for each. For example, shredders, other than those organisms associated with filamentous algae, are not typically associated with riverine systems (Vannote et al. 1980). These observations suggest the need to revise extant bioassessment indices or devise new indices that better measure processes and composition associated with water and habitat quality in higher-linkage systems such as those that are part of the statewide monitoring network.

In some ways, the MVFP index appeared to do a better job of evaluating sites in Mountain ecoregions than the MDEQ index. For example, the MDEQ index ranks the Yaak River in 2001 and the Middle Fork Flathead River in 2003 and 2005 as the worst sites in any ecoregion over all years of the study; these results seem incongruous, since both sites supported sensitive, diverse, and functional assemblages in those years. Mean scores for Mountain sites were significantly lower than scores for MVFP sites when the MDEQ index was used. This result is also not intuitively satisfying, since it is expected that rivers in the MVFP region are exposed to much more intense human disruptions. By contrast, the MVFP index ranks Mountain region sites significantly higher than either MVFP or Plains sites. The apparently more satisfactory performance of the MVFP index as compared to that of the MDEQ index may be related to the process involved in the MVFP index development, which involved testing of the index and its component metrics to assess accuracy, precision, and bias. The MVFP index was developed for lower-order stream systems over a wide range of elevations, using data collected at a large number of sites representing a large gradient of human disturbances. This may account for its apparent usefulness in assessing both montane streams and valley and foothill systems.

Accuracy of the MVFP index and metrics was evaluated by examining their ability to differentiate between unimpaired and impaired sites, categorized as such on

the basis of abiotic assessments similar to those the State uses to distinguish reference conditions (Suplee et al. 2005). Precision was tested by comparing results of replicated sampling, and by rejecting metrics that did not give repeatable results. The MVFP index was demonstrated to vary more with anthropogenic disturbances than with natural environmental gradients such as elevation, thus minimizing an important source of bias. In contrast, there are no studies that document similar testing of the MDEQ index or its metric components. Similar to the MVFP index, the Plains indices were derived using a rigorous methodology (Bramblett et al. 2003).

Although the distributions of individual metric values are typically distorted, the normally-distributed index scores in this study support the findings of Fore et al. (1994). These researchers showed that when standardized values of metrics are integrated into an index, resulting scores may typically be compared by means of standard statistical tests, since the criteria for normally distributed data are met.

Both the MVFP index and the Plains indices appeared to detect a wide range of biologic conditions; the MDEQ index for Mountain regions exhibited a similar distribution of scores as well. It appears that gradients of impairment as measured by the various indices are reduced to similar ranges when any of these indices are employed. It is important to note, however, that it remains unclear whether equivalent scores in these indices indicate an equivalent level of impairment. Sites within ecoregions can apparently be compared with one another; however, sites in different regions cannot. The results obtained here demonstrate that impairment to biological integrity differs among both the 3 major watersheds and the 3 ecoregions.

It is probably not safe to expect that bioassessment scores should remain consistent from year to year, even for riverine sites. Droughts, forest fires, and variable thermal conditions affect entire landscapes and trigger changes to aquatic invertebrate assemblages in all draining waterways. Data for statewide drought conditions were available for water years 2003, 2004, and 2005 (NRIS: 2005). These data suggest that of the 3 years, statewide conditions were apparently drier in 2003 and 2004 than in 2005. These differences were not reflected in bioassessment scores when statewide scores were aggregated: mean scores for statewide samples were in fact slightly higher in 2003 and 2004 than in 2005. Regionally, the MVFP exhibited an increased range of scores in both 2003 and 2004 compared to 2005, but higher values as well as lower values were observed. Individually, each of the 3 major river basins had a greater range of scores in 2004 than in other years. The effect of drought on bioassessment scores does not appear to be appreciable. On the other hand, habitat assessment scores were significantly lower in 2003 and 2004 than in other years. Several habitat measures included in the assessment tool used could be expected to vary with drought

conditions. However, this study can not address whether these scores are attributable to actual changes in habitat conditions or to differences in field assessment techniques.

Rankings of biologic integrity of sites were based on total bioassessment scores, and these rankings often didn't seem to correspond with the performance of metric indicators of specific stressors. For example, Table 8 records 5 positive responses to metric indicators for Milk River at Nashua and 4 such responses for Beaverhead River at Twin Bridges. Yet Beaverhead River at Twin Bridges has a lower overall bioassessment score than the Milk River site. This result is not surprising, since the bioassessment indices include metrics that have not been shown to indicate specific stressors in research performed to date. In addition, some metrics included in the MVFP index (Table 1) are probably not appropriate for the evaluation of these riverine sites. This index was crafted using lower-linkage systems, where taxa characterized as "sensitive" are far more common than at these higher-linkage sites. Similarly, filter-feeders are a negative indicator in second- and third-order streams, but are expected to be a major functional component in downstream sites. Thus, bioassessment results for MVFP sites in this study were probably conservative, and likely overestimated impairment.

Although levels of impairment are difficult to differentiate, the assessment protocols applied in this report assign 4 impairment classifications to scores: no impairment, slight impairment, moderate impairment, and severe impairment. Table 3B describes the scoring thresholds for each impairment class. This classification scheme was introduced in the original Rapid Bioassessment Protocol (RBP) (Plafkin et al. 1989), where the authors indicate that results from its application closely matched the results from a cluster analysis performed on the same taxonomic data. Aquatic life use-support thresholds suggested by MDEQ classify sites into 3 support categories: full support, partial support, and non-support (MDEQ 2005). Table 3A lists the scoring thresholds for each use-support designation. This classification scheme has been used by MDEQ for many years, and apparently relied on the best professional judgment of its biologists for rationalizing its use. Recent statistical power analyses performed on data from Western Montana sites on the Flathead Reservation indicate that the MVFP index can reliably detect a 30% change in biological condition when applied to non-replicated benthic samples (Bollman 2005). These findings suggest that aquatic life use-support categories may provide a rather robust classification of sites when this index is used for similar sites.

Habitat assessment scores exhibited large variations among the years of study. Variation may be attributable to the different assessment approaches or skills of field personnel who performed the assessments over the years. While some habitat measures

are not expected to change appreciably from year to year at riverine sites (e.g. channel alteration, riparian zone integrity), it is not unreasonable to expect other measures to change. Sediment deposition may be exacerbated by the effects of forest fires, forest road maintenance, and local or landscape-scale changes in land use. Higher flows may carry sediment off of benthic substrates in less droughty years. Flow characteristics, which are rated in the habitat assessment protocols in use by the State, obviously vary with drought, and the years between 2001 and 2005 saw both drought and more normal precipitation conditions in varying proportions throughout the State. Whether the variation in habitat assessment scores is attributable to field crew error or to real variation in habitat conditions could not be determined in the current study; it would be interesting to study this further. Such a study could compare the evaluations among years of those measures expected to remain stable with those measures that are more liable to change.

The extensive data collected for the statewide monitoring project provide an opportunity for further analysis which could compare, contrast, and evaluate differences in assessment results obtained from 2 independently assessed biological assemblages. A statistical comparison between the results reported for the periphyton flora and aquatic invertebrate fauna would enhance the understanding of ecological responses of biological assemblages to various stressors.

FIGURES AND TABLES

Table 1. Metrics and scoring criteria for bioassessment of streams of the Montana Valley and Foothill Prairies ecoregion (Bollman 1998).

	Score			
Metric	**3**	**2**	**1**	**0**
Ephemeroptera taxa richness	> 5	5 — 4	3 – 2	< 2
Plecoptera taxa richness	> 3	3 — 2	1	0
Trichoptera taxa richness	> 4	4 — 3	2	< 2
Sensitive taxa richness	> 3	3 — 2	1	0
Percent filterers	0 – 5	5.01 — 10	10.01 – 25	> 25
Percent tolerant taxa	0 – 5	5.01 — 10	10.01 – 35	> 35

Table 2. Metrics and scoring criteria for bioassessment of streams of the montane regions of Montana (Bukantis 1998, MDEQ 2005).

	Score			
Metric	**3**	**2**	**1**	**0**
Taxa richness	> 28	28 — 24	24 — 19	< 19
EPT richness	> 19	19 — 17	17 — 15	< 15
Biotic index	< 3	3 — 4	4 — 5	> 5
Percent dominant	< 25	25 — 35	35 — 45	> 45
Percent collectors	< 60	60 — 70	70 — 80	> 80
Percent EPT	> 70	70 — 55	55 — 40	< 40
Percent scraper+shredder	> 55	55 — 40	40 — 25	< 25

Table3A. Criteria for the assignment of aquatic life use-support designations (MDEQ 2005).

% Comparability to reference	Use support
>75	Full support—standards not violated
25-75	Partial support—moderate impairment—standards violated
<25	Non-support—severe impairment—standards violated

Table3B. Criteria for the assignment of impairment classifications (Plafkin et al. 1989).

% Comparability to reference	Classification
> 83	non-impaired
54-79	slightly impaired
21-50	moderately impaired
<17	severely impaired

Table 4A. Metrics comprising the indices used for Plains sites-riffles (Bramblett et al. 2003).

Metrics	Calculation of scores
EPT Richness	(Number EPT taxa/11) x 100
Proportion EPT	(% EPT/80.6) x 100
% Oligochaetes and Leeches	100-(% Oligochaetes and Leeches taxa of total sample/9.8) x 100
% 2 Dominant	100-(% 2 Dominant species taxa of total sample/77.9) x 100
Collector-Filterer Richness	(Number Collector-Filterer taxa/6) x 100
% Intolerant	(% Intolerant taxa of total sample/51.7) x 100
Univoltine Richness	(Number Univoltine taxa of total sample/17) x 100
% Clingers	(% Clinger taxa of total sample/83.3) x 100
Swimmer Richness	(Number Swimmer taxa/7) x 100

Table 4B. Scoring criteria used for Plains sites-riffles (Bramblett et al. 2003).

Rating:	**Good**	**Fair**	**Poor**	**Very Poor**
Prairie IBI Score (Riffle)	> 55	55 to 40	40 to 30	< 30

Table 5A. Metrics comprising the indices used for Plains sites-pools (Bramblett et al. 2003).

Metrics	Calculation of scores
Ephemeroptera Richness	(Number Ephemeroptera taxa/6) x 100
Trichoptera Richness	(Number Trichoptera taxa/4) x 100
Proportion EPT	(% EPT of total sample/67.3) x 100 (for ecoregion 43) (% EPT of total sample/34.6) x 100 (for ecoregion 42)
% Non-insect	100-(% Non-insect of total sample/61) x 100 (for ecoregion 43) 100-(% Non-insect of total sample/79.7) x 100 (for ecoregion 42)
Collector-Filterer Richness	(Number Collector-Filterer taxa/4) x 100
Percent Supertolerant	100-(% Supertolerant taxa of total sample/164) x 100 (Watershed Area of Influence adjusted)
Univoltine Richness	(Number Univoltine taxa/18) x 100

Table 5B. Scoring criteria used for Plains sites-pools (Bramblett et al. 2003).

Rating:	**Good**	**Fair**	**Poor**	**Very Poor**
Prairie IBI Score (Pools)	> 65	65 to 50	50 to 20	< 20

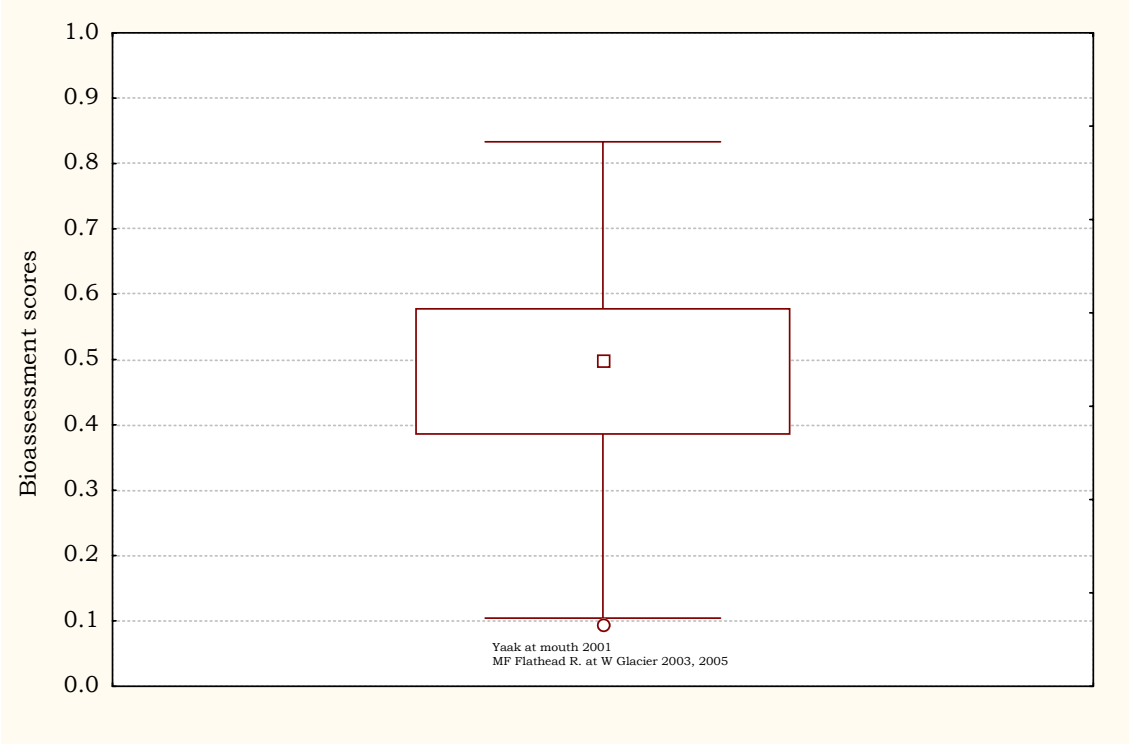

Figure 1A. Distribution of bioassessment scores for all sites in all years (n = 199). MDEQ index (Bukantis 1998) used to assess Mountain ecoregion sites.

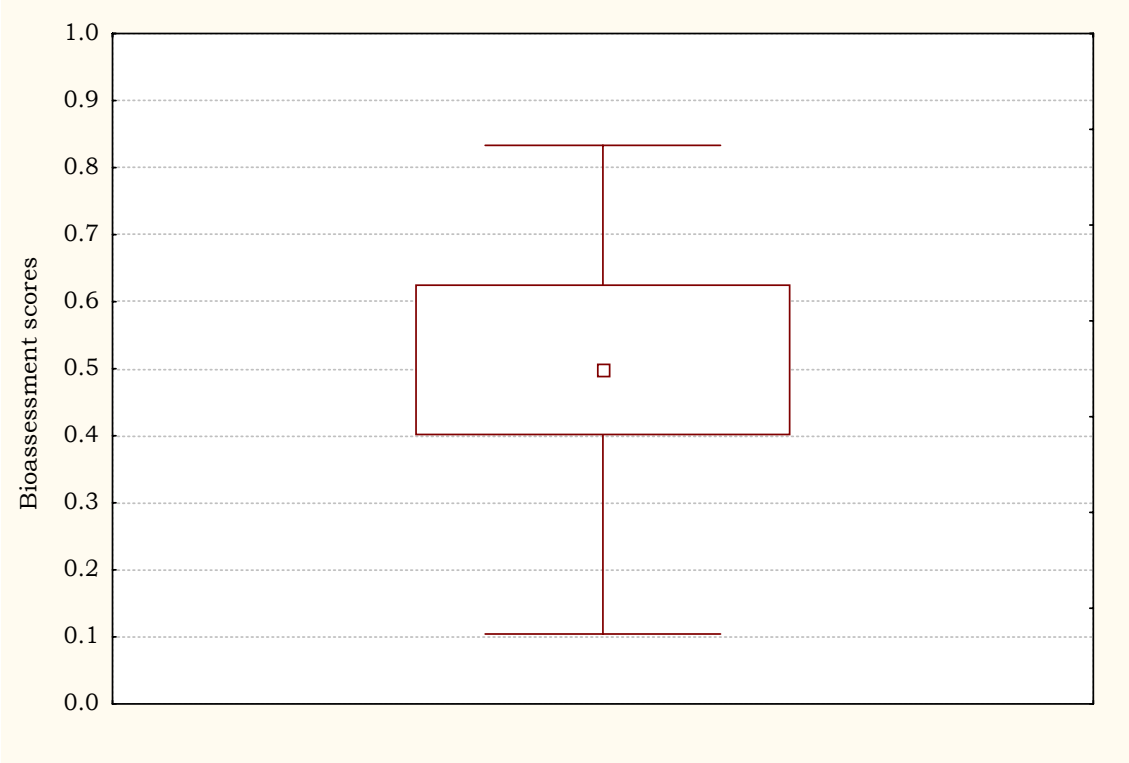

Figure 1B. Distribution of bioassessment scores for all sites in all years (n = 199). MVFP index (Bollman 1998) used to assess Mountain ecoregion sites.

Table 6. Summary statistics for total bioassessment scores from all sites in all years.

Using MDEQ index for Mountain region sites	Min:	.10
	Mean:	.48
	Median:	.50
	Max:	.83
	Total N	199
Using MVFP index for Mountain region sites	Min:	.10
	Mean:	.51
	Median:	.50
	Max:	.83
	Total N	199

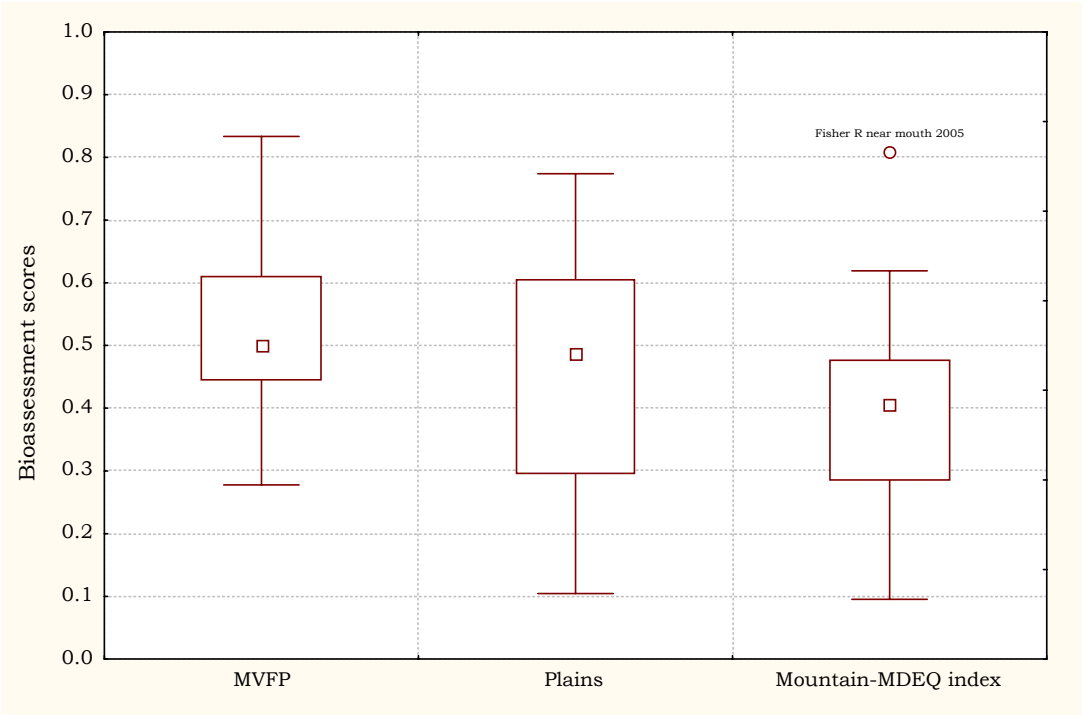

Figure 2A. Distributions of bioassessment scores for ecoregions in all years. MDEQ index (Bukantis 1998) used to assess Mountain ecoregion sites.

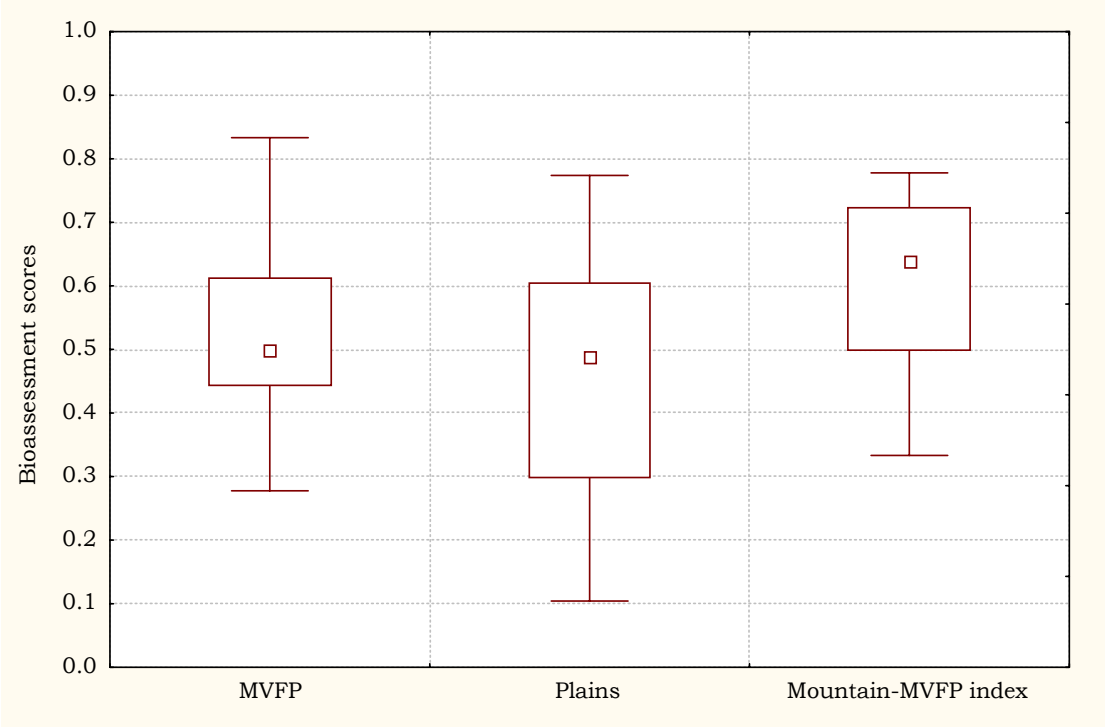

Figure 2B. Distributions of bioassessment scores for ecoregions in all years. MVFP index (Bollman 1998) used to assess Mountain ecoregion sites.

Table 7. Summary statistics for total bioassessment scores by ecoregions.

MVFP	Min:	.28
	Mean:	.51
	Median:	.50
	Max:	.83
	Total N	104
Plains	Min:	.10
	Mean:	.46
	Median:	.49
	Max:	.77
	Total N	61
Mountains (MDEQ index)	Min:	.09
	Mean:	.39
	Median:	.40
	Max:	.81
	Total N	34
Mountains (MVFP index)	Min:	.33
	Mean:	.62
	Median:	.63
	Max:	.78
	Total N	34

Table 8A. Results of T-method *a posteriori* comparisons (Sokal and Rohlf 1995) for means of bioassessment scores for ecoregions. The MDEQ index (Bukantis) was used to evaluate Mountain region sites. Homogeneous groups are indicated by x's.

	1	**2**
Mountain	xxxx	
Plains	xxxx	xxxx
MVFP		xxxx

Table 8B. Results of T-method *a posteriori* comparisons (Sokal and Rohlf 1995) for means of bioassessment scores for ecoregions. The MVFP index (Bollman) was used to evaluate Mountain region sites. Homogeneous groups are indicated by x's.

	1	**2**
Mountain		xxxx
Plains	xxxx	
MVFP	xxxx	

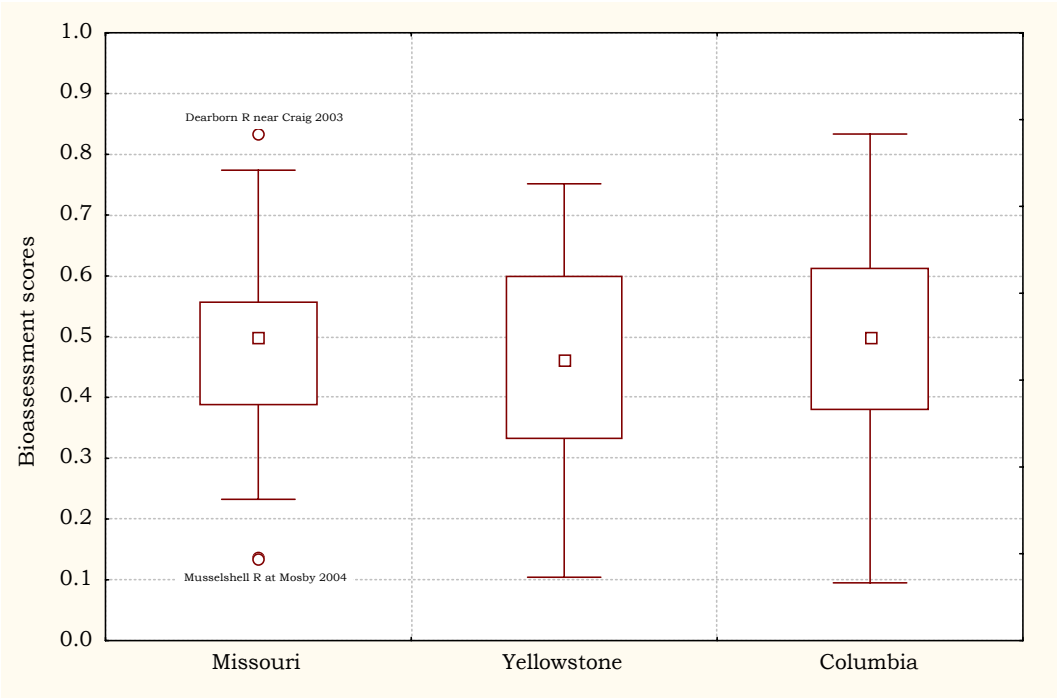

Figure 3A. Bioassessment scores for major river basins in all years. MDEQ index (Bukantis 1998) used to assess Mountain ecoregion sites.

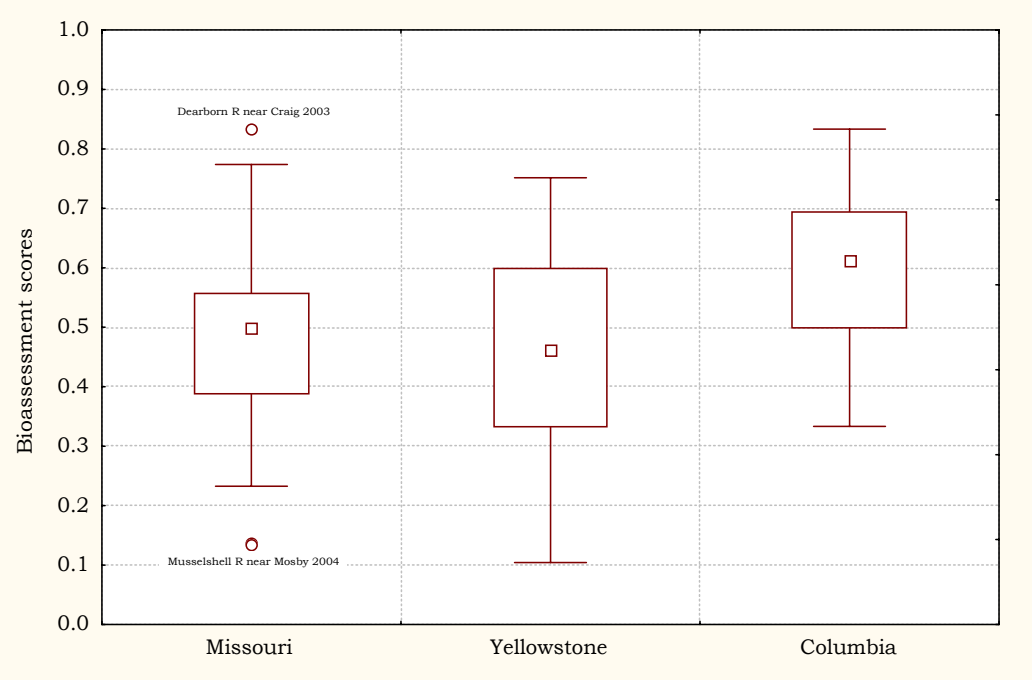

Figure 3B. Bioassessment scores for major river basins in all years. MVFP index (Bollman 1998) used to assess Mountain ecoregion sites.

Table 9. Summary statistics for total bioassessment scores by major watersheds.

Missouri	Min:	.14
	Mean:	.48
	Median:	.50
	Max:	.83
	Total N	78
Yellowstone	Min:	.10
	Mean:	.45
	Median:	.46
	Max:	.75
	Total N	53
Columbia (MDEQ index for Mountain sites)	Min:	.09
	Mean:	.49
	Median:	.50
	Max:	.83
	Total N	68
Columbia (MVFP index for Mountain sites)	Min:	.33
	Mean:	.60
	Median:	.61
	Max:	.83
	Total N	68

Table 10. Results of T-method *a posteriori* comparisons (Sokal and Rohlf 1995) for means of bioassessment scores for major watersheds. The MVFP index (Bollman) was used to evaluate Mountain region sites. Homogeneous groups are indicated by x's.

	1	**2**
Yellowstone	xxxx	
Missouri	xxxx	
Columbia		xxxx

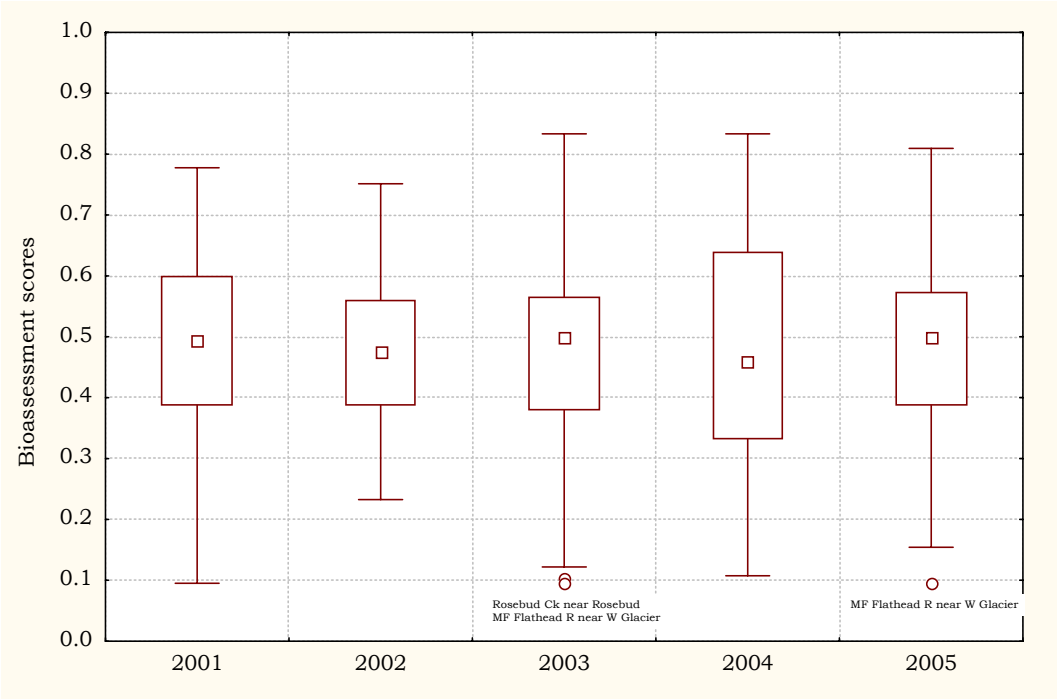

Figure 4A. Bioassessment scores among years for all sites. MDEQ index (Bukantis 1998) used to assess Mountain ecoregion sites.

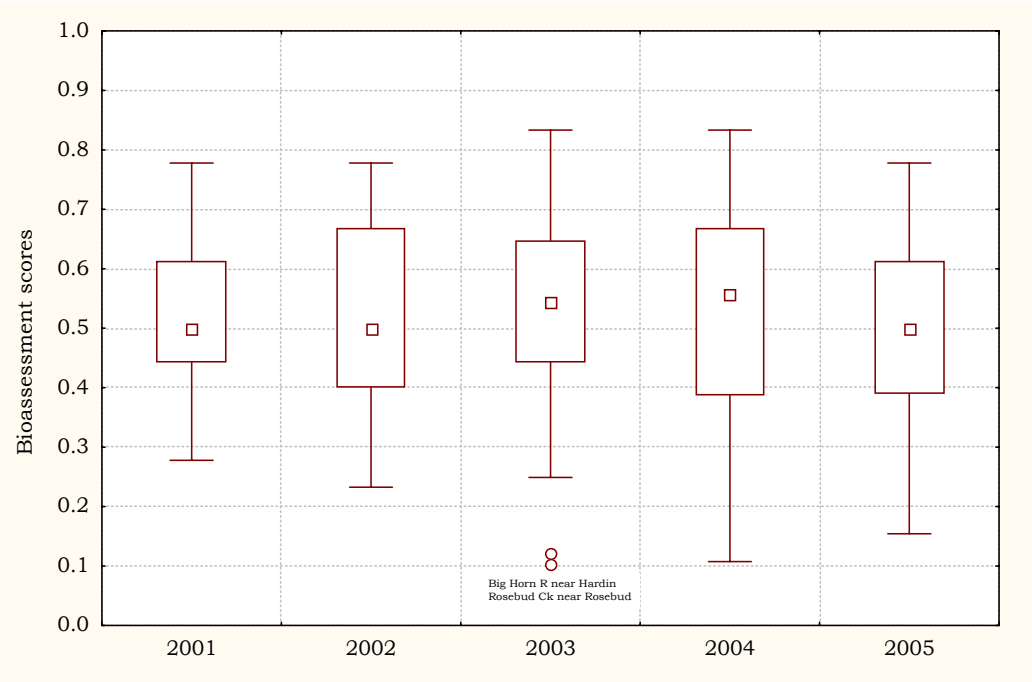

Figure 4B. Bioassessment scores among years for all sites. MVFP index (Bollman 1998) used to assess Mountain ecoregion sites.

