DEVELOPMENT OF A RIVPACS MODEL FOR WADEABLE STREAMS OF WYOMING

By **Eric G. Hargett[1], Jeremy R. ZumBerge[2], and Charles P. Hawkins[3]**

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER QUALITY DIVISION

[1]Wyoming Department of Environmental Quality - Water Quality Division, Herschler Bldg. 4W, 122 W. 25th St., Cheyenne, WY 82002 USA

[2]Wyoming Department of Environmental Quality - Water Quality Division, 1866 S. Sheridan Ave., Sheridan, WY 82801 USA

[3]Department of Aquatic, Watershed and Earth Resources, Utah State University, 5210 Old Main Hill, Logan, UT 84322 USA

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CONTENTS

TABLES

FIGURES

APPENDICES

EXECUTIVE SUMMARY

RIVPACS (River InVertebrate Prediction And Classification System) models allow an assessment of biological condition by comparing the taxa observed at sites of unknown biological condition with taxa expected to occur in the absence of human stress. The deviation of the observed from the expected biota, known as the O/E index, is a measure of the compositional similarity expressed in units of taxa richness and thus a community-level measure of biological integrity.

RIVPACS models have seen conventional use by environmental regulatory agencies in Great Britain and Australia for more than a decade. Use of these models in the United States for bioassessment purposes is still a relatively new concept, but is gaining popularity. Several predictive models already developed for selected regions of the United States, show promise as effective tools in the evaluation of stream biological condition. Development of RIVPACS models by states, tribes, and other entities is advocated by the United States Environmental Protection Agency (USEPA) in the assessment of stream biological condition.

As part a continued effort to use the best tools for bioassessment purposes, the Wyoming Department of Environmental Quality-Water Quality Division (WDEQ-WQD) developed a state-wide RIVPACS model, to assist in the evaluation of biological condition for wadeable streams in the State of Wyoming. This model was primarily developed with biological and environmental data housed within WDEQ-WQD's Ecological Database Application System (EDAS). Additional data used in model development were provided by Utah State University in Logan, Utah. Multivariate analyses were used to develop a state-wide model that is both accurate and reasonably precise. The model predicted well at sites of known biological condition and effectively responded to anthropogenic stressors acting upon the stream biota. Though the model makes effective predictions throughout most of the state, there are selected geographic regions where application of the model may be limited. The inability of the model to make successful predictions in these areas appears to be due in large part, to an absence or limited number of suitable reference streams. In light of these limitations, sites with unsuccessful model predictions comprised a small

percentage of the total number of sites evaluated with the model. Temporal variability in model predictions among replicate samples at several reference sites was low indicating that the model is robust to natural biological variation. Overall, the predictive model built for Wyoming is robust both spatially and temporally and provides effective assessments of stream biological condition.

These results support its use in the evaluation of stream biological condition in streams of Wyoming. Narrative biological criteria derived from this predictive model will provide necessary information to assist in the determination of whether designated aquatic life uses are supported in streams of Wyoming as it relates to Wyoming's 303(d) and 305(b) requirements to the USEPA Region 8.

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Eric G. Hargett
Wyoming Department of Environmental Quality - Water Quality Division
Herschler Bldg. 4W, 122 W. 25th St., Cheyenne, WY 82002 USA

Jeremy R. Zumberge
Wyoming Department of Environmental Quality - Water Quality Division
1866 S. Sheridan Ave., Sheridan, WY 82801 USA

Charles P. Hawkins
Department of Aquatic, Watershed and Earth Resources, Utah State University
5210 Old Main Hill, Logan, UT 84322 USA

ABSTRACT

RIVPACS models produce a community-level measure of biological condition known as O/E, which is derived from a comparison of the observed (O) biota with those expected (E) to occur in the absence of anthropogenic stress. Benthic macroinvertebrate and environmental data collected at 925 stream monitoring stations, from 1993 to 2001, were used to develop, validate, and apply a RIVPACS model to assess the biological condition of wadeable streams in Wyoming. From this dataset, 296 samples were identified as reference, 157 of which were used to calibrate the model, 46 to validate it, and 93 to examine temporal variability in reference site O/E values. We used cluster analyses to group the model development reference sites based on similarities in macroinvertebrate community structure and discriminant function analysis to determine which environmental variables best discriminated among reference groups. A suite of fourteen categorical and continuous environmental variables best discriminated among fifteen reference groups and explained >75% of the natural variability in biota within the reference dataset. As expected, mean O/E values for reference sites used in model development and validation were near unity and statistically similar. Temporal variability in O/E scores for reference sites was low. Test site values ranged from 0 to 1.45 (mean = 0.72). The model was accurate in both space and time and precise enough (SD of O/E values for validation data = 0.17) to detect anthropogenic stressors. These results showed that the model could produce effective assessments of biological condition over a broad, ecologically diverse region.

INTRODUCTION

RIVPACS (River InVertebrate Prediction And Classification System) is a multivariate predictive model that uses benthic macroinvertebrates to aid in the detection and interpretation of anthropogenic stress on aquatic communities of streams and rivers (Clark et al. 2003; Moss et al. 1987; Wright et al. 1993 and 2000). Its derivative, AUSRIVAS (Australian River Assessment System), is widely used by the Australian government to assess biological condition of streams in their nation (Smith et al. 1999). While these predictive models have been used in Great Britain and Australia for more than a decade, their potential has not been fully explored in the United States (Hawkins et al. 2000; Hawkins and Carlisle, 2001).

The RIVPACS models make site-specific predictions of the benthic macroinvertebrate fauna expected in the absence of anthropogenic stressors. Those predictions are based on empirical relationshipos between individual taxon probabilities of capture and natural environmental features (e.g., latitude, substrate composition, alkalinity, elevation, etc.) that are derived from data collected from a reference site network. Assessments are based on comparisons of observed and expected faunas. The deviation of the observed from the expected fauna, known as the O/E index (Clarke et al. 1996), is a measure of the compositional similarity expressed in units of taxa richness and is thus a community-level measure of biological integrity.

One of the goals of the Wyoming Department of Environmental Quality-Water Quality Division (WDEQ/WQD) is the continued development of the most effective and applicable bioassessment tools to ascertain the condition of aquatic life in streams and rivers of the State of Wyoming. The applicability of the RIVPACS approach to freshwater systems internationally as well as its promise as an effective bioindex tool in the United States presents an ideal opportunity to develop such a model for use in bioassessments in Wyoming.

The objective of this study was to develop and evaluate a RIVPACS-type model that was applicable to wadeable streams in the State of Wyoming. To do so, we used an extensive statewide database that contained (at the time of this writing) nine years of ambient benthic macroinvertebrate, physical, and chemical data collected at reference sites by the WDEQ/WQD. The final model was then used to assess the biological condition of samples from wadeable non-reference streams in Wyoming.

METHODS AND MATERIALS

Study Area

Unless otherwise noted, the following information was obtained from Knight (1994). Wyoming is biologically diverse, owing much of this diversity to variability in geology, climate, topography, and other environmental features of the state. The State of Wyoming straddles the continental divide and encompasses 251,489 km^2 (97,100 mi^2). Wyoming is characterized by abrupt topographic relief and numerous types of exposed granitic, volcanic, and sedimentary bedrock. Elevation ranges from 939 (3,081 ft) to 4,207 m (13,802 ft) with a mean of 2,030 m (6,660 ft). Average annual precipitation varies regionally, ranging from 15 (6 in) to 150 cm (59 in), which is mostly in the form of rain in the plains regions and snow in the mountain and intermountain basins. Temperature in Wyoming varies widely due to the great topographic relief of the state. For example, mean daily maximum and minimum temperatures for July range from 32°C (90°F) to <24°C (<75°F) and 13°C (55°F) to 0°C (32°F), respectively. Omernik and Gallant (1997) divided Wyoming into five level III ecoregions: Middle Rockies, Southern Rockies, Northwestern Great Plains, Wyoming Basin, and the Western High Plains. The Middle Rockies consist of the Black Hills in northeastern Wyoming, the Bighorn range in north-central Wyoming, and the Teton, Absaroka, Gallatin, Wyoming, Salt River, Wind River, Beartooth, and other ranges of northwestern/western Wyoming. Because of differences in abiotic and biotic characteristics between the different mountain ranges, the Middle Rockies ecoregion is fairly heterogeneous and as a result, can be divided into three sub-regions: Middle Rockies East (Black Hills), Middle Rockies Central (Bighorn mountains), and Middle Rockies West (mountain ranges of northwest and western Wyoming). The Laramie, Medicine Bow, and Sierra Madre ranges of south-central and southeast Wyoming comprise the Southern Rockies. The mountains of Wyoming are characterized by coniferous forest, aspen groves, subalpine meadows, and alpine tundra. The mixed-grass prairie of the Northwestern Great Plains makes up most of the eastern one-third of the state and the short-grass prairie Western High Plains are confined to the southeast corner of Wyoming. The remainder of the state is considered part of the Wyoming Basin, which is a high desert elevated plateau that consists of sagebrush, greasewood, and saltbush shrublands. Adding to the ecological diversity of Wyoming are escarpments of sedimentary and granitic rock scattered throughout the plains and basin regions of the state. Most streams in the mountains are classified as coldwater systems by the WDEQ/WQD based on the maximum temperature criteria of 20°C (68°F) (WDEQ, 2001). Streams in the plains and basin regions are a diverse mixture of coldwater and warmwater systems.

<u>Macroinvertebrates</u>

Stream benthic macroinvertebrate samples used in this study were collected by WDEQ from 1993 to 2001 in accordance with sampling procedures developed by WDEQ (WDEQ, 2001b). Samples were collected from naturally perennial streams in the most productive riverine habitat that was likely to have the greatest diversity and density of organisms. The most productive habitats were generally located in riffles characterized by coarse substrate and higher velocities. Where riffles were not present, samples were collected in habitats such as runs that were generally characterized by finer substrate and lower velocities. All samples were collected in habitats that possessed sufficient depth to remain submerged during periods of low flow. Multiple samples for a given site were all collected from the riffle or run identified during the initial monitoring of that site and within one week of the original sample date. Samples in the montane regions were sampled during the index period August 1 to October 31, whereas plains streams were sampled from July 15 to October 31. All samples were collected when streams were at wadeable baseflow conditions.

Macroinvertebrate samples were collected using Surber benthic samplers with an area of 0.09 m^2 (1 ft^2) and 500-μm mesh. Each sample consisted of a composite of eight Surber samples collected randomly along a 30.5 m (100 ft) maximum length of riffle or run (WDEQ, 2001b). Samples were collected from downstream to upstream to avoid habitat disruption, placed in polyethylene bottles and preserved in either 10% Formalin or 99% Isopropanol. Processing, taxonomic identification, and enumeration of benthic macroinvertebrate samples were performed by Aquatic Biology Associates, Inc. in Corvallis, Oregon according to methods outlined in WDEQ (2001b). Macroinvertebrate data were reported as raw taxa counts and identified to the lowest taxonomic level possible (usually genus). To ensure taxonomic resolution was consistent among samples, data were aggregated to operational taxonomic units (OTUs) as described in Hawkins et al. (2000). A subsample of 300 randomly selected individuals were used in predictive model development and testing. Ostermiller and Hawkins (2004) suggest that RIVPACS type models based on a minimum subsample of 300 individuals are more accurate, precise, and sensitive than models based on < 300 individuals.

Water Chemistry

All water quality data for each sample were collected at one location directly below the base of the riffle or run macroinvertebrate sample area and prior to macroinvertebrate sampling to minimize contamination from disturbance of the sample area. Water quality data (pH, temperature, sulfate, total phosphorus, nitrate-nitrogen, alkalinity, hardness, total suspended solids, turbidity, chloride, dissolved oxygen, and conductivity) were either measured in the field or collected and preserved in polyethylene bottles and analyzed at the WDEQ laboratory in Cheyenne, WY. Collection, preservation, and transportation of water quality samples were conducted in accordance with approved procedures (WDEQ, 2001b).

Physical Habitat and Landscape Characterization

Stream current velocity (m/s), stream discharge (m^3/s) and substrate composition of the macroinvertebrate sample riffle or run were gathered at each site according to procedures in WDEQ (2001b). Substrate composition was visually estimated as the percentage of cobble (64-254 mm), coarse gravel (25.4-63 mm), fine gravel (7.62-25.3 mm), sand (<7.62 mm, gritty), silt (<7.62 mm, soft and fine), and clay (<7.62 mm, solid and slick). Visual estimates of substrate composition were conducted within each of the eight Surber samples for a riffle/run and averaged. Values for each substrate category were grouped into two distinct substrate composition variables used in subsequent analyses: coarse substrate (sum of cobble, coarse gravel, and fine gravel) and fine substrate (sum of sand, silt, and clay). Watershed area (m^2) and elevation (m) were calculated from 1:24,000 United States Geological Survey (USGS) DRG-E topographic maps with either a digital planimeter or a geographic information system (GIS). Latitude and longitude coordinates were obtained with a handheld global positioning system (GPS) (WGS 1984 datum) and converted to decimal degrees. Sites were assigned to one of seven ecoregion or sub-region classifications as described previously and were classified as located in either the plains, foothills, or mountains landscape (WDEQ, 2001b). Primary contributing geology for each site was identified from a 1:500,000 geological bedrock map of Wyoming (USGS, 1994). The chemical, physical, and nutrient activity of geological formations within a watershed, upstream from each sample site, were based on lithological information obtained from the 1:500,000 geological bedrock map of Wyoming and associated chemical and physical weathering rates and rock nutrient content (either phosphorous, sulfate, or nitrate) (J. Olson, Utah State University - unpublished data). Chemical activity of geological formations were assigned an ordinal ranking from low activity (1- granitics, gneiss) to high activity (5 - limestone, dolomite). Likewise, physical activity of rock formations were assigned an ordinal ranking from low activity (1 - granitics, gneiss, limestone) to high activity (5 - siltstone, shale). Rock nutrient content was a three category ordinal ranking that ranged from low activity (1 - granitics and gneiss with nearly no nutrient content) to high activity (3 - phosphate, gypsum). Mean, majority, and maximum index values for chemical, physical, and nutrient activity were calculated with a GIS based on the distribution of geology classes among all pixels in the watershed.

Reference and Test Samples

A total of 925 samples were collected by the WDEQ between 1993 and 2001. From this dataset, 296 samples were identified as reference (Figure 1), of which 157 from the 1993-1999 record were use in model development (reference calibration) and 46 were used in validation to evaluate whether the model could correctly assess sites of known condition (reference validation). Additional samples (N=93) collected from the 1993-1999 reference sites were designated as reference-test and were used to evaluate temporal variability. Reference sites were identified based on whether water chemistry met numeric in-stream aquatic life criteria (WDEQ, 2001), sites possessed stable and diverse bed, bank, and instream habitat conditions, and whether sites were minimally impacted by anthropogenic stressors (WDEQ, 2001b). The remaining 629 samples were designated as test samples and evaluated with the model.

Predictive Model Construction

Data Analysis

Chemical and physical variables were evaluated for normality and either square-root, log, or log (X+1) transformed as necessary. All statistical analyses were performed with either PC-ORD (Version 4.0) (McCune and Medford, 1999) or STATISTICA (Version 6.0) (StatSoft, 2001).

Classification of Reference Samples

The Sorenson (Bray-Curtis) similarity index was used to measure the compositional similarity between all pairs of reference site samples. Rare taxa, defined as those taxa that were collected in ≤10 sites within the reference dataset, were excluded from the classification analysis. A flexible hierarchical unweighted pair-group average (UPGMA) agglomerative clustering method with $\beta = -0.5$ was then used to cluster samples based on these similarities.

Prediction of Class Membership

Once groups of reference sites were identified, we used stepwise discriminant function analysis to determine which environmental variables were most strongly associated with group membership. Candidate predictor variables included: stream origin, geological chemical activity, geological physical activity, geological nutrient activity, primary contributing bedrock geology, Julian date, several water chemistry variables, level III ecoregions and sub-regions, latitude, longitude, elevation, watershed area, landscape type, percent substrate type (cobble, coarse gravel, fine gravel, sand, silt/clay), percent coarse substrate, percent fine substrate, and velocity. Final selection of variables for inclusion in the discriminant model was based on the results of both forward and backward DFA analysis, ease of variable measurement, and ease of ecological interpretation. The final DFM was used to estimate the probability that a new site belonged to each of the biotically-defined classes.