Table 11. Summary statistics for total bioassessment scores in each year.

		MDEQ index	MVFP index
2001	Min:	.09	.28
	Mean:	.47	.53
	Median:	.49	.50
	Max:	.78	.78
	Total N	31	
2002	Min:	.23	.23
	Mean:	.49	.52
	Median:	.48	.50
	Max:	.75	.78
	Total N	39	
2003	Min:	.09	.10
	Mean:	.47	.52
	Median:	.50	.54
	Max:	.83	.83
	Total N	42	
2004	Min:	.11	.11
	Mean:	.46	.51
	Median:	.46	.56
	Max:	.83	.83
	Total N	42	
2005	Min:	.09	.15
	Mean:	.48	.50
	Median:	.50	.50
	Max:	.81	.78
	Total N	45	

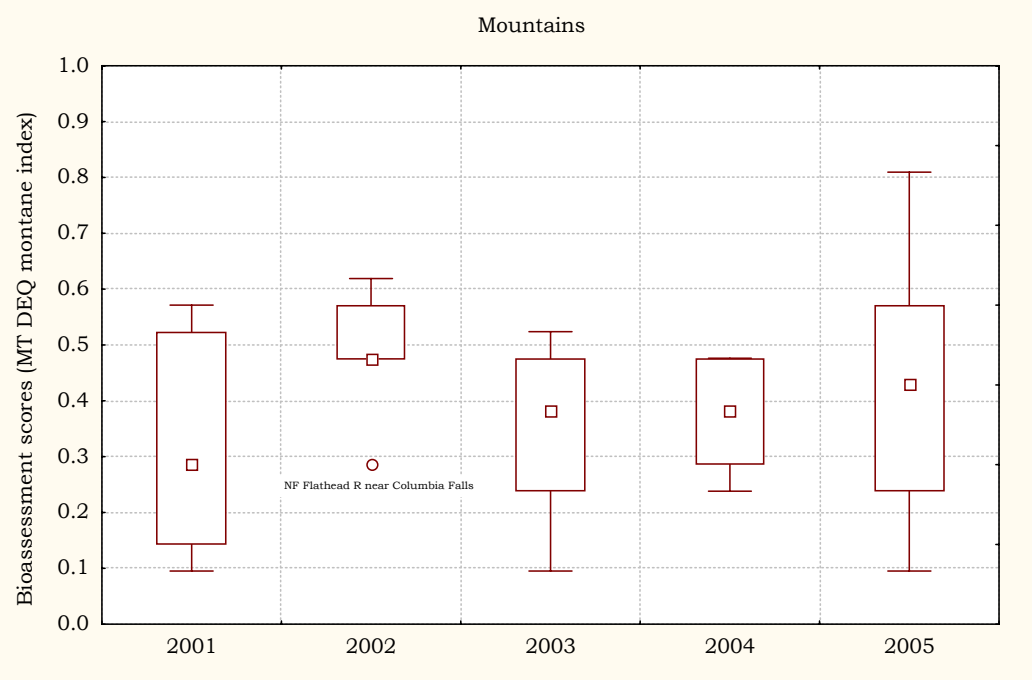

Figure 5A. Bioassessment scores among years for Mountain ecoregion sites. MDEQ index (Bukantis 1998) used.

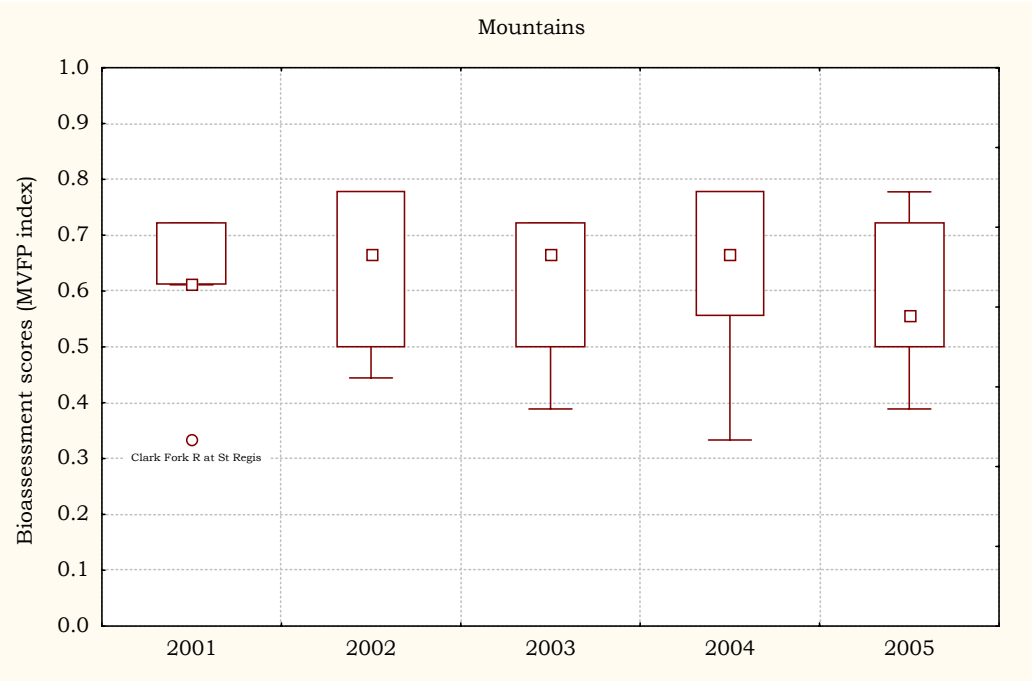

Figure 5B. Bioassessment scores among years for Mountain ecoregion sites. MVFP index (Bollman 1998) used.

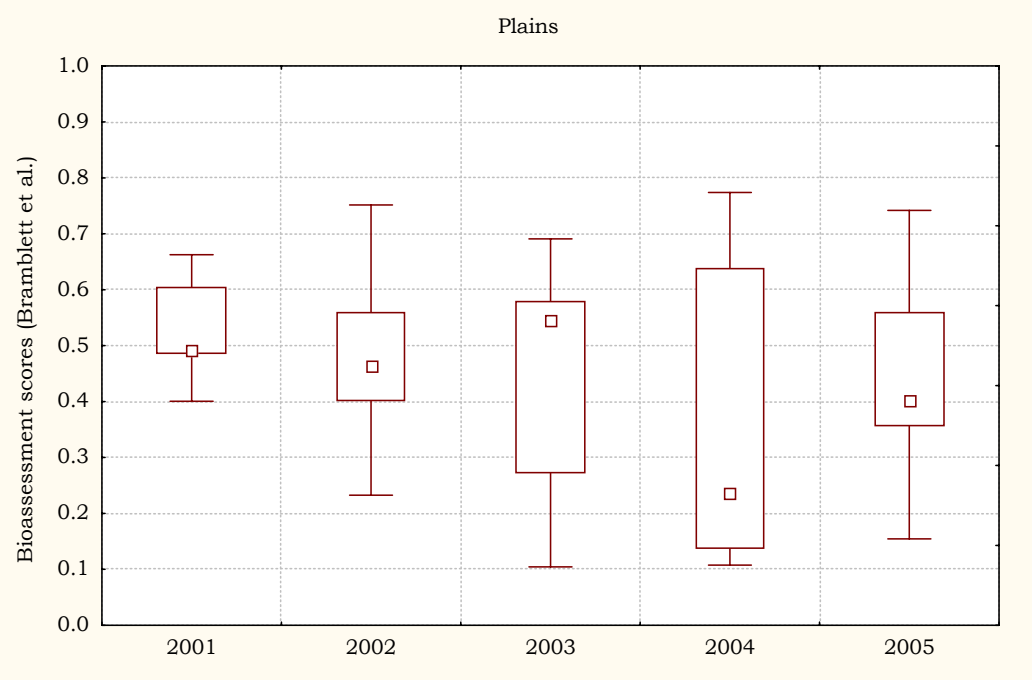

Figure 6. Bioassessment scores among years for Plains ecoregion sites. Plains index (Bramblett et al.) used.

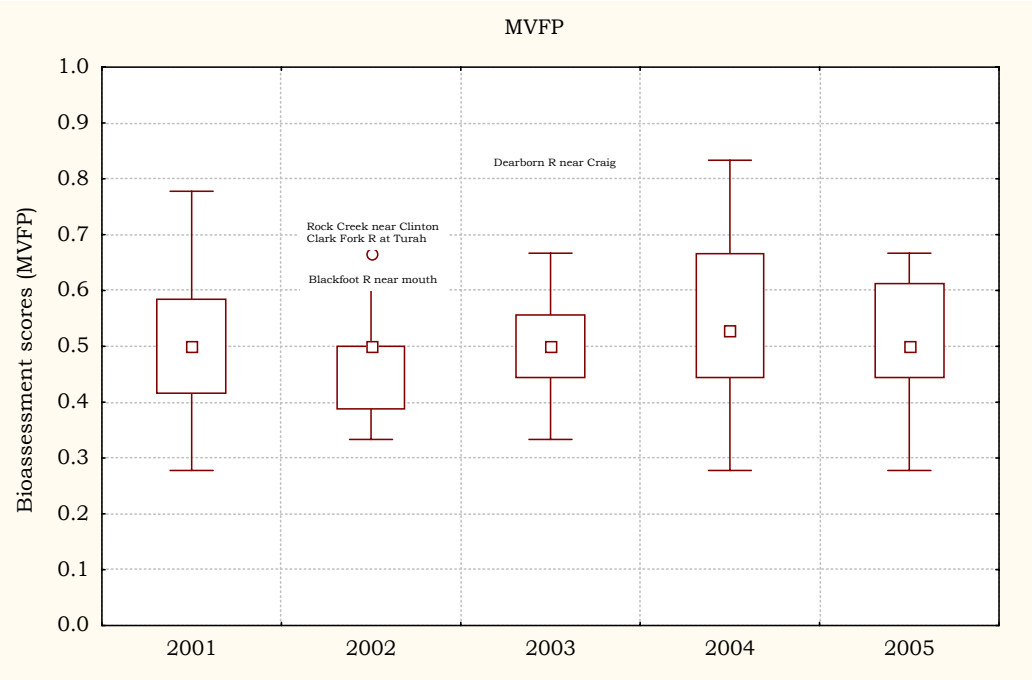

Figure 7. Bioassessment scores among years for MVFP ecoregion sites. MVFP index (Bollman 1998) used.

Table 12. Summary statistics for total bioassessment scores in each year by ecoregion.

		MVFP	Plains	Mountains (MDEQ index)	Mountains (MVFP index)
2001	Min:	.28	.40	.10	.33
	Mean:	.49	.53	.32	.60
	Median:	.50	.49	.29	.61
	Max:	.78	.66	.57	.72
	Total N	16	9	6	6
2002	Min:	.33	.23	.29	.44
	Mean:	.49	.50	.48	.65
	Median:	.50	.46	.47	.67
	Max:	.72	.75	.62	.78
	Total N	19	13	7	7
2003	Min:	.33	.10	.10	.39
	Mean:	.53	.46	.35	.61
	Median:	.50	.54	.38	.72
	Max:	.83	.69	.52	.72
	Total N	22	13	7	7
2004	Min:	.28	.11	.24	.33
	Mean:	.54	.38	.37	.64
	Median:	.53	.23	.38	.67
	Max:	.83	.77	.48	.78
	Total N	22	13	7	7
2005	Min:	.28	.15	.10	.39
	Mean:	.50	.44	.44	.58
	Median:	.50	.40	.43	.56
	Max:	.67	.75	.81	.78
	Total N	25	13	7	7

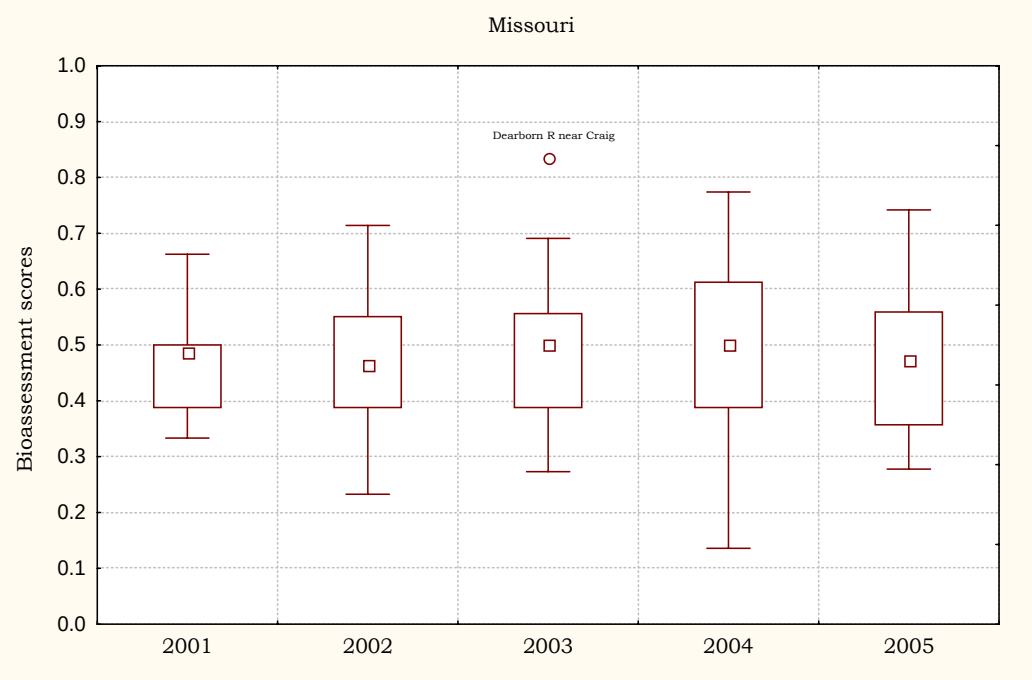

Figure 8. Variation in bioassessment scores among years for the Missouri River basin.

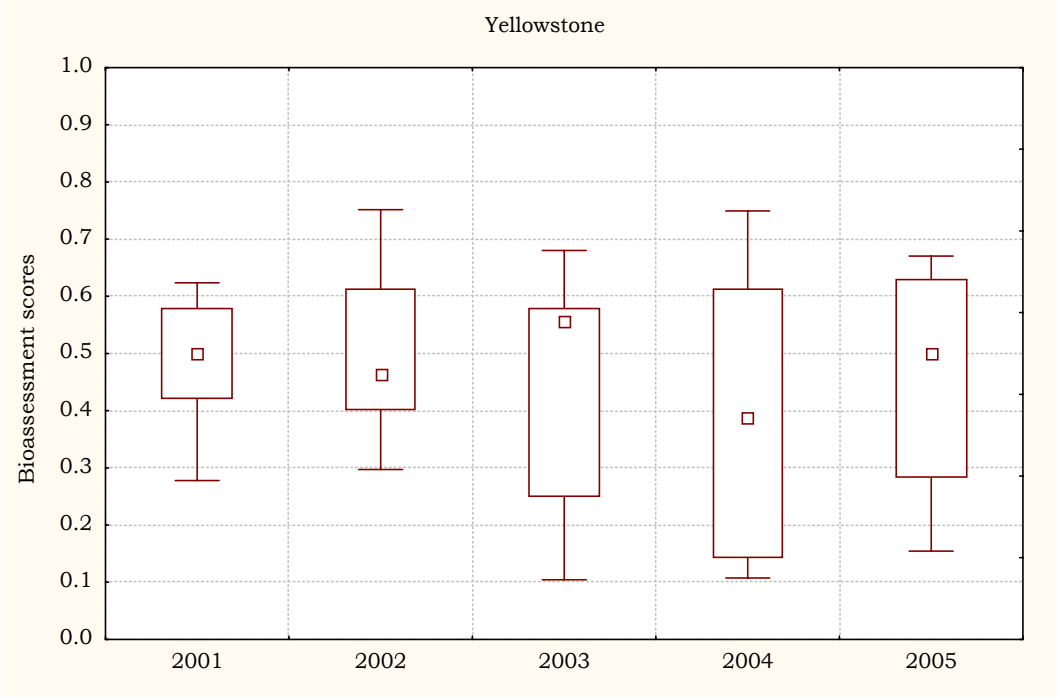

Figure 9. Variation in bioassessment scores among years for the Yellowstone River basin.

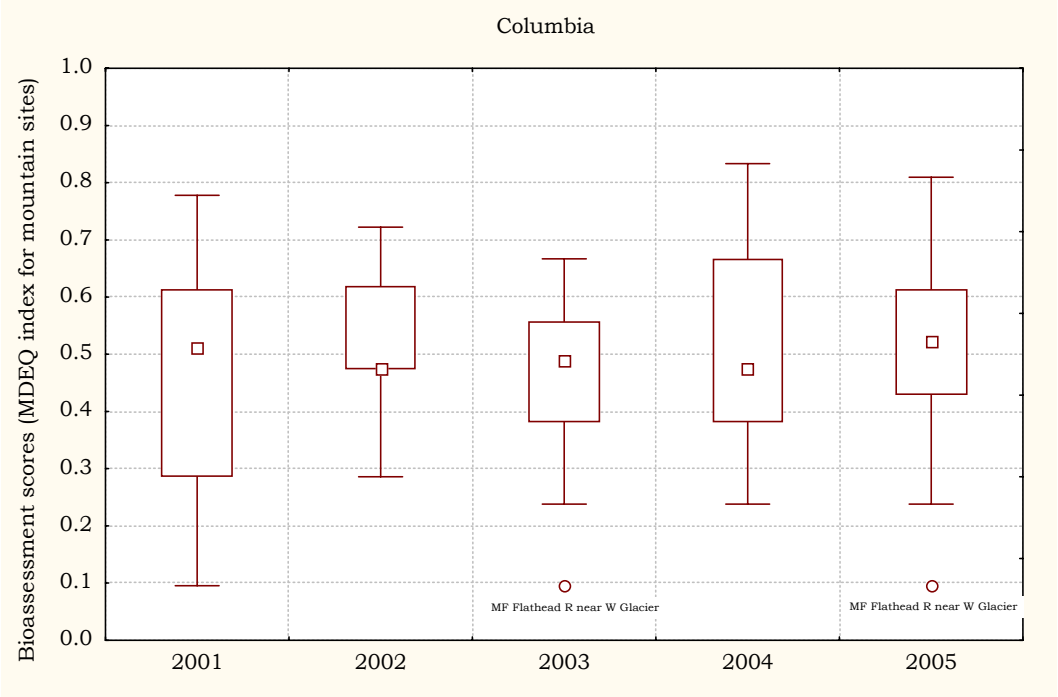

Figure 10A. Variation in bioassessment scores among years for the Columbia River basin. MDEQ index (Bukantis 1998) used for Mountain region sites.

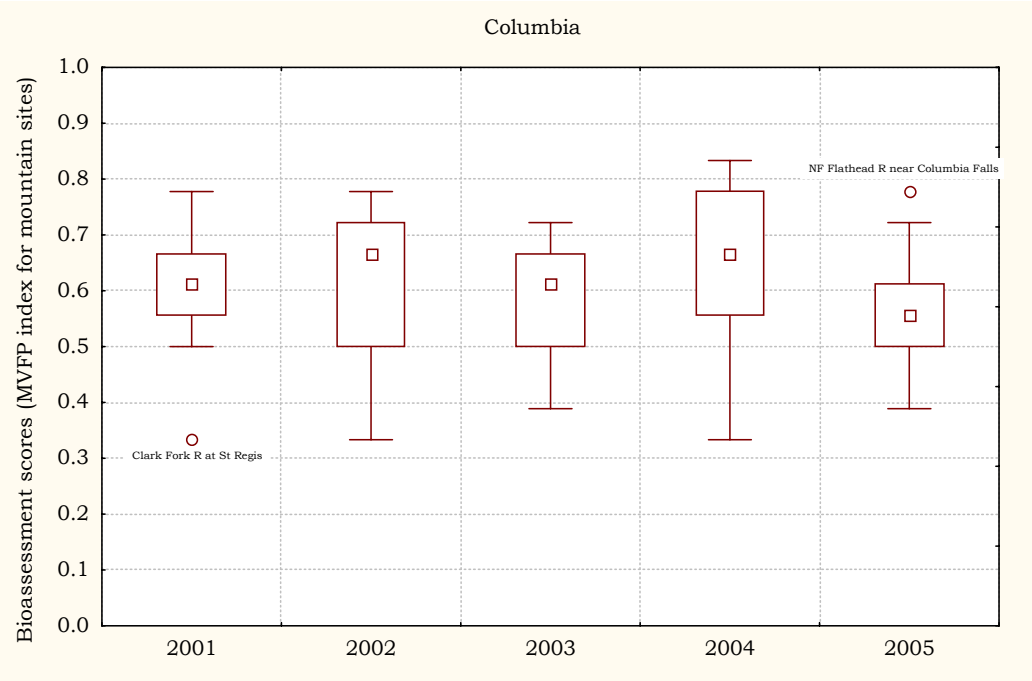

Figure 10B. Variation in bioassessment scores among years for the Columbia River basin. MVFP index (Bollman 1998) used for Mountain region sites.

Table 13. Summary statistics for total bioassessment scores in each year by watershed.

		Missouri	Yellowstone	Columbia (MDEQ index)	Columbia (MVFP index)
2001	Min:	.33	.28	.10	.33
	Mean:	.47	.49	.46	.60
	Median:	.49	.50	.51	.61
	Max:	.66	.62	.78	.78
	Total N	11	8	12	12
2002	Min:	.23	.30	.29	.33
	Mean:	.46	.49	.52	.61
	Median:	.46	.46	.48	.67
	Max:	.71	.75	.72	.78
	Total N	15	11	13	13
2003	Min:	.27	.10	.10	.39
	Mean:	.51	.45	.46	.59
	Median:	.50	.56	.49	.61
	Max:	.83	.68	.67	.72
	Total N	17	11	14	14
2004	Min:	.14	.11	.24	.33
	Mean:	.48	.39	.51	.65
	Median:	.50	.39	.48	.67
	Max:	.77	.75	.83	.83
	Total N	17	11	14	14
2005	Min:	.28	.15	.10	.39
	Mean:	.47	.45	.50	.56
	Median:	.47	.50	.52	.56
	Max:	.74	.67	.81	.78
	Total N	18	12	15	15

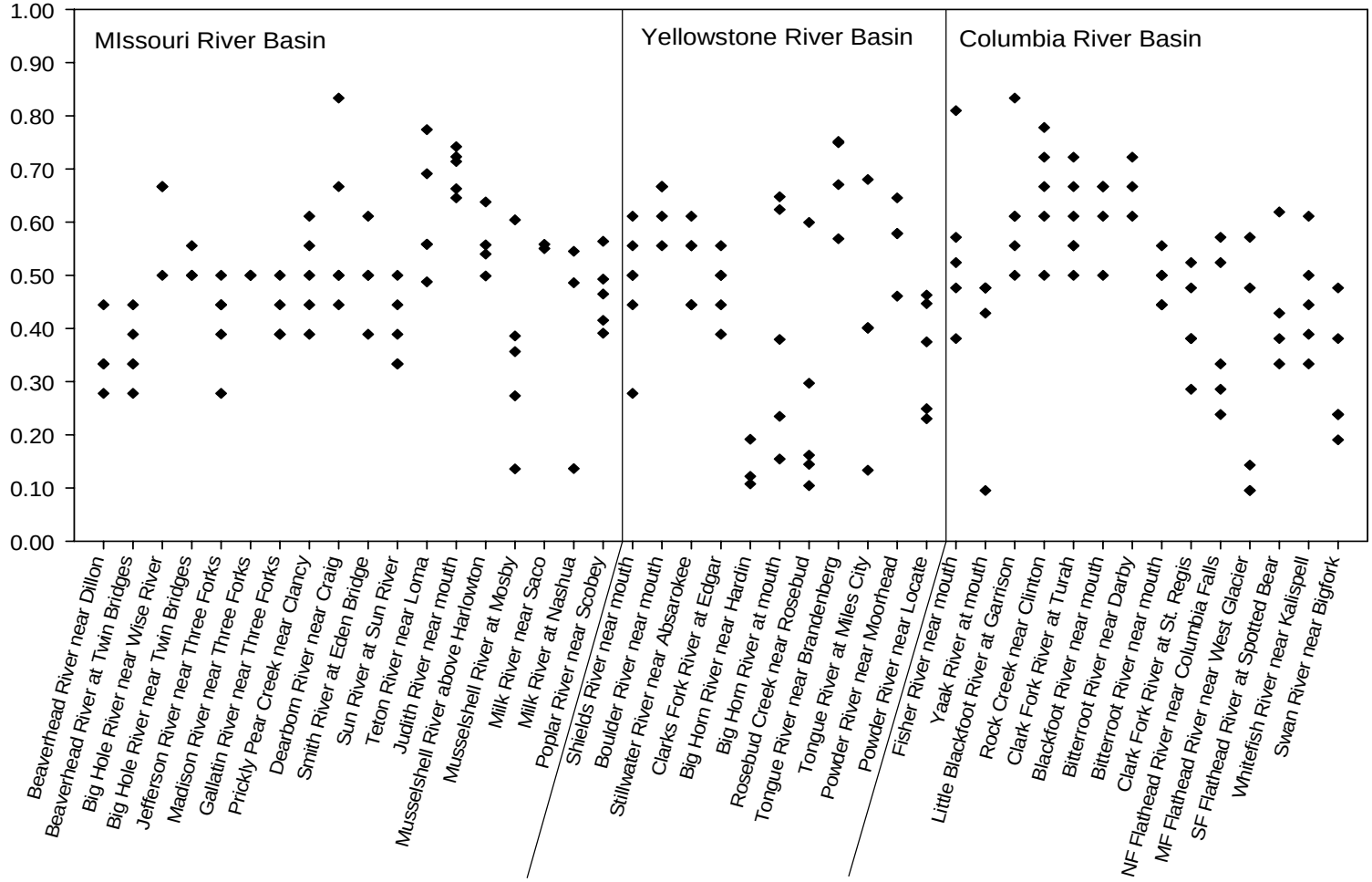

Figure 11. Variation in total bioassessment scores for sites. Sites sampled in only one year are not shown.

Table 14. Mean value of total bioassessment score over all study years, rank within each watershed/region combination, and comparison with reference condition for each site.

Rank	Site	Condition compared to reference[1]	Use support designation[2]	Index used[3]	Number of samples	Mean IBI score	Median IBI score	Min IBI score	Max IBI score	Mean habitat score
Missouri River Basin										
MVFP										
1	Big Hole River near Wise River	slight impairment	partial support	A	3	0.61	0.67	0.50	0.67	0.79
2	Dearborn River near Craig	slight impairment	partial support	A	5	0.59	0.50	0.44	0.83	0.76
3	Big Hole River near Twin Bridges	moderate impairment	partial support	A	3	0.52	0.50	0.50	0.56	0.64
4	Smith River at Eden Bridge	moderate impairment	partial support	A	4	0.50	0.50	0.39	0.61	0.74
5	Prickly Pear Creek near Clancy	moderate impairment	partial support	A	5	0.50	0.50	0.39	0.61	0.64
6	Madison River near Three Forks	moderate impairment	partial support	A	3	0.50	0.50	0.50	0.50	0.79
7	Gallatin River near Three Forks	moderate impairment	partial support	A	4	0.43	0.42	0.39	0.50	0.63
8	Jefferson River near Three Forks	moderate impairment	partial support	A	5	0.41	0.44	0.28	0.50	0.63
9	Gallatin River at Logan	moderate impairment	partial support	A	1	0.39	0.39	0.39	0.39	0.62
10	Sun River at Sun River	moderate impairment	partial support	A	6	0.39	0.36	0.33	0.50	0.65
11	Beaverhead River at Twin Bridges	moderate impairment	partial support	A	5	0.36	0.33	0.28	0.44	0.61
12	Beaverhead River near Dillon	moderate impairment	partial support	A	4	0.35	0.33	0.28	0.44	0.72
PLAINS										
1	Judith River near mouth	good	partial support	B	5	0.70	0.71	0.65	0.74	0.76
2	Teton River near Loma	good	partial support	B	5	0.61	0.56	0.49	0.77	0.58
3	Musselshell River above Harlowton	good	partial support	B	4	0.56	0.55	0.50	0.64	0.63
4	Milk River near Saco	good	partial support	B	2	0.55	0.55	0.55	0.56	0.71
5	Poplar River near Scobey	fair	partial support	B	5	0.47	0.46	0.39	0.56	0.68
6	Milk River at Nashua	poor	partial support	B	3	0.39	0.49	0.14	0.54	0.55
7	Musselshell River at Mosby	poor	partial support	B	5	0.35	0.36	0.14	0.60	0.49
8	Big Muddy Creek near Culbertson	very poor	non-support	B	1	0.23	0.23	0.23	0.23	0.64
Yellowstone River Basin										
MVFP										
1	Boulder River near mouth	slight impairment	partial support	A	5	0.63	0.67	0.56	0.67	0.76
2	Stillwater River near Absarokee	moderate impairment	partial support	A	5	0.52	0.56	0.44	0.61	0.81
3	Shields River near mouth	moderate impairment	partial support	A	6	0.48	0.50	0.28	0.61	0.71
4	Clarks Fork River at Edgar	moderate impairment	partial support	A	5	0.48	0.50	0.39	0.56	0.59
5	Tongue River near Stateline	moderate impairment	partial support	A	1	0.33	0.33	0.33	0.33	0.58
PLAINS										
1	Tongue River near Brandenberg	good	partial support	B	4	0.69	0.71	0.57	0.75	0.60
2	Powder River near Moorhead	good	partial support	B	4	0.57	0.58	0.46	0.65	0.53
3	Big Horn River at mouth	fair	partial support	B	5	0.41	0.38	0.15	0.65	0.64
4	Tongue River at Miles City	fair	partial support	B	5	0.40	0.40	0.13	0.68	0.46
5	Powder River near Locate	poor	partial support	B	5	0.35	0.37	0.23	0.46	0.46

Table 14 continued.....										
6	Rosebud Creek near Rosebud	poor	partial support	B	5	0.26	0.16	0.10	0.60	0.38
7	Big Horn River near Hardin	very poor	non-support	B	3	0.14	0.12	0.11	0.19	0.71
Columbia River Basin										
MVFP										
1	Bitterroot River near Darby	slight impairment	partial support	A	3	0.67	0.67	0.61	0.72	0.70
2	Rock Creek near Clinton	slight impairment	partial support	A	5	0.66	0.67	0.50	0.78	0.82
3	Blackfoot River near mouth	slight impairment	partial support	A	5	0.62	0.67	0.50	0.67	0.79
4	Little Blackfoot River at Garrison	slight impairment	partial support	A	5	0.62	0.61	0.50	0.83	0.77
5	Clark Fork River at Turah	slight impairment	partial support	A	6	0.60	0.58	0.50	0.72	0.75
6	Bitterroot River near mouth	moderate impairment	partial support	A	5	0.49	0.50	0.44	0.56	0.73
7	Whitefish River near Kalispell	moderate impairment	partial support	A	5	0.46	0.44	0.33	0.61	0.74
MOUNTAINS (MDEQ index)										
1	Fisher River near mouth	slight impairment	partial support	C	5	0.55	0.52	0.38	0.81	0.76
2	SF Flathead River at Spotted Bear	moderate impairment	partial support	C	4	0.44	0.40	0.33	0.62	0.88
3	Clark Fork River at St. Regis	moderate impairment	partial support	C	5	0.41	0.38	0.29	0.52	0.77
4	NF Flathead River near Columbia Falls	moderate impairment	partial support	C	5	0.39	0.33	0.24	0.57	0.90
5	Yaak River at mouth	moderate impairment	partial support	C	5	0.39	0.48	0.10	0.48	0.84
6	Swan River near Bigfork	moderate impairment	partial support	C	5	0.30	0.24	0.19	0.48	0.87
7	MF Flathead River near West Glacier	moderate impairment	partial support	C	5	0.28	0.14	0.10	0.57	0.85
MOUNTAINS (MVFP index)										
1	NF Flathead River near Columbia Falls	slight impairment	partial support	A	5	0.76	0.78	0.72	0.78	0.76
2	SF Flathead River at Spotted Bear	slight impairment	partial support	A	4	0.72	0.75	0.61	0.78	0.88
3	Fisher River near mouth	slight impairment	partial support	A	5	0.68	0.67	0.61	0.72	0.77
4	Swan River near Bigfork	slight impairment	partial support	A	5	0.62	0.67	0.39	0.78	0.90
5	MF Flathead River near West Glacier	slight impairment	partial support	A	5	0.59	0.61	0.50	0.67	0.84
6	Yaak River at mouth	slight impairment	partial support	A	5	0.58	0.56	0.50	0.72	0.87
7	Clark Fork River at St.Regis	moderate impairment	partial support	A	5	0.40	0.39	0.33	0.50	0.85

1 Threshold criteria for impairment classifications are given in Table 3B.
2 Threshold criteria for aquatic life use support designations are given in Table 3A.
3 Bioassessment indices used: A = Bollman 1998; B = Bramblett et al. 2003; C = Bukantis 1998.

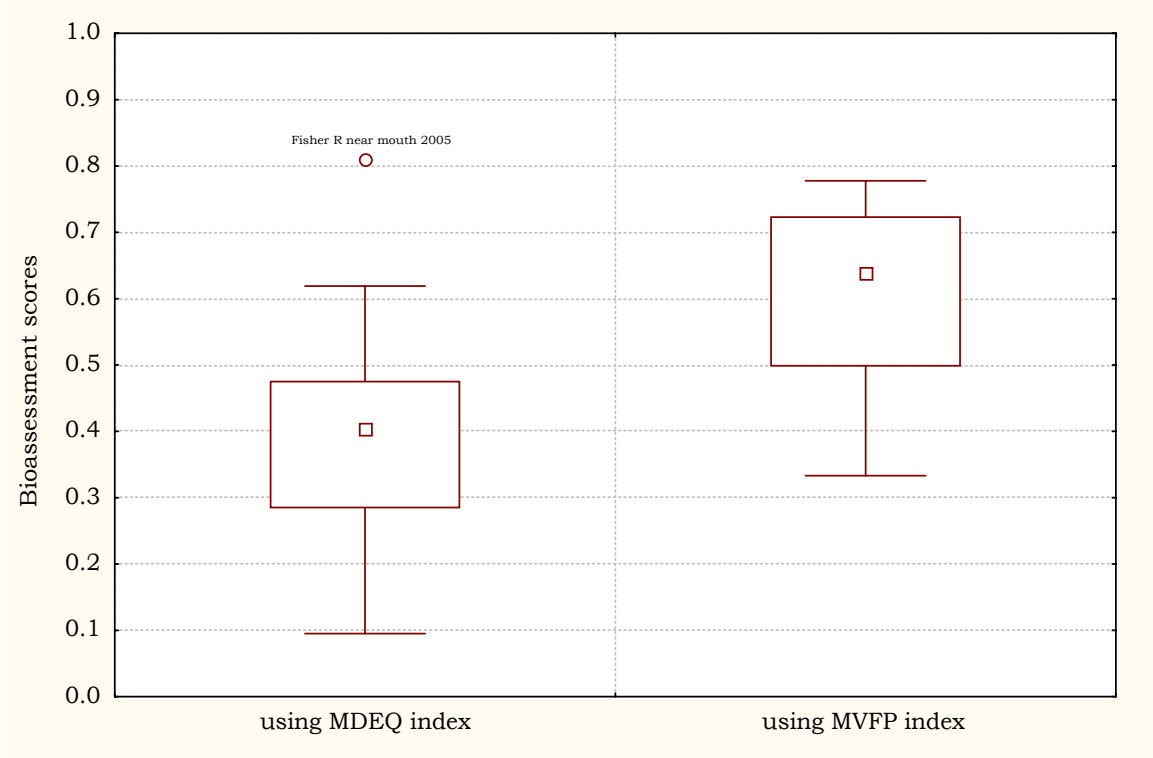

Figure 12. Bioassessment scores for Mountain region sites; a comparison of results from the MDEQ and MVFP indices.

Table 15. Probable stressors influencing invertebrate assemblages. Crosses indicate the number of positive responses (mean metric values) to indicative metrics by crosses in the columns associated with each stressor. If a metric gave a positive response in most years, but the average value over 5 years falls within the threshold value, representing no response, a cross inside parentheses appears Indicative metrics are listed in the key following the table. See text for citations.

Missouri River basin	Ecoregion	Sediment[1]	Nutrient enrichment[2]	Dewatering or thermal stress[3]	Metals[4]	Other[5]
Beaverhead River at Twin Bridges	MVFP	(+)	+++			+
Beaverhead River near Dillon	MVFP	+	++(+)			+
Big Hole River near Twin Bridges	MVFP		+			+
Big Hole River near Wise River	MVFP		(+)			+
Dearborn River near Craig	MVFP	++	+			
Gallatin River at Logan*	MVFP		+++			++
Gallatin River near Three Forks	MVFP		++(+)			++
Jefferson River near Three Forks	MVFP		++(+)			++
Madison River near Three Forks	MVFP		+			+
Prickly Pear Creek near Clancy	MVFP		+(+)		++	++
Smith River at Eden Bridge	MVFP		+			
Sun River at Sun River	MVFP	+(+)	+			+
Big Muddy Creek near Culbertson*	Plains	+	++			+
Milk River at Nashua	Plains	+	++(+)	+		+
Milk River near Saco	Plains		+(+)	+		+
Poplar River near Scobey	Plains	+	++			
Teton River near Loma	Plains	+	(+)	(+)		+
Judith River near mouth	Plains					
Musselshell River above Harlowton	Plains		+			+
Musselshell River at Mosby	Plains	+	++	+		+
Yellowstone River basin						
Big Horn River at mouth	MVFP	++	+++	(+)		++
Big Horn River near Hardin	MVFP	++	+++	+		++
Boulder River near mouth	MVFP		(+)			+
Clarks Fork River at Edgar	MVFP	++	++	(+)		++
Shields River near mouth	MVFP		+			(+)
Stillwater River near Absarokee	MVFP					+
Tongue River near Stateline*	MVFP	++				++
Powder River near Locate	Plains	+	++	+		+
Powder River near Moorhead	Plains	+	+(+)	(+)		+
Rosebud Creek near Rosebud	Plains	+	+++	(+)		+

Table 15 continued…..						
Tongue River at Miles City	Plains	+	++	(+)		+
Tongue River near Brandenberg	Plains	(+)				+
Columbia River basin	Ecoregion	Sediment[1]	Nutrient enrichment[2]	Dewatering or thermal stress[3]	Metals[4]	Other[5]
Bitterroot River near Darby	MVFP		+			
Bitterroot River near mouth	MVFP		++			+(+)
Blackfoot River near mouth	MVFP		+(+)			
Clark Fork River at Turah	MVFP		+			(+)
Little Blackfoot River at Garrison	MVFP		+			(+)
Rock Creek near Clinton	MVFP		+(+)			(+)
Whitefish River near Kalispell	MVFP		+++			
Fisher River near mouth	Mountain		+(++)			
MF Flathead River near West Glacier	Mountain	++	+			+
NF Flathead River near Columbia Falls	Mountain		+			+(+)
SF Flathead River at Spotted Bear	Mountain	++				+
Swan River near Bigfork	Mountain	(+)	++			
Yaak River at mouth	Mountain		++(+)			+
Clark Fork River at St. Regis	Mountain		+			+(+)

* denotes sites that were sampled only once.

[1] Probable stress due to sediment deposition was estimated by response to 2 metric indicators: "Clinger" taxa richness and Trichoptera taxa richness.
[2] Probable stress due to nutrient enrichment was estimated by response to 3 metric indicators: Ephemeroptera taxa richness, the biotic index, and the percent of hemoglobin-bearing taxa.
[3] Probable stress due to dewatering or thermal extremes was estimated by response to 1 metric indicator: semivoltine taxa richness.
[4] Probable stress due to metals contamination was estimated by response to 2 metric indicators: presence of heptageniid mayflies and the Montana metals tolerance index.
[5] Probable stress due to non-specific disturbances was estimated by response to 2 metric indicators: Plecoptera taxa richness and number of unique taxa.

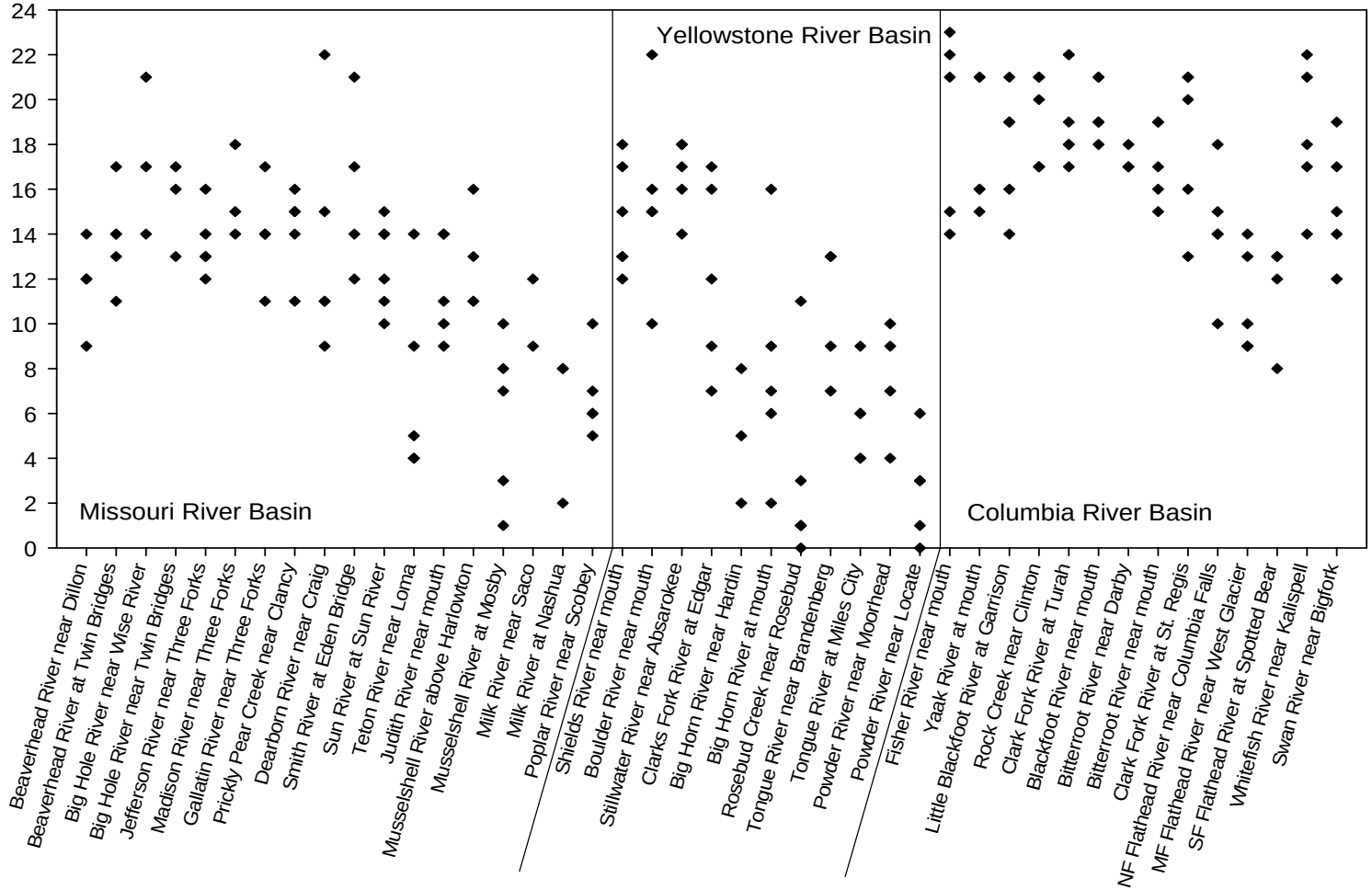

Figure 13. Ranges of scores for the "clinger" taxa richness metric.

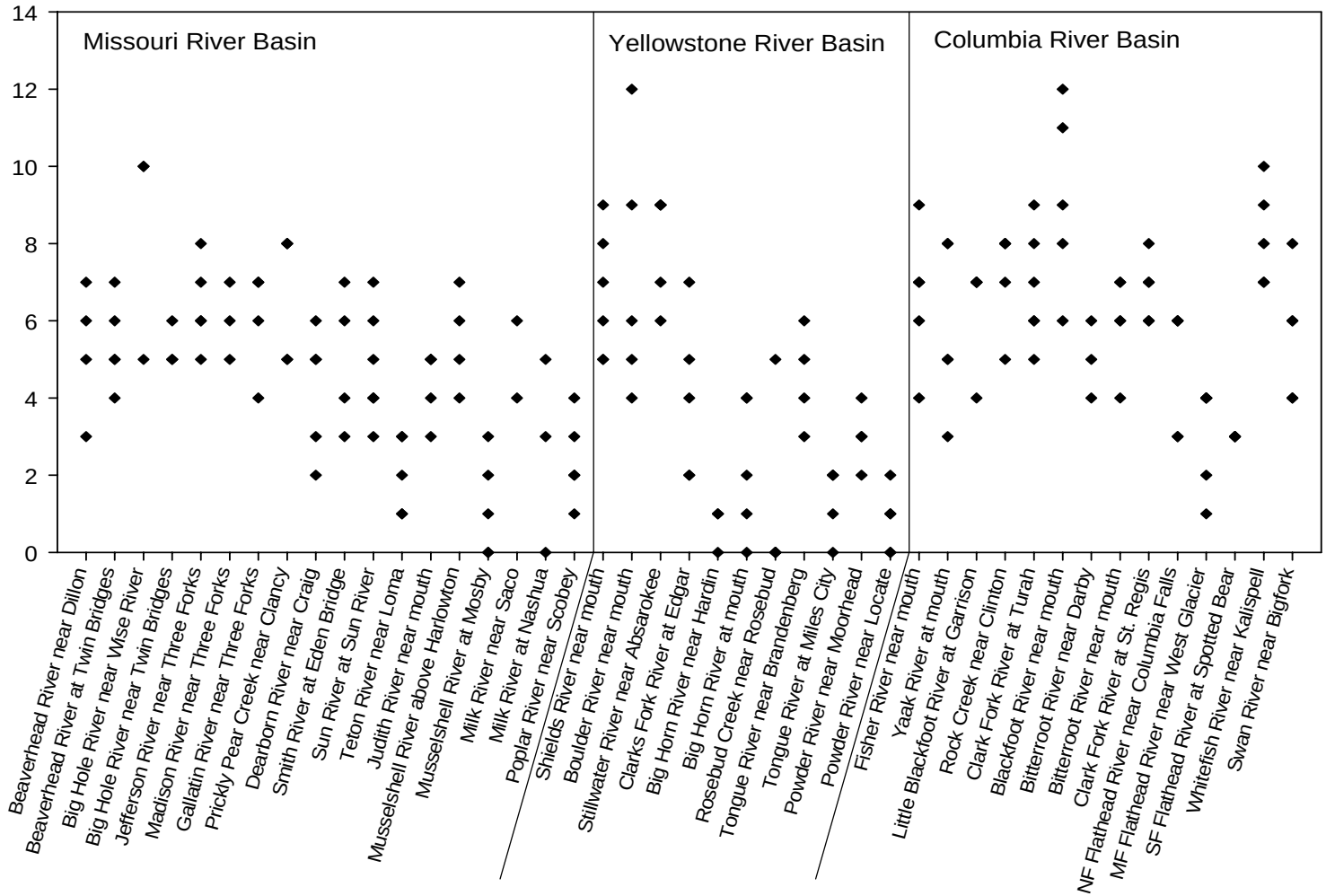

Figure 14. Ranges of scores for the Trichoptera taxa richness metric.

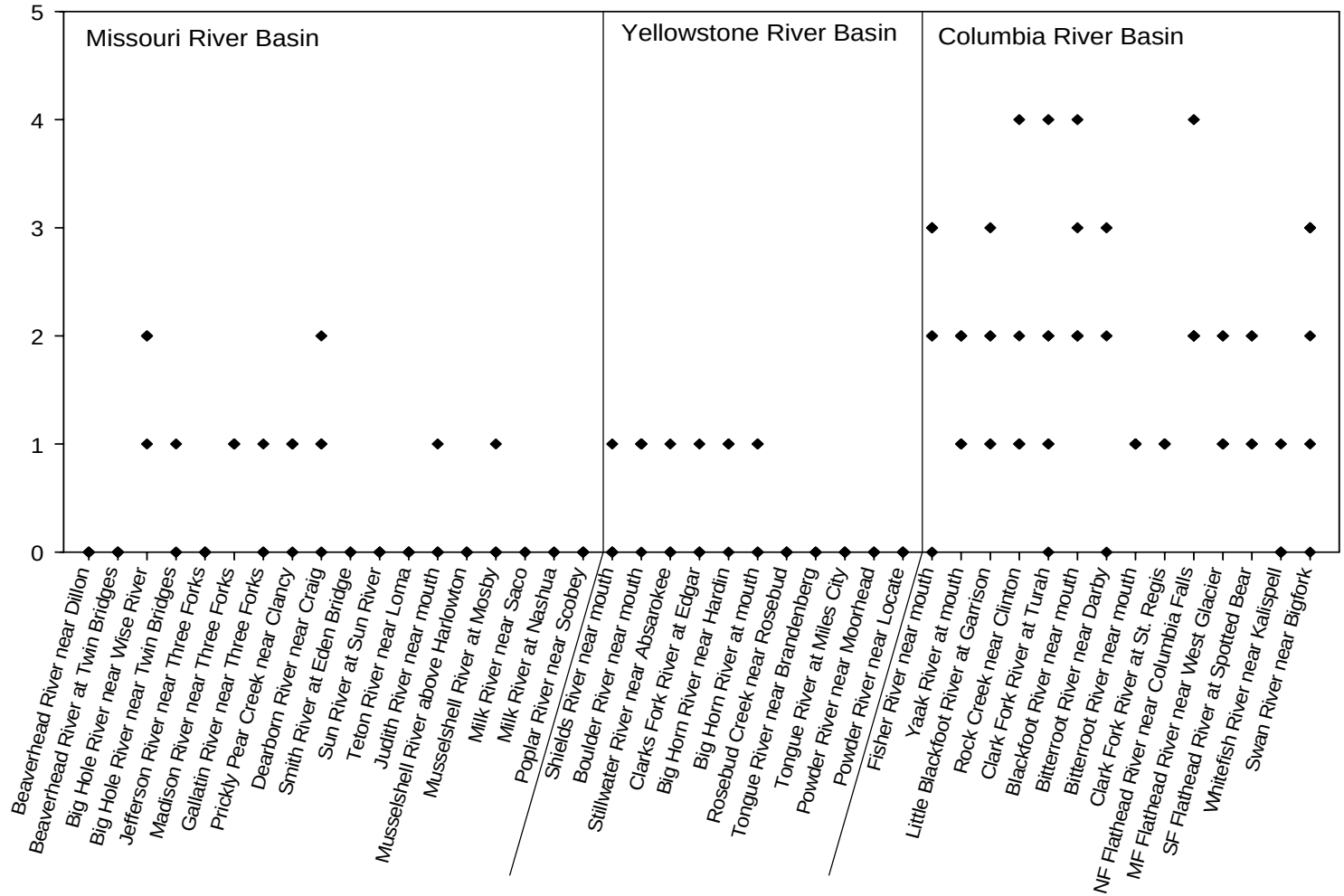

Figure 15. Ranges of scores for the sensitive taxa richness metric.

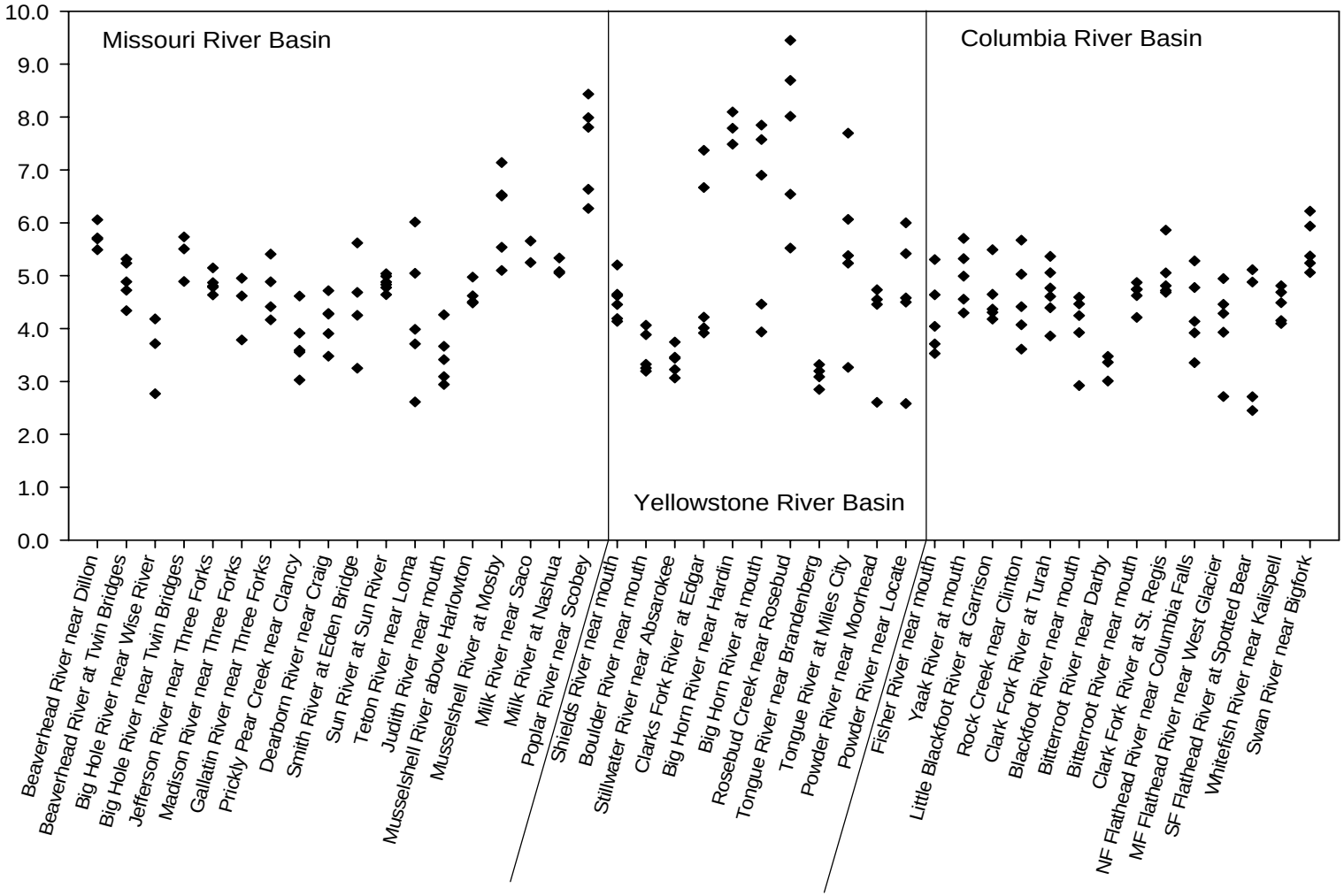

Figure 16. Ranges of scores for the Biotic Index.

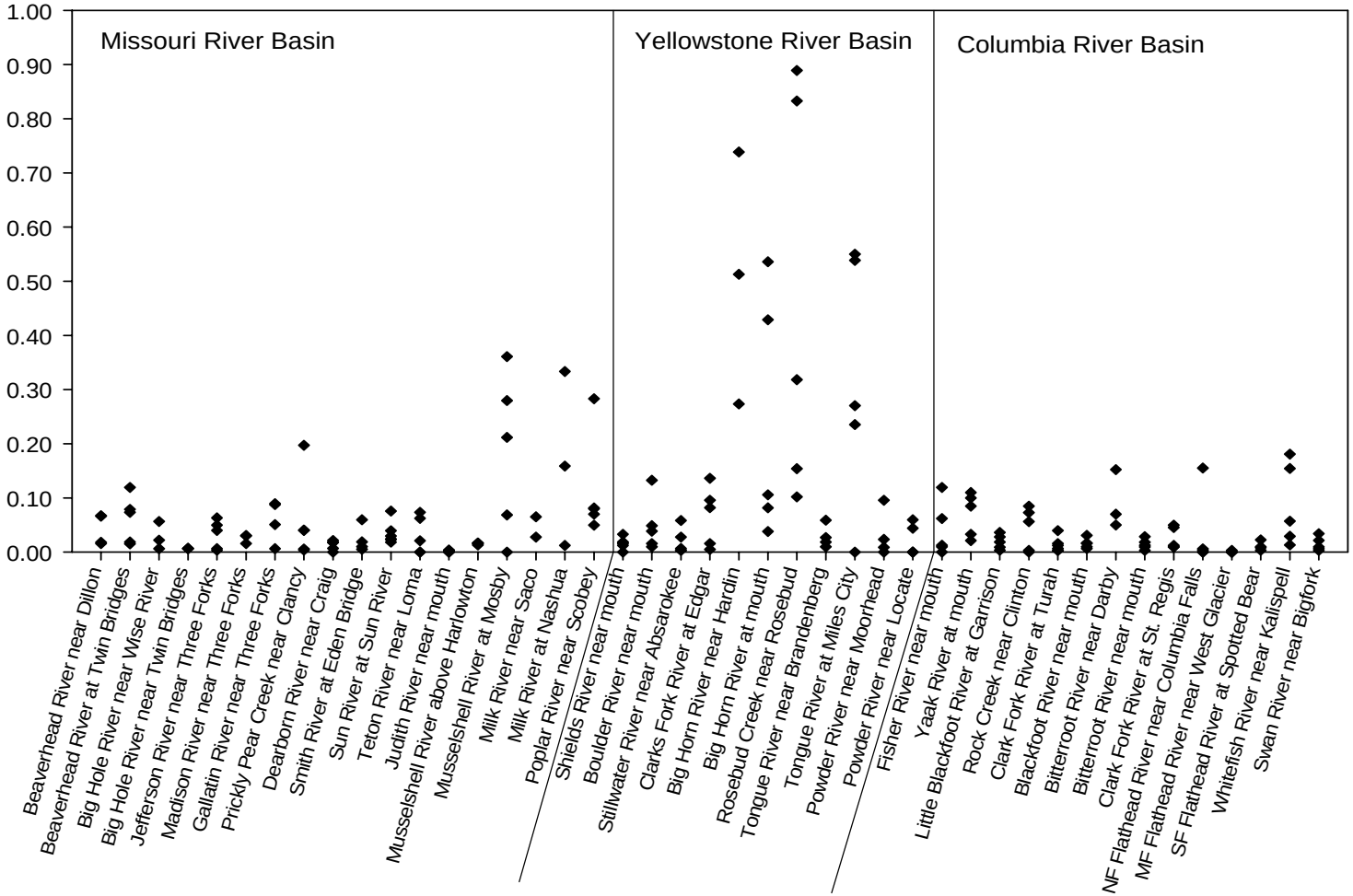

Figure 17. Ranges of scores for the hemoglobin-bearer percent metric.

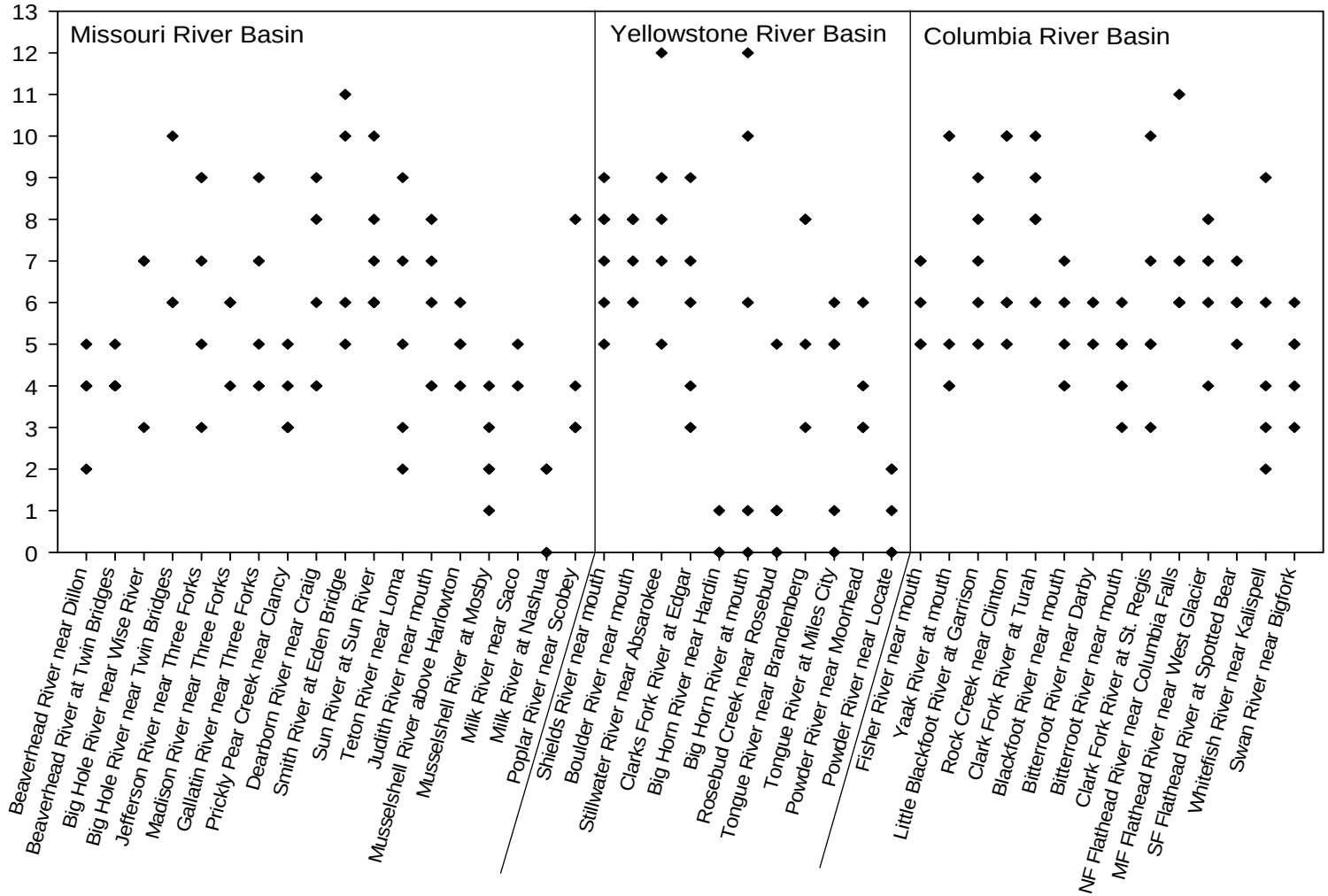

Figure 18. Ranges of scores for the Ephemeroptera taxa richness metric

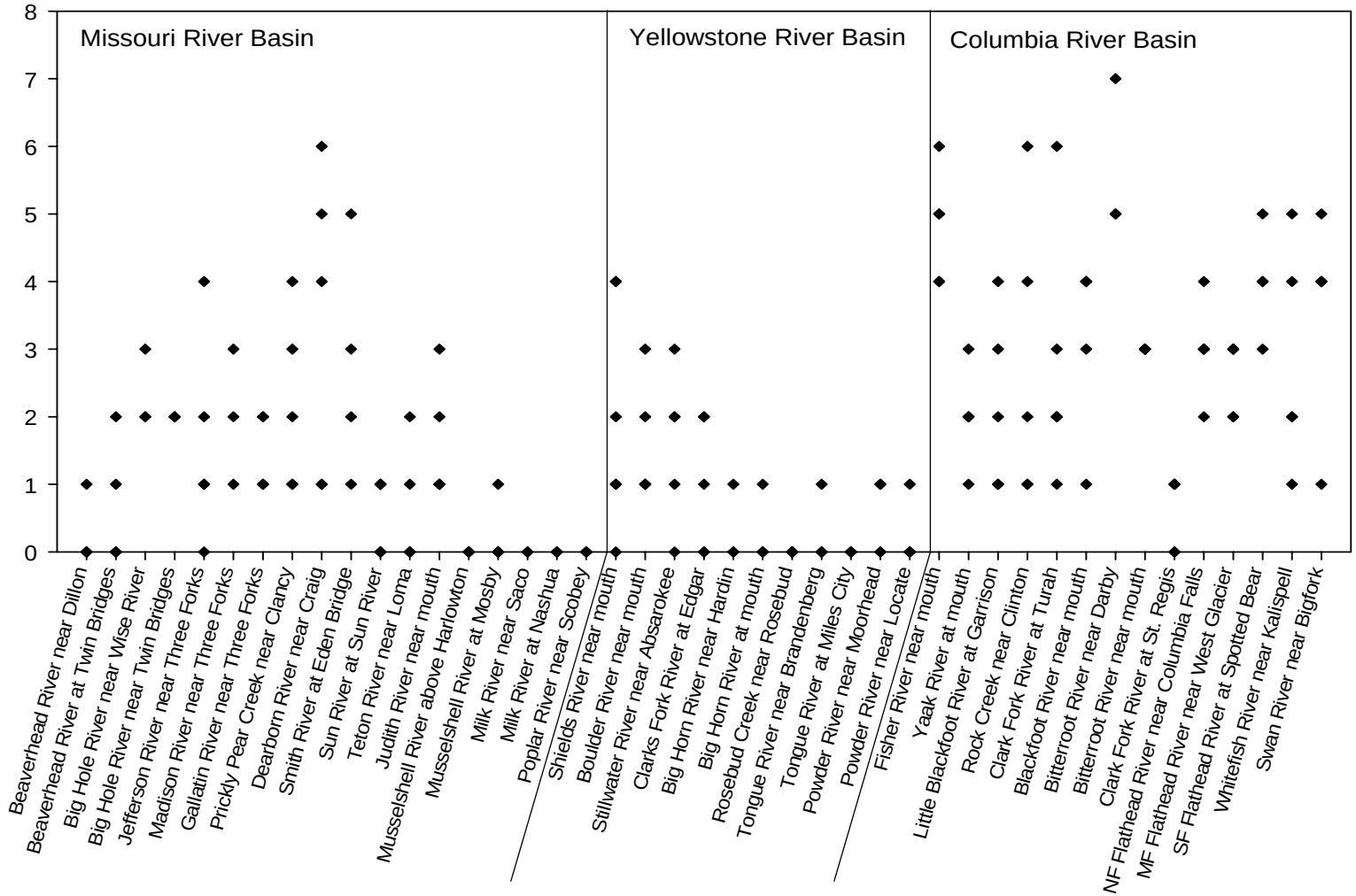

Figure 19. Ranges of scores for the Plecoptera taxa richness metric.