Estimating Probabilities of Capture, E, O/E, and Taxon Sensitivity to Stress

Site-specific probabilities of capture (pc) were estimated as the frequencies of occurrence of taxa observed within each reference site group weighted by the DFM-derived probabilities that a site was a member of each class. The pc values were then summed to estimate the number of expected (E) taxa in each sample. O/E was estimated as the ratio of the observed number of predicted taxa (O) to E. O/E values were calculated based on pc > 0.5 because pc ≥ 0.5 results in a more precise index than pc ≥ 0 (Hawkins et al. 2000; Ostermiller and Hawkins 2004, Van Sickle et al. 2004). The relative sensitivity of individual taxa can be estimated as the ratio of the number of test sites at which a taxon was observed to the number at which it was predicted to occur (sum of pc > 0 across all test sites). For the purposes of this study, a ratio > 1.25 indicates the taxon was found at more sites than expected and therefore likely a tolerant taxon that tends to increase in response to anthropogenic stressors. Taxa with ratios between 0.75 and 1.25 are not considered responsive to anthropogenic stress. Lastly, a ratio < 0.75 indicates the taxon was found at fewer sites than expected, decreases in response to anthropogenic stressors, and therefore may be considered intolerant. Taxa that were expected to occur at any site but were not collected were assigned values of 999. In many cases, these taxa were found too infrequently to infer if they were truly tolerant taxa, although in a few cases many sites contained a taxon that was not predicted to occur.

<u>Model Validation and Responsiveness</u>

Following methods described by Hawkins et al. (2000) and Van Sickle et al. (2004), we evaluated the accuracy and precision of the predictive model by applying the model to the reference construction dataset used in development in addition to our separate reference validation dataset. Model accuracy and precision were evaluated by estimating the standard deviation of O/E values in calibration and validation data sets and by determining how well O was correlated with E. The slope of the regression of

O on E should be near 1 for RIVPACS-type models with good accuracy (Hawkins et al. 2000; Van Sickle et al. 2004). Likewise, the scatter of points along the regression line (evaluated as the coefficient of determination (r^2)) should be small for a model with good precision. Hawkins et al. (2000) and Van Sickle et al. (2004) found that the best performing models generally have reference site O/E standard deviations < 0.20 and account for a significant amount of the variation in O among reference sites.

To further evaluate the overall precision of the predictive model, we constructed a null model and estimated the standard deviation expected for replicate reference site samples following the methods of Van Sickle et al. (2004). Together, the null model and replicate sample standard deviations estimate the minimum and maximum levels of precision, respectively, that is theoretically attainable by any RIVPACS-type model given the reference dataset (Van Sickle et al. 2004). Comparison of the predictive model's precision with these minimum and maximum levels of precision provided context regarding how well the model performed relative to its possible performance. We also exampled model bias by testing (ANOVA, $\alpha = 0.05$) whether reference site O/E scores were associated with ecoregions/subregions and landscape setting. We used Tukey multiple comparison tests to identify sets of ecoregions and landscape types that differed in mean O/E values.

Application of the Model to Reference and Test Sites

Based on protocols described by Moss et al. (1987), Clarke et al. (1996), and Hawkins et al. (2000), all reference-test and test samples were evaluated as to whether they were within the experience of the model. These procedures determines if the Mahalanobis squared distances between a test site and each classification group in multivariate discriminant space are greater than expected as measured by a x^2 test. Reference-test or test samples that failed this test were not considered in the evaluation of results. For those test samples evaluated with the model, we then used ANOVA ($\alpha = 0.05$) followed by Tukey multiple comparison tests to determine whether O/E scores differed among ecoregions/sub-regions and landscapes as described above. The parametric two-sample t-test was used to compare the similarities of 1) reference O/E scores between the calibration and validation datasets, 2) reference, reference-test, and test site O/E scores, and 3) calibration and known degraded test site scores from the 1993-1999 dataset. To examine inter-annual variability in O/E values, we estimated standard deviations for multiple samples collected at the same reference sites.

RESULTS

Operational Taxonomic Units

Two-hundred nineteen operational taxonomic units (OTUs) were identified from the reference construction dataset (Appendix A). Ninety-six of these taxa occurred at 10 or more calibration sites and were used to create the biotic classification. Among all 219 OTUs, 12%, 25%, 21%, 11%, 10%, 11%, and 6% were allocated among the Diptera, Chironomidae, Trichoptera, Ephemeroptera, Plecoptera, non-insects, and Coleoptera, respectively. Check to make sure they coincide with 219 taxa and not 96

Reference and Test Sample Characteristics

Both reference and test sites exhibited considerable variation in values among several environmental variables (Table 1). Reference and test samples generally occurred at similar elevations, were considered well buffered, alkaline, and sampled within comparable dates. However, differences in substrate composition were apparent between reference and test sites. These differences were minimal when individual substrate composition categories were compiled as either coarse or fine substrate. Overall, test sites were characterized by higher conductivity, greater discharge and watershed area, and elevated levels of hardness, alkalinity, sulfate, total phosphorous, nitrate-nitrogen, and turbidity relative to reference sites. The distribution of test sites among ecoregions/sub-regions in Wyoming was not similar to the distribution of reference sites due primarily to a greater percentage of test sites located in the Northwestern Great Plains and Wyoming Basin ecoregions (Table 2).

The Predictive Model

Reference Site Classification

Fifteen reference groups were derived from the cluster analysis of the calibration samples (Figure 2). Percent chaining of the cluster analysis was low (0.52). All reference groups contained a minimum of five reference samples. Generally, samples from upper-elevation montane regions (groups 1-11) were distinct from those from the plains and the low-elevation mountains of northeastern Wyoming (groups 12-15). Reference site samples from the Northwestern Great Plains and Western High Plains ecoregions tended to fall in either group 14 or 15. Samples from streams in the mid to upper-elevations of the Absaroka, Gallatin and Beartooth mountains of northwestern Wyoming clustered into groups 1, 2, 3, or 9. The majority of samples from streams in the sub-alpine regions of the Big Horn mountains clustered together to form group 6. These regional associations may indicate that ecoregion and/or landscape-scale processes are important factors controlling stream environments and the biotic and abiotic composition of streams in these areas. Regional structuring of macroinvertebrate communities was less pronounced among assemblage groups 5, 7, 8, 10, and 11. Samples from these groups were scattered among the mountain ranges of the Southern Rockies ecoregion, the Wyoming, Salt River, and Wind River ranges of western Wyoming, and foothills along the eastern slope of the Big Horn mountains.

Predictor Variables

Fourteen predictor variables were selected that best accounted for the natural variability in taxonomic composition among the fifteen reference groups (Table 3). Those variables most important in discriminating between groups were log watershed area, log percent coarse substrate, Western High Plains and Middle Rockies West ecoregions (presence/absence), latitude, Middle Rockies Central and Northwestern Great Plains ecoregions (presence/absence) and longitude. Other factors were less important in distinguishing groups.

Predictive Model Validation

O/E values for both the calibration (x^2 = 11.82, P = 0.06) and validation (x^2 = 2.08, P = 0.35) datasets were normally distributed (Figures 3 and 4). Predicted values of E were similar to values of O for both calibration (r^2 = 0.70, P = 0.74) and validation (r^2 = 0.69, P = 0.06) datasets (Figures 5 and 6). The mean and standard deviation of calibration O/E scores were 1.01 and 0.174, respectively (Table 4). The mean and standard deviation for validation O/E values were similar to calibration values, 0.98 and 0.152, respectively (Table 4). Mean O/E values for calibration and validation datasets were not significantly different from one another (t = 0.789, P = 0.43) (Figure 7). There was no evidence that calibration O/E values varied among classification groups (F = 1.391, P = 0.165), indicating the model was unbiased and predicted similarly among reference groups (Table 5). In contrast, calibration O/E scores were significantly different (F = 2.527, P = 0.02) among ecoregion/sub-regions (Table 6). The Tukey multiple comparison test showed that calibration O/E values were significantly lower in the Western High Plains (mean = 0.90) relative to the other regions, implying that reference sites were of lower quality in this ecoregion than elsewhere. Mean calibration O/E scores among landscape types (i.e., mountains, foothills, and plains) were similar (F = 0.269, P = 0.77) (Table 6). The standard deviation of calibration O/E values (0.174) was only slightly greater than the replicate-sample standard deviation of 0.140 (theoretical best model) and appreciably less than that for the null model (0.289). These results indicate that the predictive model accounted for >75% of the natural variability within the reference dataset.

O/E Scores of Reference-Test Sites

Mean O/E values for reference-test samples (0.98) were no different from that for calibration samples (Figure 7, t = 1.31, P = 0.19). Standard deviations of O/E scores for replicate reference test samples ranged from 0.001 to 0.435 (Table 7).

O/E Scores of Test Sites

Mean test site O/E values (0.73) were significantly lower than calibration O/E scores (t = 11.95, P = <0.001) (Figure 8). Mean O/E values (0.53) for known degraded test sites from the 1993-1999 record were significantly lower than mean values (1.00) for calibration sites (t = 11.73, P = <0.001) (Figure 8). Mean test sample O/E scores varied by 0.2 O/E units among ecoregion/sub-regions (F = 6.43, P = <0.001, Table 6). Test site O/E scores were significantly greater in the mountainous sub-regions of the Middle Rockies West and Middle Rockies Central than those from the Middle Rockies East, Southern Rockies and basin and plains regions (Table 6). Mean test site O/E values varied less markedly among landscape types (0.14 O/E units) than ecoregions, but mean values from streams in plains landscapes (0.72) were significantly lower (F = 15.22, P < 0.001) than those from mountain (0.86) and foothill (0.81) regions (Table 6). One hundred and twenty (16.6%) of the 722 reference-test and test samples fell outside the experience of the model (Appendix B) and could not be assessed.

Summary of Individual Taxa Responses

The 239 OTUs that occurred in the test site samples varied markedly in their response to environmental alterations at test sites. Thirty-one percent (74) of these taxa were found at more sites than predicted and were considered increaser or tolerant taxa (Table 8). Over one-half of the Chironomidae and the majority of the Oligochaeta within the test site dataset were increaser taxa. The majority of taxa (43% or 103 taxa) within the test site dataset were considered un-responsive to anthropogenic stress while 19% (46) were found at fewer sites than predicted and were considered to be decreaser or intolerant taxa (Table 8). Decreaser taxa were primarily associated with the Ephemeroptera, Plecoptera, Trichoptera, Diptera, and Coleoptera groups. Sixteen or 7% of taxa occurred too infrequently in the dataset to infer their response to anthropogenic stress.

DISCUSSION

Benthic macroinvertebrates are a particularly effective indicator of the condition of lotic systems and are thus commonly used in bioassessments of water-quality conditions (Barbour et al. 1999, Plafkin et al. 1989). The diversity and abundances of benthic macroinvertebrates are derived from complex interrelationships with the physical, chemical, and biotic attributes (i.e., competition, predation, etc.) of their environment (Plafkin et al. 1989). Lotic habitats that contain similar macroinvertebrate communities can be described in terms of assemblages, which reflect the influence of broad, and to some extent local-scale abiotic and biotic processes that structure benthic fauna. In Wyoming, fifteen biotically-defined assemblage groups were identified from the reference dataset. The diversity in macroinvertebrate assemblages in Wyoming is structured in large part by the high environmental heterogeneity within the state which our model largely captured through the use of 14 predictor variables.

In our model, the strongest predictor variables were those that described the substrate composition of the streambed (percent coarse substrate) and the area of the drainage basin upstream from a sample location. These results are consistent with observations by Minshall (1984) who concluded that substrate type is a major determinant in the distribution and abundance of aquatic insects and Vannote et al. (1980) whose conceptual model predicts that stream macroinvertebrate assemblages should exhibit strong adjustments to changes in geomorphic, physical, and chemical factors with distance downstream and a corresponding increase in watershed area. The significance of the ecoregion/sub-ecoregion predictors indicate that differences in the stream macroinvertebrate assemblages in Wyoming are tied to the broad-scale abiotic and biotic patterns acting upon streams which may include steam geomorphology, vegetation, climate, soils and hydrology. The use of latitude, longitude, and elevation by the model imply that temperature has a primary role in the structuring of aquatic assemblages (Vannote and Sweeny 1980, Hawkins et al. 1997, 2000). The selection of several geology related predictors and alkalinity demonstrates that geologic setting probably has a strong effect on invertebrate distributions by affecting both physical and chemical aspects of the stream environments. Old gneiss bedrock (Ugn) geology appears to be particularly important, a formation that is common in some mountain ranges of northwestern and northcentral Wyoming.

Model Performance

In general, the Wyoming predictive model was accurate and precise enough to detect modest degradation. However, a small amount of systematic bias occurred associated with ecoregion setting (Table 7). For such a systematic bias to occur, the model had to over-predict for some streams and under-predict for others. We cannot explain this bias at this time, but because the model is statistical in nature, the average O/E value for calibration samples must be approximately one, and any errors of under-prediction will be balanced by errors of over-prediction. The over-prediction that occurred in the Western High Plains may simply be associated with the inadequate representation of reference sites (low number) and their lower overall quality (least disturbed versus minimally disturbed in most other regions) in this ecoregion.

Model Validation

The mean and standard deviation in O/E values of our calibration and validation datasets was similar. Sites in our validation dataset that we determined reference quality received high O/E values while those sites subjected to intense human perturbations attained low O/E values. Because the validation dataset was not used in any phase of model development, these results are strong evidence that our model accurately predicts biological condition for new datasets. These results also indicate that there is no strong evidence to suggest that the model is overfit. In other words, the model is not so 'specific' to the calibration dataset that it reproduces random 'noise' variations of the calibration dataset as biological predictions for new observations, thereby leading to inaccurate and perhaps biased results.

Temporal Variability

Ideally, a RIVPACS model should be able to effectively account for biotic and environmental variation both spatially and temporally (Hawkins et al. 2000). Temporal variability in both the diversity and abundance of macroinvertebrate assemblages are associated not only with life history traits such as timing of emergence and dispersal, but also natural variation in environmental variables. In addition, temporal variation in measurement and sampling error may become manifest as variation in O/E values. Examination of the O/E scores among multiple samples for individual reference sites (reference-test samples) indicated that biological condition was relatively consistent through time with a low overall average CV of 12%. We can infer from these results that the Wyoming model was reasonably robust temporally in light of inter-annual changes in macroinvertebrate communities, environmental factors, and crew sampling efficiencies.

Test Site Assessments

Because the model was able to predict invertebrate composition, and hence richness, across a broad range of naturally differing stream conditions, any deviation between observed and predicted assemblages beyond model error should be associated with biological degradation of a site associated with either habitat alteration or direct toxicity of pollutants. Test sites with high O/E scores were primarily distributed among Wyoming's mountainous regions where the potential for human disturbance is minimal due to rough terrain and the limited number of population centers. Areas with high densities of test sites with appreciably low O/E scores were confined to the mountains of southeast Wyoming and the plains and basin regions, particularly in southwest, central, and northeast Wyoming. Predominant human activities which have the potential to either directly or indirectly alter the biota of stream ecosystems in these areas include hydrologic modifications, point and non-point source pollutants, and stream alterations such as channelization, excessive aggradation or degradation of sediment in the stream channel, and urbanization.