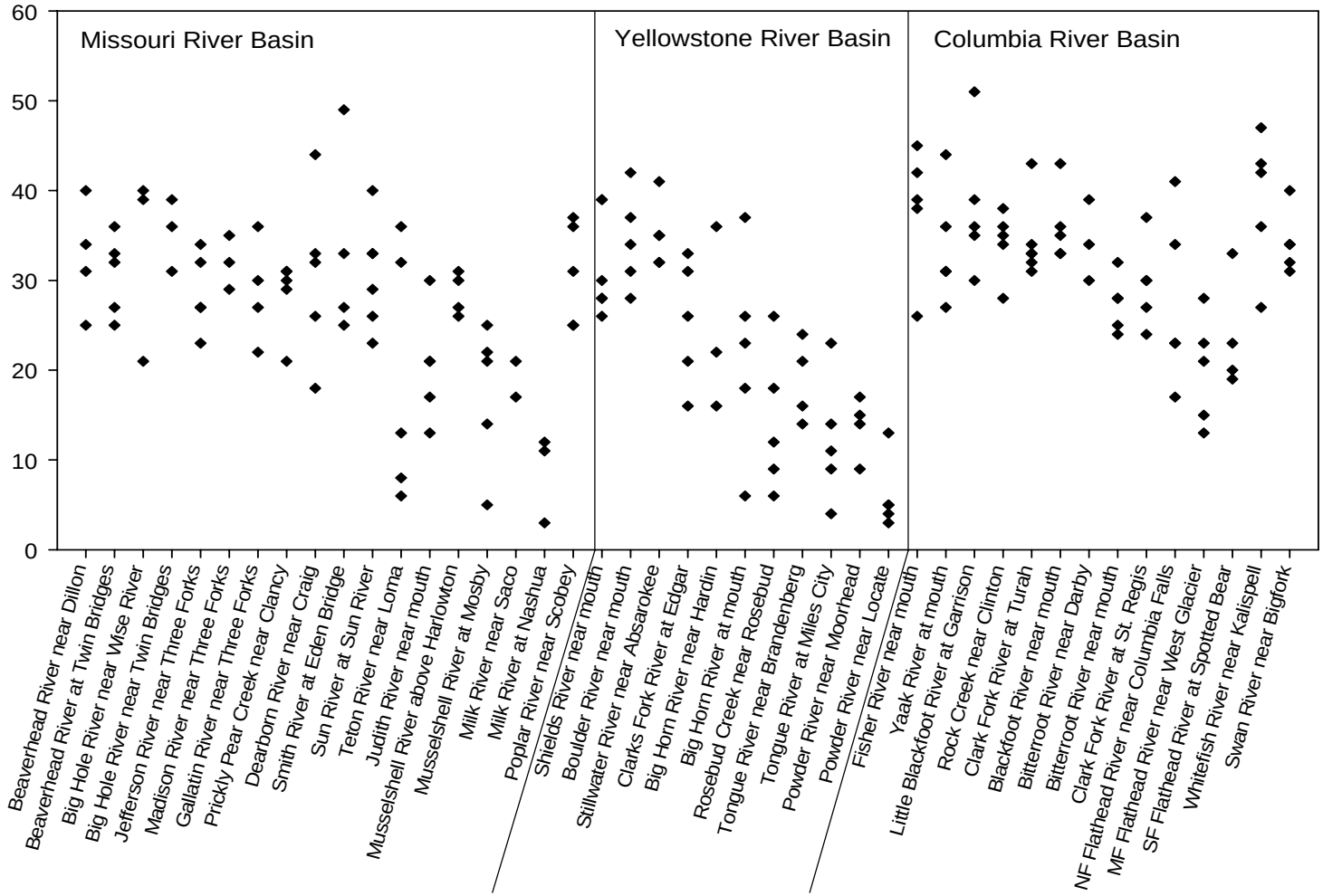

Figure 20. Ranges of scores for the unique taxa richness metric

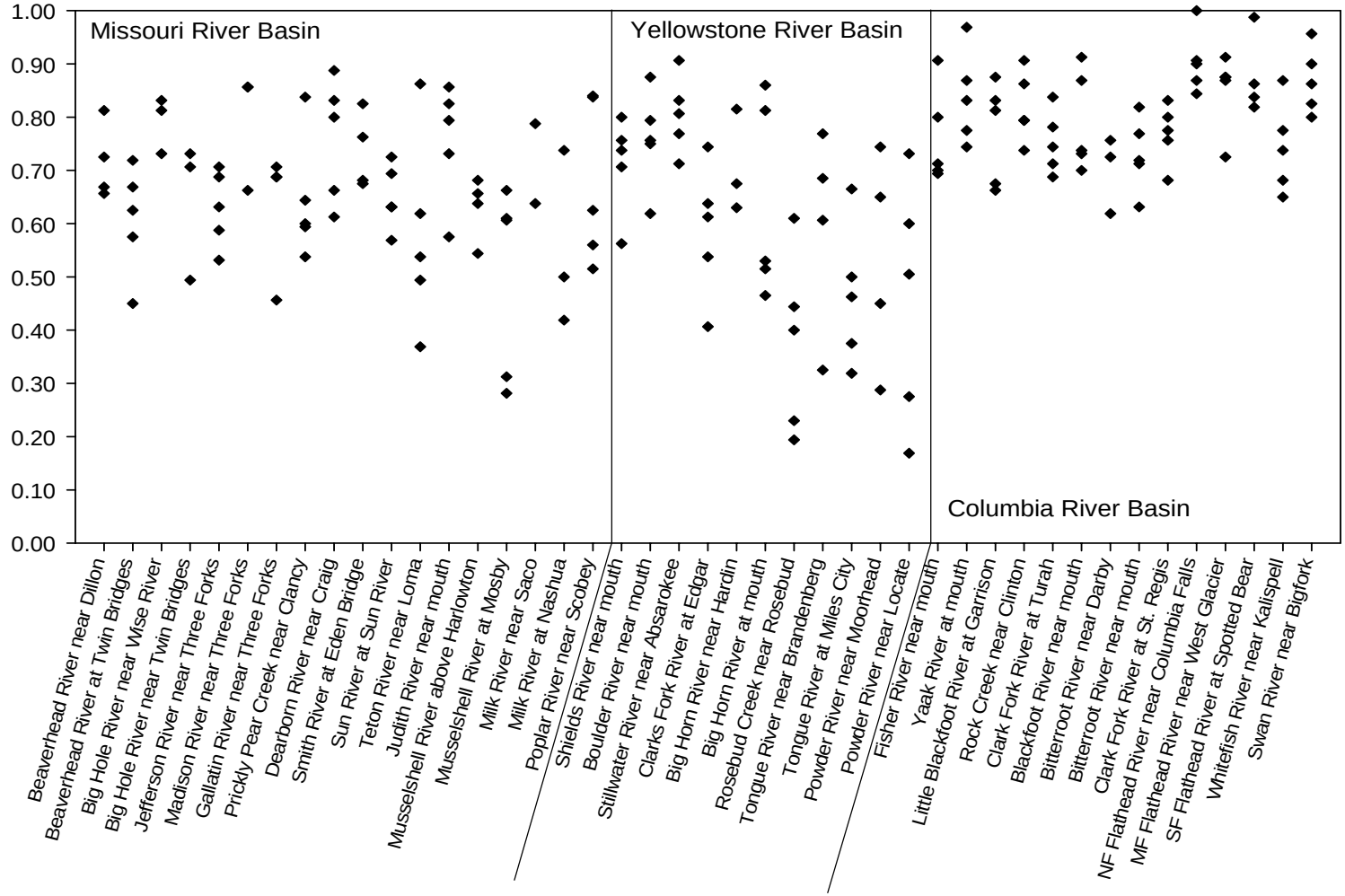

Figure 21. Ranges of total habitat assessment scores for each site.

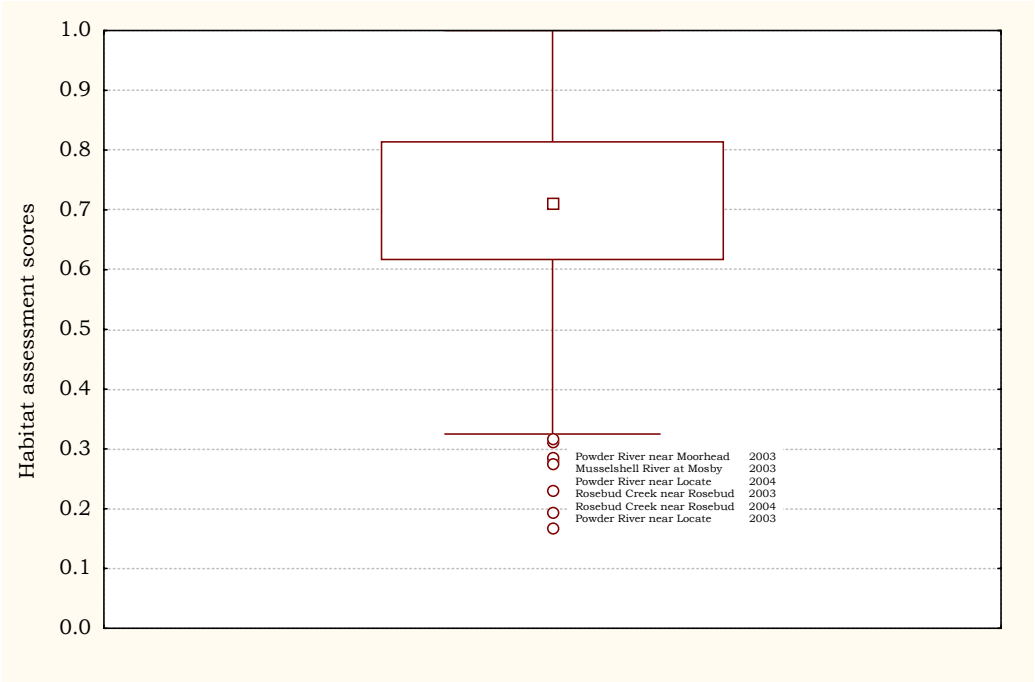

Figure 22. Distribution of habitat assessment scores for all sites for which habitat assessments were available in all years (n = 196).

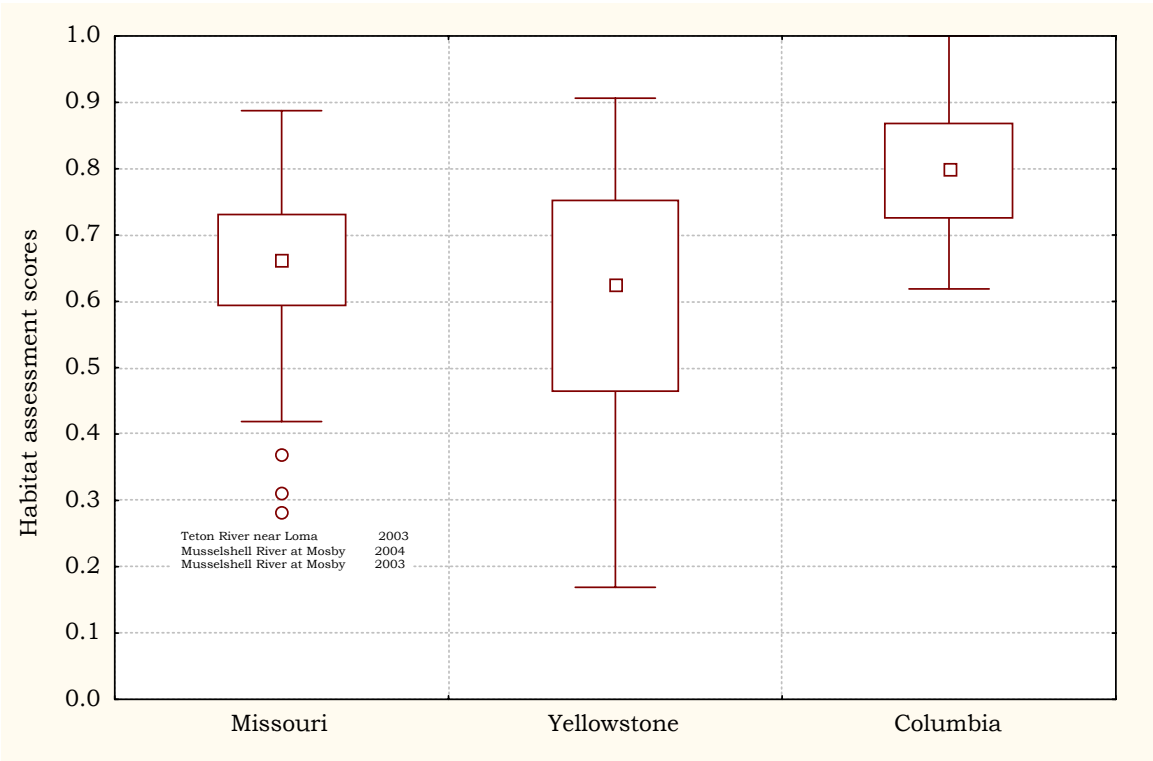

Figure 23. Distribution of habitat scores within major basins.

Table 16. Summary statistics for habitat scores within watersheds.

Missouri	Min:	.28
	Mean:	.66
	Median:	.66
	Max:	.89
	Total N	67
Yellowstone	Min:	.17
	Mean:	.60
	Median:	.62
	Max:	.91
	Total N	52
Columbia	Min:	.62
	Mean:	.80
	Median:	.80
	Max:	1.00
	Total N	77

Table 17. Results of T-method *a posteriori* comparisons (Sokal and Rohlf 1995) for means of bioassessment scores for major watersheds. The MVFP index (Bollman) was used to evaluate Mountain region sites. Homogeneous groups are indicated by x's.

	1	**2**	**3**
Yellowstone	xxxx		
Missouri		xxxx	
Columbia			xxxx

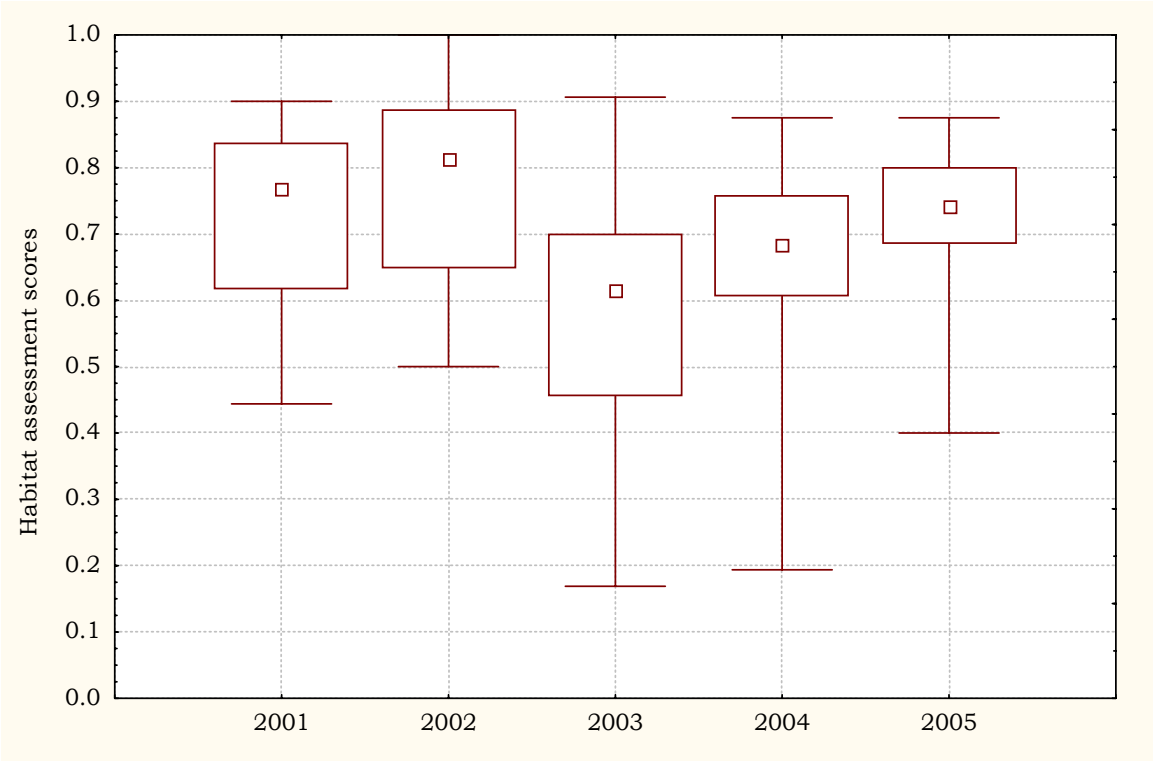

Figure 24. Habitat scores among years for all sites.

Table 18. Summary statistics for habitat scores among years.

2001	Min:	.44
	Mean:	.73
	Median:	.77
	Max:	.90
	Total N	31
2002	Min:	.50
	Mean:	.78
	Median:	.81
	Max:	1.0
	Total N	39
2003	Min:	.17
	Mean:	.58
	Median:	.62
	Max:	.91
	Total N	42
2004	Min:	.19
	Mean:	.66
	Median:	.68
	Max:	.88
	Total N	42
2005	Min:	.40
	Mean:	.73
	Median:	.74
	Max:	.88
	Total N	42

Table 19. Results of T-method *a posteriori* comparisons (Sokal and Rohlf 1995) for means of habitat assessment scores each year. Homogeneous groups are indicated by x's.

	1	**2**	**3**
2001		xxxx	xxxx
2002			xxxx
2003	xxxx		
2004	xxxx	xxxx	
2005		xxxx	xxxx

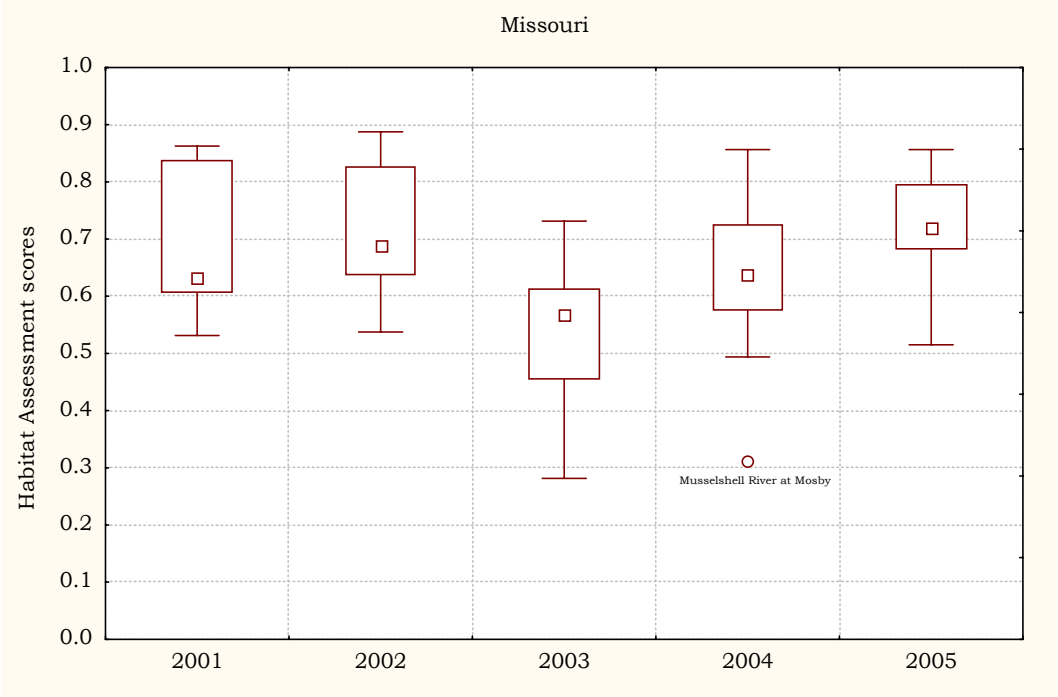

Figure 25. Distributions of habitat assessment scores in the Missouri River drainage in each year.

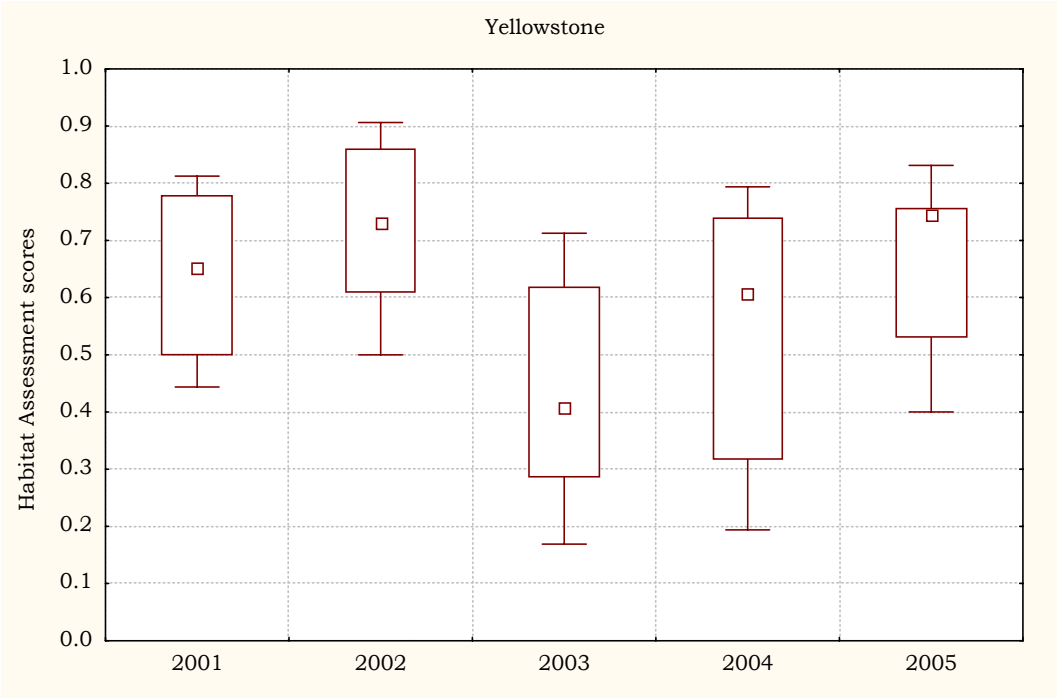

Figure 26. Distributions of habitat assessment scores in the Yellowstone River drainage in each year.

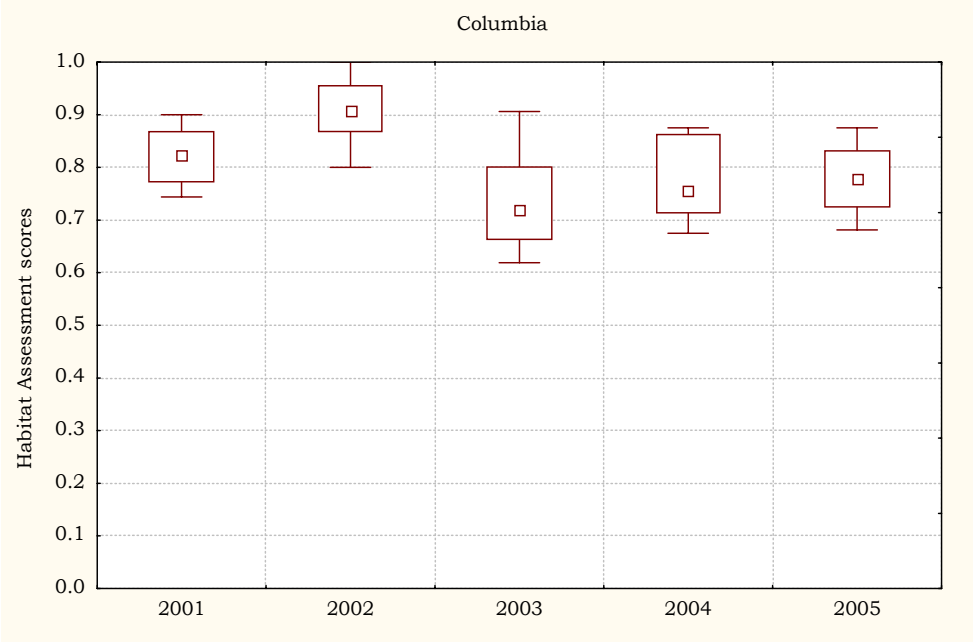

Figure 27. Distributions of habitat assessment scores in the Columbia River drainage in each year.

Table 20. Summary statistics for habitat assessment scores for each watershed in each year.

		Missouri	Yellowstone	Columbia
2001	Min:	.53	.44	.74
	Mean:	.70	.64	.82
	Median:	.63	.65	.82
	Max:	.86	.81	.90
	Total N	11	8	12
2002	Min:	.54	.50	.80
	Mean:	.71	.72	.90
	Median:	.69	.73	.91
	Max:	.89	.91	1.00
	Total N	15	11	13
2003	Min:	.28	.17	.62
	Mean:	.54	.43	.73
	Median:	.57	.41	.72
	Max:	.73	.71	.91
	Total N	17	11	14
2004	Min:	.31	.19	.68
	Mean:	.64	.54	.77
	Median:	.64	.61	.76
	Max:	.86	.79	.88
	Total N	17	11	14
2005	Min:	.52	.40	.68
	Mean:	.73	.68	.78
	Median:	.72	.74	.78
	Max:	.86	.83	.88
	Total N	17	11	14

REFERENCES

Bollman, W. 1998. Improving Stream Bioassessment Methods for the Montana Valley and Foothill Prairies Ecoregion. M.S.Thesis. University of Montana, Missoula, Montana. 78 pp.

Bollman, W. 2001. Standard Operating Procedures for Aquatic Invertebrate Sample Processing and Taxonomy. Rhithron Associates, Inc. Missoula, Montana.

Bollman, W. 2005. Project manager's report: reservation-wide monitoring program. Report prepared for the Confederated Salish and Kootenai Tribes. Rhithron Associates, Inc. Missoula, Montana.

Bramblett, B., Johnson, T.R., Zale, A. V., and Heggem, D. 2003. Development of biotic integrity indices for prairie streams in Montana using fish, macroinvertebrate, and diatom assemblages. Montana State University, Department of Ecology, Bozeman.

Bukantis, R. 1998. Rapid bioassessment macroinvertebrate protocols: Sampling and sample analysis SOP's. Working draft. Montana Department of Environmental Quality. Planning Prevention and Assistance Division. Helena, Montana.

Clark, W.H. 1997. Macroinvertebrate temperature indicators for Idaho. Draft manuscript with citations. Idaho Department of Environmental Quality. Boise, Idaho.

Clements, W.H. 1994. Benthic invertebrate community responses to heavy metals in the Upper Arkansas River Basin, Colorado. *Journal of the North American Benthological Society* 13:1(30-44).

Fore, L.S., Karr, J.R. and Conquest, L.L. 1994 Statistical properties of an index of biological integrity used to evaluate water resources. Canadian Journal of Fisheries and Aquatic Sciences 51: 1077-1087.

Fore, L. 1996. Description of biological metrics for the Pacific Northwest. Unpublished manuscript. Statistical Design, Inc. Seattle, WA.

Hilsenhoff, W.L. 1987. An improved biotic index of organic stream pollution. *Great Lakes Entomologist.* 20: 31-39.

Kiffney, P.M. and W.H. Clements. 1994. Effects of heavy metals on a macroinvertebrate assemblage from a Rocky Mountain stream in experimental microcosms. *Journal of the North American Benthological Society* 13:4(511-523).

Kleindl, W.J. 1995. A benthic index of biotic integrity for Puget Sound Lowland Streams, Washington, USA. M.S. Thesis. University of Washington, Seattle, Washington.

McGuire, D. 1993. Clark Fork River macroinvertebrate biointegrity 1986 through 1992. Report to the Montana Department of Health and Environmental Sciences. Helena, Montana.

MDEQ. 2005. Sample Collection, Sorting, and Taxonomic Identification of Benthic Macroinvertebrates. Water Quality Planning Bureau. Standard Operating Procedure. WQPBWQM-009. Montana Department of Environmental Quality. Helena, Montana.

NRIS. 3/18/05. *Montana Drought Information.* http://nris.mt.gov/drought/(2/8/06).

Patterson, A.J. 1996. The effect of recreation on biotic integrity of small streams in Grand Teton National Park. M.S. Thesis. University of Washington, Seattle, Washington.

Plafkin, J.L., Barbour, M.T., Porter, K.T., Gross, S.K. and R.M. Hughes. 1989. Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish. EPA/440/4-89/001. U.S. Environmental Protection Agency. Washington, D.C.

Relyea, C., Minshall, G.W., and R.J.Danehy. 2000. Stream insects as bioindicators of fine sediment. Draft manuscript. Idaho State University. Pocatello, Idaho.

Sokal, R.R. and Rohlf, J. 1995. *Biometry: the Principles and Practice of Statistics in Biological Research.* 3rd edition. W.H. Freeman and Company, New York.

Suplee, M., Sada de Suplee, R., Feldman, D. and Laidlaw, T. November 2005. Identification and Assessment of Montana Reference Streams: A Follow-up and Expansion of the 1992 Benchmark Biology Study. Report to the Montana Department of Environmental Quality. Helena, Montana.

Vannote, R.L., Minshall, G.W., Cummins, K.W., Sedell, J.R., and C.E. Cushing. 1980. The river continuum concept. *Canadian Journal of Fisheries and Aquatic Sciences* 37:130-137.

Wisseman, R.W. 2002. Characterization of benthic invertebrate communities in the Clackamas River Watershed, Oregon. Report to Portland General Electric, Clackamas Hydroelectric Relicensing Project, Water Quality 3 Studies. Aquatic Biology Associates, Inc. Corvallis, Oregon.

Woods, A.J., Omernik, J.M., Nesser, J.A., Shelden, J. and S.J. Azevedo. 1999. Ecoregions of Montana. (Color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,500,000).

Woods, A.J., Omernik, J.M., Nesser, J.A., Shelden, J., Comstock, J.A. and S.J. Azevedo. 2002. Ecoregions of Montana, 2nd edition. (Color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,500,000).