Although output from our model indicates the majority of test sites are receiving some degree of anthropogenic influence, the mean O/E score for test sites (0.73) suggests that on a statewide scale, 27% of the biota expected in a sample have been lost. Further evaluation of these scores reveals that on average, test sites within the plains landscapes exhibited significantly lower O/E scores than in the mountain and foothill landscapes. In fact, the mean O/E score for test sites in the plains was 0.72, implying that (for the period of record) streams in the plains are experiencing noticeable biological degradation. This comes as no surprise since the majority of human development (and their influences on aquatic systems) and the major population centers of Wyoming occur in low-land grassland and sagebrush steppe environments. Conversely, the mean test site O/E scores in the mountainous (0.86) and foothill (0.81) landscapes of Wyoming were much greater, though still suggested that respectively, 14% and 19% of the biota expected in a sample was not present. Collectively, these findings suggest (on a statewide scale) differing levels of biological degradation within Wyoming. However, biological condition at many of these sites may have improved since the original sample due to implementation of best management practices, pollutant removal, and/or broad scale watershed improvement projects. It is recommended that repeat samples be conducted at these biologically degraded sites to characterize their current biological condition.

Individual Taxa Responses

When we summarized model output on a taxon-by-taxon basis across test sites, it was apparent that some taxa were more sensitive than others to the changes that have occurred to stream ecosystems in Wyoming. Moreover, our results were consistent with previous observations regarding the sensitivities of stream invertebrate taxa to stressors. Decreaser taxa in our study are known to be intolerant to anthropogenic stressors (e.g., the nemourid stoneflies *Zapada*, *Prostoia*, and *Malenka*; the perlid stoneflies *Claassenia*, *Doroneuria*, and *Hesperoperla;* rhyacophilid (*Rhyacophila*) caddisflies, and numerous cold-water adapted mayflies (Ephemeroptera)). Increaser taxa were also consistent with previous observations and typically included many non-insects (oligochaetes, amphipods and gastropods), hydropsychid caddisflies (*Hydropsyche* and *Cheumatopsyche*), odonates, and numerous chironomids. These taxa response summaries provide an additional line of evidence that the model made ecological meaningful predictions.

Model Limitations

The inability of our model to effectively predict biological condition at all test sites was associated with two primary factors: 1) a limited representation of reference quality streams in certain regions and 2) all potentially relevant environmental predictor variables were not included in the model. Reference sites offer the basis for the development of reference conditions that allow for comparisons and detection of anthropogenic stressors on the aquatic community (Gibson et al. 1996 and Barbour et al. 1999). Because a reference site network forms the basis for the development of predictive bioassessment models, poor or incomplete representation of the reference conditions for streams in particular regions will result in data gaps in the range of conditions covered by the model. Because we did not allow the model to extrapolate beyond the range of conditions represented by the reference sites, we could not assess several streams. The majority of our test sites that fell outside the model's experience were geographically confined to four regions of the state: the Bear River basin, lower Big Horn River basin, eastern foothills of the Bighorn Mountains, and the Salt Creek watershed (Figure 9). The reason several test sites in the Bear River and lower Big Horn River basins fell outside the experience of the model appeared to be related to the fact that nearly all reference sites in these regions occurred at high elevation, mountainous regions, whereas many test sites occurred at lower elevations in lowland/foothill regions. Successful predictions occurred at test sites in mountainous regions of these watersheds.

In regions where suitable reference sites are not available due to wide-spread significant alterations to stream habitat and hydrologic regime, the applicability of a predictive model may also be limited. This explanation may account for the inability of our model to effectively predict at most test sites within the Salt Creek watershed of northeastern Wyoming. Over a century of mineral development has altered the lotic ecology of streams in this watershed, transforming what were once ephemeral to intermittent drainages into perennial systems fed almost exclusively by production water. From a practical standpoint, effluent dominated or dependent streams are currently at or near their biotic potential and thus can really only be compared to themselves. This essentially means that the model may under-predict on effluent dependent or dominated streams where surrounding reference sites do not reflect the true biotic potential of these systems.

A number of test sites along the eastern slope of the Bighorn Mountains in north-central Wyoming also fell outside the experience of the model. This may be due, in part, to longitudinal effects on macronvertebrate assemblages of these systems that are not adequately reflected in the model. Longitudinal changes in the diversity and abundance of macroinvertebrate communities in these streams are apparent as the streams flow eastward onto the plains from their headwaters in the Bighorn

Mountains. The benthic fauna as well as the environmental conditions within the middle reaches of these streams do not possess distinct associations with either montane or plains environments but may be best described as a transitional. Minimally disturbed and least-impacted reference sites that describe the transitional reaches of these streams are limited in number, due primarily to the extensive anthropogenic influences within this region.

In some instances, unsuccessful model predictions at test sites in these and other regions appeared to be the result of percent coarse substrate values that fell outside the expected range of conditions predicted by the model for those sites. Many of these sites were located in plains or basin regions of the state and possessed substrates comprised entirely of sand, silt, and/or organic material. Considering that only a few of the reference samples used in the development of this model possessed fine sediment dominated substrates, its likely that inadequate representation of these systems would ultimately translate to unsuccessful model predictions for samples collected from these streams. This inherent limitation in the model can only be fixed by inclusion of additional reference sites that expand the range of coverage for those predictor variables.

It is also possible that human activities at some locations, has resulted in excessive sedimentation that altered the percent of naturally occurring coarse substrates beyond that occurring at reference sites. In such a case, if the model were allowed to make a prediction, it would predict a fauna more associated with altered conditions than natural ones. At sites where excessive sedimentation may be a concern, additional data should be used to evaluate the validity of the O/E values obtained. However, based on all available information, we believe that many streams that fell outside the model experience due to fine sediment dominated substrates appears to be a natural condition. The ultimate implication of this finding is that future revisions of the model should avoid the use of percent substrate predictors.

Although we thoroughly examined the suite of environmental variables in our dataset to ultimately choose the fourteen predictor variables that effectively discriminated among all reference groups, those variables did not account for 100% of the natural variability within the reference dataset. Clarke et al. (1996) suggested that errors in the predictive capability of a RIVPACS model may be the result of not including all necessary environmental variables to effectively discriminate among reference and test sites. We believe that environmental variables such as aspect, channel gradient, percent of human-altered environments in watershed catchments, and parameters derived from climatological and channel morphological data, may prove to be useful predictors and enhance the accuracy, precision, and spatial applicability in future revisions of our predictive model.

Though several test samples in the aforementioned regions of Wyoming fell outside the model's experience, the model interpolated O/E values based on the available information. These values may adequately summarize the biological condition at sample sites, however, because they fell outside the experience of the model, application of the results to natural resource management should be used for evaluative purposes only.

Comparability to other Models

Several unpublished RIVPACS-type models have been developed for several regions in the United States which include North Carolina, Ohio, Maine, the Cascade and coastal regions of Oregon, and the northeastern Mid-Atlantic Highlands region (C.P. Hawkins, personal communications). Attempts at constructing predictive models for these regions have resulted in varying levels of success. Model errors have varied widely with some of the more successful attempts possessing errors of 0.18 or less. Considering that our model had to explain the natural variability attributed to the broad environmental heterogeneity of the State of Wyoming, our model error of 0.174 is comparable to other successful applications of RIVPACS-type models in the United States. Some of the more successful predictive models used fewer predictor variables than in the Wyoming model. For regions with minimal environmental hetereogeneity, a small number of predictor variables may adequately capture the naturally occurring biotic variation among sites. Our use of fourteen variables in the Wyoming model may seem high compared to these other models, but they were apparently necessary because of Wyoming's topographic, geologic, and climatic diversity.

Assessment of Biological Condition using Narrative Criteria

Under the authority of the federal Clean Water Act and the oversight and direction of the United States Environmental Protection Agency (USEPA), the Wyoming Department of Environmental Quality (WDEQ) is the entity responsible for restoring and maintaining the chemical, physical, and biological integrity of waters within the State of Wyoming. Evaluating the biological integrity of waters in Wyoming is based, in part, on the attainment of a designated aquatic life use as defined in state water quality standards (WDEQ/WQD, 2001). With respect to this model and its application in Wyoming, there are three categories of attainment status: 'full', 'indeterminate', and 'partial/non support'. The RIVPACS-type model for Wyoming is one of several tools available to resource managers to evaluate the aquatic life use support status of streams in Wyoming. However, when evaluating output from our model, it is necessary to first define what O/E scores constitute 'full', 'indeterminate', or 'partial/non-support' status of aquatic life use. While there are likely several methods to developing these biological narrative thresholds, the conventional statistical approach has been to use the mean and standard deviation (model error) of reference sample O/E scores. For our model, the 'full-support' narrative threshold is based on one standard deviation from the reference sample mean or an O/E score of 0.836. Setting the threshold at this score functions to minimize false-positive assignments of 'full-support' to known disturbed sites while also allowing most reference sites with lower O/E scores to maintain a 'full-support' status. 53% of 1993-2001 samples received a 'full-support' status. O/E scores between 0.662 and 0.836 would tentatively fall into the 'indeterminate' category. The 'indeterminate' status is technically not an attainment category in itself but is rather a designation which would require the use of ancillary information and/or additional data in the decision on a proper narrative assignment. (i.e., full or partial/non-support). 20% of 1993-2001 samples were assigned an 'indeterminate' narrative rating. Samples with O/E scores less than two standard deviations from the mean, or an O/E score of 0.662, would be assigned a 'partial/non-support' condition which would indicate anthropogenic perturbations are occurring at and/or upstream of the sample location. Under these narrative criteria, 27% of 1993-2001 samples were classified as 'partial/non-supportive' for stream biological condition. Samples with a 'partial/non-supportive' narrative rating are dispersed throughout Wyoming, though are typically found in the plains and basin regions (Figure 10). In special circumstances the 'disturbance' may in fact be the result of localized environmental heterogeneity that is not fully represented in the existing model. However, based on a review of the site O/E scores, ancillary information, and local knowledge, we believe that these special circumstances are minimal within the 1993-2001 dataset. For those special circumstances where a 'partial/non-support' status may not be warranted, additional site visits and supporting information is recommended to evaluate the degree of anthropogenic disturbance versus natural conditions.

Conclusions

Our model was developed with the best available reference data set that adequately explained the spatial variation in streams and their benthic macroinvertebrate communities across Wyoming. Validation revealed that our model is both accurate and reasonably precise and was able to effectively predict biological condition at stream sites of known condition and in response to anthropogenic stressors. It is believed that these results indicate our predictive model is a useful tool in the assessment of biological condition of perennial wadeable streams in Wyoming. Use of this model to assess biological condition on ephemeral and intermittent streams or extremely low-gradient lentic-type streams should not be performed since the model was specifically developed to evaluate biological condition of perennial lotic systems. Application of this model to large river systems may also not be appropriate since the model was developed for wadeable streams. Although we advocate the use of our model in the determination of aquatic life use support as well as the evaluation of best management projects that rehabilitate the aquatic biota of streams in Wyoming, we realize that future modifications are needed to enhance its spatial applicability. We believe that this issue can be addressed through a concerted effort to identify minimally influenced reference stream segments in regions of Wyoming where they are limited or absent, the examination of additional environmental variables that may help to further explain the heterogeneity of stream ecosystems in Wyoming, and implementation of new and innovative analytical procedures to assist in selecting the best subset of predictor variables.

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Table 1 - Mean and range of values for selected environmental variables for reference and test samples.

	*Reference (N=296)		Test (N=629)	
	Mean	Range	Mean	Range
Julian sample date	266.7	217-305	267.5	92-305
Alkalinity (mg/L)	104.5	10-310	158.9	5-1630
Conductivity (uS/cm)	312.5	23-2420	838.6	8-21700
Hardness as CaCO3 (mg/L)	157.2	8-1455	276.7	11-2680
Sulfate (mg/L)	81.5	9-2037	257.7	10-8678
Elevation (m)	2031	1091-2798	1834	1024-2930
pH	8	6-9	8	5-10.8
Chloride (mg/L)	6.5	<5-89	53.3	<5-6685
Turbidity (NTU)	2.9	<0.1-58.2	7.6	0-425
Nitrate-Nitrogen (mg/L)	0.2	<0.1-4.5	0.2	<0.1-12.8
Total Phosphorous (mg/L)	<0.1	<0.1-0.3	0.1	<0.1-4.0
Water temperature (°C)	9.6	2.1-19	10.5	0-37.5
Watershed area (km^2)	450.1	0.8-7620	771.6	0.8-11103
Percent located in the foothills	26.1	-	23.9	-
Percent located in the mountains	54.8	-	35.1	-
Percent located in the plains	19.1	-	41	-
Percent coarse gravel	15.8	0-78	19.3	0-91
Percent cobble	58.4	0-95	45.1	0-95
Percent fine gravel	11.6	0-59	16.9	0-83
Percent sand	10.1	0-98	11.8	0-100
Percent silt	3.6	0-99	5.2	0-100
Percent clay	0.6	0-46	1.4	0-84
Percent coarse substrate	85.8	0-100	81.3	0-100
Percent fine substrate	14.3	0-100	18.4	0-100
Velocity (m/s)	0.5	0.1-1.0	0.5	0.5-3.3
Discharge (m^3/s)	1.2	<0.1-14.2	1.2	<0.1-531

* Includes calibration, validation, and reference-test samples

Table 2 – Reference and test samples by ecoregion and sub-region.

	Reference (N=157) Calibration Dataset		Reference-test (N=93)		Reference (N=46) Validation Dataset		Test (N=629)	
	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
Middle Rockies Central (MRC)	33	21	27	29	9	20	123	20
Middle Rockies East (MRE)	9	6	6	6	5	11	16	3
Middle Rockies West (MRW)	57	36	38	41	13	28	104	17
Southern Rockies (SR)	28	18	9	10	7	15	21	3
Northwestern Great Plains (NGP)	10	6	3	3	0	0	184	28
Western High Plains (WHP)	6	4	0	0	2	4	30	5
Wyoming Basin (WB)	14	9	10	11	10	22	151	24

Table 3 - Predictor variables (with corresponding F values) used in the discriminant model.

log Watershed Area	8.85
log Percent Coarse Substrate	6.01
Western High Plains (WHP)	6.00
Middle Rockies West (MRW)	4.98
Latitude	4.80
Middle Rockies Central (MRC)	4.54
Northwestern Great Plains (NGP)	3.35
Longitude	3.03
Geological Chemical Activity (Majority in watershed)	2.37
Old Gneiss Bedrock Geology (UGN)	2.17
log Alkalinity	2.10
log Elevation	1.92
Middle Rockies East (MRE)	1.79
Geological Nutrient Activity (Majority in watershed)	1.39

Table 4 - Means, standard deviations (SD), percentiles, and minimum and maximum O/E scores for reference and test samples. Includes only reference-test and test samples that were within the experience of the model.

	Mean	SD	10th	25th	75th	90th	Min	Max
Reference Calibration (N=157)	1.01	0.174	0.75	0.90	1.13	1.21	0.50	1.44
Reference Validation (N=46)	0.98	0.152	0.79	0.89	1.06	1.16	0.60	1.30
Reference Test (N=93)	0.98	0.187	0.74	0.88	1.12	1.19	0.41	1.37
Test (N=609)	0.73	0.272	0.33	0.55	0.93	1.08	0.07	1.29

Table 5 - Mean and standard deviation (SD) of reference calibration O/E scores by reference group.

Reference Group	Mean	SD
1 (N=6)	0.96	0.22
2 (N=11)	0.98	0.19
3 (N=9)	0.99	0.17
4 (N=7)	0.95	0.16
5 (N=9)	1.07	0.08
6 (N=11)	1.03	0.18
7 (N=5)	1.03	0.29
8 (N=16)	1.12	0.16
9 (N=6)	1.11	0.13
10 (N=18)	1.02	0.10
11 (N=17)	1.04	0.18
12 (N=9)	0.97	0.14
13 (N=16)	0.93	0.20
14 (N=9)	0.91	0.21
15 (N=8)	1.03	0.16

ANOVA between reference groups: $F = 1.391$; $P = 0.165$

Table 6 - Means, p-values, and F-values for comparisons between ecoregion/sub-region and landscape types for both reference calibration and test samples. Capitol letters denote homogeneous groups as determined from the Tukey multiple comparison test.