APPENDIX

1. Metric values, and bioassessments from statewide monitoring network sites .....A - R

Missouri River Basin	Beaverhead River near Dillon	Beaverhead River near Dillon	Beaverhead River near Dillon	Beaverhead River near Dillon	Beaverhead River at Twin Bridges	Beaverhead River at Twin Bridges	Beaverhead River at Twin Bridges	Beaverhead River at Twin Bridges	Beaverhead River at Twin Bridges
Ecoregion	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**
	2002	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**
TOTAL	332	319	328	334	330	327	326	333	327
METRICS									
Air Breather Percent	0.00%	0.00%	0.61%	0.30%	0.30%	0.00%	0.31%	0.00%	0.00%
Air Breather Richness	0	0	1	1	1	0	1	0	0
Baetidae/Ephemeroptera	0.26	0.62	0.26	0.18	0.53	0.26	0.22	0.28	0.44
Burrower Percent	0.00%	0.31%	0.00%	0.30%	1.21%	0.31%	0.00%	0.60%	0.31%
Burrower Richness	0	1	0	1	2	1	0	1	1
Clinger Percent	41.27%	63.32%	25.61%	52.99%	42.73%	39.76%	26.99%	41.74%	27.52%
Clinger Richness	9	14	12	12	14	11	13	17	14
Cold Stenotherm Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cold Stenotherm Richness	0	0	0	0	0	0	0	0	0
Collector Percent	56.93%	74.92%	85.37%	66.17%	67.88%	75.23%	84.97%	79.58%	82.57%
CTQa	94.78	94.73	95.29	88.88	95.46	98.20	90.88	85.74	99.65
Dominant Taxa (10) Percent	88.55%	86.21%	69.51%	83.23%	84.85%	89.91%	89.26%	84.68%	83.49%
Dominant Taxa (2) Percent	42.77%	47.34%	34.15%	31.74%	39.70%	44.65%	64.11%	42.94%	48.32%
Dominant Taxa (3) Percent	56.63%	56.11%	41.46%	42.81%	52.73%	54.74%	70.86%	52.55%	58.41%
Dominant Taxon Percent	21.39%	34.80%	19.51%	18.86%	21.21%	32.72%	49.39%	30.33%	26.91%
E Richness	4	4	5	2	4	4	4	4	5
EPT Percent	48.49%	33.54%	36.59%	56.29%	60.91%	66.67%	82.82%	63.66%	55.35%
EPT Richness	9	11	9	8	9	9	11	13	9
Evenness	0.07	0.06	0.05	0.06	0.06	0.07	0.08	0.07	0.07
Filterer Percent	3.31%	40.44%	15.24%	23.35%	16.36%	22.32%	14.72%	21.92%	18.96%
Filterer Richness	2	5	3	4	5	6	6	5	7
Hemoglobin Bearer Percent	6.63%	1.57%	6.71%	1.80%	7.88%	7.34%	1.84%	1.50%	11.93%
Hemoglobin Bearer Richness	2	3	5	2	7	4	2	3	4
Hilsenhoff Biotic Index	5.49	5.71	6.06	5.69	5.32	4.88	4.34	4.72	5.24
Hydropsychidae/Trichoptera	0.18	0.31	0.31	0.44	0.09	0.55	0.67	0.07	0.33
Intolerant Percent	0.00%	0.94%	1.22%	0.00%	4.85%	9.48%	3.99%	10.51%	2.75%
Margalef D	4.14	5.72	6.89	5.22	5.52	4.15	4.55	6.17	5.41
Metals Tolerance Index	4.40	4.79	4.84	4.61	4.36	4.23	4.04	4.12	4.57
Multivoltine Percent	22.89%	36.05%	46.34%	35.03%	54.55%	29.97%	26.99%	27.63%	41.90%
Non-Insect Percent	23.19%	8.46%	17.38%	17.96%	7.27%	9.48%	2.45%	8.41%	16.82%
Oligochaeta+Hirudinea Percent	6.02%	3.13%	7.62%	14.97%	1.82%	4.28%	0.00%	0.30%	8.87%
P Richness	0	0	1	0	0	0	1	2	0
Pollution Sensitive Richness	0	0	0	0	0	0	0	0	0
Pollution Tolerant Percent	65.06%	25.39%	38.72%	37.72%	43.33%	51.38%	62.88%	47.45%	43.12%
Predator Percent	3.31%	2.82%	3.66%	1.80%	1.82%	3.06%	2.15%	2.40%	1.53%
Predator Richness	5	5	6	5	5	4	5	6	4
Scraper/Filterer	7.45	0.18	0.30	0.64	0.56	0.47	0.42	0.38	0.19
Scraper/Scraper+Filterer	0.88	0.15	0.23	0.39	0.36	0.32	0.29	0.28	0.16
Scraper+Shredder Percent	33.13%	16.93%	7.01%	16.77%	17.27%	20.18%	9.51%	9.31%	7.95%
Sediment Sensitive Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.30%	0.00%
Sediment Sensitive Richness	0	0	0	0	0	0	0	1	0
Sediment Tolerant Percent	21.39%	7.84%	25.30%	13.17%	20.30%	37.00%	49.39%	30.33%	35.47%
Sediment Tolerant Richness	1	3	3	4	2	2	1	1	2
Semivoltine Richness	1	3	2	2	4	3	3	5	4
Shannon H (log2)	3.41	3.56	4.10	3.80	3.74	3.36	2.73	3.43	3.37
Shannon H (loge)	2.36	2.47	2.84	2.64	2.60	2.33	1.89	2.38	2.34
Simpson D	0.13	0.16	0.10	0.10	0.11	0.15	0.31	0.17	0.16
Supertolerant Percent	24.70%	13.48%	36.59%	30.24%	12.12%	10.09%	2.45%	8.71%	12.23%
Swimmer Percent	10.24%	12.54%	7.01%	2.69%	22.12%	12.23%	15.34%	12.61%	21.41%
Swimmer Richness	1	1	2	2	4	2	2	1	1
T Richness	5	7	3	6	5	5	6	7	4
Taxa Richness	25	34	40	31	33	25	27	36	32
Univoltine Richness	12	17	14	15	9	9	11	15	11
Site Score	8	6	6	5	6	6	7	8	5
Percent of maximum	**44.44%**	**33.33%**	**33.33%**	**27.78%**	**33.33%**	**33.33%**	**38.89%**	**44.44%**	**27.78%**

Missouri River Basin	Big Hole River near Wise River	Big Hole River near Wise River	Big Hole River near Wise River	Big Hole River near Twin Bridges	Big Hole River near Twin Bridges	Big Hole River near Twin Bridges	Jefferson River near Three Forks	Jefferson River near Three Forks	Jefferson River near Three Forks	Jefferson River near Three Forks	Jefferson River near Three Forks
Ecoregion	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**
	2003	**2004**	**2005**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**
TOTAL	327	302	321	300	321	315	302	322	303	301	303
METRICS											
Air Breather Percent	0.31%	1.66%	0.93%	0.00%	0.00%	0.95%	0.00%	0.62%	0.99%	0.00%	0.00%
Air Breather Richness	1	2	1	0	0	1	0	2	1	0	0
Baetidae/Ephemeroptera	0.00	0.13	0.18	0.40	0.36	0.65	0.52	0.09	0.15	0.13	0.04
Burrower Percent	0.00%	1.32%	0.93%	2.00%	6.54%	3.49%	1.66%	0.62%	1.32%	2.33%	6.60%
Burrower Richness	0	1	1	2	1	2	2	2	2	3	2
Clinger Percent	94.80%	68.21%	64.49%	79.67%	57.01%	60.63%	70.20%	90.99%	62.71%	72.09%	39.93%
Clinger Richness	14	21	17	17	16	13	13	12	13	16	14
Cold Stenotherm Percent	0.31%	2.32%	4.36%	0.00%	0.00%	0.32%	0.00%	0.00%	0.00%	0.00%	0.00%
Cold Stenotherm Richness	1	1	2	0	0	1	0	0	0	0	0
Collector Percent	86.54%	61.92%	70.40%	88.67%	71.34%	79.68%	72.19%	86.96%	80.20%	71.10%	75.91%
CTQa	72.06	81.42	77.94	74.00	89.90	86.62	82.31	65.90	77.86	91.20	91.79
Dominant Taxa (10) Percent	95.41%	82.78%	78.50%	85.33%	70.72%	71.75%	81.79%	92.55%	85.81%	67.77%	86.14%
Dominant Taxa (2) Percent	78.59%	38.41%	40.19%	42.00%	22.74%	27.62%	36.75%	77.95%	56.44%	25.91%	51.49%
Dominant Taxa (3) Percent	83.79%	50.33%	47.98%	54.33%	33.33%	37.14%	49.67%	80.75%	65.02%	34.88%	60.40%
Dominant Taxon Percent	73.09%	23.51%	27.41%	22.00%	11.53%	15.56%	21.85%	72.36%	34.98%	12.96%	41.91%
E Richness	3	7	7	10	6	6	7	5	9	3	9
EPT Percent	84.71%	52.65%	49.22%	53.33%	20.56%	26.67%	78.81%	91.61%	81.19%	35.55%	68.98%
EPT Richness	10	19	20	18	13	13	16	14	16	11	16
Evenness	0.06	0.06	0.06	0.06	0.05	0.05	0.06	0.06	0.08	0.05	0.07
Filterer Percent	79.51%	28.48%	39.25%	70.67%	35.20%	36.51%	41.72%	80.12%	45.21%	22.26%	14.85%
Filterer Richness	3	3	4	7	7	6	4	4	4	6	5
Hemoglobin Bearer Percent	0.61%	5.63%	2.18%	0.67%	0.62%	0.63%	3.97%	0.62%	4.95%	6.31%	0.33%
Hemoglobin Bearer Richness	1	1	2	1	1	1	1	1	1	2	1
Hilsenhoff Biotic Index	2.77	3.72	4.18	4.89	5.73	5.50	4.80	4.87	4.64	5.15	4.78
Hydropsychidae/Trichoptera	0.08	0.04	0.09	0.80	0.76	0.74	0.64	0.95	0.87	0.51	0.60
Intolerant Percent	75.23%	47.35%	40.81%	9.33%	2.49%	6.35%	5.63%	3.11%	5.61%	1.33%	1.65%
Margalef D	3.45	6.74	6.80	5.26	6.69	6.37	5.43	3.82	4.55	4.97	5.93
Metals Tolerance Index	3.10	3.04	3.09	3.42	4.73	4.52	4.32	4.72	4.28	4.31	4.13
Multivoltine Percent	11.01%	26.82%	30.84%	44.33%	63.24%	47.30%	34.77%	2.48%	15.84%	32.56%	20.13%
Non-Insect Percent	0.31%	12.91%	16.51%	0.33%	4.05%	9.52%	0.66%	0.00%	0.66%	6.31%	1.32%
Oligochaeta+Hirudinea Percent	0.00%	0.00%	1.25%	0.00%	3.12%	9.21%	0.00%	0.00%	0.66%	2.99%	0.00%
P Richness	2	2	3	2	2	2	2	4	1	0	1
Pollution Sensitive Richness	1	2	2	0	0	1	0	0	0	0	0
Pollution Tolerant Percent	5.20%	9.27%	9.03%	17.33%	11.22%	18.10%	45.36%	15.84%	39.93%	47.51%	74.26%
Predator Percent	0.92%	3.31%	5.30%	6.67%	10.90%	7.30%	4.64%	5.59%	7.59%	4.98%	8.91%
Predator Richness	3	6	9	5	6	6	5	7	4	4	6
Scraper/Filterer	0.07	0.88	0.33	0.04	0.04	0.06	0.13	0.06	0.09	0.13	0.11
Scraper/Scraper+Filterer	0.07	0.47	0.25	0.04	0.04	0.06	0.11	0.05	0.08	0.12	0.10
Scraper+Shredder Percent	12.54%	33.77%	23.36%	4.00%	15.89%	11.75%	9.60%	7.45%	10.23%	11.63%	6.60%
Sediment Sensitive Percent	1.83%	17.88%	11.53%	0.33%	0.31%	2.54%	0.00%	0.00%	0.00%	0.33%	0.00%
Sediment Sensitive Richness	2	3	3	1	1	2	0	0	0	1	0
Sediment Tolerant Percent	0.31%	1.99%	1.56%	3.67%	3.74%	1.90%	7.28%	2.48%	22.44%	8.97%	41.91%
Sediment Tolerant Richness	1	3	3	1	1	2	2	3	2	1	1
Semivoltine Richness	5	4	5	4	4	3	5	4	3	5	4
Shannon H (log2)	1.81	3.82	3.93	3.69	4.28	4.21	3.83	1.90	3.29	4.16	3.05
Shannon H (loge)	1.26	2.65	2.73	2.55	2.97	2.92	2.66	1.32	2.28	2.88	2.11
Simpson D	0.54	0.11	0.12	0.12	0.07	0.08	0.10	0.54	0.18	0.07	0.26
Supertolerant Percent	0.31%	12.91%	15.26%	0.00%	11.84%	13.33%	0.66%	2.80%	2.64%	5.32%	3.30%
Swimmer Percent	0.00%	0.33%	0.31%	6.33%	2.18%	3.17%	10.26%	0.62%	2.64%	0.66%	1.65%
Swimmer Richness	0	1	1	5	2	2	4	1	4	1	3
T Richness	5	10	10	6	5	5	7	5	6	8	6
Taxa Richness	21	39	40	31	39	36	32	23	27	27	34
Univoltine Richness	8	17	18	14	12	11	14	15	13	9	12
Site Score	9	12	12	9	9	10	8	9	7	5	8
Percent of maximum	**50.00%**	**66.67%**	**66.67%**	**50.00%**	**50.00%**	**55.56%**	**44.44%**	**50.00%**	**38.89%**	**27.78%**	**44.44%**

Missouri River Basin	Madison River near Three Forks	Madison River near Three Forks	Madison River near Three Forks	Gallatin River at Logan	Gallatin River near Three Forks	Gallatin River near Three Forks	Gallatin River near Three Forks	Gallatin River near Three Forks	Missouri River near Toston
Ecoregion	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**
	2003	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**	**2001**
TOTAL	329	321	336	324	331	354	314	316	403
METRICS									
Air Breather Percent	0.00%	0.00%	0.00%	0.00%	0.30%	0.00%	0.00%	0.32%	0.00%
Air Breather Richness	0	0	0	0	1	0	0	1	0
Baetidae/Ephemeroptera	0.49	0.04	0.38	0.82	0.32	0.48	0.15	0.26	0.33
Burrower Percent	0.00%	0.62%	0.00%	0.00%	0.30%	1.13%	0.00%	0.63%	0.00%
Burrower Richness	0	2	0	0	1	3	0	2	0
Clinger Percent	73.86%	67.60%	57.14%	72.53%	79.15%	61.30%	70.06%	47.15%	45.41%
Clinger Richness	14	18	15	15	11	14	17	14	8
Cold Stenotherm Percent	0.61%	4.98%	2.38%	0.00%	1.21%	0.00%	0.00%	0.00%	0.00%
Cold Stenotherm Richness	1	1	1	0	1	0	0	0	0
Collector Percent	81.46%	76.95%	79.46%	53.70%	87.01%	76.84%	62.10%	69.94%	67.00%
CTQa	85.56	82.00	85.19	83.42	72.62	86.32	94.92	81.47	95.33
Dominant Taxa (10) Percent	87.54%	81.93%	75.00%	84.26%	91.24%	88.70%	82.48%	79.75%	89.58%
Dominant Taxa (2) Percent	47.42%	46.42%	26.79%	32.72%	56.80%	29.94%	27.71%	34.18%	41.44%
Dominant Taxa (3) Percent	55.93%	52.34%	35.71%	45.06%	64.95%	42.66%	38.85%	42.09%	55.34%
Dominant Taxon Percent	36.78%	29.91%	15.77%	17.28%	38.37%	16.95%	14.97%	23.73%	26.05%
E Richness	6	4	6	4	4	7	5	9	3
EPT Percent	59.88%	37.07%	50.00%	60.19%	92.15%	56.50%	37.90%	62.34%	73.70%
EPT Richness	12	13	15	13	13	14	11	17	9
Evenness	0.07	0.06	0.05	0.06	0.08	0.06	0.06	0.06	0.07
Filterer Percent	45.90%	10.28%	25.60%	26.54%	61.03%	31.36%	20.38%	10.76%	17.37%
Filterer Richness	5	5	4	4	3	5	6	5	4
Hemoglobin Bearer Percent	3.04%	1.56%	2.98%	15.43%	0.60%	8.76%	8.92%	5.06%	11.41%
Hemoglobin Bearer Richness	1	1	2	1	1	2	5	4	4
Hilsenhoff Biotic Index	3.78	4.95	4.62	4.56	4.16	4.89	5.41	4.41	4.93
Hydropsychidae/Trichoptera	0.04	0.31	0.23	0.21	0.86	0.87	0.09	0.58	0.44
Intolerant Percent	37.69%	8.10%	21.73%	12.65%	14.50%	2.82%	5.10%	11.08%	3.23%
Margalef D	4.85	5.82	6.04	4.67	3.63	4.43	5.14	6.21	4.00
Metals Tolerance Index	3.79	3.92	4.07	4.03	4.40	4.51	4.39	3.89	4.24
Multivoltine Percent	19.45%	21.18%	26.49%	45.99%	10.88%	34.75%	35.03%	31.33%	46.40%
Non-Insect Percent	3.95%	3.12%	8.93%	1.23%	0.91%	0.85%	11.78%	7.59%	10.42%
Oligochaeta+Hirudinea Percent	0.00%	1.87%	5.95%	0.00%	0.00%	0.00%	11.15%	0.32%	3.47%
P Richness	1	2	3	1	2	1	2	1	0
Pollution Sensitive Richness	1	1	1	0	1	0	0	0	0
Pollution Tolerant Percent	31.00%	64.49%	39.29%	33.64%	34.14%	38.42%	44.59%	54.75%	59.31%
Predator Percent	6.08%	2.80%	2.38%	1.54%	3.32%	4.52%	4.78%	7.91%	6.45%
Predator Richness	5	5	5	3	5	7	5	7	5
Scraper/Filterer	0.18	0.67	0.31	0.85	0.13	0.14	0.33	0.74	0.04
Scraper/Scraper+Filterer	0.15	0.40	0.24	0.46	0.11	0.12	0.25	0.42	0.04
Scraper+Shredder Percent	12.46%	14.02%	15.18%	40.12%	8.76%	17.80%	14.97%	19.62%	10.92%
Sediment Sensitive Percent	0.61%	5.30%	2.38%	0.31%	3.32%	0.00%	0.00%	0.00%	0.00%
Sediment Sensitive Richness	1	2	1	1	1	0	0	0	0
Sediment Tolerant Percent	8.51%	16.51%	9.23%	1.54%	8.46%	16.95%	10.19%	24.05%	27.30%
Sediment Tolerant Richness	1	1	2	1	2	1	1	2	2
Semivoltine Richness	4	5	5	4	5	4	5	5	2
Shannon H (log2)	3.33	3.98	4.20	3.84	2.99	3.74	3.79	3.97	3.41
Shannon H (loge)	2.31	2.76	2.91	2.66	2.07	2.59	2.63	2.75	2.36
Simpson D	0.18	0.10	0.08	0.09	0.21	0.09	0.10	0.10	0.13
Supertolerant Percent	2.13%	8.72%	10.71%	8.02%	1.51%	0.28%	12.10%	2.53%	5.96%
Swimmer Percent	7.60%	0.93%	8.93%	12.35%	7.25%	16.67%	0.00%	12.03%	13.90%
Swimmer Richness	2	1	1	2	2	2	0	5	1
T Richness	5	7	6	8	7	6	4	7	6
Taxa Richness	29	32	35	28	22	27	30	36	25
Univoltine Richness	10	14	14	11	8	12	9	16	12
Site Score	9	9	9	7	9	7	7	8	5
Percent of maximum	**50.00%**	**50.00%**	**50.00%**	**38.89%**	**50.00%**	**38.89%**	**38.89%**	**44.44%**	**27.78%**

Missouri River Basin	Prickly Pear Creek near Clancy	Prickly Pear Creek near Clancy	Prickly Pear Creek near Clancy	Prickly Pear Creek near Clancy	Prickly Pear Creek near Clancy	Dearborn River near Craig	Dearborn River near Craig	Dearborn River near Craig	Dearborn River near Craig	Dearborn River near Craig
Ecoregion	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**
	2001	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**
TOTAL	249	355	291	325	323	57	147	322	282	327
METRICS										
Air Breather Percent	11.24%	2.82%	9.62%	3.38%	2.79%	19.30%	4.08%	1.86%	1.42%	1.22%
Air Breather Richness	2	2	1	2	1	3	3	2	1	3
Baetidae/Ephemeroptera	0.26	0.05	0.32	0.63	0.39	0.50	0.42	0.26	0.18	0.50
Burrower Percent	2.01%	1.69%	0.34%	0.92%	0.00%	22.81%	3.40%	6.52%	1.06%	4.28%
Burrower Richness	3	3	1	3	0	4	2	5	1	3
Clinger Percent	77.51%	63.66%	67.01%	66.77%	75.23%	29.82%	48.98%	61.18%	65.25%	57.80%
Clinger Richness	16	15	11	14	15	9	11	15	11	22
Cold Stenotherm Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.48%	0.00%	1.53%
Cold Stenotherm Richness	0	0	0	0	0	0	0	1	0	1
Collector Percent	51.41%	46.76%	64.60%	65.23%	43.34%	33.33%	56.46%	43.17%	64.18%	38.53%
CTQa	65.28	69.13	67.79	73.86	71.54	73.38	84.33	70.12	66.09	70.50
Dominant Taxa (10) Percent	83.94%	82.82%	90.38%	82.15%	81.73%	85.96%	69.39%	77.64%	85.82%	69.42%
Dominant Taxa (2) Percent	35.74%	51.83%	43.64%	39.08%	42.72%	31.58%	21.09%	34.78%	36.88%	27.83%
Dominant Taxa (3) Percent	49.40%	61.13%	56.01%	48.62%	52.32%	43.86%	29.25%	46.89%	51.06%	38.53%
Dominant Taxon Percent	20.08%	31.27%	21.99%	19.69%	32.51%	15.79%	10.88%	22.05%	21.28%	15.60%
E Richness	4	3	3	3	5	4	6	8	4	9
EPT Percent	53.41%	72.96%	61.51%	45.23%	72.14%	56.14%	57.82%	73.91%	45.39%	59.02%
EPT Richness	14	12	9	12	16	7	12	17	12	21
Evenness	0.06	0.07	0.08	0.07	0.06	0.07	0.05	0.06	0.07	0.05
Filterer Percent	22.89%	31.27%	23.37%	29.85%	11.46%	1.75%	14.29%	15.53%	30.14%	11.01%
Filterer Richness	3	1	1	3	3	1	4	4	5	8
Hemoglobin Bearer Percent	4.02%	0.56%	0.34%	19.69%	4.02%	1.75%	0.68%	0.00%	1.77%	2.14%
Hemoglobin Bearer Richness	1	1	1	1	1	1	1	0	1	3
Hilsenhoff Biotic Index	3.91	3.59	3.03	4.61	3.55	3.91	4.27	3.48	4.28	4.71
Hydropsychidae/Trichoptera	0.81	0.48	0.83	0.88	0.15	0.20	0.25	0.64	0.82	0.20
Intolerant Percent	29.72%	36.62%	39.18%	15.38%	14.24%	29.82%	20.41%	34.47%	12.06%	18.96%
Margalef D	5.26	4.79	3.54	5.36	5.30	4.20	6.21	5.56	4.61	7.57
Metals Tolerance Index	3.48	3.34	3.91	4.68	3.30	3.15	3.59	2.46	3.45	3.23
Multivoltine Percent	18.07%	5.35%	32.99%	48.62%	16.72%	17.54%	36.73%	25.16%	24.47%	55.96%
Non-Insect Percent	3.21%	4.79%	1.37%	2.46%	4.33%	8.77%	4.08%	5.90%	0.35%	1.53%
Oligochaeta+Hirudinea Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.59%	0.00%	1.22%
P Richness	2	1	1	4	3	1	1	4	5	6
Pollution Sensitive Richness	0	1	1	1	0	0	0	2	1	1
Pollution Tolerant Percent	18.07%	18.03%	4.81%	4.92%	38.08%	21.05%	19.05%	4.66%	28.37%	22.32%
Predator Percent	6.83%	10.99%	23.37%	6.46%	8.05%	40.35%	27.89%	34.16%	16.31%	24.16%
Predator Richness	7	7	3	7	7	5	8	12	6	10
Scraper/Filterer	1.30	0.63	0.31	0.16	3.35	9.00	0.05	0.40	0.55	0.56
Scraper/Scraper+Filterer	0.56	0.39	0.24	0.14	0.77	0.90	0.05	0.29	0.36	0.36
Scraper+Shredder Percent	40.56%	42.25%	12.03%	28.31%	48.61%	24.56%	11.56%	21.74%	19.50%	25.08%
Sediment Sensitive Percent	0.80%	2.82%	1.72%	0.62%	1.24%	0.00%	0.00%	0.00%	0.00%	0.00%
Sediment Sensitive Richness	2	1	1	1	1	0	0	0	0	0
Sediment Tolerant Percent	12.05%	2.82%	9.62%	3.38%	2.79%	19.30%	4.08%	1.86%	1.42%	1.22%
Sediment Tolerant Richness	4	2	1	2	1	3	2	2	1	3
Semivoltine Richness	9	5	2	6	5	4	4	6	8	7
Shannon H (log2)	3.80	3.44	3.27	3.54	3.74	3.69	4.39	3.97	3.46	4.25
Shannon H (loge)	2.63	2.38	2.27	2.45	2.60	2.56	3.05	2.75	2.40	2.95
Simpson D	0.10	0.16	0.14	0.14	0.12	0.08	0.05	0.10	0.13	0.08
Supertolerant Percent	4.02%	8.17%	2.06%	7.08%	5.57%	8.77%	2.72%	9.94%	1.42%	5.81%
Swimmer Percent	5.62%	0.28%	10.65%	6.77%	3.41%	15.79%	16.33%	14.60%	0.71%	17.43%
Swimmer Richness	2	1	1	2	4	1	3	3	2	4
T Richness	8	8	5	5	8	2	5	5	3	6
Taxa Richness	30	29	21	31	31	18	32	33	26	44
Univoltine Richness	13	16	11	13	16	12	13	16	8	22
Site Score	9	7	10	11	8	8	9	15	9	12
Percent of maximum	**50.00%**	**38.89%**	**55.56%**	**61.11%**	**44.44%**	**44.44%**	**50.00%**	**83.33%**	**50.00%**	**66.67%**

Missouri River Basin	Smith River at Eden Bridge	Smith River at Eden Bridge	Smith River at Eden Bridge	Smith River at Eden Bridge	Sun River at Sun River	Sun River at Sun River	Sun River at Sun River	Sun River at Sun River	Sun River at Sun River	Sun River at Sun River
Ecoregion	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**
	2002	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005A**	**2005B**
TOTAL	300	201	302	323	345	277	332	334	317	337
METRICS										
Air Breather Percent	0.00%	1.00%	0.00%	3.41%	0.87%	0.36%	0.60%	0.30%	0.32%	0.00%
Air Breather Richness	0	2	0	3	1	1	2	1	1	0
Baetidae/Ephemeroptera	0.20	0.23	0.73	0.21	0.58	0.90	0.82	0.85	0.20	0.10
Burrower Percent	0.00%	0.00%	1.66%	3.72%	1.45%	0.36%	2.41%	0.30%	0.95%	1.78%
Burrower Richness	0	0	1	6	3	1	4	1	3	3
Clinger Percent	40.33%	68.66%	62.91%	53.25%	81.74%	73.65%	33.13%	50.00%	66.56%	37.09%
Clinger Richness	14	12	17	21	10	12	14	11	15	14
Cold Stenotherm Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cold Stenotherm Richness	0	0	0	0	0	0	0	0	0	0
Collector Percent	84.00%	55.22%	63.91%	65.94%	76.81%	86.64%	80.12%	74.25%	60.57%	83.38%
CTQa	88.57	70.23	75.00	80.08	85.04	83.57	80.88	92.69	87.00	91.56
Dominant Taxa (10) Percent	81.00%	86.07%	75.17%	69.04%	89.28%	92.42%	82.83%	85.63%	80.13%	79.82%
Dominant Taxa (2) Percent	39.00%	34.33%	29.80%	28.79%	53.04%	42.24%	53.01%	50.60%	30.91%	29.67%
Dominant Taxa (3) Percent	46.33%	49.75%	42.38%	37.77%	65.51%	59.21%	61.14%	58.38%	41.64%	42.73%
Dominant Taxon Percent	24.67%	17.41%	16.23%	15.48%	39.13%	21.30%	39.46%	33.23%	20.19%	15.43%
E Richness	5	10	6	11	7	6	6	6	8	10
EPT Percent	36.67%	88.56%	29.14%	63.78%	67.25%	45.49%	72.89%	64.97%	64.67%	53.12%
EPT Richness	9	16	17	21	12	10	14	12	13	14
Evenness	0.06	0.07	0.06	0.04	0.08	0.08	0.07	0.08	0.06	0.05
Filterer Percent	16.67%	26.37%	22.85%	26.94%	55.65%	49.10%	17.77%	22.46%	28.39%	16.62%
Filterer Richness	5	4	5	8	4	4	4	4	6	5
Hemoglobin Bearer Percent	1.00%	0.50%	5.96%	1.86%	2.32%	1.81%	3.92%	2.40%	7.57%	2.97%
Hemoglobin Bearer Richness	2	1	2	3	2	1	3	2	4	6
Hilsenhoff Biotic Index	4.68	3.25	5.62	4.25	4.83	5.03	4.64	4.78	4.99	4.88
Hydropsychidae/Trichoptera	0.59	0.14	0.38	0.10	0.95	0.99	0.74	0.80	0.47	0.87
Intolerant Percent	22.33%	44.78%	8.61%	22.91%	1.45%	1.44%	2.41%	1.80%	11.04%	16.62%
Margalef D	4.56	4.53	5.74	8.40	4.28	3.92	5.53	4.97	5.79	6.81
Metals Tolerance Index	2.70	2.49	4.88	3.12	4.54	4.73	4.67	4.69	4.37	3.47
Multivoltine Percent	45.33%	16.92%	61.26%	35.91%	14.20%	29.60%	60.84%	55.39%	36.91%	19.29%
Non-Insect Percent	8.33%	0.00%	1.66%	2.17%	4.35%	1.44%	1.20%	2.69%	10.73%	16.62%
Oligochaeta+Hirudinea Percent	8.33%	0.00%	0.99%	1.24%	0.00%	0.00%	0.90%	0.00%	6.62%	7.72%
P Richness	1	2	5	3	1	1	1	0	0	0
Pollution Sensitive Richness	0	0	0	0	0	0	0	0	0	0
Pollution Tolerant Percent	24.33%	6.97%	15.23%	19.81%	41.74%	22.74%	18.37%	23.95%	46.06%	49.26%
Predator Percent	0.67%	7.46%	4.30%	6.50%	7.25%	3.25%	5.42%	2.99%	4.42%	3.26%
Predator Richness	1	6	6	8	4	3	7	5	6	6
Scraper/Filterer	0.22	1.28	0.12	0.60	0.27	0.13	0.39	0.43	0.64	0.68
Scraper/Scraper+Filterer	0.18	0.56	0.10	0.37	0.21	0.11	0.28	0.30	0.39	0.40
Scraper+Shredder Percent	15.33%	37.31%	25.50%	25.70%	15.94%	9.39%	14.16%	19.46%	18.61%	12.17%
Sediment Sensitive Percent	0.00%	0.00%	2.65%	0.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sediment Sensitive Richness	0	0	1	1	0	0	0	0	0	0
Sediment Tolerant Percent	3.00%	3.48%	1.32%	18.89%	1.16%	0.72%	8.43%	6.29%	17.67%	15.13%
Sediment Tolerant Richness	1	1	3	5	2	2	2	3	3	3
Semivoltine Richness	4	4	7	7	4	4	3	3	3	5
Shannon H (log2)	3.82	3.66	3.94	4.39	3.19	3.23	3.40	3.10	3.80	4.01
Shannon H (loge)	2.65	2.54	2.73	3.05	2.21	2.24	2.35	2.15	2.64	2.78
Simpson D	0.11	0.11	0.09	0.07	0.20	0.14	0.19	0.21	0.11	0.09
Supertolerant Percent	1.33%	1.00%	16.23%	5.88%	2.32%	0.36%	1.81%	2.10%	9.15%	17.21%
Swimmer Percent	5.33%	19.40%	5.63%	10.22%	6.09%	17.69%	42.77%	34.43%	3.79%	3.86%
Swimmer Richness	2	4	2	4	4	3	4	4	2	4
T Richness	3	4	6	7	4	3	7	6	5	4
Taxa Richness	27	25	33	49	26	23	33	29	33	40
Univoltine Richness	10	15	12	25	12	10	16	8	15	16
Site Score	7	9	11	9	6	7	9	8	6	6
Percent of maximum	**38.89%**	**50.00%**	**61.11%**	**50.00%**	**33.33%**	**38.89%**	**50.00%**	**44.44%**	**33.33%**	**33.33%**

Missouri River Basin	Teton River near Loma	Teton River near Loma	Teton River near Loma	Teton River near Loma	Teton River near Loma	Peoples Creek near Dodson	Milk River near Saco	Milk River near Saco	Milk River at Nashua	Milk River at Nashua	Milk River at Nashua
Ecoregion	**GLPL**	**GLPL**	**GLPL**	**GLPL**	**GLPL**	**GLPL**	**GLPL**	**GLPL**	**GLPL**	**GLPL**	**GLPL**
	2001	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2005**	**2001**	**2003**	**2004**
TOTAL	289	22	97	327	44	384	323	327	327	309	3
METRICS											
Air Breather Percent	2.42%	0.00%	0.00%	0.92%	0.00%	0.52%	0.00%	0.00%	0.00%	0.00%	0.00%
Air Breather Richness	3	0	0	1	0	1	0	0	0	0	0
Baetidae/Ephemeroptera	0.09	0.00	0.03	0.06	0.00	0.12	0.53	0.29	0.41	0.42	0.00
Burrower Percent	2.08%	13.64%	11.34%	18.96%	0.00%	0.00%	1.24%	0.31%	0.00%	0.00%	0.00%
Burrower Richness	4	1	2	3	0	0	1	1	0	0	0
Clinger Percent	40.14%	68.18%	86.60%	59.94%	70.45%	0.00%	89.78%	91.44%	97.25%	93.85%	66.67%
Clinger Richness	5	4	9	14	4	0	9	12	8	8	2
Cold Stenotherm Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cold Stenotherm Richness	0	0	0	0	0	0	0	0	0	0	0
Collector Percent	52.60%	68.18%	71.13%	74.31%	43.18%	82.55%	95.98%	93.27%	88.99%	75.73%	66.67%
CTQa	92.42	84.00	78.23	85.26	75.00	97.71	94.86	93.29	96.00	102.00	108.00
Dominant Taxa (10) Percent	82.70%	100.00%	96.91%	78.29%	100.00%	98.96%	97.52%	94.19%	99.69%	98.38%	100.00%
Dominant Taxa (2) Percent	44.98%	45.45%	49.48%	33.64%	72.73%	79.43%	76.16%	65.14%	84.40%	49.19%	66.67%
Dominant Taxa (3) Percent	54.67%	63.64%	67.01%	46.79%	79.55%	86.46%	85.45%	74.01%	88.07%	64.40%	100.00%
Dominant Taxon Percent	32.87%	27.27%	25.77%	18.35%	50.00%	71.35%	65.33%	55.05%	80.43%	25.24%	33.33%
E Richness	7	2	5	9	3	2	4	5	2	2	0
EPT Percent	14.88%	72.73%	83.51%	70.64%	81.82%	6.77%	81.42%	24.77%	89.91%	57.93%	0.00%
EPT Richness	8	4	8	14	5	2	8	11	5	7	0
Evenness	0.06	0.17	0.11	0.06	0.14	0.08	0.08	0.08	0.07	0.12	0.33
Filterer Percent	33.22%	54.55%	58.76%	40.67%	18.18%	0.00%	86.07%	85.63%	86.54%	69.90%	33.33%
Filterer Richness	2	3	5	7	2	0	4	4	3	4	1
Hemoglobin Bearer Percent	6.23%	0.00%	2.06%	7.34%	0.00%	1.56%	6.50%	2.75%	1.22%	15.86%	33.33%
Hemoglobin Bearer Richness	6	0	1	5	0	2	5	2	1	2	1
Hilsenhoff Biotic Index	6.01	5.05	3.71	3.98	2.61	7.84	5.25	5.66	5.05	5.07	5.33
Hydropsychidae/Trichoptera	0.00	1.00	0.91	0.99	1.00	0.00	0.99	0.88	1.00	0.95	0.00
Intolerant Percent	8.65%	27.27%	38.14%	33.33%	52.27%	0.00%	1.86%	0.61%	2.14%	7.77%	0.00%
Margalef D	5.51	1.62	2.62	6.10	1.88	2.02	2.77	3.54	1.73	1.93	1.82
Metals Tolerance Index	3.05	5.00	4.35	4.35	4.50	3.01	4.94	4.89	4.89	4.74	2.50
Multivoltine Percent	48.44%	0.00%	10.31%	25.69%	0.00%	1.56%	6.81%	11.32%	10.40%	22.65%	33.33%
Non-Insect Percent	20.76%	0.00%	0.00%	2.75%	4.55%	83.07%	5.57%	0.92%	0.00%	1.29%	33.33%
Oligochaeta+Hirudinea Percent	6.23%	0.00%	0.00%	1.53%	2.27%	0.52%	3.10%	0.00%	0.00%	1.29%	33.33%
P Richness	0	0	0	2	1	0	0	0	0	0	0
Pollution Sensitive Richness	0	0	0	0	0	0	0	0	0	0	0
Pollution Tolerant Percent	29.41%	18.18%	19.59%	18.35%	2.27%	14.84%	13.31%	11.62%	85.93%	4.53%	0.00%
Predator Percent	10.73%	0.00%	2.06%	5.81%	2.27%	8.59%	0.31%	0.61%	0.31%	0.32%	0.00%
Predator Richness	8	0	1	9	1	2	1	1	1	1	0
Scraper/Filterer	0.45	0.25	0.40	0.40	2.88	0.00	0.01	0.03	0.04	0.11	0.00
Scraper/Scraper+Filterer	0.31	0.20	0.29	0.28	0.74	0.00	0.01	0.02	0.03	0.10	0.00
Scraper+Shredder Percent	15.57%	13.64%	26.80%	18.65%	54.55%	8.07%	3.41%	4.89%	10.40%	22.98%	33.33%
Sediment Sensitive Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sediment Sensitive Richness	0	0	0	0	0	0	0	0	0	0	0
Sediment Tolerant Percent	1.04%	0.00%	2.06%	1.83%	0.00%	1.04%	1.86%	0.31%	0.00%	0.65%	0.00%
Sediment Tolerant Richness	1	0	1	3	0	1	1	1	0	1	0
Semivoltine Richness	8	0	2	5	1	1	1	1	0	0	0
Shannon H (log2)	3.58	2.50	2.92	3.96	1.99	1.62	1.96	2.10	1.29	2.74	1.58
Shannon H (loge)	2.48	1.74	2.02	2.75	1.38	1.12	1.36	1.46	0.89	1.90	1.10
Simpson D	0.15	0.15	0.16	0.10	0.34	0.53	0.45	0.42	0.65	0.18	0.00
Supertolerant Percent	25.95%	18.18%	0.00%	1.83%	4.55%	84.11%	5.57%	1.22%	0.00%	1.29%	0.00%
Swimmer Percent	20.07%	18.18%	1.03%	5.20%	22.73%	2.08%	3.10%	1.22%	2.14%	4.53%	0.00%
Swimmer Richness	7	1	1	3	1	4	2	2	1	1	0
T Richness	1	2	3	3	1	0	4	6	3	5	0
Taxa Richness	32	6	13	36	8	13	17	21	11	12	3
Univoltine Richness	12	6	7	15	7	9	9	10	4	6	2
Site Score											
Percent of maximum	**48.75%**	**55.83%**	**69.09%**	**77.38%**	**55.81%**	**25.71%**	**55.02%**	**55.82%**	**48.60%**	**54.49%**	**13.65%**

Missouri River Basin	Poplar River near Scobey	Poplar River near Scobey	Poplar River near Scobey	Poplar River near Scobey	Poplar River near Scobey	Big Muddy Creek near Culbertson	Missouri River near Culbertson	Judith River near mouth	Judith River near mouth	Judith River near mouth	Judith River near mouth	Judith River near mouth
Ecoregion	**GLPL**	**GLPL**	**GLPL**	**GLPL**	**GLPL**	**GLPL**	**GLPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**
	2001	**2002**	**2003**	**2004**	**2005**	**2002**	**2001**	**2001**	**2002**	**2003**	**2004**	**2005**
TOTAL	301	320	332	326	322	341	27	163	310	301	225	328
METRICS												
Air Breather Percent	0.33%	0.31%	0.00%	1.23%	0.62%	0.00%	0.00%	0.61%	0.65%	0.00%	0.44%	0.00%
Air Breather Richness	1	1	0	2	2	0	0	1	1	0	1	0
Baetidae/Ephemeroptera	0.87	0.90	0.14	0.07	0.38	1.00	0.00	0.29	0.34	0.70	0.17	0.09
Burrower Percent	1.00%	2.19%	9.34%	1.84%	4.97%	0.00%	51.85%	0.61%	2.90%	0.00%	1.78%	0.00%
Burrower Richness	2	2	3	3	4	0	1	1	4	0	1	0
Clinger Percent	7.64%	7.50%	34.64%	17.18%	9.32%	0.88%	33.33%	88.34%	67.10%	91.69%	88.44%	83.84%
Clinger Richness	5	6	10	7	6	1	3	10	14	9	11	14
Cold Stenotherm Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cold Stenotherm Richness	0	0	0	0	0	0	0	0	0	0	0	0
Collector Percent	59.80%	58.13%	69.28%	86.50%	46.58%	21.70%	62.96%	88.34%	65.81%	95.68%	86.22%	83.23%
CTQa	94.61	99.58	84.00	101.85	95.81	72.00	92.00	60.19	79.14	75.42	78.06	86.59
Dominant Taxa (10) Percent	82.72%	85.00%	91.87%	82.21%	91.93%	100.00%	100.00%	95.71%	73.23%	99.00%	89.78%	92.38%
Dominant Taxa (2) Percent	45.51%	52.50%	37.65%	43.56%	60.56%	81.52%	77.78%	71.78%	33.87%	77.74%	69.33%	66.77%
Dominant Taxa (3) Percent	55.15%	64.38%	51.51%	53.68%	71.74%	91.20%	85.19%	78.53%	40.65%	86.71%	72.89%	75.91%
Dominant Taxon Percent	26.25%	35.00%	19.28%	30.06%	44.72%	67.16%	51.85%	38.04%	18.06%	67.11%	54.67%	45.43%
E Richness	3	3	8	3	4	1	2	4	8	4	6	7
EPT Percent	24.25%	13.44%	19.88%	32.82%	31.06%	1.47%	55.56%	90.80%	62.26%	87.38%	84.44%	90.24%
EPT Richness	7	4	11	5	6	1	2	12	15	8	11	13
Evenness	0.06	0.07	0.08	0.06	0.08	0.17	0.15	0.11	0.05	0.09	0.08	0.09
Filterer Percent	2.66%	1.25%	19.58%	8.28%	2.48%	14.37%	3.70%	71.78%	42.26%	86.71%	72.89%	71.34%
Filterer Richness	1	4	2	3	2	1	1	2	4	3	4	5
Hemoglobin Bearer Percent	6.98%	8.13%	28.31%	7.98%	4.97%	0.29%	0.00%	0.00%	0.32%	0.33%	0.00%	0.30%
Hemoglobin Bearer Richness	5	8	3	7	7	1	0	0	1	1	0	1
Hilsenhoff Biotic Index	7.81	7.99	6.27	6.63	8.43	9.50	5.58	3.67	4.26	2.94	3.09	3.41
Hydropsychidae/Trichoptera	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.43	0.71	0.12	0.21	0.34
Intolerant Percent	0.00%	0.31%	0.00%	0.00%	0.00%	0.00%	0.00%	41.10%	15.81%	68.44%	59.11%	48.78%
Margalef D	6.24	5.40	4.19	6.28	4.71	1.27	1.82	3.14	5.21	2.10	3.72	3.48
Metals Tolerance Index	2.78	3.25	3.63	2.96	3.83	4.76	3.00	3.83	3.84	3.48	3.46	3.62
Multivoltine Percent	36.21%	23.13%	64.16%	27.61%	18.01%	16.72%	37.04%	8.59%	15.16%	8.97%	6.67%	10.98%
Non-Insect Percent	33.22%	47.50%	4.82%	27.30%	8.39%	20.23%	0.00%	0.61%	0.00%	0.00%	0.00%	0.30%
Oligochaeta+Hirudinea Percent	0.33%	0.00%	0.00%	7.67%	0.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
P Richness	0	0	0	0	0	0	0	3	2	1	1	1
Pollution Sensitive Richness	0	0	0	0	0	0	0	0	1	0	0	0
Pollution Tolerant Percent	30.56%	29.38%	25.00%	47.55%	35.71%	1.47%	3.70%	12.27%	24.52%	0.66%	8.44%	14.02%
Predator Percent	19.27%	7.81%	4.82%	5.21%	5.59%	10.26%	7.41%	3.68%	9.68%	1.00%	5.33%	0.61%
Predator Richness	9	8	3	6	6	3	1	4	7	1	3	1
Scraper/Filterer	1.38	6.50	0.12	0.63	0.00	0.00	1.00	0.03	0.37	0.00	0.07	0.09
Scraper/Scraper+Filterer	0.58	0.87	0.11	0.39	0.00	0.00	0.50	0.03	0.27	0.00	0.07	0.08
Scraper+Shredder Percent	8.97%	13.75%	13.86%	7.06%	0.31%	0.88%	29.63%	2.45%	22.58%	2.99%	7.56%	10.98%
Sediment Sensitive Percent	0.00%	0.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sediment Sensitive Richness	0	1	0	0	0	0	0	0	0	0	0	0
Sediment Tolerant Percent	2.99%	3.75%	13.86%	2.15%	1.24%	0.00%	0.00%	6.13%	7.42%	0.00%	1.33%	9.15%
Sediment Tolerant Richness	3	3	1	4	2	0	0	2	2	0	2	1
Semivoltine Richness	3	4	3	4	4	0	0	5	4	2	4	2
Shannon H (log2)	3.63	3.25	3.36	3.69	3.29	1.95	1.98	2.48	4.19	1.80	2.49	2.53
Shannon H (loge)	2.52	2.25	2.33	2.56	2.28	1.35	1.37	1.72	2.91	1.25	1.72	1.75
Simpson D	0.15	0.22	0.13	0.14	0.17	0.31	0.32	0.27	0.08	0.47	0.35	0.29
Supertolerant Percent	61.79%	76.25%	20.78%	21.78%	64.91%	89.44%	0.00%	0.61%	0.32%	0.00%	1.78%	0.00%
Swimmer Percent	39.53%	35.63%	14.76%	2.15%	58.07%	78.89%	0.00%	2.45%	7.10%	6.98%	1.78%	1.52%
Swimmer Richness	6	6	6	4	3	4	0	2	3	2	1	2
T Richness	4	1	3	2	2	0	0	5	5	3	4	5
Taxa Richness	36	31	25	37	25	7	7	17	30	13	21	21
Univoltine Richness	19	12	12	16	10	4	3	8	15	5	10	8
Site Score												
Percent of maximum	**49.27%**	**46.47%**	**56.39%**	**41.54%**	**39.11%**	**23.26%**	**29.07%**	**66.26%**	**71.40%**	**64.55%**	**72.31%**	**74.18%**

Missouri River Basin	Musselshell River above Harlowton	Musselshell River above Harlowton	Musselshell River above Harlowton	Musselshell River above Harlowton	Musselshell River at Mosby	Musselshell River at Mosby	Musselshell River at Mosby	Musselshell River at Mosby	Musselshell River at Mosby
Ecoregion	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**
	2002	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**
TOTAL	309	298	310	323	321	304	331	61	27
METRICS									
Air Breather Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.99%	5.14%	36.07%	0.00%
Air Breather Richness	0	0	0	0	0	1	1	3	0
Baetidae/Ephemeroptera	0.46	0.27	0.12	0.38	0.00	0.00	0.00	0.00	0.00
Burrower Percent	0.65%	21.14%	0.00%	3.72%	4.98%	24.01%	14.20%	40.98%	0.00%
Burrower Richness	2	3	0	2	3	2	2	4	0
Clinger Percent	22.33%	18.79%	47.42%	22.29%	46.42%	42.43%	4.83%	3.28%	92.59%
Clinger Richness	13	11	16	11	10	8	7	1	3
Cold Stenotherm Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%
Cold Stenotherm Richness	0	0	0	0	0	0	0	0	1
Collector Percent	84.47%	66.44%	86.13%	71.21%	44.86%	67.76%	50.45%	49.18%	92.59%
CTQa	97.63	87.13	93.24	97.15	94.26	95.11	98.67	102.00	58.40
Dominant Taxa (10) Percent	86.41%	85.57%	87.10%	87.93%	88.79%	91.12%	90.33%	90.16%	100.00%
Dominant Taxa (2) Percent	55.99%	37.92%	54.19%	31.58%	30.22%	50.99%	38.07%	49.18%	85.19%
Dominant Taxa (3) Percent	63.43%	52.35%	59.68%	45.51%	41.74%	63.82%	51.36%	57.38%	88.89%
Dominant Taxon Percent	29.13%	20.47%	35.48%	16.10%	15.58%	27.96%	21.15%	26.23%	55.56%
E Richness	6	5	4	5	4	3	2	1	2
EPT Percent	71.20%	55.37%	81.29%	60.68%	38.01%	8.55%	18.43%	3.28%	11.11%
EPT Richness	10	11	11	10	8	3	4	1	3
Evenness	0.07	0.07	0.08	0.07	0.07	0.08	0.08	0.09	0.11
Filterer Percent	2.59%	4.70%	29.68%	2.48%	15.58%	29.61%	1.21%	0.00%	88.89%
Filterer Richness	3	3	6	4	4	2	2	0	2
Hemoglobin Bearer Percent	1.62%	1.68%	1.29%	1.55%	6.85%	27.96%	21.15%	36.07%	0.00%
Hemoglobin Bearer Richness	5	1	3	3	5	5	7	4	0
Hilsenhoff Biotic Index	4.48	4.97	4.62	4.50	5.10	6.53	7.14	6.51	5.54
Hydropsychidae/Trichoptera	0.23	0.20	0.63	0.04	0.52	0.00	0.50	0.00	0.00
Intolerant Percent	9.71%	15.44%	7.74%	15.79%	21.50%	0.33%	0.30%	0.00%	7.41%
Margalef D	5.24	4.39	4.59	5.12	4.16	3.50	3.69	3.16	1.36
Metals Tolerance Index	4.10	3.60	4.61	4.46	3.19	4.43	3.76	5.24	4.50
Multivoltine Percent	43.04%	18.79%	21.29%	44.27%	40.50%	54.61%	48.94%	45.90%	3.70%
Non-Insect Percent	10.03%	10.74%	2.26%	25.08%	17.13%	2.63%	17.82%	9.84%	0.00%
Oligochaeta+Hirudinea Percent	0.32%	2.68%	1.29%	15.79%	0.62%	0.00%	8.16%	6.56%	0.00%
P Richness	0	0	0	0	1	0	0	0	0
Pollution Sensitive Richness	0	0	0	0	0	0	0	0	1
Pollution Tolerant Percent	43.04%	48.66%	18.39%	18.89%	45.17%	38.49%	47.43%	52.46%	0.00%
Predator Percent	1.94%	25.84%	1.29%	11.76%	17.76%	18.75%	30.51%	36.07%	7.41%
Predator Richness	5	5	2	5	7	4	6	4	2
Scraper/Filterer	2.50	0.71	0.08	6.25	1.74	0.10	8.00	0.00	0.00
Scraper/Scraper+Filterer	0.71	0.42	0.07	0.86	0.64	0.09	0.89	0.00	0.00
Scraper+Shredder Percent	11.33%	5.03%	7.74%	16.72%	30.22%	11.84%	11.78%	14.75%	0.00%
Sediment Sensitive Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sediment Sensitive Richness	0	0	0	0	0	0	0	0	0
Sediment Tolerant Percent	26.86%	19.13%	4.52%	14.24%	0.00%	0.00%	3.63%	14.75%	0.00%
Sediment Tolerant Richness	1	2	2	2	0	0	0	2	0
Semivoltine Richness	5	5	6	4	1	2	1	1	1
Shannon H (log2)	3.32	3.62	3.17	3.58	3.72	3.17	3.29	3.24	1.16
Shannon H (loge)	2.30	2.51	2.19	2.48	2.58	2.20	2.28	2.25	0.81
Simpson D	0.17	0.12	0.20	0.12	0.09	0.16	0.14	0.13	0.61
Supertolerant Percent	10.03%	14.09%	6.13%	18.89%	21.18%	30.26%	40.48%	37.70%	0.00%
Swimmer Percent	31.07%	12.08%	5.48%	17.03%	2.49%	1.97%	7.85%	0.00%	3.70%
Swimmer Richness	3	1	1	2	2	3	1	0	1
T Richness	4	6	7	5	3	0	2	0	1
Taxa Richness	31	26	27	30	25	21	22	14	5
Univoltine Richness	10	13	12	12	13	8	11	6	3
Site Score									
Percent of maximum	**55.70%**	**53.98%**	**63.78%**	**49.86%**	**60.42%**	**38.58%**	**27.32%**	**13.59%**	**35.63%**

Yellowstone River Basin	Yellowstone River above Livingston	Shields River near mouth	Shields River near mouth	Shields River near mouth	Shields River near mouth	Shields River near mouth	Shields River near mouth	Boulder River near mouth	Boulder River near mouth	Boulder River near mouth	Boulder River near mouth	Boulder River near mouth
Ecoregion	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**
	2001	**2001**	**2002**	**2003**	**2004**	**2005A**	**2005B**	**2001**	**2002**	**2003**	**2004**	**2005**
TOTAL	335	306	340	309	330	325	327	332	194	206	185	287
METRICS												
Air Breather Percent	0.30%	0.98%	0.88%	0.32%	0.00%	2.15%	0.61%	1.81%	2.58%	5.83%	1.62%	2.09%
Air Breather Richness	1	1	1	1	0	1	1	2	2	3	3	3
Baetidae/Ephemeroptera	0.50	0.43	0.37	0.08	0.08	0.37	0.40	0.45	0.00	0.71	0.04	0.73
Burrower Percent	2.39%	0.00%	1.47%	1.62%	4.24%	3.38%	3.36%	3.01%	3.09%	5.83%	0.54%	1.05%
Burrower Richness	1	0	2	2	2	4	4	3	3	3	1	2
Clinger Percent	94.63%	63.40%	76.76%	39.48%	57.27%	55.08%	51.68%	80.12%	61.86%	40.78%	60.00%	31.36%
Clinger Richness	9	12	15	13	13	18	17	15	22	16	10	15
Cold Stenotherm Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.52%	1.94%	0.54%	0.00%
Cold Stenotherm Richness	0	0	0	0	0	0	0	0	1	1	1	0
Collector Percent	82.69%	65.36%	85.00%	77.35%	46.97%	57.54%	56.57%	66.57%	56.70%	67.48%	31.89%	70.38%
CTQa	68.21	79.74	76.97	65.44	75.46	78.00	73.59	76.60	73.11	65.17	73.42	70.90
Dominant Taxa (10) Percent	98.81%	85.62%	82.65%	89.97%	81.52%	66.46%	72.48%	84.64%	62.37%	85.92%	78.38%	75.61%
Dominant Taxa (2) Percent	76.72%	34.64%	36.76%	59.87%	33.33%	24.92%	26.61%	57.23%	19.07%	58.25%	35.68%	45.64%
Dominant Taxa (3) Percent	85.37%	46.08%	52.94%	69.90%	42.12%	32.92%	35.17%	62.35%	26.80%	71.36%	44.86%	52.61%
Dominant Taxon Percent	51.04%	19.93%	18.53%	49.19%	17.88%	16.92%	13.46%	45.18%	10.82%	45.15%	17.84%	36.24%
E Richness	3	5	7	8	6	8	9	8	7	8	8	6
EPT Percent	68.66%	52.29%	57.06%	72.82%	83.64%	61.23%	53.82%	71.99%	55.15%	84.47%	69.73%	72.47%
EPT Richness	8	10	14	17	15	19	20	14	21	15	15	16
Evenness	0.11	0.06	0.06	0.08	0.06	0.04	0.05	0.06	0.04	0.08	0.06	0.06
Filterer Percent	78.81%	28.76%	58.53%	11.33%	20.00%	10.15%	5.50%	47.59%	21.13%	16.99%	2.16%	9.06%
Filterer Richness	3	3	6	3	6	6	4	5	7	4	1	5
Hemoglobin Bearer Percent	1.49%	3.27%	1.76%	0.00%	1.52%	1.85%	1.22%	13.25%	1.55%	0.97%	4.86%	3.83%
Hemoglobin Bearer Richness	1	2	2	0	2	2	1	3	2	1	2	1
Hilsenhoff Biotic Index	3.15	5.20	4.62	4.45	4.19	4.14	4.65	3.25	4.06	3.19	3.32	3.88
Hydropsychidae/Trichoptera	0.10	0.54	0.89	0.87	0.26	0.13	0.09	0.03	0.26	0.05	0.18	0.12
Intolerant Percent	63.88%	5.23%	10.29%	2.91%	15.15%	12.31%	7.65%	57.53%	38.14%	38.83%	46.49%	26.13%
Margalef D	2.24	4.37	5.13	4.73	4.73	6.84	6.76	6.20	7.80	5.09	5.76	5.93
Metals Tolerance Index	2.52	4.15	4.42	3.97	3.62	3.72	3.97	3.02	3.18	1.80	2.31	2.72
Multivoltine Percent	29.55%	30.07%	16.18%	19.09%	4.85%	32.31%	43.43%	27.41%	26.80%	50.97%	11.89%	61.32%
Non-Insect Percent	0.00%	14.71%	1.47%	0.97%	1.21%	7.38%	5.20%	1.81%	0.52%	0.97%	4.32%	2.09%
Oligochaeta+Hirudinea Percent	0.00%	12.75%	1.47%	0.00%	0.91%	1.54%	3.06%	0.90%	0.00%	0.00%	3.24%	0.35%
P Richness	1	0	1	4	1	2	4	1	2	1	3	1
Pollution Sensitive Richness	0	0	1	0	0	0	0	1	1	1	1	0
Pollution Tolerant Percent	0.60%	38.56%	18.53%	59.55%	53.03%	41.23%	35.47%	5.12%	20.10%	2.43%	18.38%	4.53%
Predator Percent	6.87%	1.96%	5.00%	4.21%	17.58%	10.15%	7.95%	5.72%	9.79%	8.25%	12.43%	7.67%
Predator Richness	3	3	6	8	5	8	11	8	11	4	9	7
Scraper/Filterer	0.11	0.74	0.13	0.66	1.29	2.33	4.00	0.31	0.95	1.03	12.25	1.50
Scraper/Scraper+Filterer	0.10	0.42	0.11	0.40	0.56	0.70	0.80	0.24	0.49	0.51	0.92	0.60
Scraper+Shredder Percent	10.45%	25.16%	10.00%	18.45%	35.45%	28.92%	32.42%	27.71%	32.99%	22.33%	55.68%	21.95%
Sediment Sensitive Percent	12.84%	0.65%	0.00%	0.32%	0.00%	0.31%	0.00%	6.33%	4.64%	0.97%	0.00%	0.00%
Sediment Sensitive Richness	2	1	0	1	0	1	0	3	3	1	0	0
Sediment Tolerant Percent	0.60%	9.48%	5.29%	49.51%	16.36%	11.08%	9.17%	1.81%	4.12%	5.83%	1.62%	1.74%
Sediment Tolerant Richness	2	3	3	2	2	3	2	2	2	3	2	2
Semivoltine Richness	4	3	4	5	4	5	5	5	7	4	2	3
Shannon H (log2)	2.15	3.80	3.77	2.82	3.75	4.62	4.39	3.31	4.70	2.97	3.98	3.57
Shannon H (loge)	1.49	2.63	2.61	1.96	2.60	3.20	3.04	2.29	3.25	2.06	2.76	2.47
Simpson D	0.34	0.10	0.12	0.28	0.10	0.05	0.07	0.23	0.05	0.25	0.09	0.18
Supertolerant Percent	0.00%	14.38%	1.76%	0.32%	9.70%	3.69%	5.81%	2.41%	7.73%	0.97%	5.41%	3.48%
Swimmer Percent	1.19%	6.86%	5.59%	4.85%	2.73%	11.08%	12.23%	9.64%	11.34%	47.09%	11.89%	42.16%
Swimmer Richness	1	3	2	4	3	2	3	5	2	4	4	3
T Richness	4	5	6	5	8	9	7	5	12	6	4	9
Taxa Richness	14	26	30	28	28	39	39	37	42	28	31	34
Univoltine Richness	6	12	15	14	16	19	18	18	22	15	20	19
Site Score	7	5	9	10	8	9	11	10	11	12	12	12
Percent of maximum	**38.89%**	**27.78%**	**50.00%**	**55.56%**	**44.44%**	**50.00%**	**61.11%**	**55.56%**	**61.11%**	**66.67%**	**66.67%**	**66.67%**

Yellowstone River Basin	Stillwater River near Absarokee	Stillwater River near Absarokee	Stillwater River near Absarokee	Stillwater River near Absarokee	Stillwater River near Absarokee	Clarks Fork River at Edgar	Clarks Fork River at Edgar	Clarks Fork River at Edgar	Clarks Fork River at Edgar	Clarks Fork River at Edgar	Big Horn River near Hardin	Big Horn River near Hardin	Big Horn River near Hardin
Ecoregion	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**GRPL**	**GRPL**	**GRPL**
	2001	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**	**2003**	**2004**	**2005**
TOTAL	309	307	306	316	291	318	320	335	301	217	321	312	311
METRICS													
Air Breather Percent	0.65%	0.65%	0.00%	0.00%	0.69%	2.52%	1.25%	1.49%	0.00%	0.00%	0.00%	0.00%	0.96%
Air Breather Richness	2	2	0	0	2	1	2	2	0	0	0	0	3
Baetidae/Ephemeroptera	0.52	0.42	0.65	0.33	0.78	0.04	0.20	0.00	0.02	0.36	0.00	0.00	0.00
Burrower Percent	2.27%	1.30%	0.33%	0.63%	0.69%	2.52%	1.25%	2.99%	1.99%	0.00%	57.94%	10.26%	4.50%
Burrower Richness	3	3	1	2	2	1	2	3	3	0	4	2	4
Clinger Percent	79.61%	82.41%	63.07%	70.89%	36.08%	73.27%	61.56%	76.72%	11.30%	54.38%	11.21%	3.85%	13.50%
Clinger Richness	18	18	17	14	16	17	16	9	7	12	2	5	8
Cold Stenotherm Percent	0.00%	0.00%	0.00%	0.00%	0.34%	1.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cold Stenotherm Richness	0	0	0	0	1	1	0	0	0	0	0	0	0
Collector Percent	57.28%	78.83%	50.00%	51.27%	70.45%	80.82%	67.50%	20.00%	86.71%	54.38%	81.00%	82.05%	79.42%
CTQa	71.37	70.89	77.50	69.50	67.83	79.89	80.00	92.84	99.18	75.85	107.71	103.06	100.83
Dominant Taxa (10) Percent	82.52%	83.71%	79.08%	80.70%	77.32%	80.19%	84.38%	88.66%	95.68%	96.77%	95.64%	94.23%	84.24%
Dominant Taxa (2) Percent	44.01%	57.65%	45.42%	46.20%	48.80%	32.08%	30.00%	69.25%	72.76%	59.45%	52.65%	57.69%	47.59%
Dominant Taxa (3) Percent	54.05%	62.22%	52.61%	52.53%	56.70%	41.19%	40.63%	73.73%	81.40%	71.89%	63.24%	67.31%	55.31%
Dominant Taxon Percent	28.48%	29.64%	27.12%	26.58%	38.49%	21.38%	16.56%	63.28%	62.79%	35.02%	41.74%	39.10%	26.37%
E Richness	5	7	9	8	12	6	9	3	4	7	0	0	1
EPT Percent	77.67%	85.34%	88.56%	88.61%	86.94%	75.79%	80.00%	6.57%	14.95%	98.16%	0.00%	0.32%	1.29%
EPT Richness	16	17	20	17	19	15	15	6	6	12	0	1	3
Evenness	0.06	0.07	0.06	0.06	0.06	0.06	0.06	0.07	0.08	0.10	0.10	0.09	0.07
Filterer Percent	33.98%	59.61%	14.71%	7.91%	7.56%	28.93%	20.94%	4.18%	2.66%	6.45%	0.00%	0.32%	6.75%
Filterer Richness	5	4	4	4	2	5	5	3	2	4	0	0	1
Hemoglobin Bearer Percent	5.83%	0.65%	0.33%	0.32%	2.75%	8.18%	1.56%	9.55%	13.62%	0.46%	73.83%	51.28%	27.33%
Hemoglobin Bearer Richness	1	2	1	1	2	3	3	6	4	1	6	3	7
Hilsenhoff Biotic Index	3.22	3.44	3.46	3.06	3.75	3.92	4.22	6.67	7.37	4.01	7.79	8.10	7.49
Hydropsychidae/Trichoptera	0.08	0.45	0.14	0.10	0.17	0.64	0.98	0.50	0.67	0.75	0.00	0.00	0.00
Intolerant Percent	44.66%	39.41%	22.55%	36.71%	18.56%	39.62%	15.00%	1.19%	0.33%	2.30%	0.00%	0.64%	0.64%
Margalef D	5.93	5.41	7.00	5.42	6.11	5.21	5.55	4.30	3.50	2.79	2.60	3.68	6.36
Metals Tolerance Index	3.09	3.68	2.91	2.71	3.18	2.98	3.36	3.56	4.69	2.55	4.64	5.29	5.17
Multivoltine Percent	23.30%	13.36%	29.74%	19.30%	51.89%	20.44%	24.69%	85.07%	10.63%	34.10%	75.70%	37.18%	37.62%
Non-Insect Percent	4.85%	0.33%	2.61%	0.32%	4.47%	3.46%	1.56%	7.46%	73.09%	0.00%	21.50%	68.91%	63.34%
Oligochaeta+Hirudinea Percent	3.88%	0.00%	1.31%	0.00%	4.47%	3.14%	0.94%	5.37%	71.76%	0.00%	19.63%	58.65%	47.59%
P Richness	2	1	2	3	0	2	2	1	0	0	0	0	1
Pollution Sensitive Richness	0	0	0	0	1	1	0	0	0	0	0	1	1
Pollution Tolerant Percent	19.42%	16.29%	32.35%	29.11%	17.53%	21.38%	21.25%	5.97%	24.25%	17.51%	64.17%	49.36%	31.83%
Predator Percent	7.44%	4.89%	5.88%	6.96%	4.47%	8.49%	4.38%	4.78%	2.99%	0.46%	4.67%	2.56%	7.72%
Predator Richness	9	6	8	8	5	7	7	7	5	1	4	6	7
Scraper/Filterer	0.80	0.27	2.80	4.08	2.82	0.11	1.12	0.57	0.63	5.57	0.00	10.00	0.29
Scraper/Scraper+Filterer	0.44	0.21	0.74	0.80	0.74	0.10	0.53	0.36	0.38	0.85	0.00	0.91	0.22
Scraper+Shredder Percent	33.98%	16.29%	43.79%	41.77%	25.09%	7.86%	27.50%	73.73%	10.30%	45.16%	11.53%	3.53%	7.40%
Sediment Sensitive Percent	13.59%	6.51%	7.52%	0.63%	2.75%	2.83%	0.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sediment Sensitive Richness	2	2	3	1	2	2	1	0	0	0	0	0	0
Sediment Tolerant Percent	1.29%	3.91%	0.00%	0.00%	4.47%	7.23%	10.94%	3.58%	19.93%	12.44%	8.72%	39.10%	21.86%
Sediment Tolerant Richness	3	4	0	0	4	2	3	3	3	1	1	1	2
Semivoltine Richness	7	5	5	1	3	8	8	2	1	2	1	2	2
Shannon H (log2)	3.77	3.41	3.89	3.69	3.55	3.96	3.93	2.46	2.17	2.68	2.82	2.75	3.62
Shannon H (loge)	2.61	2.36	2.70	2.56	2.46	2.74	2.73	1.70	1.51	1.86	1.96	1.90	2.51
Simpson D	0.13	0.17	0.12	0.13	0.20	0.09	0.09	0.41	0.41	0.21	0.22	0.23	0.14
Supertolerant Percent	6.15%	0.65%	4.58%	4.75%	7.22%	4.72%	1.25%	7.76%	74.09%	0.46%	75.08%	71.15%	59.49%
Swimmer Percent	7.12%	4.56%	24.18%	13.61%	48.80%	1.57%	11.88%	0.60%	0.66%	32.72%	1.56%	2.56%	0.00%
Swimmer Richness	2	2	4	4	4	1	3	2	2	2	2	1	0
T Richness	9	9	9	6	7	7	4	2	2	5	0	1	1
Taxa Richness	35	32	41	32	35	31	33	26	21	16	16	22	36
Univoltine Richness	15	16	18	18	22	13	15	10	9	9	6	7	12
Site Score	8	8	10	11	10	10	9	8	7	9	3	4	5
Percent of maximum	**44.44%**	**44.44%**	**55.56%**	**61.11%**	**55.56%**	**55.56%**	**50.00%**	**44.44%**	**38.89%**	**50.00%**	**16.67%**	**22.22%**	**27.78%**