	Landscape					Ecoregion / Sub-region								
	Mountains	Foothills	Plains	F	P	MRC	MRE	MRW	SR	WB	NGP	WHP	F	P
Reference calibration	1.02	1.00	1.00	0.269	0.770	0.93	1.00	1.05	1.04	0.99	1.08	0.90	2.527	*0.020*
	A	A	A	-	-	A	A	A	A	A	A	B	-	-
Test	0.86	0.81	0.72	15.22	*<0.001*	0.83	0.77	0.89	0.70	0.70	0.76	0.72	6.43	*<0.001*
	A	A	B	-	-	A	B	A	B	B	B	B	-	-

MRC = Middle Rockies Central, MRE = Middle Rockies East, MRW = Middle Rockies West, SR = Southern Rockies, NGP = Northw estern Great Plains, WHP = Western High Plains

Table 7 - Mean, standard deviation (SD), and coefficient of variation (CV) of O/E scores for reference-test samples. Samples that fell outside the experience of the model are not included in the calculations.

Station ID	Waterbody Name	N	Mean	SD	CV
MRC18	LITTLE BIGHORN RIVER	7	0.674	0.138	20.460
MRC22	NORTH TONGUE RIVER-HIDEOUT	2	0.951	0.001	0.147
MRC23	SOUTH TONGUE EIVER	3	1.083	0.100	9.250
MRC24	TONGUE RIVER	7	0.959	0.073	7.606
MRC25	CLEAR CREEK	2	0.973	0.195	20.053
MRC26	NORTH FORK CRAZY WOMAN CREEK-UPPER	8	0.888	0.183	20.655
MRC38	LITTLE GOOSE CREEK	2	0.889	0.058	6.509
MRC6	MIDDLE FORK POWDER RIVER-LOWER CANYON	2	1.024	0.042	4.063
MRCI19	HUNTER CREEK-UPPER	3	0.698	0.087	12.409
MRE1	WHITELAW CREEK	7	1.063	0.182	17.095
MRW1	CACHE CREEK-LOWER USGS STREAM GAGE	7	1.019	0.139	13.633
MRW17	ROARING FORK	4	1.088	0.082	7.568
MRW18	CROW CREEK	7	1.100	0.152	13.821
MRW3	SNAKE RIVER-FLAGG RANCH	7	0.970	0.117	12.070
MRW45	MIDDLE CREEK	7	0.980	0.110	20.367
MRW47	LITTLE POPO AGIE RIVER-RED CANYON	2	1.193	0.157	13.204
MRW56	WEST FORK SMITHS FORK	3	1.050	0.119	11.334
MRW67	GRINNEL CREEK-ABOVE	2	1.149	0.197	17.165
MRW68	LIBBY CREEK-ABOVE	2	1.029	0.001	0.052
MRW69	MORMON CREEK-ABOVE	2	1.111	0.112	10.117
MRW70	NORTH FORK SHOSHONE RIVER-SITE 2 ABOVE	2	0.996	0.008	0.796
MRW71	MIDDLE FORK SHOSHONE RIVER-ABOVE	2	0.953	0.435	45.654
MRW72	CLOCKTOWER CREEK-ABOVE	2	0.802	0.268	33.435
MRW73	ELK FORK CREEK-ABOVE	2	1.161	0.048	4.121
MRWI6	MIDDLE FORK SHOSHONE RIVER-BELOW	2	1.178	0.001	0.113
NGPI24	TONGUE RIVER-KLEENBURN	2	1.056	0.079	7.444
SR15	ENCAMPMENT RIVER-WILDERNESS	4	1.054	0.130	12.294
SR16	NORTH FORK LITTLE SNAKE RIVER	4	1.050	0.075	7.105
SR3	ROCK CREEK	4	0.893	0.085	9.532
WB23	FONTENELLE CREEK-LOWER	4	1.023	0.167	16.333
WB28	NEW FORK RIVER-BULL PASTURE	4	1.126	0.069	6.088
WB3	LITTLE LARAMIE RIVER	4	1.020	0.033	3.270
				Mean	11.993

Table 8 - Taxa response summary. Note that ratios for taxa with both low expected and observed values may be unreliable estimations of their sensitivity.

Taxa Group	Operational Taxonomic Unit	Mean Probability of Capture	Number of Sites Expected	Numberof Sites Observed	Sensitivity Index
Amphipoda	*Hyalella azteca*	0.125	62.556	40	0.639
Chironomidae	*Synorthocladius*	0.056	27.889	18	0.645
Plecoptera	*Malenka*	0.037	18.428	12	0.651
Coleoptera	*Narpus*	0.021	10.673	7	0.656
Trichoptera	*Neureclipsis*	0.018	9.098	6	0.659
Plecoptera	*Claassenia sabulosa*	0.105	52.604	35	0.665
Trichoptera	*Neotrichia*	0.056	28.026	19	0.678
Diptera	Blephariceridae	0.027	13.230	9	0.680
Plecoptera	*Doroneuria*	0.128	63.911	44	0.688
Diptera	*Hesperoconopa*	0.028	14.151	10	0.707
Oligochaeta	*Pristina*	0.054	26.809	19	0.709
Trichoptera	*Hesperophylax*	0.073	36.240	26	0.717
Diptera	*Dixella*	0.003	1.394	1	0.718
Diptera	*Ormosia*	0.003	1.394	1	0.718
Ephemeroptera	*Drunella coloradensis/flavilinea*	0.204	101.596	73	0.719
Trichoptera	*Micrasema*	0.342	170.799	124	0.726
Ephemeroptera	*Cinygmula*	0.479	239.087	174	0.728
Trichoptera	*Oligophlebodes*	0.269	134.277	99	0.737
Prosobranchia	Hydrobiidae	0.011	5.388	4	0.742
Trichoptera	*Nectopsyche*	0.086	42.879	32	0.746
Coleoptera	*Lara avara*	0.011	5.337	4	0.749
Coleoptera	*Dubiraphia*	0.218	108.661	82	0.755
Plecoptera	Capniidae	0.317	158.168	120	0.759
Ephemeroptera	*Epeorus*	0.351	175.003	133	0.760
Coleoptera	Dytiscidae	0.095	47.213	36	0.762
Ephemeroptera	*Drunella doddsi*	0.451	224.888	172	0.765
Trichoptera	*Parapsyche elsis*	0.170	84.774	65	0.767
Trichoptera	*Rhyacophila angelita Gr.*	0.016	7.807	6	0.769
Trichoptera	*Arctopsyche grandis*	0.280	139.751	108	0.773
Plecoptera	*Isoperla*	0.466	232.359	180	0.775
Ephemeroptera	*Caudatella*	0.039	19.314	15	0.777
Trichoptera	*Glossosoma*	0.356	177.870	139	0.781
Ephemeroptera	*Ameletus*	0.295	147.110	116	0.789
Plecoptera	*Pteronarcella*	0.207	103.532	82	0.792
Bivalvia	Sphaeriidae	0.316	157.679	125	0.793
Trichoptera	*Neothremma*	0.116	57.884	46	0.795
Ephemeroptera	*Rhithrogena*	0.637	317.872	253	0.796
Chironomidae	*Sublettea*	0.043	21.307	17	0.798
Plecoptera	Chloroperlidae	0.652	325.375	260	0.799
Diptera	*Atherix*	0.171	85.336	69	0.809
Plecoptera	*Megarcys*	0.136	67.947	55	0.809
Plecoptera	Leuctridae	0.022	11.016	9	0.817
Pulmonata	*Fluminicola*	0.015	7.338	6	0.818
Diptera	*Ptychoptera*	0.027	13.392	11	0.821
Chironomidae	*Cardiocladius*	0.054	26.716	22	0.823
Trichoptera	*Rhyacophila brunnea Gr.*	0.308	153.804	127	0.826
Plecoptera	*Zapada oregonensis Gr.*	0.208	103.887	86	0.828
Ephemeroptera	*Caenis*	0.068	33.819	28	0.828
Coleoptera	*Cleptelmis*	0.197	98.343	82	0.834
Ephemeroptera	*Paraleptophlebia*	0.440	219.662	184	0.838
Trichoptera	*Psychomyia*	0.079	39.261	33	0.841
Coleoptera	*Heterlimnius*	0.302	150.769	127	0.842
Trichoptera	*Agraylea*	0.028	14.208	12	0.845

Table 8 (cont.) - Taxa response summary. Note that ratios for taxa with both low expected and observed values may be unreliable estimations of their sensitivity.

Taxa Group	Operational Taxonomic Unit	Mean Probability of Capture	Number of Sites Expected	Numberof Sites Observed	Sensitivity Index
Plecoptera	*Hesperoperla*	0.250	124.802	107	0.857
Coleoptera	*Zaitzevia*	0.353	176.171	152	0.863
Diptera	*Hemerodromia*	0.130	64.693	56	0.866
Oligochaeta	*Ophidonais serpentina*	0.148	73.827	64	0.867
Chironomidae	*Symposiocladius*	0.005	2.295	2	0.871
Diptera	*Glutops*	0.011	5.724	5	0.873
Chironomidae	*Pagastia*	0.270	134.783	118	0.875
Chironomidae	*Eukiefferiella*	0.471	235.166	206	0.876
Coleoptera	*Haliplus*	0.018	9.098	8	0.879
Ephemeroptera	*Baetis*	0.948	472.885	417	0.882
Plecoptera	*Isogenoides*	0.022	11.199	10	0.893
Trichoptera	*Lepidostoma*	0.363	181.122	163	0.900
Turbellaria	Turbellaria	0.263	131.108	119	0.908
Chironomidae	*Parakiefferiella*	0.075	37.388	34	0.909
Chironomidae	*Rheocricotopus*	0.086	42.883	39	0.909
Gastropoda	Planorbidae	0.028	14.061	13	0.925
Chironomidae	*Lopescladius*	0.039	19.322	18	0.932
Ephemeroptera	*Serratella tibialis*	0.135	67.401	63	0.935
Plecoptera	*Zapada columbiana*	0.055	27.644	26	0.941
Coleoptera	*Optioservus*	0.550	274.248	261	0.952
Plecoptera	*Zapada cinctipes*	0.419	209.289	201	0.960
Trichoptera	*Helicopsyche*	0.173	86.272	83	0.962
Trichoptera	*Oecetis*	0.211	105.308	102	0.969
Plecoptera	*Pteronarcys*	0.037	18.471	18	0.974
Chironomidae	*Thienemanniella*	0.096	47.964	47	0.980
Trichoptera	*Cheumatopsyche*	0.302	150.754	148	0.982
Trichoptera	*Brachycentrus occidentalis*	0.276	137.482	136	0.989
Oligochaeta	Enchytraeidae	0.200	99.758	99	0.992
Chironomidae	*Chaetocladius*	0.060	30.184	30	0.994
Trichoptera	*Chimarra*	0.032	15.917	16	1.005
Oligochaeta	Lumbriculidae	0.088	43.728	44	1.006
Ephemeroptera	*Ephemerella*	0.549	273.779	276	1.008
Ephemeroptera	*Drunella grandis/spinifera*	0.367	183.351	186	1.014
Nematoda	*Nematoda*	0.225	112.310	114	1.015
Diptera	Simulidae	0.554	276.394	281	1.017
Gastropoda	*Physella*	0.193	96.324	98	1.017
Plecoptera	*Skwala*	0.183	91.289	93	1.019
Chironomidae	*Brillia*	0.066	33.039	34	1.029
Trichoptera	*Hydropsyche*	0.589	294.068	303	1.030
Hirudinea	*Helobdella stagnalis*	0.017	8.732	9	1.031
Diptera	*Hexatoma*	0.373	186.021	192	1.032
Trichoptera	*Rhyacophila hyalinata Gr.*	0.106	53.039	55	1.037
Plecoptera	Taeniopterygidae	0.251	125.086	130	1.039
Chironomidae	*Psilometriocnemus*	0.006	2.861	3	1.049
Acari	*Acari*	0.771	384.609	405	1.053
Ephemeroptera	*Tricorythodes*	0.334	166.657	177	1.062
Trichoptera	*Rhyacophila narvae*	0.009	4.682	5	1.068
Odonata	Gomphidae	0.107	53.302	57	1.069
Diptera	*Dicranota*	0.173	86.342	93	1.077
Diptera	*Pericoma*	0.223	111.056	120	1.081
Diptera	*Wiedemannia*	0.017	8.286	9	1.086
Diptera	*Antocha*	0.231	115.322	126	1.093
Chironomidae	*Micropsectra*	0.364	181.675	200	1.101

Table 8 (cont.) - Taxa response summary. Note that ratios for taxa with both low expected and observed values may be unreliable estimations of their sensitivity.

Taxa Group	Operational Taxonomic Unit	Mean Probability of Capture	Number of Sites Expected	Numberof Sites Observed	Sensitivity Index
Odonata	*Hetaerina*	0.036	18.196	0	0.000
Diptera	*Maruina*	0.013	6.379	0	0.000
Coleoptera	*Ordobrevia*	0.073	36.392	0	0.000
Chironomidae	*Paramerina*	0.033	16.568	1	0.060
Chironomidae	*Parachaetocladius*	0.023	11.298	1	0.089
Trichoptera	*Leucotrichia*	0.016	7.989	1	0.125
Trichoptera	*Mayatrichia*	0.015	7.338	1	0.136
Trichoptera	*Marilia*	0.023	11.591	2	0.173
Trichoptera	*Wormaldia*	0.020	9.830	2	0.203
Plecoptera	*Prostoia*	0.018	9.029	2	0.222
Oligochaeta	*Nais elinguis*	0.026	12.984	3	0.231
Chironomidae	*Endochironomus*	0.015	7.338	2	0.273
Plecoptera	*Cultus*	0.029	14.536	4	0.275
Chironomidae	*Procladius*	0.027	13.448	4	0.297
Diptera	*Deuterophlebia*	0.046	22.915	7	0.305
Coleoptera	*Helichus*	0.019	9.513	3	0.315
Chironomidae	*Limnophyes*	0.025	12.667	4	0.316
Trichoptera	*Ceraclea*	0.019	9.348	3	0.321
Trichoptera	*Ithytrichia*	0.018	9.098	3	0.330
Trichoptera	*Dicosmoecus atripes*	0.006	2.934	1	0.341
Trichoptera	*Neophylax*	0.039	19.555	7	0.358
Chironomidae	*Stempellinella*	0.044	22.193	8	0.360
Diptera	*Cryptolabis*	0.027	13.451	5	0.372
Trichoptera	*Rhyacophila vagrita Gr.*	0.016	7.986	3	0.376
Trichoptera	*Oxyethira*	0.042	21.057	8	0.380
Trichoptera	*Rhyacophila cyalinata Gr.*	0.047	23.661	9	0.380
Diptera	*Limonia*	0.015	7.338	3	0.409
Oligochaeta	*Specaria*	0.015	7.338	3	0.409
Chironomidae	*Tanytarsus*	0.093	46.402	19	0.409
Trichoptera	*Rhyacophila pellisa*	0.151	75.112	32	0.426
Odonata	*Enallagma/Ischnura*	0.086	42.917	19	0.443
Chironomidae	*Conchapelopia*	0.004	2.175	1	0.460
Chironomidae	*Nilotanypus*	0.004	2.175	1	0.460
Diptera	*Dixa*	0.042	21.097	10	0.474
Trichoptera	*Dolophilodes*	0.081	40.653	20	0.492
Chironomidae	*Euorthocladius*	0.008	3.995	2	0.501
Trichoptera	*Dicosmoecus gilvipes*	0.008	3.960	2	0.505
Chironomidae	*Stictochironomus*	0.043	21.684	11	0.507
Chironomidae	*Paraphaenocladius*	0.047	23.633	12	0.508
Diptera	Cecidomyiidae	0.004	1.943	1	0.515
Trichoptera	*Chyranda centralis*	0.008	3.781	2	0.529
Chironomidae	*Macropelopia*	0.026	13.180	7	0.531
Chironomidae	*Demicryptochironomus*	0.015	7.338	4	0.545
Ephemeroptera	*Acentrella turbida*	0.183	91.306	50	0.548
Trichoptera	*Rhyacophila coloradensis Gr.*	0.188	93.733	52	0.555
Trichoptera	*Ecclisomyia*	0.059	29.299	17	0.580
Diptera	Stratiomyiidae	0.069	34.432	20	0.581
Coleoptera	*Brychius*	0.020	10.144	6	0.591
Ephemeroptera	*Leptophlebia*	0.087	43.363	26	0.600
Trichoptera	*Rhyacophila betteni Gr.*	0.079	39.410	24	0.609
Ephemeroptera	*Diphetor hageni*	0.170	84.862	53	0.625
Trichoptera	*Apatania*	0.200	99.775	63	0.631
Gastropoda	Lymnaeidae	0.053	26.681	17	0.637

Table 8 (cont.) - Taxa response summary. Note that ratios for taxa with both low expected and observed values may be unreliable estimations of their sensitivity.

Taxa Group	Operational Taxonomic Unit	Mean Probability of Capture	Number of Sites Expected	Numberof Sites Observed	Sensitivity Index
Chironomidae	*Orthocladius*	0.702	350.275	386	1.102
Chironomidae	*Dicrotendipes*	0.042	20.786	23	1.107
Coleoptera	*Microcylloepus*	0.145	72.348	81	1.120
Chironomidae	*Tvetenia*	0.328	163.513	184	1.125
Trichoptera	*Rhyacophila iranda Gr.*	0.043	21.266	24	1.129
Trichoptera	*Brachycentrus americanus*	0.294	146.802	166	1.131
Amphipoda	*Gammarus*	0.047	23.691	27	1.140
Chironomidae	*Cricotopus*	0.524	261.701	300	1.146
Turbellaria	*Uncinais uncinata*	0.070	34.858	40	1.148
Trichoptera	*Protoptila*	0.097	48.490	56	1.155
Oligochaeta	Tubificidae	0.258	128.693	151	1.173
Chironomidae	*Diamesa*	0.152	75.938	91	1.198
Chironomidae	*Rheotanytarsus*	0.288	143.730	173	1.204
Chironomidae	*Odontomesa*	0.013	6.611	8	1.210
Diptera	Ceratopogoninae	0.144	71.996	89	1.236
Diptera	*Clinocera*	0.055	27.374	34	1.242
Lepidoptera	*Petrophila*	0.108	54.103	70	1.294
Chironomidae	*Stempellina*	0.029	14.491	19	1.311
Ephemeroptera	*Fallceon qulleri*	0.036	18.196	24	1.319
Pulmonata	*Ferrissia*	0.057	28.646	38	1.327
Chironomidae	*Heleniella*	0.007	3.689	5	1.356
Ephemeroptera	*Callibaetis*	0.004	2.175	3	1.379
Ephemeroptera	*Choroterpes*	0.041	20.371	29	1.424
Chironomidae	*Potthastia*	0.049	24.421	35	1.433
Chironomidae	*Thienemannimyia*	0.163	81.294	119	1.464
Chironomidae	*Microtendipes*	0.069	34.188	51	1.492
Chironomidae	*Paratanytarsus*	0.023	11.273	17	1.508
Megaloptera	*Sialis*	0.016	7.750	12	1.548
Chironomidae	*Parorthocladius*	0.035	17.362	27	1.555
Chironomidae	*Pseudorthocladius*	0.009	4.327	7	1.618
Diptera	*Tipula*	0.090	45.104	74	1.641
Hemiptera	*Ambrysus*	0.018	9.098	15	1.649
Ephemeroptera	*Stenonema*	0.036	18.196	30	1.649
Chironomidae	*Polypedilum*	0.131	65.222	110	1.687
Diptera	*Chelifera*	0.160	79.884	140	1.753
Chironomidae	*Pentaneura*	0.024	11.959	21	1.756
Trichoptera	*Hydroptila*	0.172	86.059	153	1.778
Coleoptera	Hydrophilidae	0.012	5.956	11	1.847
Trichoptera	*Amiocentrus aspilus*	0.021	10.482	20	1.908
Chironomidae	*Hydrobaenus*	0.057	28.452	55	1.933
Chironomidae	*Parametriocnemus*	0.049	24.454	48	1.963
Chironomidae	*Cladotanytarsus*	0.056	27.800	55	1.978
Plecoptera	*Visoka cataractae*	0.007	3.533	7	1.981
Ephemeroptera	*Timpanoga*	0.005	2.493	5	2.006
Chironomidae	*Nanocladius*	0.005	2.437	5	2.052
Diptera	*Limnophora*	0.029	14.569	31	2.128
Trichoptera	*Agapetus*	0.013	6.255	14	2.238
Ephemeroptera	*Heptagenia/Nixe*	0.072	35.773	84	2.348
Trichoptera	*Ochrotrichia*	0.033	16.650	40	2.402
Chironomidae	*Pseudodiamesa*	0.010	4.874	12	2.462
Chironomidae	*Cryptochironomus*	0.027	13.448	34	2.528
Trichoptera	*Polycentropus*	0.006	3.210	9	2.804
Oligochaeta	Lumbricidae	0.011	5.248	17	3.239

Table 8 (cont.) - Taxa response summary. Note that ratios for taxa with both low expected and observed values may be unreliable estimations of their sensitivity.

Taxa Group	Operational Taxonomic Unit	Mean Probability of Capture	Number of Sites Expected	Number of Sites Observed	Sensitivity Index
Chironomidae	*Chironomus*	0.009	4.350	15	3.448
Chironomidae	*Phaenopsectra*	0.008	3.960	17	4.293
Trichoptera	*Limnephilus*	0.015	7.617	33	4.333
Chironomidae	*Heterotrissocladius*	0.003	1.394	7	5.023
Chironomidae	*Prodiamesa*	0.003	1.394	8	5.740
Diptera	Tabanidae	0.003	1.467	10	6.816
Odonata	*Argia*	0.004	2.175	15	6.896
Ephemeroptera	*Acentrella insignificans*	0.018	9.098	68	7.474
Chironomidae	*Paratendipes*	0.003	1.394	13	9.328
Oligochaeta	*Nais communis*	0.004	2.175	21	9.654
Oligochaeta	*Nais variabilis*	0.005	2.493	46	18.455
Chironomidae	*Acricotopus*	0.000	0.000	1	999.000
Ephemeroptera	*Attenella margarita*	0.000	0.000	6	999.000
Chironomidae	*Boreoheptagyia*	0.000	0.000	1	999.000
Isopoda	*Caecidotea*	0.000	0.000	4	999.000
Ephemeroptera	*Centroptilum*	0.000	0.000	3	999.000
Oligochaeta	*Dero*	0.000	0.000	2	999.000
Chironomidae	*Glyptotendipes*	0.000	0.000	1	999.000
Oligochaeta	*Haplotaxis*	0.000	0.000	2	999.000
Hydroida	*Hydra*	0.000	0.000	5	999.000
Chironomidae	*Pseudochironomus*	0.000	0.000	16	999.000
Chironomidae	*Pseudosmittia*	0.000	0.000	7	999.000
Trichoptera	*Rhyacophila verrula*	0.000	0.000	3	999.000
Chironomidae	*Saetheria*	0.000	0.000	8	999.000
Coleoptera	*Stenelmis*	0.000	0.000	25	999.000
Chironomidae	*Tanypus*	0.000	0.000	0	999.000
Chironomidae	*Tribelos*	0.000	0.000	1	999.000

Figure 1 - Reference (solid circles) and test (open circles) sites in relation to ecoregions and sub-regions of Wyoming.

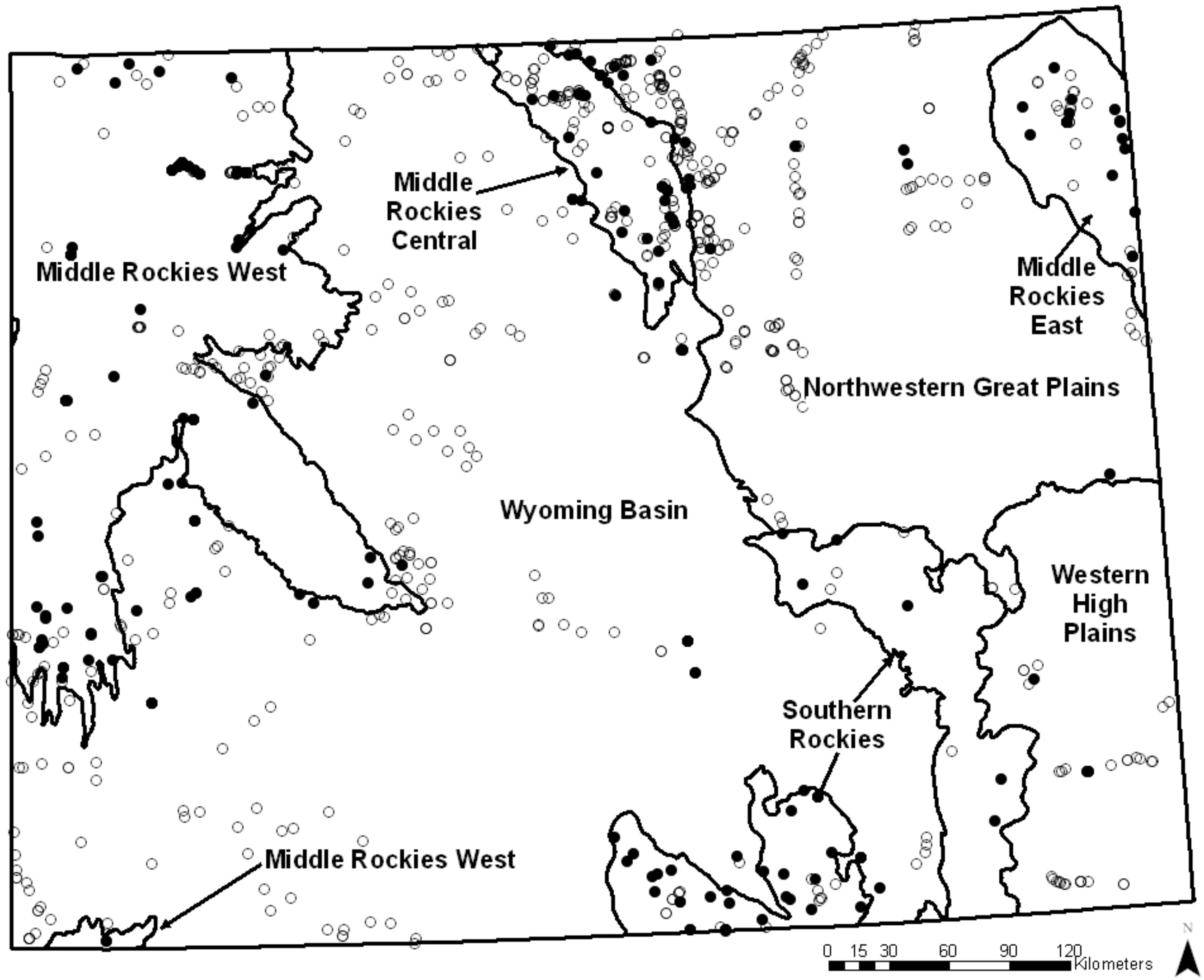


Figure 2 - UPGMA cluster analysis dendrogram that shows the fifteen biologically similar groups derived from the reference calibration dataset.

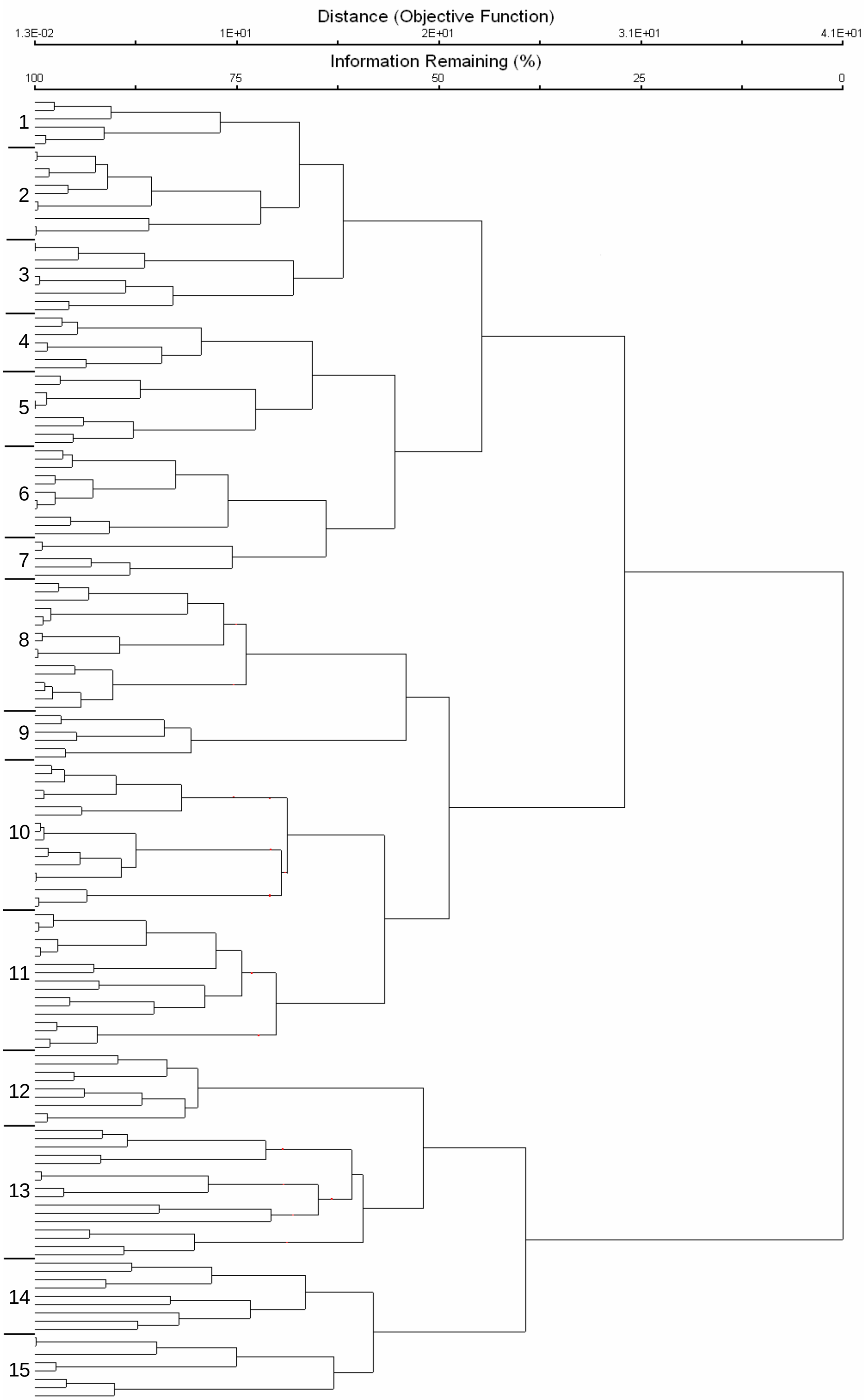


Figure 3 - Distribution of O/E scores for reference calibration samples.