Yellowstone River Basin	Big Horn River at mouth	Big Horn River at mouth	Big Horn River at mouth	Big Horn River at mouth	Big Horn River at mouth	Tongue River near Stateline	Rosebud Creek near Rosebud	Rosebud Creek near Rosebud	Rosebud Creek near Rosebud	Rosebud Creek near Rosebud	Rosebud Creek near Rosebud	Tongue River near Brandenberg	Tongue River near Brandenberg	Tongue River near Brandenberg	Tongue River near Brandenberg
Ecoregion	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**MVFP**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**
	2001	**2002**	**2003**	**2004**	**2005**	**2002**	**2001**	**2002**	**2003**	**2004**	**2005**	**2002**	**2003**	**2004**	**2005**
TOTAL	322	294	252	7	132	293	206	323	27	88	26	314	85	327	112
METRICS															
Air Breather Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.49%	0.31%	0.00%	1.14%	7.69%	0.00%	0.00%	0.00%	0.00%
Air Breather Richness	0	0	0	0	0	0	1	1	0	1	2	0	0	0	0
Baetidae/Ephemeroptera	0.27	0.23	0.04	0.00	0.00	0.21	0.10	0.00	0.00	0.00	0.00	0.02	0.00	0.08	0.03
Burrower Percent	1.24%	0.68%	9.92%	28.57%	0.76%	5.80%	12.62%	55.42%	0.00%	19.32%	7.69%	12.42%	41.18%	25.08%	24.11%
Burrower Richness	2	2	4	1	1	2	5	2	0	1	1	2	2	3	1
Clinger Percent	30.12%	24.49%	11.90%	28.57%	6.06%	36.18%	62.14%	1.86%	7.41%	5.68%	0.00%	73.25%	38.82%	59.02%	59.82%
Clinger Richness	16	9	7	2	6	10	11	3	1	1	0	13	7	13	9
Cold Stenotherm Percent	1.86%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cold Stenotherm Richness	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Collector Percent	81.99%	67.69%	67.86%	14.29%	38.64%	77.47%	64.08%	58.51%	40.74%	42.05%	76.92%	84.71%	90.59%	73.70%	88.39%
CTQa	88.90	81.27	94.11	103.75	107.43	80.55	95.22	101.67	102.86	99.56	107.20	83.47	88.42	80.91	78.64
Dominant Taxa (10) Percent	75.47%	83.33%	89.29%	100.00%	93.18%	90.44%	78.16%	95.67%	100.00%	96.59%	100.00%	91.08%	94.12%	85.02%	91.07%
Dominant Taxa (2) Percent	33.85%	41.84%	37.30%	42.86%	61.36%	49.15%	31.07%	70.90%	62.96%	46.59%	76.92%	51.91%	57.65%	38.23%	46.43%
Dominant Taxa (3) Percent	42.86%	50.34%	50.00%	57.14%	72.73%	59.39%	41.75%	80.19%	74.07%	65.91%	84.62%	63.38%	68.24%	48.62%	56.25%
Dominant Taxon Percent	22.05%	25.17%	24.21%	28.57%	39.39%	35.84%	18.45%	53.56%	33.33%	25.00%	61.54%	34.08%	38.82%	22.94%	24.11%
E Richness	12	10	6	0	1	9	5	1	1	1	0	8	3	8	5
EPT Percent	72.05%	78.57%	19.84%	0.00%	4.55%	78.84%	43.20%	0.93%	3.70%	7.95%	0.00%	89.49%	80.00%	76.15%	79.46%
EPT Richness	17	14	8	0	2	13	10	1	1	1	0	14	6	13	10
Evenness	0.05	0.07	0.07	0.17	0.09	0.08	0.06	0.09	0.13	0.11	0.16	0.09	0.10	0.07	0.09
Filterer Percent	15.53%	0.34%	2.38%	0.00%	0.00%	11.26%	35.44%	0.93%	0.00%	0.00%	0.00%	20.06%	12.94%	24.46%	23.21%
Filterer Richness	5	1	2	0	0	2	3	2	0	0	0	3	3	3	3
Hemoglobin Bearer Percent	10.56%	8.16%	53.57%	42.86%	3.79%	4.10%	10.19%	83.28%	88.89%	31.82%	15.38%	0.96%	5.88%	1.83%	2.68%
Hemoglobin Bearer Richness	4	3	7	2	4	2	4	6	6	2	1	1	2	2	2
Hilsenhoff Biotic Index	4.46	3.93	6.90	7.57	7.85	3.47	5.52	9.45	8.69	8.01	6.54	3.09	2.85	3.32	3.20
Hydropsychidae/Trichoptera	0.87	0.20	0.50	0.00	0.00	0.87	0.60	0.00	0.00	0.00	0.00	0.87	0.80	0.96	0.89
Intolerant Percent	17.39%	29.25%	5.56%	0.00%	0.00%	39.59%	2.91%	0.00%	0.00%	0.00%	0.00%	55.41%	60.00%	44.65%	50.00%
Margalef D	6.23	4.43	4.08	2.57	3.88	3.52	4.69	2.99	2.43	2.49	1.59	3.49	2.98	4.05	3.22
Metals Tolerance Index	3.54	2.66	4.42	4.40	4.72	2.53	3.80	4.19	5.13	4.31	5.14	2.60	3.21	3.69	3.43
Multivoltine Percent	24.53%	20.41%	45.24%	42.86%	30.30%	21.50%	44.66%	85.76%	55.56%	10.23%	0.00%	2.87%	16.47%	13.76%	6.25%
Non-Insect Percent	11.49%	2.38%	15.08%	14.29%	8.33%	1.71%	3.88%	2.48%	33.33%	47.73%	15.38%	0.64%	1.18%	0.00%	5.36%
Oligochaeta+Hirudinea Percent	9.32%	1.70%	15.08%	0.00%	7.58%	0.00%	1.46%	0.00%	33.33%	25.00%	15.38%	0.00%	0.00%	0.00%	1.79%
P Richness	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Pollution Sensitive Richness	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Pollution Tolerant Percent	51.55%	54.08%	65.08%	28.57%	8.33%	68.94%	51.46%	82.97%	85.19%	68.18%	19.23%	25.80%	17.65%	24.77%	29.46%
Predator Percent	4.66%	3.06%	6.75%	14.29%	14.39%	4.44%	19.90%	30.65%	48.15%	30.68%	15.38%	2.55%	3.53%	7.03%	0.00%
Predator Richness	6	6	4	1	4	4	7	7	4	5	3	3	2	5	0
Scraper/Filterer	0.74	47.00	1.67	0.00	0.00	1.21	0.15	0.33	0.00	0.00	0.00	0.57	0.09	0.71	0.46
Scraper/Scraper+Filterer	0.43	0.98	0.63	0.00	0.00	0.55	0.13	0.25	0.00	0.00	0.00	0.36	0.08	0.42	0.32
Scraper+Shredder Percent	12.11%	22.11%	8.33%	57.14%	3.03%	17.41%	8.25%	0.93%	7.41%	21.59%	7.69%	12.42%	5.88%	19.27%	11.61%
Sediment Sensitive Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sediment Sensitive Richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sediment Tolerant Percent	22.98%	18.37%	22.22%	14.29%	3.79%	3.75%	2.43%	0.00%	33.33%	25.00%	15.38%	1.59%	10.59%	5.81%	6.25%
Sediment Tolerant Richness	2	2	2	1	1	1	3	0	1	1	1	2	1	2	2
Semivoltine Richness	4	3	2	1	2	3	2	3	0	2	2	3	2	4	3
Shannon H (log2)	4.16	3.61	3.46	2.52	3.08	3.25	4.00	2.06	2.56	2.80	1.91	3.05	2.72	3.57	3.16
Shannon H (loge)	2.89	2.50	2.40	1.75	2.14	2.25	2.77	1.43	1.77	1.94	1.32	2.11	1.89	2.48	2.19
Simpson D	0.09	0.12	0.13	0.05	0.18	0.17	0.08	0.39	0.19	0.17	0.34	0.18	0.23	0.12	0.15
Supertolerant Percent	9.63%	3.40%	42.06%	42.86%	49.24%	1.71%	7.77%	89.16%	77.78%	60.23%	15.38%	0.96%	2.35%	0.31%	5.36%
Swimmer Percent	17.70%	24.49%	19.44%	14.29%	54.55%	13.65%	3.40%	11.76%	7.41%	9.09%	3.85%	0.64%	0.00%	7.34%	1.79%
Swimmer Richness	4	5	4	1	2	2	3	5	2	2	1	2	0	4	1
T Richness	4	4	2	0	1	4	5	0	0	0	0	6	3	4	5
Taxa Richness	37	26	23	6	18	21	26	18	9	12	6	21	14	24	16
Univoltine Richness	20	14	13	3	6	11	13	7	4	6	4	13	6	11	10
Site Score	8	8	8	4	5	6									
Percent of maximum	**44.44%**	**44.44%**	**44.44%**	**22.22%**	**27.78%**	**33.33%**	**59.92%**	**29.71%**	**10.43%**	**14.43%**	**16.17%**	**75.15%**	**56.86%**	**74.94%**	**67.03%**

Yellowstone River Basin	Tongue River at Miles City	Tongue River at Miles City	Tongue River at Miles City	Tongue River at Miles City	Tongue River at Miles City	Powder River near Moorhead	Powder River near Moorhead	Powder River near Moorhead	Powder River near Moorhead	Powder River near Locate	Powder River near Locate	Powder River near Locate	Powder River near Locate	Powder River near Locate	Yellowstone River near Sidney
Ecoregion	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**	**GRPL**
	2001	**2002**	**2003**	**2004**	**2005**	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**	**2001**
TOTAL	17	140	50	13	37	172	226	324	157	13	297	9	67	6	163
METRICS															
Air Breather Percent	0.00%	0.00%	0.00%	15.38%	2.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	19.63%
Air Breather Richness	0	0	0	1	1	0	0	0	0	0	0	0	0	0	3
Baetidae/Ephemeroptera	0.00	0.20	0.09	0.00	0.00	0.00	0.00	0.00	0.01	0.50	0.00	0.00	0.00	0.00	0.83
Burrower Percent	0.00%	11.43%	6.00%	30.77%	21.62%	2.33%	2.65%	0.00%	0.64%	0.00%	12.79%	77.78%	7.46%	33.33%	25.15%
Burrower Richness	0	3	1	3	2	2	3	0	1	0	5	2	1	1	5
Clinger Percent	100.00%	49.29%	84.00%	30.77%	54.05%	37.21%	88.94%	94.75%	93.63%	84.62%	86.53%	0.00%	5.97%	66.67%	46.01%
Clinger Richness	4	9	6	4	6	9	7	10	4	3	6	0	1	3	5
Cold Stenotherm Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cold Stenotherm Richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Collector Percent	76.47%	47.86%	100.00%	69.23%	59.46%	85.47%	89.82%	58.64%	91.72%	100.00%	63.64%	33.33%	94.03%	100.00%	80.37%
CTQa	107.00	97.71	85.70	99.11	96.36	96.20	90.45	93.00	93.29	100.80	97.75	90.00	108.00	108.00	96.00
Dominant Taxa (10) Percent	100.00%	85.00%	98.00%	100.00%	86.49%	94.77%	97.35%	96.91%	100.00%	100.00%	98.99%	100.00%	100.00%	100.00%	94.48%
Dominant Taxa (2) Percent	64.71%	38.57%	50.00%	46.15%	40.54%	75.00%	65.49%	61.73%	80.89%	69.23%	68.69%	88.89%	89.55%	66.67%	49.69%
Dominant Taxa (3) Percent	88.24%	47.14%	62.00%	53.85%	51.35%	79.65%	81.42%	70.68%	85.99%	84.62%	79.12%	100.00%	95.52%	83.33%	60.74%
Dominant Taxon Percent	35.29%	29.29%	26.00%	30.77%	21.62%	54.07%	47.35%	45.68%	75.16%	46.15%	53.20%	66.67%	82.09%	33.33%	32.52%
E Richness	0	5	6	1	5	3	6	3	4	2	0	2	0	1	2
EPT Percent	64.71%	9.29%	82.00%	7.69%	27.03%	81.98%	47.79%	70.37%	89.81%	53.85%	68.69%	88.89%	0.00%	33.33%	7.36%
EPT Richness	2	7	8	1	6	8	8	7	7	4	2	2	0	2	2
Evenness	0.25	0.07	0.11	0.12	0.09	0.10	0.11	0.10	0.08	0.20	0.11	0.26	0.10	0.25	0.10
Filterer Percent	64.71%	5.71%	46.00%	0.00%	8.11%	26.16%	63.72%	52.47%	15.29%	84.62%	62.63%	0.00%	0.00%	50.00%	43.56%
Filterer Richness	2	3	3	0	1	3	3	4	2	3	2	0	0	2	2
Hemoglobin Bearer Percent	23.53%	55.00%	0.00%	53.85%	27.03%	2.33%	0.88%	9.57%	0.00%	0.00%	4.38%	0.00%	5.97%	0.00%	12.88%
Hemoglobin Bearer Richness	1	5	0	4	3	2	2	2	0	0	5	0	1	0	4
Hilsenhoff Biotic Index	5.24	6.06	3.27	7.69	5.38	4.55	4.73	4.46	2.61	5.42	4.58	6.00	2.58	4.50	6.80
Hydropsychidae/Trichoptera	1.00	1.00	1.00	0.00	1.00	0.86	1.00	0.99	0.56	1.00	1.00	0.00	0.00	1.00	0.00
Intolerant Percent	0.00%	5.00%	36.00%	0.00%	5.41%	1.16%	24.78%	16.98%	79.62%	0.00%	15.49%	0.00%	82.09%	16.67%	6.13%
Margalef D	1.06	4.46	2.56	3.12	3.72	3.11	2.59	2.31	1.60	1.56	2.11	0.91	0.95	1.67	3.21
Metals Tolerance Index	4.53	4.17	3.58	4.55	3.88	4.45	4.13	4.52	1.54	4.92	4.47	3.33	3.80	4.00	2.44
Multivoltine Percent	23.53%	80.00%	10.00%	23.08%	48.65%	5.81%	1.77%	14.51%	3.82%	7.69%	13.47%	11.11%	100.00%	33.33%	56.44%
Non-Insect Percent	0.00%	7.14%	0.00%	30.77%	5.41%	0.00%	0.44%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.59%
Oligochaeta+Hirudinea Percent	0.00%	6.43%	0.00%	30.77%	2.70%	0.00%	0.44%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.36%
P Richness	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0
Pollution Sensitive Richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pollution Tolerant Percent	29.41%	31.43%	28.00%	61.54%	35.14%	34.88%	16.81%	63.89%	7.64%	30.77%	60.61%	22.22%	1.49%	16.67%	14.72%
Predator Percent	0.00%	12.14%	0.00%	7.69%	2.70%	6.40%	3.10%	5.25%	3.82%	0.00%	27.95%	0.00%	0.00%	0.00%	5.52%
Predator Richness	0	4	0	1	1	6	2	4	2	0	5	0	0	0	4
Scraper/Filterer	0.00	0.13	0.00	0.00	1.67	0.20	0.10	0.56	0.21	0.00	0.08	0.00	0.00	0.00	0.03
Scraper/Scraper+Filterer	0.00	0.11	0.00	0.00	0.63	0.17	0.09	0.36	0.17	0.00	0.07	0.00	0.00	0.00	0.03
Scraper+Shredder Percent	23.53%	39.29%	0.00%	23.08%	35.14%	6.98%	7.08%	36.11%	4.46%	0.00%	8.42%	0.00%	5.97%	0.00%	2.45%
Sediment Sensitive Percent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sediment Sensitive Richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sediment Tolerant Percent	0.00%	7.14%	2.00%	30.77%	5.41%	4.07%	0.88%	0.00%	0.64%	7.69%	1.35%	0.00%	0.00%	0.00%	0.00%
Sediment Tolerant Richness	0	2	1	1	2	2	1	0	1	1	1	0	0	0	0
Semivoltine Richness	1	3	1	2	2	4	0	3	0	0	4	0	0	0	1
Shannon H (log2)	1.90	3.62	2.91	2.93	3.29	2.31	2.33	2.34	1.28	1.99	2.18	1.22	1.00	1.92	2.89
Shannon H (loge)	1.32	2.51	2.02	2.03	2.28	1.60	1.62	1.62	0.88	1.38	1.51	0.85	0.69	1.33	2.00
Simpson D	0.24	0.12	0.15	0.09	0.11	0.34	0.29	0.32	0.63	0.24	0.33	0.44	0.68	0.13	0.20
Supertolerant Percent	0.00%	19.29%	0.00%	38.46%	8.11%	2.33%	0.44%	3.09%	0.00%	0.00%	1.01%	0.00%	0.00%	0.00%	23.93%
Swimmer Percent	0.00%	2.14%	8.00%	0.00%	2.70%	0.00%	2.21%	0.31%	5.10%	7.69%	0.34%	0.00%	0.00%	0.00%	17.79%
Swimmer Richness	0	2	3	0	1	0	1	1	3	1	1	0	0	0	2
T Richness	2	2	2	0	1	4	2	3	3	2	1	0	0	1	0
Taxa Richness	4	23	11	9	14	17	15	14	9	5	13	3	5	4	17
Univoltine Richness	2	9	7	4	8	7	11	6	7	4	4	1	0	3	8
Site Score															
Percent of maximum	**40.06%**	**40.04%**	**68.02%**	**13.32%**	**40.20%**	**46.06%**	**57.82%**	**57.86%**	**64.56%**	**44.68%**	**46.26%**	**24.90%**	**23.02%**	**37.47%**	**29.39%**

Columbia River Basin	Kootenai River below Libby Dam	Fisher River near mouth	Fisher River near mouth	Fisher River near mouth	Fisher River near mouth	Fisher River near mouth	Yaak River at mouth	Yaak River at mouth	Yaak River at mouth	Yaak River at mouth	Yaak River at mouth
Ecoregion	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**
	2001	**2001**	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**
TOTAL	297	322	190	313	307	327	334	189	255	180	122
METRICS											
Air Breather Percent	0.00%	0.62%	1.58%	2.88%	0.65%	1.83%	0.00%	0.00%	1.57%	1.11%	1.64%
Air Breather Richness	0	1	2	4	2	3	0	0	2	2	2
Baetidae/Ephemeroptera	0.16	0.21	0.28	0.12	0.08	0.41	0.05	0.24	0.24	0.11	0.00
Burrower Percent	1.35%	1.55%	1.05%	1.92%	0.00%	3.06%	0.00%	0.00%	1.57%	0.56%	3.28%
Burrower Richness	1	2	1	4	0	4	0	0	2	1	4
Clinger Percent	39.39%	80.43%	54.74%	61.34%	37.79%	62.08%	80.24%	48.68%	57.65%	57.22%	74.59%
Clinger Richness	11	22	14	23	21	15	16	15	21	21	16
Cold Stenotherm Percent	0.00%	4.35%	3.16%	3.19%	0.00%	0.00%	0.60%	1.06%	0.00%	0.56%	0.00%
Cold Stenotherm Richness	0	3	3	2	0	0	2	1	0	1	0
Collector Percent	47.14%	53.73%	86.32%	69.97%	83.39%	41.28%	88.92%	60.85%	76.08%	69.44%	59.02%
CTQa	93.41	73.09	63.35	67.49	83.03	71.56	85.04	73.00	67.75	76.08	73.04
Dominant Taxa (10) Percent	85.19%	76.71%	84.21%	69.65%	66.45%	76.76%	91.32%	84.66%	72.16%	57.78%	77.05%
Dominant Taxa (2) Percent	29.97%	41.61%	44.21%	26.20%	26.38%	29.66%	71.26%	52.38%	34.51%	17.78%	31.15%
Dominant Taxa (3) Percent	41.08%	49.38%	56.84%	36.10%	37.13%	40.67%	75.45%	61.38%	42.35%	26.11%	43.44%
Dominant Taxon Percent	17.85%	22.05%	23.68%	15.02%	13.36%	15.29%	63.77%	38.10%	23.53%	8.89%	18.85%
E Richness	4	7	6	7	5	5	4	10	10	5	4
EPT Percent	15.82%	24.84%	58.42%	35.46%	24.10%	42.51%	8.98%	36.51%	34.51%	21.11%	24.59%
EPT Richness	7	17	15	19	16	20	9	17	19	16	11
Evenness	0.06	0.05	0.07	0.04	0.04	0.05	0.07	0.07	0.05	0.04	0.06
Filterer Percent	5.72%	33.85%	32.63%	24.60%	27.04%	7.03%	65.87%	11.64%	29.02%	32.22%	37.70%
Filterer Richness	3	8	5	6	7	6	3	4	5	6	5
Hemoglobin Bearer Percent	2.36%	1.24%	0.00%	0.96%	6.19%	11.93%	2.10%	8.47%	10.98%	10.00%	3.28%
Hemoglobin Bearer Richness	3	2	0	1	3	2	2	2	1	3	3
Hilsenhoff Biotic Index	5.66	5.30	3.53	4.04	4.64	3.71	5.70	4.30	4.56	4.99	5.32
Hydropsychidae/Trichoptera	0.50	0.46	0.86	0.42	0.13	0.10	0.00	0.13	0.23	0.29	0.06
Intolerant Percent	1.35%	17.08%	24.74%	23.64%	24.76%	30.28%	4.49%	12.17%	20.00%	18.89%	15.57%
Margalef D	4.57	6.58	4.76	7.14	7.81	6.69	4.47	5.73	6.33	8.65	6.29
Metals Tolerance Index	3.68	3.39	2.99	3.03	3.72	2.77	3.01	2.03	2.39	3.77	2.98
Multivoltine Percent	73.74%	59.01%	37.37%	32.59%	54.40%	35.78%	79.94%	68.25%	54.51%	63.33%	66.39%
Non-Insect Percent	35.35%	9.01%	0.00%	11.18%	14.33%	6.73%	8.98%	1.06%	7.84%	6.11%	9.02%
Oligochaeta+Hirudinea Percent	3.70%	7.76%	0.00%	7.67%	13.36%	0.00%	7.19%	0.00%	7.45%	4.44%	6.56%
P Richness	0	4	5	5	4	6	2	2	1	3	2
Pollution Sensitive Richness	0	3	3	2	2	0	2	2	1	2	1
Pollution Tolerant Percent	5.05%	6.52%	10.00%	23.32%	7.17%	22.63%	4.49%	8.47%	11.37%	10.56%	14.75%
Predator Percent	21.89%	8.70%	10.00%	11.50%	4.89%	14.37%	2.40%	8.47%	9.02%	10.56%	9.84%
Predator Richness	3	11	6	13	8	13	5	6	6	8	10
Scraper/Filterer	0.47	0.22	0.08	0.45	0.24	4.04	0.07	1.41	0.31	0.26	0.24
Scraper/Scraper+Filterer	0.32	0.18	0.07	0.31	0.19	0.80	0.06	0.58	0.24	0.21	0.19
Scraper+Shredder Percent	21.21%	36.96%	3.68%	16.93%	11.40%	44.34%	6.89%	26.98%	11.37%	18.33%	23.77%
Sediment Sensitive Percent	0.00%	1.86%	2.63%	0.96%	0.00%	0.92%	0.00%	0.53%	1.18%	0.56%	1.64%
Sediment Sensitive Richness	0	1	1	2	0	1	0	1	2	1	2
Sediment Tolerant Percent	2.36%	0.62%	1.58%	2.24%	0.65%	0.92%	0.00%	0.53%	1.57%	1.67%	0.82%
Sediment Tolerant Richness	2	1	2	3	2	2	0	1	2	3	1
Semivoltine Richness	3	8	5	8	7	6	6	6	6	8	5
Shannon H (log2)	3.84	4.03	3.63	4.46	4.45	4.12	2.39	3.38	4.19	4.69	4.04
Shannon H (loge)	2.66	2.79	2.51	3.09	3.08	2.85	1.65	2.34	2.91	3.25	2.80
Simpson D	0.09	0.11	0.12	0.06	0.07	0.09	0.42	0.18	0.09	0.05	0.08
Supertolerant Percent	19.19%	8.07%	0.53%	7.99%	14.98%	1.83%	6.29%	0.00%	10.98%	8.33%	9.02%
Swimmer Percent	2.36%	1.86%	5.79%	1.60%	0.65%	3.98%	0.30%	7.41%	3.92%	0.56%	0.82%
Swimmer Richness	2	2	2	3	2	2	1	6	4	1	1
T Richness	3	6	4	7	7	9	3	5	8	8	5
Taxa Richness	27	39	26	42	45	38	27	31	36	44	31
Univoltine Richness	9	14	13	20	15	21	9	9	19	13	13
Site Score	8	13	12	13	12	11	11	13	9	10	9
Percent of maximum	**44.44%**	**72.22%**	**66.67%**	**72.22%**	**66.67%**	**61.11%**	**61.11%**	**72.22%**	**50.00%**	**55.56%**	**50.00%**

Columbia River Basin	Little Blackfoot River at Garrison	Little Blackfoot River at Garrison	Little Blackfoot River at Garrison	Little Blackfoot River at Garrison	Little Blackfoot River at Garrison	Rock Creek near Clinton	Rock Creek near Clinton	Rock Creek near Clinton	Rock Creek near Clinton	Rock Creek near Clinton	Clark Fork River at Turah	Clark Fork River at Turah
Ecoregion	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**
	2001	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**
TOTAL	312	377	338	322	331	325	334	358	321	342	323	324
METRICS												
Air Breather Percent	1.60%	2.65%	4.44%	3.73%	0.91%	1.23%	2.69%	0.28%	0.62%	0.00%	0.93%	0.00%
Air Breather Richness	1	3	3	2	2	2	1	1	1	0	1	0
Baetidae/Ephemeroptera	0.59	0.42	0.27	0.56	0.43	0.42	0.36	0.05	0.21	0.03	0.57	0.62
Burrower Percent	1.92%	3.71%	1.48%	6.52%	2.11%	0.62%	3.29%	0.28%	0.00%	0.29%	0.00%	0.00%
Burrower Richness	2	4	3	5	3	1	2	1	0	1	0	0
Clinger Percent	60.26%	43.24%	57.69%	50.62%	68.28%	58.77%	79.04%	61.45%	26.17%	36.26%	80.80%	78.09%
Clinger Richness	14	16	19	21	19	17	21	20	21	17	22	19
Cold Stenotherm Percent	1.60%	0.80%	1.18%	3.11%	0.30%	7.08%	5.99%	0.00%	0.00%	0.29%	1.86%	1.23%
Cold Stenotherm Richness	2	1	1	1	1	4	2	0	0	1	2	3
Collector Percent	84.62%	47.48%	61.54%	46.27%	67.37%	81.23%	75.75%	70.11%	85.05%	82.75%	81.42%	69.44%
CTQa	80.40	79.00	72.24	77.77	68.61	62.97	63.45	75.15	64.94	71.72	67.86	59.37
Dominant Taxa (10) Percent	85.90%	75.60%	75.15%	64.91%	60.42%	76.31%	79.34%	79.33%	72.90%	82.46%	78.02%	79.63%
Dominant Taxa (2) Percent	46.79%	28.91%	27.22%	25.47%	18.13%	38.46%	46.41%	37.43%	46.11%	30.41%	35.91%	41.05%
Dominant Taxa (3) Percent	58.65%	38.99%	37.87%	34.16%	25.08%	45.54%	53.89%	48.32%	52.96%	42.40%	44.27%	51.23%
Dominant Taxon Percent	28.21%	18.04%	15.98%	15.22%	10.88%	22.77%	36.53%	19.55%	32.40%	15.20%	27.24%	25.31%
E Richness	6	5	9	8	7	10	6	5	10	6	8	6
EPT Percent	38.78%	51.19%	42.60%	47.52%	47.43%	56.31%	77.25%	22.63%	19.94%	19.30%	56.35%	66.36%
EPT Richness	12	13	17	19	17	19	20	14	20	14	16	18
Evenness	0.07	0.05	0.05	0.03	0.04	0.05	0.06	0.06	0.06	0.06	0.06	0.06
Filterer Percent	47.12%	10.61%	12.72%	4.04%	25.08%	30.77%	44.61%	25.14%	40.81%	23.10%	52.32%	47.53%
Filterer Richness	3	4	5	5	4	3	5	4	5	7	4	5
Hemoglobin Bearer Percent	0.32%	1.86%	0.89%	2.80%	3.63%	0.00%	0.30%	7.26%	5.61%	8.48%	0.31%	0.31%
Hemoglobin Bearer Richness	1	2	2	3	1	0	1	2	3	2	1	1
Hilsenhoff Biotic Index	5.49	4.18	4.65	4.31	4.37	4.07	3.61	4.41	5.03	5.67	4.61	4.77
Hydropsychidae/Trichoptera	0.92	0.19	0.27	0.04	0.55	0.77	0.79	0.10	0.37	0.19	0.81	0.87
Intolerant Percent	4.49%	28.65%	23.08%	24.84%	24.47%	27.08%	33.23%	35.20%	18.07%	19.59%	14.86%	13.58%
Margalef D	5.05	5.92	6.53	9.19	6.05	6.05	5.85	5.62	6.44	4.77	5.71	5.20
Metals Tolerance Index	4.63	3.62	4.31	3.40	3.82	3.25	3.68	4.75	4.54	4.93	4.29	4.48
Multivoltine Percent	34.94%	36.07%	40.83%	31.99%	35.35%	35.38%	16.17%	64.53%	75.39%	57.31%	22.29%	28.09%
Non-Insect Percent	5.45%	2.12%	1.78%	1.86%	0.60%	5.54%	0.30%	5.31%	3.12%	15.20%	0.00%	0.00%
Oligochaeta+Hirudinea Percent	4.17%	1.06%	1.18%	1.55%	0.60%	5.23%	0.00%	4.47%	3.12%	15.20%	0.00%	0.00%
P Richness	2	1	1	4	3	4	6	1	2	1	2	6
Pollution Sensitive Richness	2	1	3	2	1	4	2	1	1	1	2	4
Pollution Tolerant Percent	9.94%	15.38%	13.31%	33.54%	18.43%	8.92%	8.98%	9.50%	2.80%	8.77%	24.15%	27.16%
Predator Percent	5.77%	5.31%	10.36%	13.04%	11.78%	10.77%	11.38%	1.40%	3.74%	2.63%	4.02%	5.25%
Predator Richness	6	5	7	10	7	8	9	3	5	5	5	5
Scraper/Filterer	0.12	1.38	1.19	4.54	0.46	0.16	0.09	0.29	0.16	0.25	0.18	0.25
Scraper/Scraper+Filterer	0.11	0.58	0.54	0.82	0.31	0.14	0.09	0.22	0.14	0.20	0.15	0.20
Scraper+Shredder Percent	7.37%	47.21%	27.81%	40.68%	19.03%	8.00%	12.57%	27.37%	10.90%	14.04%	14.55%	25.31%
Sediment Sensitive Percent	1.92%	0.80%	1.48%	3.11%	5.74%	7.08%	6.89%	1.40%	1.87%	2.05%	2.48%	1.54%
Sediment Sensitive Richness	3	1	2	1	2	4	4	2	1	3	3	3
Sediment Tolerant Percent	2.24%	2.92%	4.44%	2.17%	0.60%	1.23%	2.69%	0.84%	0.62%	0.00%	0.93%	0.00%
Sediment Tolerant Richness	2	4	3	2	1	2	1	2	1	0	1	0
Semivoltine Richness	4	5	3	6	7	7	9	5	5	6	6	9
Shannon H (log2)	3.53	4.13	4.29	4.99	4.56	4.06	3.68	3.94	3.86	3.78	3.97	3.82
Shannon H (loge)	2.44	2.86	2.97	3.46	3.16	2.81	2.55	2.73	2.68	2.62	2.75	2.64
Simpson D	0.14	0.08	0.07	0.04	0.05	0.10	0.16	0.10	0.14	0.10	0.11	0.11
Supertolerant Percent	17.95%	12.20%	25.15%	12.73%	4.83%	8.31%	0.90%	10.06%	11.53%	35.38%	3.72%	4.94%
Swimmer Percent	3.21%	9.55%	7.99%	12.11%	9.67%	8.31%	8.68%	0.28%	1.87%	0.29%	4.95%	8.02%
Swimmer Richness	1	2	4	2	2	3	2	1	2	1	3	2
T Richness	4	7	7	7	7	5	8	8	8	7	6	6
Taxa Richness	30	36	39	51	35	36	35	34	38	28	34	31
Univoltine Richness	12	18	19	21	14	17	15	14	16	10	13	11
Site Score	11	9	11	15	10	14	13	9	12	11	11	13
Percent of maximum	**61.11%**	**50.00%**	**61.11%**	**83.33%**	**55.56%**	**77.78%**	**72.22%**	**50.00%**	**66.67%**	**61.11%**	**61.11%**	**72.22%**

Columbia River Basin	Clark Fork River at Turah	Clark Fork River at Turah	Clark Fork River at Turah	Clark Fork River at Turah	Blackfoot River near mouth	Blackfoot River near mouth	Blackfoot River near mouth	Blackfoot River near mouth	Blackfoot River near mouth	Bitterroot River near Darby	Bitterroot River near Darby	Bitterroot River near Darby
Ecoregion	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**
	2003	**2004**	**2005A**	**2005B**	**2001**	**2002**	**2003**	**2004**	**2005**	**2003**	**2004**	**2005**
TOTAL	326	329	318	321	306	315	316	309	327	321	329	322
METRICS												
Air Breather Percent	0.31%	3.04%	0.00%	0.93%	0.65%	0.32%	4.11%	2.27%	2.45%	0.62%	3.65%	2.48%
Air Breather Richness	1	2	0	2	1	1	2	1	1	1	2	2
Baetidae/Ephemeroptera	0.23	0.29	0.31	0.28	0.71	0.28	0.30	0.38	0.54	0.12	0.09	0.06
Burrower Percent	1.23%	1.22%	1.57%	1.56%	0.00%	0.00%	0.63%	0.97%	0.00%	0.93%	4.26%	1.86%
Burrower Richness	1	3	1	2	0	0	1	1	0	2	4	1
Clinger Percent	75.77%	62.92%	75.47%	72.59%	81.37%	78.41%	79.43%	40.13%	57.49%	81.00%	84.80%	77.95%
Clinger Richness	18	22	17	18	19	21	19	18	21	18	17	17
Cold Stenotherm Percent	0.00%	1.22%	0.00%	0.00%	1.31%	10.48%	4.11%	1.29%	0.61%	1.25%	0.00%	0.00%
Cold Stenotherm Richness	0	1	0	0	3	4	2	2	1	2	0	0
Collector Percent	69.94%	62.31%	66.04%	77.57%	76.14%	57.46%	61.71%	69.90%	68.20%	62.62%	50.76%	47.21%
CTQa	65.57	74.97	77.93	69.68	80.42	64.72	63.63	70.55	71.28	60.89	72.48	67.81
Dominant Taxa (10) Percent	75.77%	64.44%	69.81%	75.70%	82.68%	80.00%	80.70%	77.99%	64.22%	81.93%	78.42%	81.06%
Dominant Taxa (2) Percent	34.97%	20.36%	21.70%	33.64%	42.16%	31.11%	37.34%	50.16%	28.13%	38.63%	26.75%	38.20%
Dominant Taxa (3) Percent	42.94%	29.79%	30.82%	44.86%	54.90%	40.32%	47.15%	56.31%	34.56%	49.22%	39.51%	48.45%
Dominant Taxon Percent	25.15%	10.64%	12.26%	22.12%	28.10%	16.19%	20.25%	42.07%	16.21%	26.17%	13.98%	22.98%
E Richness	9	8	8	10	4	4	6	5	7	6	6	5
EPT Percent	71.78%	27.96%	55.35%	56.07%	46.73%	57.46%	73.10%	29.77%	45.26%	65.73%	60.18%	53.73%
EPT Richness	17	19	18	18	13	19	16	18	22	17	16	16
Evenness	0.05	0.04	0.05	0.06	0.06	0.05	0.06	0.06	0.04	0.06	0.05	0.07
Filterer Percent	34.97%	16.11%	21.07%	36.14%	60.13%	31.11%	30.38%	11.00%	25.69%	15.58%	15.81%	13.04%
Filterer Richness	5	8	5	5	6	5	5	4	4	4	5	4
Hemoglobin Bearer Percent	1.23%	3.95%	0.63%	1.56%	1.63%	0.95%	1.58%	0.65%	3.06%	4.98%	6.99%	15.22%
Hemoglobin Bearer Richness	2	2	1	2	2	2	2	2	2	1	2	1
Hilsenhoff Biotic Index	3.86	5.36	4.39	5.06	4.59	4.24	2.92	3.93	4.46	3.36	3.01	3.47
Hydropsychidae/Trichoptera	0.83	0.50	0.69	0.93	0.41	0.62	0.38	0.52	0.68	0.45	0.17	0.16
Intolerant Percent	29.14%	7.29%	18.24%	12.46%	25.16%	27.62%	47.15%	13.92%	16.51%	56.70%	58.36%	46.27%
Margalef D	5.36	7.57	5.66	5.69	5.94	5.57	5.57	6.25	7.47	5.72	6.77	5.12
Metals Tolerance Index	3.64	4.19	3.53	4.45	3.52	3.78	2.81	2.32	3.50	2.66	2.83	3.19
Multivoltine Percent	17.18%	55.02%	34.59%	38.94%	42.16%	31.43%	19.30%	57.28%	37.92%	20.87%	17.33%	24.22%
Non-Insect Percent	0.31%	0.00%	0.31%	0.00%	4.58%	0.63%	0.63%	7.44%	14.07%	3.12%	0.91%	11.18%
Oligochaeta+Hirudinea Percent	0.00%	0.00%	0.00%	0.00%	0.33%	0.00%	0.00%	0.97%	6.12%	3.12%	0.61%	11.18%
P Richness	3	2	2	1	1	4	4	4	3	7	5	5
Pollution Sensitive Richness	1	2	0	1	3	4	2	2	2	2	3	0
Pollution Tolerant Percent	21.17%	23.71%	16.04%	10.28%	17.32%	23.49%	10.44%	14.24%	19.57%	12.15%	20.06%	9.32%
Predator Percent	14.72%	3.95%	6.29%	3.12%	5.56%	9.84%	7.91%	12.30%	10.09%	15.26%	12.16%	4.97%
Predator Richness	6	7	6	5	6	7	8	10	7	10	9	5
Scraper/Filterer	0.40	0.81	0.66	0.16	0.27	0.31	0.96	1.21	0.67	0.64	1.75	2.31
Scraper/Scraper+Filterer	0.29	0.45	0.40	0.13	0.21	0.23	0.49	0.55	0.40	0.39	0.64	0.70
Scraper+Shredder Percent	15.03%	27.66%	26.73%	18.38%	18.30%	32.70%	30.38%	16.83%	19.88%	22.12%	36.78%	47.52%
Sediment Sensitive Percent	9.51%	3.34%	5.66%	1.56%	5.56%	4.44%	20.25%	4.85%	4.59%	13.08%	18.24%	23.91%
Sediment Sensitive Richness	2	4	2	2	3	4	1	3	4	2	2	2
Sediment Tolerant Percent	0.61%	3.95%	0.31%	1.87%	0.65%	0.32%	4.11%	3.24%	4.28%	0.62%	4.26%	2.48%
Sediment Tolerant Richness	2	3	1	3	1	1	2	2	2	1	3	2
Semivoltine Richness	7	5	5	4	5	9	7	8	7	9	8	8
Shannon H (log2)	4.04	4.57	4.30	3.84	3.75	4.08	3.91	3.30	4.44	3.85	4.10	3.65
Shannon H (loge)	2.80	3.17	2.98	2.66	2.60	2.83	2.71	2.29	3.08	2.67	2.84	2.53
Simpson D	0.10	0.06	0.06	0.11	0.13	0.08	0.10	0.25	0.07	0.11	0.09	0.13
Supertolerant Percent	3.07%	15.81%	5.35%	13.08%	5.23%	2.86%	0.95%	3.88%	11.93%	4.36%	1.82%	11.80%
Swimmer Percent	4.91%	2.43%	9.12%	6.23%	1.63%	2.86%	5.70%	1.62%	4.59%	3.74%	1.82%	0.62%
Swimmer Richness	2	2	2	4	2	2	2	3	3	2	2	2
T Richness	5	9	8	7	8	11	6	9	12	4	5	6
Taxa Richness	32	43	33	33	35	33	33	36	43	34	39	30
Univoltine Richness	14	18	12	15	13	12	13	13	19	12	14	11
Site Score	10	12	10	9	9	12	12	12	11	12	13	11
Percent of maximum	**55.56%**	**66.67%**	**55.56%**	**50.00%**	**50.00%**	**66.67%**	**66.67%**	**66.67%**	**61.11%**	**66.67%**	**72.22%**	**61.11%**

Columbia River Basin	Bitterroot River near mouth	Bitterroot River near mouth	Bitterroot River near mouth	Bitterroot River near mouth	Bitterroot River near mouth	Clark Fork River at St. Regis	Clark Fork River at St. Regis	Clark Fork River at St. Regis	Clark Fork River at St. Regis	Clark Fork River at St. Regis	NF Flathead River near Columbia Falls	NF Flathead River near Columbia Falls
Ecoregion	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**
	2001	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**
TOTAL	317	324	332	325	324	323	327	309	327	323	71	76
METRICS												
Air Breather Percent	0.00%	0.00%	0.00%	0.92%	1.23%	0.00%	0.00%	0.00%	0.00%	0.00%	2.82%	2.63%
Air Breather Richness	0	0	0	1	1	0	0	0	0	0	1	2
Baetidae/Ephemeroptera	0.54	0.67	0.10	0.07	0.14	0.27	0.31	0.80	0.00	0.32	0.20	0.31
Burrower Percent	0.00%	3.09%	0.60%	2.46%	0.00%	0.31%	2.75%	0.32%	0.00%	0.93%	11.27%	1.32%
Burrower Richness	0	2	1	3	0	1	1	1	0	1	2	1
Clinger Percent	91.48%	91.67%	96.39%	86.15%	83.64%	87.31%	85.63%	84.14%	78.90%	79.88%	77.46%	46.05%
Clinger Richness	19	16	15	19	17	16	21	13	20	21	10	14
Cold Stenotherm Percent	0.95%	0.93%	0.30%	0.00%	0.00%	0.31%	1.83%	0.32%	0.00%	0.00%	14.08%	3.95%
Cold Stenotherm Richness	1	1	1	0	0	1	1	1	0	0	2	3
Collector Percent	82.65%	86.73%	78.61%	68.92%	65.43%	81.42%	74.92%	55.02%	81.65%	72.14%	54.93%	75.00%
CTQa	71.64	69.91	69.30	72.29	70.44	86.25	80.65	87.70	82.27	78.74	49.06	62.38
Dominant Taxa (10) Percent	89.91%	92.59%	93.07%	79.38%	83.02%	88.24%	82.26%	91.26%	82.57%	76.16%	88.73%	80.26%
Dominant Taxa (2) Percent	69.40%	72.22%	60.84%	35.69%	38.27%	66.25%	58.72%	45.63%	48.62%	31.27%	38.03%	28.95%
Dominant Taxa (3) Percent	73.82%	76.54%	72.89%	46.15%	49.07%	70.59%	62.39%	58.58%	55.66%	40.56%	46.48%	40.79%
Dominant Taxon Percent	55.52%	50.62%	44.28%	21.23%	27.16%	34.67%	35.78%	32.04%	32.72%	21.67%	22.54%	15.79%
E Richness	5	3	5	6	4	5	7	3	5	10	6	6
EPT Percent	84.86%	80.56%	43.67%	52.00%	62.35%	80.80%	78.90%	32.04%	49.85%	53.25%	71.83%	36.84%
EPT Richness	14	13	12	15	14	12	15	10	11	19	13	12
Evenness	0.07	0.08	0.08	0.06	0.07	0.08	0.07	0.08	0.07	0.06	0.08	0.06
Filterer Percent	71.61%	76.85%	67.17%	51.69%	40.74%	68.73%	61.16%	41.10%	60.55%	53.56%	40.85%	21.05%
Filterer Richness	5	4	4	4	4	5	5	6	6	7	4	2
Hemoglobin Bearer Percent	2.84%	0.31%	1.81%	1.23%	0.93%	4.95%	1.22%	4.53%	0.92%	0.93%	15.49%	0.00%
Hemoglobin Bearer Richness	2	1	1	1	1	2	1	2	1	2	1	0
Hilsenhoff Biotic Index	4.74	4.87	4.62	4.74	4.21	4.81	4.68	5.86	5.05	4.72	3.35	4.78
Hydropsychidae/Trichoptera	0.95	0.96	0.65	0.62	0.71	0.91	0.87	0.88	0.85	0.69	0.89	0.83
Intolerant Percent	8.83%	4.01%	17.77%	14.15%	20.68%	9.91%	10.70%	1.62%	7.34%	13.00%	42.25%	28.95%
Margalef D	4.69	4.15	3.97	5.49	4.77	4.50	5.01	4.01	5.07	6.32	3.75	5.08
Metals Tolerance Index	4.58	4.83	4.29	4.29	4.04	4.64	4.51	3.94	3.71	4.03	3.04	4.86
Multivoltine Percent	15.14%	7.10%	5.42%	27.69%	15.12%	14.24%	24.77%	67.31%	47.40%	39.94%	22.54%	53.95%
Non-Insect Percent	0.00%	0.31%	0.60%	1.23%	7.41%	0.62%	1.22%	1.29%	0.61%	1.86%	0.00%	0.00%
Oligochaeta+Hirudinea Percent	0.00%	0.00%	0.00%	0.31%	3.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
P Richness	3	3	3	3	3	0	1	1	0	1	4	3
Pollution Sensitive Richness	1	1	1	1	1	1	1	1	1	1	2	4
Pollution Tolerant Percent	18.30%	29.63%	12.05%	12.00%	29.01%	43.03%	41.59%	16.50%	37.92%	26.32%	0.00%	3.95%
Predator Percent	3.15%	5.56%	2.41%	6.46%	4.63%	2.48%	6.42%	3.56%	1.83%	4.02%	38.03%	9.21%
Predator Richness	4	7	5	7	3	4	4	6	3	4	7	6
Scraper/Filterer	0.08	0.07	0.22	0.19	0.62	0.14	0.14	0.00	0.18	0.26	0.03	0.50
Scraper/Scraper+Filterer	0.08	0.07	0.18	0.16	0.38	0.12	0.12	0.00	0.15	0.21	0.03	0.33
Scraper+Shredder Percent	13.88%	7.10%	18.67%	13.23%	29.32%	16.10%	14.98%	39.48%	14.37%	19.81%	7.04%	14.47%
Sediment Sensitive Percent	3.15%	2.16%	12.65%	7.08%	10.80%	3.72%	3.98%	0.97%	3.36%	6.50%	1.41%	0.00%
Sediment Sensitive Richness	2	2	2	2	1	2	2	1	2	2	1	0
Sediment Tolerant Percent	0.00%	0.00%	0.00%	0.92%	1.23%	1.24%	0.00%	0.00%	0.00%	0.00%	2.82%	2.63%
Sediment Tolerant Richness	0	0	0	1	1	2	0	0	0	0	1	2
Semivoltine Richness	8	7	6	5	5	3	4	2	3	4	5	4
Shannon H (log2)	2.67	2.58	2.81	3.78	3.68	2.99	3.38	3.27	3.39	3.99	3.54	3.92
Shannon H (loge)	1.85	1.79	1.95	2.62	2.55	2.07	2.34	2.26	2.35	2.76	2.46	2.72
Simpson D	0.33	0.31	0.25	0.11	0.13	0.23	0.19	0.16	0.17	0.10	0.10	0.07
Supertolerant Percent	1.26%	1.23%	0.30%	5.85%	5.86%	2.79%	1.83%	1.29%	2.75%	2.48%	0.00%	27.63%
Swimmer Percent	4.73%	2.47%	0.60%	0.31%	0.93%	2.17%	3.36%	1.29%	0.00%	2.17%	5.63%	5.26%
Swimmer Richness	2	1	1	1	1	1	1	2	0	4	3	2
T Richness	6	7	4	6	7	7	7	6	6	8	3	3
Taxa Richness	28	25	24	32	28	27	30	24	30	37	17	23
Univoltine Richness	8	9	9	15	11	13	14	7	11	14	7	10
Site Score	9	8	8	10	9	6	8	7	6	9	13	14
Percent of maximum	**50.00%**	**44.44%**	**44.44%**	**55.56%**	**50.00%**	**33.33%**	**44.44%**	**38.89%**	**33.33%**	**50.00%**	**72.22%**	**77.78%**

Columbia River Basin	NF Flathead River near Columbia Falls	NF Flathead River near Columbia Falls	NF Flathead River near Columbia Falls	MF Flathead River near West Glacier	MF Flathead River near West Glacier	MF Flathead River near West Glacier	MF Flathead River near West Glacier	MF Flathead River near West Glacier	SF Flathead River at Spotted Bear	SF Flathead River at Spotted Bear	SF Flathead River at Spotted Bear	SF Flathead River at Spotted Bear
Ecoregion	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**
	2003	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**	**2002**	**2003**	**2004**	**2005**
TOTAL	299	340	348	307	70	334	328	166	89	123	305	103
METRICS												
Air Breather Percent	0.00%	0.29%	1.15%	0.65%	1.43%	0.60%	1.22%	0.00%	0.00%	1.63%	0.33%	5.83%
Air Breather Richness	0	1	2	2	1	1	1	0	0	2	1	1
Baetidae/Ephemeroptera	0.17	0.15	0.20	0.06	0.20	0.14	0.15	0.03	0.17	0.04	0.31	0.11
Burrower Percent	0.00%	0.29%	0.57%	0.65%	1.43%	1.50%	1.22%	0.00%	0.00%	0.81%	0.98%	5.83%
Burrower Richness	0	1	2	2	1	2	1	0	0	1	3	1
Clinger Percent	43.81%	10.00%	25.86%	88.60%	61.43%	92.81%	70.12%	90.96%	75.28%	53.66%	40.33%	56.31%
Clinger Richness	14	15	18	10	9	13	14	9	12	13	13	8
Cold Stenotherm Percent	1.34%	0.29%	4.31%	7.82%	17.14%	7.78%	14.94%	5.42%	13.48%	7.32%	1.97%	3.88%
Cold Stenotherm Richness	1	1	1	1	1	2	1	1	2	2	1	1
Collector Percent	85.62%	93.53%	79.60%	79.48%	48.57%	82.63%	69.21%	81.93%	50.56%	64.23%	78.69%	76.70%
CTQa	48.90	64.45	67.33	60.00	46.36	52.50	57.29	37.83	58.67	54.00	64.96	51.67
Dominant Taxa (10) Percent	93.65%	87.06%	70.69%	93.16%	91.43%	94.01%	84.76%	97.59%	87.64%	85.37%	81.31%	88.35%
Dominant Taxa (2) Percent	48.83%	48.24%	30.46%	63.52%	34.29%	74.85%	45.73%	63.86%	31.46%	30.89%	30.49%	47.57%
Dominant Taxa (3) Percent	63.21%	65.29%	39.08%	71.34%	45.71%	82.04%	57.62%	74.70%	43.82%	40.65%	42.95%	65.05%
Dominant Taxon Percent	24.75%	29.12%	15.80%	53.75%	17.14%	67.37%	30.79%	52.41%	19.10%	17.89%	16.72%	25.24%
E Richness	7	6	11	6	8	7	8	4	6	5	7	6
EPT Percent	12.71%	9.41%	32.47%	39.41%	74.29%	28.44%	44.51%	40.96%	89.89%	39.02%	26.56%	65.05%
EPT Richness	15	15	20	11	11	14	15	10	13	11	15	13
Evenness	0.08	0.07	0.05	0.08	0.09	0.07	0.07	0.10	0.07	0.06	0.06	0.08
Filterer Percent	28.76%	22.06%	15.23%	61.24%	7.14%	75.15%	38.41%	69.88%	10.11%	13.01%	18.36%	17.48%
Filterer Richness	3	5	5	2	2	3	3	3	2	1	2	1
Hemoglobin Bearer Percent	0.00%	0.29%	0.57%	0.00%	0.00%	0.00%	0.30%	0.00%	2.25%	0.81%	0.33%	0.97%
Hemoglobin Bearer Richness	0	1	1	0	0	0	1	0	1	1	1	1
Hilsenhoff Biotic Index	5.28	4.14	3.92	4.28	2.71	4.94	3.93	4.46	2.45	4.88	5.11	2.71
Hydropsychidae/Trichoptera	0.69	0.33	0.65	0.92	1.00	0.89	0.82	0.87	0.95	0.94	0.98	0.95
Intolerant Percent	14.38%	36.76%	35.34%	26.06%	52.86%	19.16%	33.54%	21.08%	67.42%	24.39%	13.11%	45.63%
Margalef D	3.86	5.74	7.01	3.49	3.33	3.79	4.68	2.37	4.01	4.57	5.61	4.10
Metals Tolerance Index	3.52	6.74	5.04	3.80	2.28	4.26	3.19	4.08	2.35	2.75	3.65	2.43
Multivoltine Percent	87.96%	89.71%	66.09%	6.84%	18.57%	4.79%	26.52%	1.20%	16.85%	41.46%	58.36%	30.10%
Non-Insect Percent	0.00%	1.18%	1.72%	0.65%	0.00%	0.00%	0.00%	0.60%	1.12%	17.89%	11.48%	0.00%
Oligochaeta+Hirudinea Percent	0.00%	1.18%	0.86%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.89%	11.15%	0.00%
P Richness	2	3	3	3	2	3	3	2	4	3	5	4
Pollution Sensitive Richness	2	2	2	2	1	2	1	1	2	1	2	1
Pollution Tolerant Percent	0.00%	0.88%	1.72%	0.98%	17.14%	0.90%	0.61%	0.60%	2.25%	0.00%	0.00%	2.91%
Predator Percent	3.34%	2.35%	12.93%	13.36%	38.57%	13.77%	25.00%	14.46%	35.96%	14.63%	6.56%	20.39%
Predator Richness	5	7	10	8	5	7	8	4	5	7	9	8
Scraper/Filterer	0.08	0.11	0.40	0.06	1.40	0.04	0.12	0.02	0.78	0.19	0.09	0.11
Scraper/Scraper+Filterer	0.08	0.10	0.28	0.06	0.58	0.03	0.11	0.02	0.44	0.16	0.08	0.10
Scraper+Shredder Percent	11.04%	3.53%	7.18%	6.51%	12.86%	3.59%	5.79%	3.01%	12.36%	21.14%	14.75%	2.91%
Sediment Sensitive Percent	0.33%	0.59%	2.87%	0.00%	0.00%	3.29%	7.62%	1.81%	12.36%	0.81%	1.97%	1.94%
Sediment Sensitive Richness	1	1	2	0	0	2	2	2	1	1	1	1
Sediment Tolerant Percent	0.00%	0.29%	1.15%	0.33%	1.43%	0.60%	1.22%	0.00%	0.00%	1.63%	0.33%	5.83%
Sediment Tolerant Richness	0	1	2	1	1	1	1	0	0	2	1	1
Semivoltine Richness	3	4	4	4	2	6	4	4	5	4	4	4
Shannon H (log2)	3.16	3.21	4.31	2.63	3.36	2.08	3.45	2.22	3.64	3.81	3.87	3.29
Shannon H (loge)	2.19	2.23	2.99	1.82	2.33	1.45	2.39	1.54	2.52	2.64	2.68	2.28
Simpson D	0.16	0.18	0.08	0.31	0.10	0.47	0.15	0.34	0.09	0.09	0.10	0.15
Supertolerant Percent	17.06%	8.53%	10.06%	0.00%	0.00%	0.60%	0.91%	0.00%	1.12%	25.20%	16.39%	0.97%
Swimmer Percent	1.34%	1.18%	3.74%	1.63%	12.86%	2.10%	3.35%	0.60%	8.99%	0.81%	2.95%	3.88%
Swimmer Richness	2	2	4	1	2	2	3	1	2	1	2	2
T Richness	6	6	6	2	1	4	4	4	3	3	3	3
Taxa Richness	23	34	41	21	15	23	28	13	19	23	33	20
Univoltine Richness	12	14	21	11	10	10	11	7	8	10	14	9
Site Score	13	14	14	11	9	12	11	10	14	11	14	13
Percent of maximum	**72.22%**	**77.78%**	**77.78%**	**61.11%**	**50.00%**	**66.67%**	**61.11%**	**55.56%**	**77.78%**	**61.11%**	**77.78%**	**72.22%**

Columbia River Basin	Whitefish River near Kalispell	Whitefish River near Kalispell	Whitefish River near Kalispell	Whitefish River near Kalispell	Whitefish River near Kalispell	Swan River near Bigfork	Swan River near Bigfork	Swan River near Bigfork	Swan River near Bigfork	Swan River near Bigfork	Flathead River near Perma
Ecoregion	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**MVFP**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**
	2001	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**	**2001**
TOTAL	334	306	299	318	310	324	326	331	322	322	336
METRICS											
Air Breather Percent	1.20%	0.00%	1.00%	0.31%	0.00%	0.93%	1.84%	2.72%	2.17%	2.48%	0.00%
Air Breather Richness	1	0	2	1	0	1	1	2	2	2	0
Baetidae/Ephemeroptera	0.32	0.00	0.53	0.00	0.57	0.11	0.06	0.04	0.00	0.17	0.00
Burrower Percent	1.20%	0.33%	0.67%	2.20%	0.97%	0.93%	2.15%	3.02%	2.17%	2.48%	0.60%
Burrower Richness	3	1	2	2	3	1	2	4	2	3	1
Clinger Percent	61.98%	85.29%	61.87%	49.37%	71.61%	21.91%	46.93%	48.64%	34.78%	24.84%	15.77%
Clinger Richness	21	14	22	18	17	19	15	17	14	12	9
Cold Stenotherm Percent	0.30%	0.00%	0.00%	0.00%	0.00%	0.93%	1.23%	5.44%	0.31%	0.00%	0.00%
Cold Stenotherm Richness	1	0	0	0	0	2	1	3	1	0	0
Collector Percent	67.96%	68.63%	57.86%	54.72%	74.52%	81.17%	64.72%	66.47%	78.88%	76.40%	35.42%
CTQa	77.83	82.33	73.65	88.31	84.29	74.29	75.14	74.66	68.74	80.46	93.93
Dominant Taxa (10) Percent	76.95%	89.87%	61.87%	63.84%	79.35%	89.51%	88.04%	80.36%	88.20%	85.71%	86.61%
Dominant Taxa (2) Percent	35.63%	47.71%	19.40%	22.01%	40.97%	64.51%	40.18%	45.62%	66.46%	50.62%	59.52%
Dominant Taxa (3) Percent	44.31%	61.44%	26.76%	30.82%	50.97%	75.00%	53.99%	53.78%	72.36%	60.25%	64.88%
Dominant Taxon Percent	20.66%	24.51%	11.04%	12.58%	29.68%	35.80%	22.09%	29.00%	46.58%	38.51%	36.61%
E Richness	9	2	6	3	4	6	5	5	4	3	3
EPT Percent	51.20%	74.51%	42.81%	31.45%	39.03%	8.33%	28.53%	29.31%	15.84%	8.39%	6.25%
EPT Richness	20	11	21	14	13	14	17	15	15	8	5
Evenness	0.05	0.07	0.04	0.04	0.06	0.08	0.06	0.06	0.07	0.07	0.07
Filterer Percent	30.24%	49.67%	26.42%	17.30%	49.68%	29.94%	8.59%	10.57%	2.80%	9.63%	7.14%
Filterer Richness	4	4	6	5	6	4	2	4	4	4	3
Hemoglobin Bearer Percent	5.69%	1.31%	18.06%	15.41%	2.90%	0.62%	3.37%	2.11%	0.93%	0.31%	8.63%
Hemoglobin Bearer Richness	5	2	3	4	5	2	1	2	1	1	4
Hilsenhoff Biotic Index	4.15	4.09	4.81	4.69	4.49	5.37	5.06	5.24	5.93	6.22	6.27
Hydropsychidae/Trichoptera	0.50	0.65	0.45	0.25	0.41	0.40	0.64	0.61	0.45	0.25	0.91
Intolerant Percent	17.07%	21.90%	13.04%	21.38%	20.00%	5.56%	21.17%	19.34%	14.91%	8.07%	1.79%
Margalef D	7.92	4.55	7.21	7.43	6.15	5.71	5.70	6.73	5.40	5.51	5.33
Metals Tolerance Index	3.27	3.97	3.53	2.90	2.75	2.21	2.67	2.82	2.78	2.93	3.08
Multivoltine Percent	35.63%	15.03%	40.47%	44.34%	54.19%	44.14%	21.78%	14.20%	10.56%	25.47%	10.42%
Non-Insect Percent	5.39%	1.31%	10.37%	15.41%	3.87%	38.58%	30.37%	35.35%	51.55%	53.73%	80.36%
Oligochaeta+Hirudinea Percent	0.90%	0.00%	0.00%	0.63%	0.32%	1.23%	0.31%	1.21%	0.00%	0.93%	1.19%
P Richness	4	2	5	2	1	4	4	4	5	1	0
Pollution Sensitive Richness	1	0	0	0	0	3	1	3	2	0	1
Pollution Tolerant Percent	20.36%	39.22%	35.45%	28.30%	18.71%	15.74%	27.30%	22.05%	24.53%	22.05%	61.90%
Predator Percent	5.09%	0.98%	7.36%	5.35%	4.84%	10.19%	16.26%	16.92%	12.42%	9.63%	7.74%
Predator Richness	9	3	10	6	6	10	10	13	9	7	7
Scraper/Filterer	0.68	0.56	0.89	2.02	0.36	0.21	1.43	0.86	2.56	1.19	7.04
Scraper/Scraper+Filterer	0.41	0.36	0.47	0.67	0.27	0.17	0.59	0.46	0.72	0.54	0.88
Scraper+Shredder Percent	26.05%	29.09%	32.78%	39.62%	20.65%	8.64%	17.48%	15.41%	8.70%	13.98%	56.25%
Sediment Sensitive Percent	4.49%	4.90%	2.68%	7.55%	11.29%	0.31%	0.00%	0.00%	0.00%	0.31%	0.00%
Sediment Sensitive Richness	1	1	1	1	1	1	0	0	0	1	0
Sediment Tolerant Percent	4.49%	0.65%	11.71%	15.09%	2.58%	1.54%	2.15%	3.32%	2.80%	2.80%	41.37%
Sediment Tolerant Richness	6	2	4	5	4	3	2	4	4	3	2
Semivoltine Richness	8	4	7	5	4	5	4	6	5	3	3
Shannon H (log2)	4.21	3.35	4.73	4.55	3.71	2.98	3.63	3.83	2.75	3.17	3.24
Shannon H (loge)	2.92	2.32	3.28	3.15	2.57	2.06	2.51	2.65	1.91	2.20	2.24
Simpson D	0.09	0.15	0.05	0.06	0.14	0.22	0.12	0.13	0.34	0.23	0.20
Supertolerant Percent	2.99%	0.98%	10.03%	14.47%	2.58%	33.02%	29.75%	34.14%	49.38%	49.69%	32.44%
Swimmer Percent	1.20%	0.00%	2.68%	0.00%	1.29%	0.31%	0.31%	0.30%	0.00%	0.31%	1.49%
Swimmer Richness	2	0	2	0	1	1	1	1	0	1	2
T Richness	7	7	10	9	8	4	8	6	6	4	2
Taxa Richness	47	27	42	43	36	34	34	40	31	32	32
Univoltine Richness	20	13	20	19	18	18	17	19	19	15	17
Site Score	11	6	9	8	7	11	12	12	14	7	5
Percent of maximum	**61.11%**	**33.33%**	**50.00%**	**44.44%**	**38.89%**	**61.11%**	**66.67%**	**66.67%**	**77.78%**	**38.89%**	**27.78%**