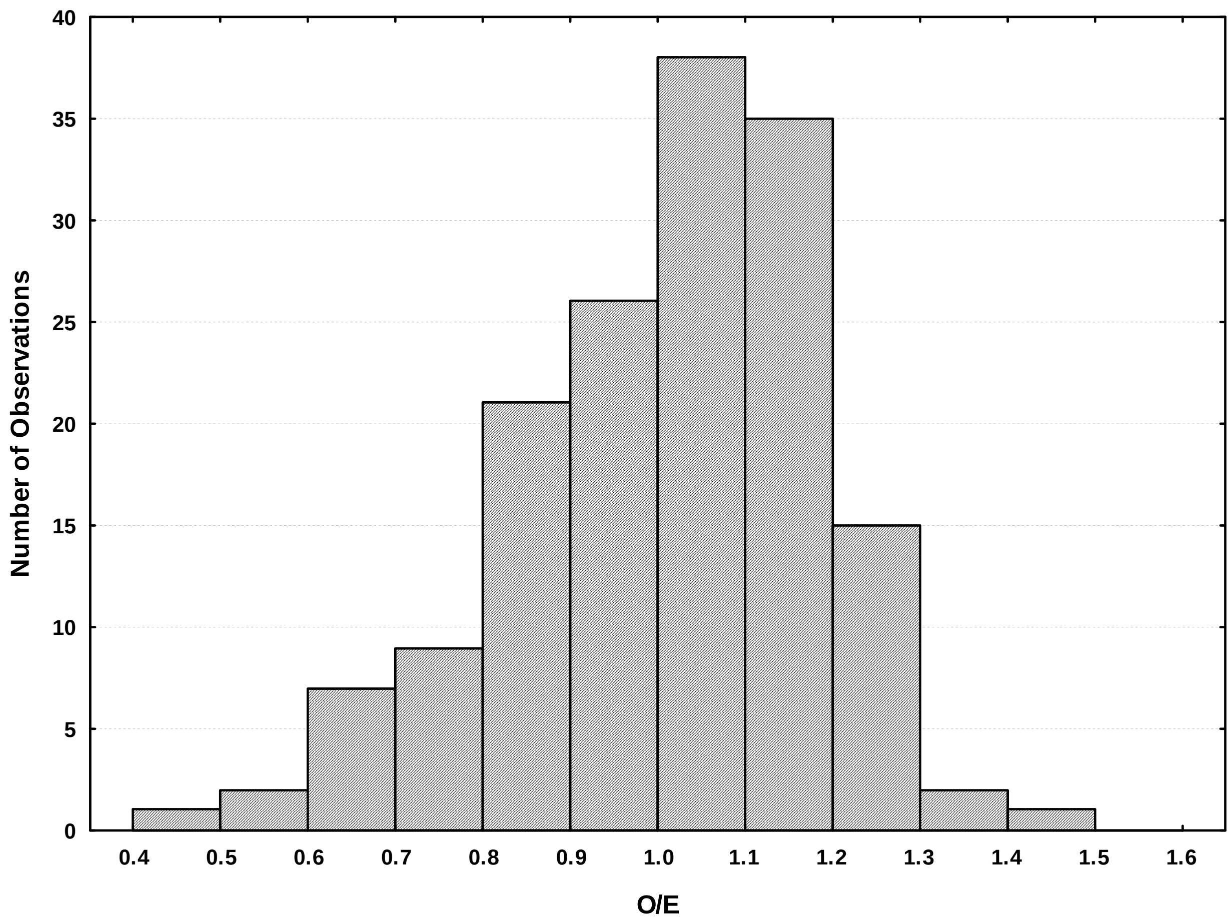


Figure 4 - Distribution of O/E scores for reference validation samples.

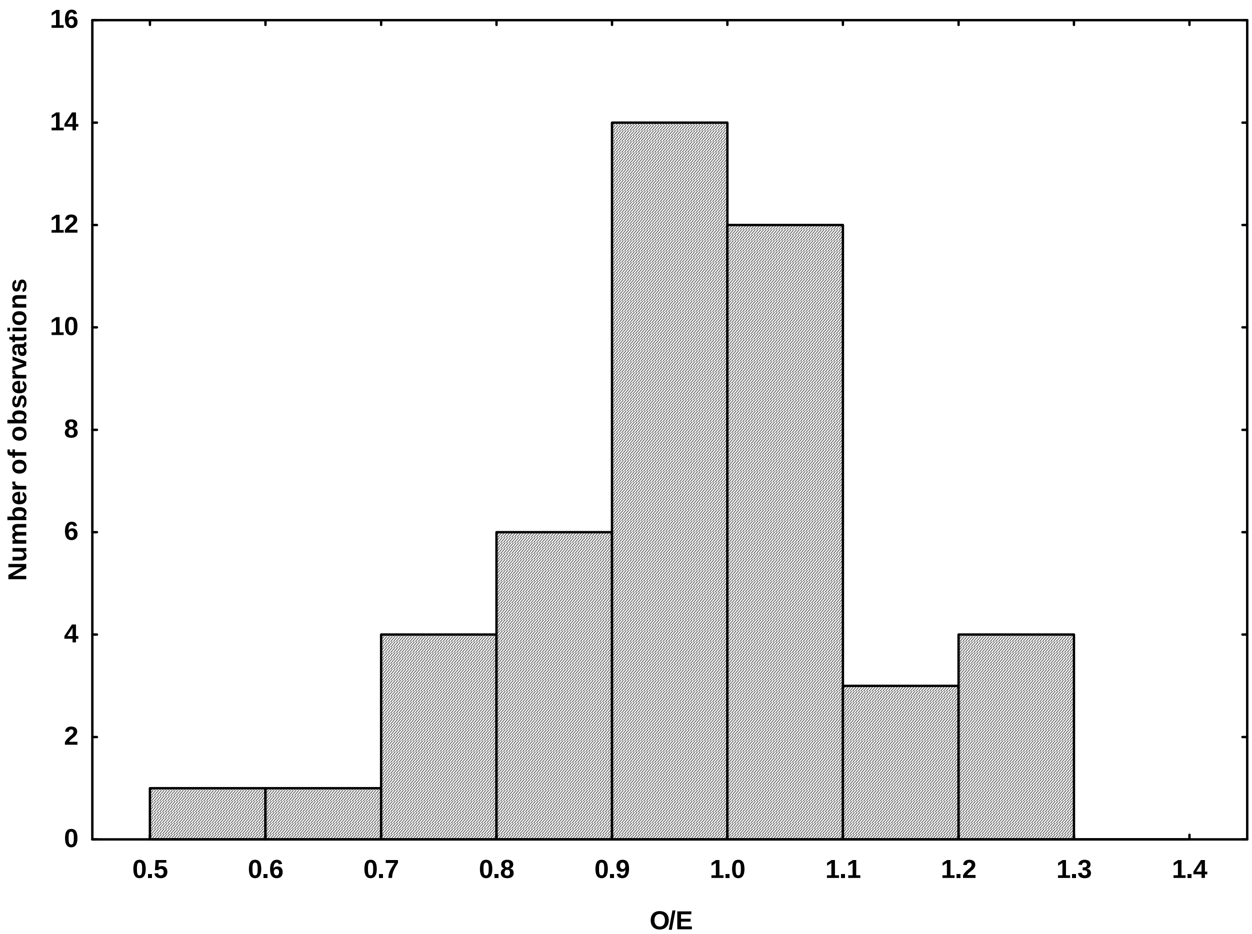


Figure 5 - Linear regression of observed and expected scores for reference calibration samples.

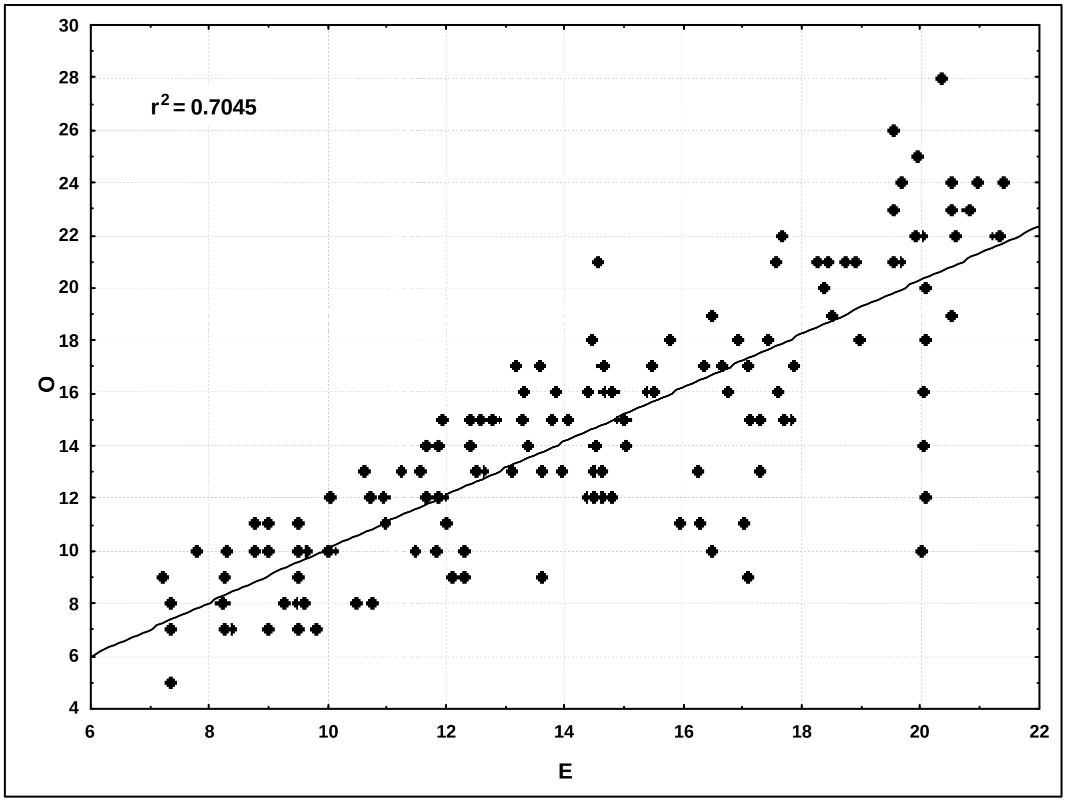


Figure 6 - Linear regression of observed and expected scores for reference validation samples.

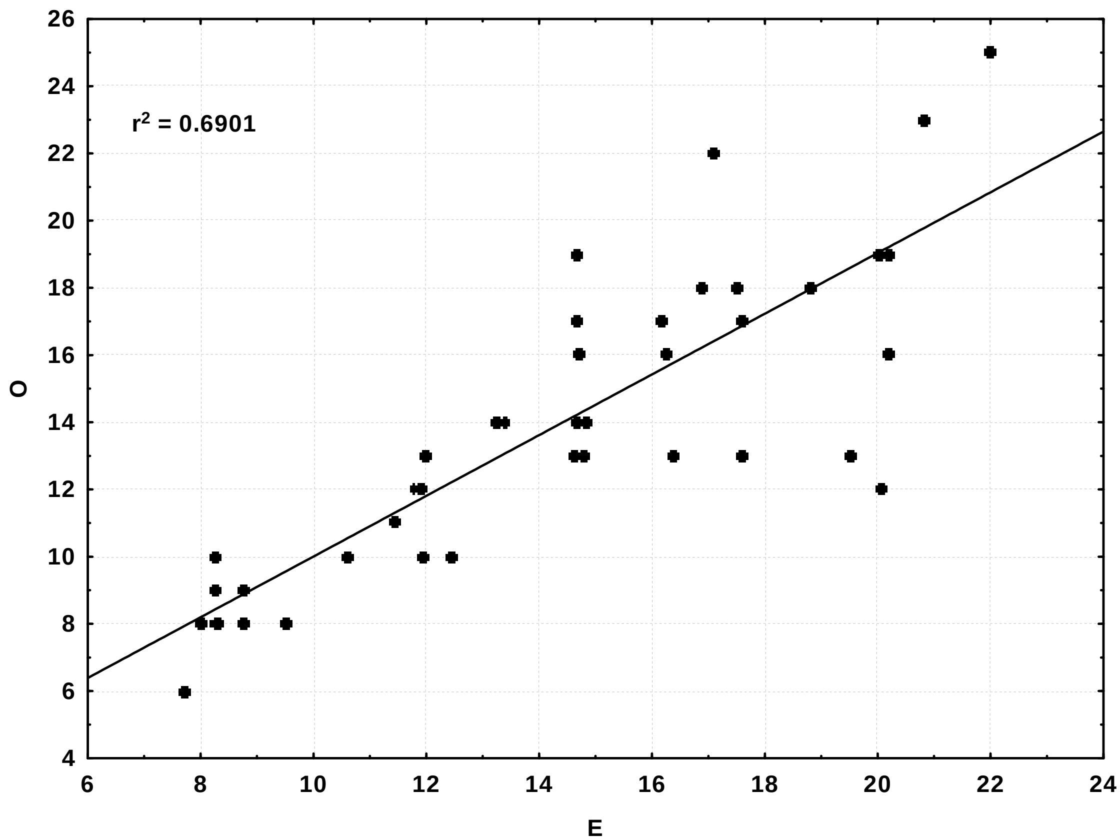


Figure 7 - Box and whisker plot distribution of reference O/E scores by sample type.

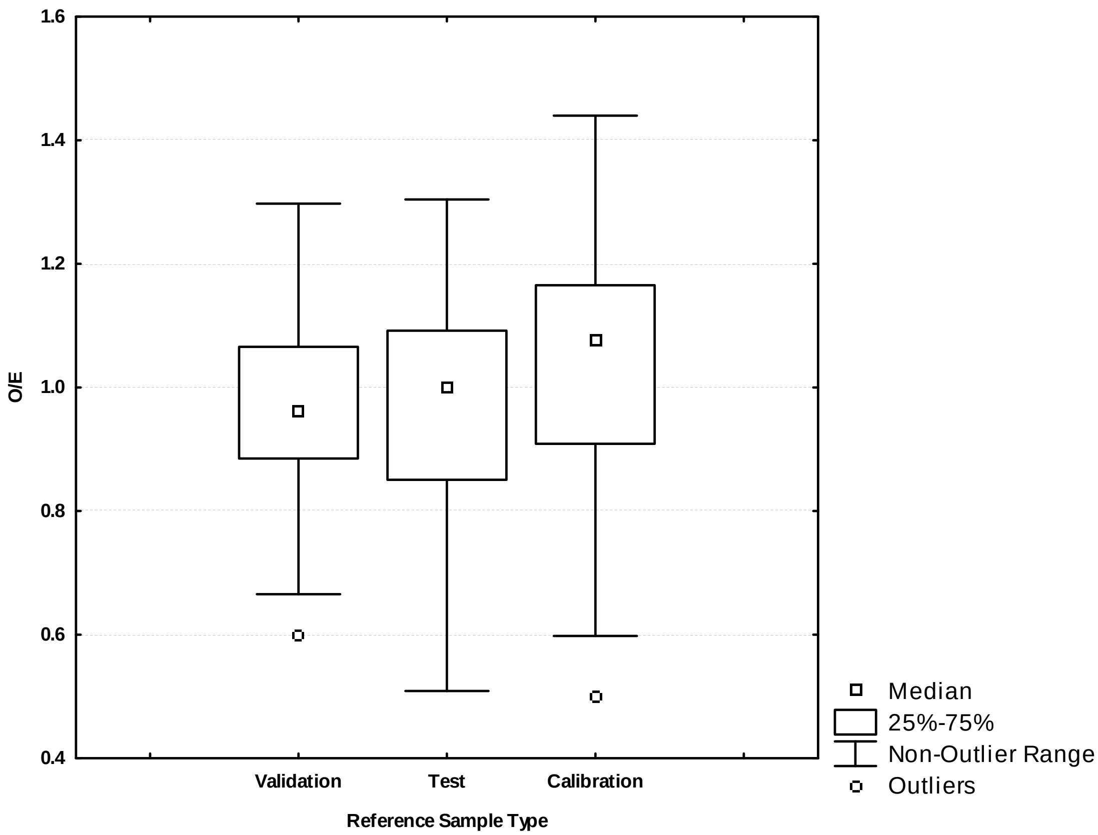


Figure 8 - Box and whisker plot distribution of O/E scores by sample type.

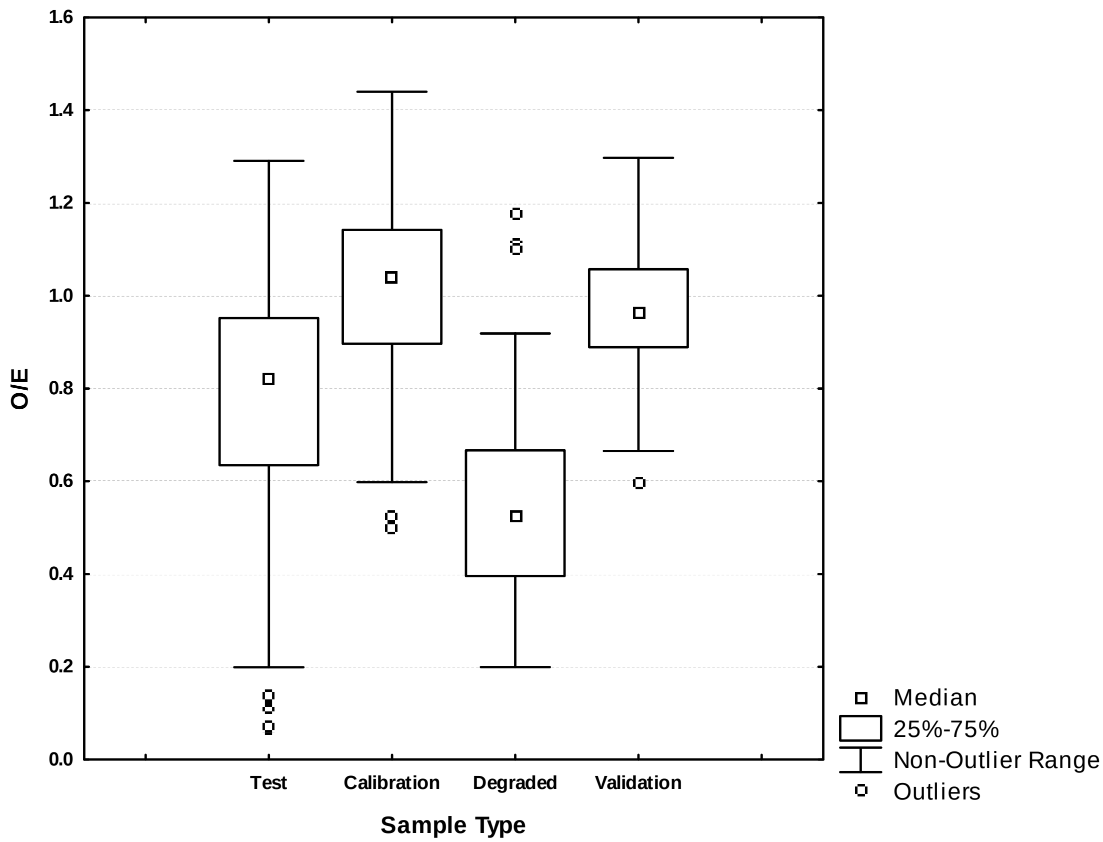


Figure 9 - Samples that were within (solid circles) and outside (open circles) model experience.

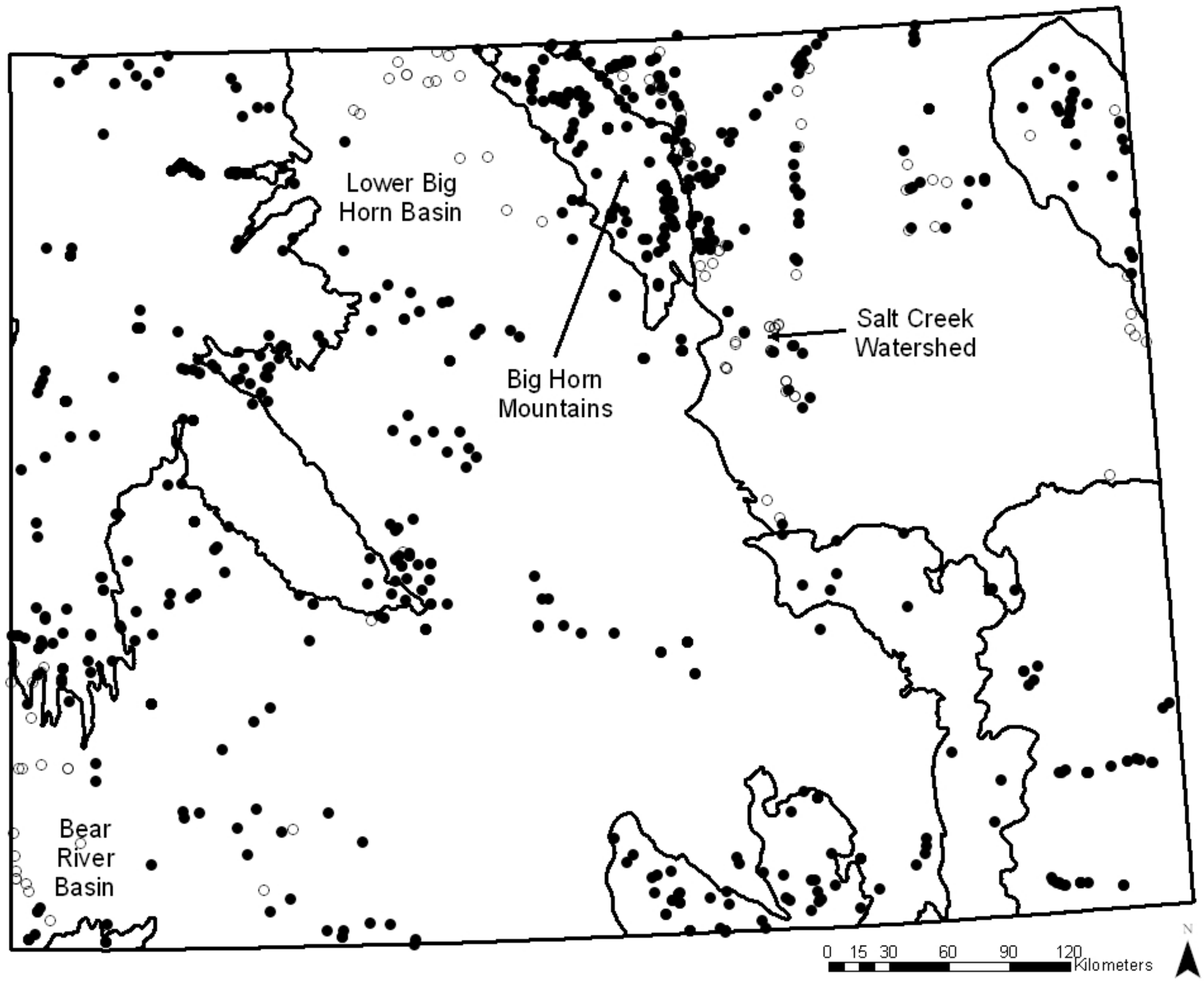
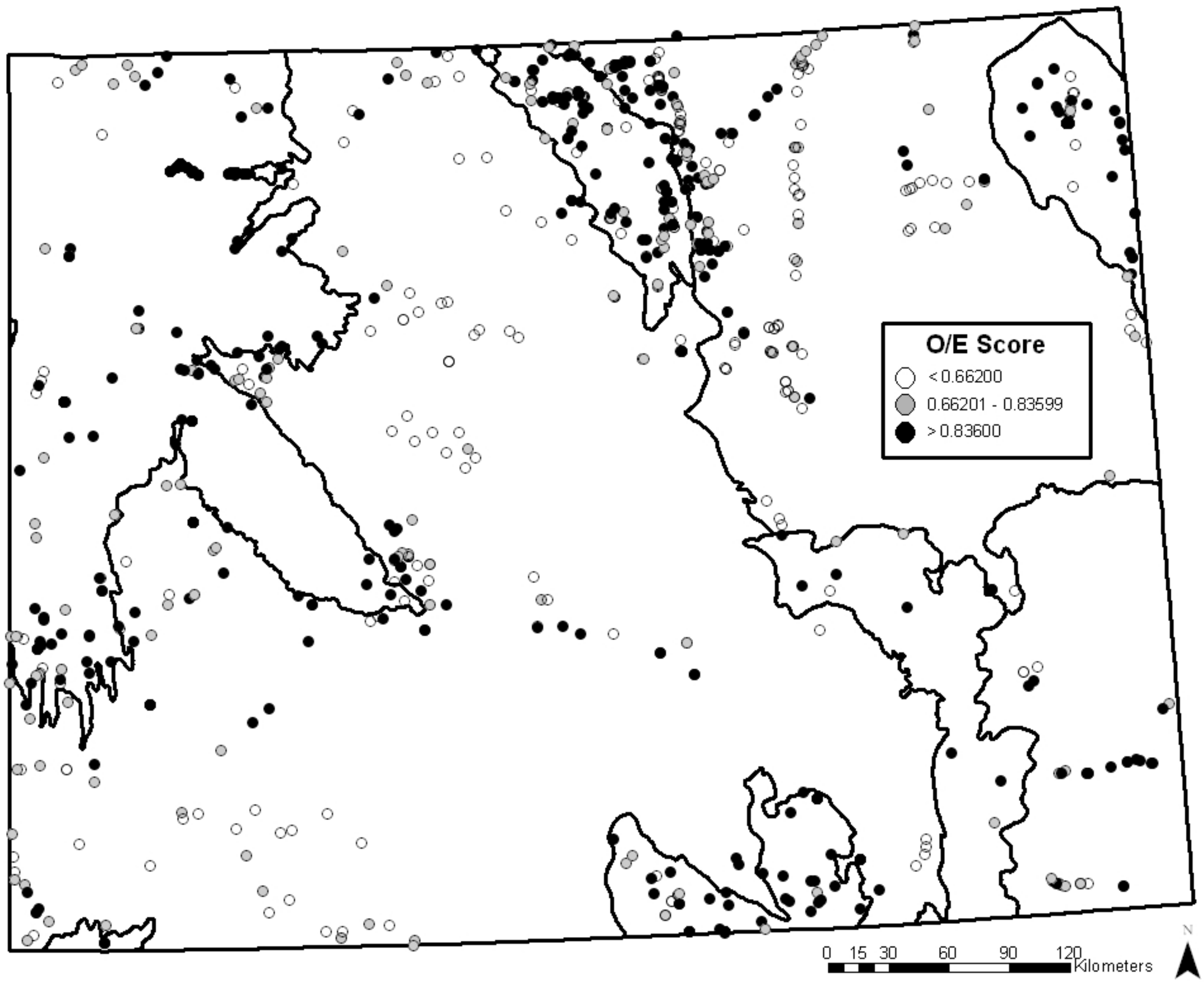


Figure 10 - Distribution of O/E scores by narrative biological criteria across Wyoming.



Appendix A – Operational taxonomic units (OTUs) derived from the reference calibration dataset. Asterisks denote OTUs that occurred at 10 or more samples.

Taxa Group	Operational Taxonomic Unit
Acari	**Acari*
Ephemeroptera	**Acentrella insignificans*
Ephemeroptera	**Acentrella turbida*
Ephemeroptera	**Ameletus*
Diptera	**Antocha*
Trichoptera	**Arctopsyche grandis*
Diptera	**Atherix*
Ephemeroptera	**Baetis*
Trichoptera	**Brachycentrus americanus*
Trichoptera	**Brachycentrus occidentalis*
Chironomidae	**Brillia*
Plecoptera	*Capniidae
Diptera	*Ceratopogoninae
Chironomidae	**Chaetocladius*
Diptera	**Chelifera*
Trichoptera	**Cheumatopsyche*
Plecoptera	*Chloroperlidae
Ephemeroptera	**Cinygmula*
Plecoptera	**Claassenia sabulosa*
Coleoptera	**Cleptelmis*
Chironomidae	**Cricotopus*
Chironomidae	**Diamesa*
Diptera	**Dicranota*
Ephemeroptera	**Diphetor hageni*
Trichoptera	**Dolophilodes*
Plecoptera	**Doroneuria*
Ephemeroptera	**Drunella coloradensis/flavilinea*
Ephemeroptera	**Drunella doddsi*
Ephemeroptera	**Drunella grandis/spinifera*
Coleoptera	**Dubiraphia*
Coleoptera	*Dytiscidae
Trichoptera	**Ecclisomyia*
Oligochaeta	*Enchytraeidae
Ephemeroptera	**Epeorus*
Ephemeroptera	**Ephemerella*
Chironomidae	**Eukiefferiella*
Trichoptera	**Glossosoma*
Trichoptera	**Helicopsyche*
Diptera	**Hemerodromia*
Plecoptera	**Hesperoperla*
Coleoptera	**Heterlimnius*
Ephemeroptera	**Hexatoma*
Amphipoda	**Hyalella azteca*
Trichoptera	**Hydropsyche*
Trichoptera	**Hydroptila*
Plecoptera	**Isoperla*
Trichoptera	**Lepidostoma*
Trichoptera	**Limnephilus*
Oligochaeta	*Lumbriculidae
Plecoptera	**Megarcys*
Trichoptera	**Micrasema*
Coleoptera	**Microcylloepus*
Chironomidae	**Micropsectra*
Nematoda	*Nematoda

Appendix A (cont.) – Operational taxonomic units (OTUs) derived from the reference calibration dataset. Asterisks denote OTUs that occurred at 10 or more samples.

Taxa Group	**Operational Taxonomic Unit**
Trichoptera	**Neothremma*
Trichoptera	**Oecetis*
Trichoptera	**Oligophlebodes*
Oligochaeta	**Ophidonais serpentina*
Coleoptera	**Optioservus*
Chironomidae	**Orthocladius*
Chironomidae	**Pagastia*
Ephemeroptera	**Paraleptophlebia*
Trichoptera	**Parapsyche elsis*
Diptera	**Pericoma*
Gastropoda	**Physella*
Chironomidae	**Polypedilum*
Chironomidae	**Potthastia*
Trichoptera	**Protoptila*
Chironomidae	**Pseudosmittia*
Plecoptera	**Pteronarcella*
Plecoptera	**Pteronarcys*
Chironomidae	**Rheocricotopus*
Chironomidae	**Rheotanytarsus*
Ephemeroptera	**Rhithrogena*
Trichoptera	**Rhyacophila betteni Gr.*
Trichoptera	**Rhyacophila brunnea Gr.*
Trichoptera	**Rhyacophila coloradensis Gr.*
Trichoptera	**Rhyacophila hyalinata Gr.*
Trichoptera	**Rhyacophila pellisa*
Ephemeroptera	**Serratella tibialis*
Diptera	*Simuliidae
Plecoptera	**Skwala*
Bivalvia	*Sphaeriidae
Chironomidae	**Stempellina*
Plecoptera	*Taeniopterygidae
Chironomidae	**Tanytarsus*
Chironomidae	**Thienemanniella*
Diptera	**Tipula*
Ephemeroptera	**Tricorythodes*
Oligochaeta	*Tubificidae
Turbellaria	*Turbellaria
Diptera	**Tvetenia*
Coleoptera	**Zaitzevia*
Plecoptera	**Zapada cinctipes*
Plecoptera	**Zapada columbiana*
Plecoptera	**Zapada oregonensis Gr.*
Trichoptera	*Agapetus*
Trichoptera	*Agraylea*
Hemiptera	*Ambrysus*
Trichoptera	*Amiocentrus aspilus*
Plecoptera	*Amphinemura*
Odonata	*Argia*
Diptera	Blephariceridae
Chironomidae	*Boreoheptagyia*
Coleoptera	*Brychius*
Ephemeroptera	*Caenis*
Ephemeroptera	*Callibaetis*
Chironomidae	*Cardiocladius*

Appendix A (cont.) – Operational taxonomic units (OTUs) derived from the reference calibration dataset. Asterisks denote OTUs that occurred at 10 or more samples.

Taxa Group	Operational Taxonomic Unit
Ephemeroptera	*Caudatella*
Diptera	Cecidomyiidae
Ephemeroptera	*Centroptilum*
Trichoptera	*Ceraclea*
Trichoptera	*Chimarra*
Chironomidae	*Chironomus*
Ephemeroptera	*Choroterpes*
Chironomidae	*Cladotanytarsus*
Diptera	*Clinocera*
Chironomidae	*Conchapelopia*
Chironomidae	*Cryptochironomus*
Diptera	*Cryptolabis*
Plecoptera	*Cultus*
Chironomidae	*Demicryptochironomus*
Diptera	*Deuterophlebia*
Trichoptera	*Dicosmoecus atripes*
Trichoptera	*Dicosmoecus gilvipes*
Chironomidae	*Dicrotendipes*
Diptera	*Dixa*
Diptera	*Dixella*
Odonata	*Enallagma/Ischnura*
Chironomidae	*Endochironomus*
Chironomidae	*Euorthocladius*
Ephemeroptera	*Fallceon qulleri*
Gastropoda	*Ferrissia*
Gastropoda	*Fluminicola*
Amphipoda	Gammarus
Diptera	*Glutops*
Odonata	Gomphidae
Coleoptera	*Haliplus*
Oligochaeta	*Haplotaxis*
Chironomidae	*Heleniella*
Coleoptera	*Helichus*
Hirudinea	*Helobdella stagnalis*
Ephemeroptera	*Heptagenia/Nixe*
Diptera	*Hesperoconopa*
Odonata	*Hetaerina*
Chironomidae	*Heterotrissocladius*
Chironomidae	*Hydrobaenus*
Gastropoda	Hydrobiidae
Coleoptera	Hydrophilidae
Plecoptera	*Isogenoides*
Coleoptera	*Lara avara*
Ephemeroptera	*Leptophlebia*
Trichoptera	*Leucotrichia*
Plecoptera	Leuctridae
Diptera	*Limnophora*
Chironomidae	*Limnophyes*
Chironomidae	*Lopescladius*
Oligochaeta	Lumbricidae
Gastropoda	Lymnaeidae
Chironomidae	*Macropelopia*
Plecoptera	*Malenka*
Trichoptera	*Marilia*

Appendix A (cont.) – Operational taxonomic units (OTUs) derived from the reference calibration dataset. Asterisks denote OTUs that occurred at 10 or more samples.

Taxa Group	Operational Taxonomic Unit
Diptera	*Maruina*
Trichoptera	*Mayatrichia*
Chironomidae	*Microtendipes*
Oligochaeta	*Nais communis*
Oligochaeta	*Nais elinguis*
Oligochaeta	*Nais variabilis*
Chironomidae	*Nanocladius*
Coleoptera	*Narpus*
Trichoptera	*Nectopsyche*
Trichoptera	*Neophylax*
Trichoptera	*Neotrichia*
Chironomidae	*Nilotanypus*
Trichoptera	*Ochrotrichia*
Chironomidae	*Odontomesa*
Coleoptera	*Ordobrevia*
Diptera	*Ormosia*
Trichoptera	*Oxyethira*
Chironomidae	*Parachaetocladius*
Chironomidae	*Parakiefferiella*
Chironomidae	*Paramerina*
Chironomidae	*Parametriocnemus*
Chironomidae	*Paraphaenocladius*
Chironomidae	*Paratanytarsus*
Chironomidae	*Parorthocladius*
Chironomidae	*Pentaneura*
Lepidoptera	*Petrophila*
Chironomidae	*Phaenopsectra*
Gastropoda	Planorbidae
Oligochaeta	*Pristina*
Chironomidae	*Procladius*
Chironomidae	*Prodiamesa*
Plecoptera	*Prostoia*
Chironomidae	*Pseudochironomus*
Chironomidae	*Pseudodiamesa*
Chironomidae	*Pseudorthocladius*
Chironomidae	*Psilometriocnemus*
Trichoptera	*Psychomyia*
Diptera	*Ptychoptera*
Trichoptera	*Rhyacophila angelita Gr.*
Trichoptera	*Rhyacophila cyalinata Gr.*
Trichoptera	*Rhyacophila iranda Gr.*
Trichoptera	*Rhyacophila narvae*
Trichoptera	*Rhyacophila vagrita Gr.*
Trichoptera	*Rhyacophila verrula*
Megaloptera	*Sialis*
Oligochaeta	*Specaria*
Ephemeroptera	*Stenonema*
Chironomidae	*Stictochironomus*
Diptera	Stratiomyiidae
Chironomidae	*Sublettea*
Chironomidae	*Symposiocladius*
Chironomidae	*Synorthocladius*
Diptera	Tabanidae
Oligochaeta	*Uncinais uncinata*
Plecoptera	*Visoka cataractae*
Diptera	*Wiedemannia*
Trichoptera	*Wormaldia*

Appendix B - O/E scores and narrative ratings for samples by ecoregion/sub-region. Samples outside model experience are noted with an asterisk.

SAMPLE ID	TYPE	STATION ID	WATERBODY NAME	LAT (N)	LONG (W)	COLLECTION DATE	O	E	O/E	NARRATIVE RATING
MIDDLE ROCKIES CENTRAL										
1084	T	MRC95	Battle Creek below headwaters	44.51232000	-107.49489000	9/11/2001	5	17.40586	0.28726	PARTIAL/NON SUPPORT
831	T	MRC39A	Bear Trap Creek in Bear Trap Meadow	43.90550000	-107.03055560	10/1/1999	8	10.46785	0.764245 *	INDETERMINATE
623	T	MRC39	Beartrap Creek	43.90380556	-107.02985560	8/19/1998	11	17.18526	0.640083	PARTIAL/NON SUPPORT
42	R	MRC9	BEARTRAP CREEK	43.90777778	-107.03027780	10-22-1993	9	17.08285	0.526844	PARTIAL/NON SUPPORT
678	T	MRCI48	Big Goose Creek - Canyon (T-T Ranch)	44.69918611	-107.18516110	10/22/1998	17	18.25138	0.931436	FULL SUPPORT
47	T	MRCI25	BIG WILLOW CREEK	44.76555556	-107.54027780	9/8/1993	11	17.16306	0.640911	PARTIAL/NON SUPPORT
630	T	MRC46	Big Willow Creek - Above Hwy 14A	44.76462778	-107.54130560	9/1/1998	14	16.52529	0.847186	FULL SUPPORT
631	T	MRC47	Big Willow Creek - Upper	44.73092222	-107.56103610	9/1/1998	16	17.02653	0.939710	FULL SUPPORT
624	T	MRC40	Blue Creek	43.65460833	-106.90920560	8/20/1998	7	17.19869	0.407008	PARTIAL/NON SUPPORT
48	T	MRCI26	BULL CREEK	44.75993889	-107.58985280	9/9/1993	15	17.50096	0.857096	FULL SUPPORT
665	T	MRCI26	BULL CREEK	44.75993889	-107.58985280	8/26/1998	16	17.48823	0.914901	FULL SUPPORT
633	T	MRC49	Bull Creek - Upper	44.73987500	-107.59312780	8/27/1998	10	17.39758	0.574793	PARTIAL/NON SUPPORT
21	RT	MRC25	CLEAR CREEK	44.32327778	-106.82557500	9/24/1993	14	16.76457	0.835095	INDETERMINATE
829	R	MRC25	CLEAR CREEK	44.32327778	-106.82557500	10-19-1999	16	14.40076	1.111053	FULL SUPPORT
1000	R	MRC25	CLEAR CREEK	44.32328000	-106.82558000	10/6/2000	16	16.26929	0.983448	FULL SUPPORT
46	T	MRCI24	CLEAR CREEK - BUFFALO	44.35190833	-106.69115830	10/1/1996	12	16.5962	0.723057	INDETERMINATE
837	T	MRCI24	CLEAR CREEK - BUFFALO	44.35190833	-106.69115830	9/27/1999	15	18.30254	0.819559	INDETERMINATE
832	T	MRC76	Clear Creek - City Park	44.34523056	-106.70433890	9/22/1999	20	18.60242	1.075129	FULL SUPPORT
2	R	MRC10	COLUMBUS CREEK	44.91138889	-107.39416670	10/25/1993	17	14.65036	1.160381	FULL SUPPORT
66	T	MRCI44	CONEY CREEK	44.60951944	-107.30264440	9/16/1996	11	17.04958	0.645177	PARTIAL/NON SUPPORT
323	T	MRCI44	CONEY CREEK	44.60951944	-107.30264440	9/17/1997	11	16.69161	0.659014	PARTIAL/NON SUPPORT
677	T	MRCI44	CONEY CREEK	44.60951944	-107.30264440	9/14/1998	14	17.42963	0.803230	INDETERMINATE
634	T	MRC50	Doyle Creek - Lower	44.07118056	-106.98251110	9/18/1998	14	20.01388	0.699515	INDETERMINATE
635	R	MRC51	Doyle Creek - Upper	44.04860000	-107.02375830	09-17-1998	18	20.06876	0.896916	FULL SUPPORT
28	R	MRC27	EAST PASS CREEK	44.57694444	-107.54527780	10-20-1993	18	17.41524	1.033578	FULL SUPPORT
636	T	MRC52	French Creek - Above Paradise Guest Ranch	44.34611667	-106.96205280	9/22/1998	17	20.03231	0.848629	FULL SUPPORT
637	T	MRC53	French Creek - Goddard Ranch	44.37102778	-106.74716670	9/28/1998	16	17.30821	0.924417	FULL SUPPORT
638	R	MRC54	French Creek - Sanders	44.36444167	-106.81364720	09-28-1998	18	15.77311	1.141183	FULL SUPPORT
1007	R	MRC28	GRANITE CREEK	44.57694000	-107.54528000	9/12/2000	17	16.18005	1.050677	FULL SUPPORT
1006	T	MRC82	Granite Creek Below Antelope Butte Ski A	44.61075000	-107.52208000	9/12/2000	18	17.30196	1.040345	FULL SUPPORT
378	T	MRCI37	HALF OUNCE CREEK	44.82500000	-107.77166670	9/18/1997	16	17.30096	0.924804	FULL SUPPORT
1052	T	MRCI37	HALF OUNCE CREEK	44.82500000	-107.77167000	9/14/2000	15	18.01825	0.832489	INDETERMINATE
331	T	MRCI20	HUNTER CREEK - LOWER	44.32031111	-106.95016940	9/26/1997	16	20.04658	0.798141	INDETERMINATE
662	T	MRCI20	HUNTER CREEK - LOWER	44.32031111	-106.95016940	9/18/1998	19	20.02586	0.948773	FULL SUPPORT
836	T	MRCI20	HUNTER CREEK - LOWER	44.32031111	-106.95016940	9/8/1999	21	19.97304	1.051417	FULL SUPPORT
1001	T	MRCI20	HUNTER CREEK - LOWER	44.32031000	-106.95017000	9/28/2000	18	19.99847	0.900069	FULL SUPPORT
1116	T	MRCI20	HUNTER CREEK - LOWER	44.32031000	-106.95017000	9/12/2001	19	19.9754	0.95117	FULL SUPPORT
329	R	MRCI19	HUNTER CREEK - UPPER	44.33475833	-106.97610000	09-25-1997	12	20.07013	0.597903	PARTIAL/NON SUPPORT
661	RT	MRCI19	HUNTER CREEK - UPPER	44.33475833	-106.97610000	9/18/1998	15	20.06208	0.747679	INDETERMINATE
835	RT	MRCI19	HUNTER CREEK - UPPER	44.33475833	-106.97610000	9/21/1999	15	20.04997	0.748131	INDETERMINATE
1004	R	MRCI19	HUNTER CREEK - UPPER	44.33476000	-106.97610000	9/28/2000	12	20.05828	0.598257	PARTIAL/NON SUPPORT
983	T	MRC90	Jenks Creek Above Peno Creek	44.58453000	-106.85553000	11/2/2000	7	16.92614	0.413561	PARTIAL/NON SUPPORT
982	T	MRC91	Jenks Creek Below Peno Creek	44.58891000	-106.84907000	11/2/2000	5	16.92635	0.295397	PARTIAL/NON SUPPORT
49	T	MRCI27	L. N.FK. CRAZY WOMAN CRK.	44.19809167	-106.77617780	10/6/1993	15	14.89584	1.006993	FULL SUPPORT
666	T	MRCI27	L. N.FK. CRAZY WOMAN CRK.	44.19809167	-106.77617780	9/24/1998	18	16.41659	1.096452	FULL SUPPORT
29	T	MRC29	LAKE CREEK	44.19333333	-107.20722220	9/29/1993	21	17.8737	1.174911	FULL SUPPORT
988	T	MRC87	Little Bighorn Headwaters	44.79872000	-107.76513000	9/18/2000	10	17.76214	0.562995	PARTIAL/NON SUPPORT
354	RT	MRC18	LITTLE BIGHORN RIVER	44.98688333	-107.63868060	10/15/1997	8	15.71794	0.508972	PARTIAL/NON SUPPORT
10	RT	MRC18	LITTLE BIGHORN RIVER	44.98688333	-107.63868060	10/21/1994	10	18.39171	0.543723	PARTIAL/NON SUPPORT
11	RT	MRC18	LITTLE BIGHORN RIVER	44.98688333	-107.63868060	10/20/1995	10	16.43172	0.608579	PARTIAL/NON SUPPORT
9	R	MRC18	LITTLE BIGHORN RIVER	44.98688333	-107.63868060	10/27/93	11	16.29592	0.675015	INDETERMINATE
827	RT	MRC18	LITTLE BIGHORN RIVER	44.98688333	-107.63868060	10/11/1999	12	16.44347	0.729773	INDETERMINATE
12	RT	MRC18	LITTLE BIGHORN RIVER	44.98688333	-107.63868060	9/27/1996	12	16.30982	0.735753	INDETERMINATE
616	RT	MRC18	LITTLE BIGHORN RIVER	44.98688333	-107.63868060	10/9/1998	15	16.37252	0.916170	FULL SUPPORT
1002	R	MRC18	LITTLE BIGHORN RIVER	44.98688000	-107.63868000	9/18/2000	13	17.6005	0.738615	INDETERMINATE
1079	R	MRC18	LITTLE BIGHORN RIVER	44.98688000	-107.63868000	10/8/2001	13	16.36536	0.794361	INDETERMINATE
985	T	MRC83	Little Bighorn River Above Dry Fork	44.93360000	-107.68221000	9/19/2000	12	12.79234	0.938061	FULL SUPPORT
987	T	MRC86	Little Bighorn River Below Dayton Gulch	44.84127000	-107.75404000	9/14/2000	20	17.677	1.131413	FULL SUPPORT
986	T	MRC84	Little Bighorn River Below Wagon Box Cre	44.88619000	-107.74356000	9/13/2000	17	16.65679	1.020605	FULL SUPPORT
622	R	MRC38	LITTLE GOOSE CREEK	44.62665556	-107.03036110	10-28-1998	15	17.69683	0.847610	FULL SUPPORT
37	RT	MRC38	LITTLE GOOSE CREEK	44.62665556	-107.03036110	10/1/1996	17	18.29145	0.929396	FULL SUPPORT
639	R	MRC55	Little Piney Creek - Lower	44.52911667	-106.81895280	10-02-1998	16	15.5063	1.031839	FULL SUPPORT
640	R	MRC56	Little Piney Creek - Upper	44.55084167	-106.88288330	10-02-1998	14	14.52976	0.963539	FULL SUPPORT
641	T	MRC57	Little Sourdough Creek - Elgin Road Crossing	44.24445833	-106.91658330	9/23/1998	5	20.03276	0.249591	PARTIAL/NON SUPPORT
642	T	MRC58	Little Sourdough Creek - Lower	44.27468333	-106.92172780	9/23/1998	17	19.96929	0.851307	FULL SUPPORT
31	R	MRC30	LITTLE TONGUE RIVER	44.80916667	-107.28916670	10-20-1993	10	12.32967	0.811052	INDETERMINATE
664	T	MRCI23	LITTLE TONGUE RIVER - LOWER	44.87681111	-107.26584720	10/13/1998	12	14.55193	0.824633	INDETERMINATE
45	T	MRCI23	LITTLE TONGUE RIVER - LOWER	44.87681111	-107.26584720	10/9/1996	13	14.44818	0.899767	FULL SUPPORT
341	T	MRCI23	LITTLE TONGUE RIVER - LOWER	44.87681111	-107.26584720	10/9/1997	13	14.44818	0.899767	FULL SUPPORT
628	T	MRC44	M.Fk. Powder R. above Hazelton Rd.	43.57614444	-107.14244170	8/18/1998	14	19.92979	0.702466	INDETERMINATE
629	T	MRC45	M.Fk. Powder R. below Hazelton Rd.	43.57778611	-107.13679720	8/18/1998	14	18.84362	0.742957	INDETERMINATE
1005	T	MRC81	Mail Creek Above Shell Creek	44.54102000	-107.46438000	9/13/2000	15	16.78092	0.893872	FULL SUPPORT
32	R	MRC31	MEDICINE LODGE CREEK - LOWER	44.29972222	-107.53805560	09-28-1993	15	17.12038	0.876149	FULL SUPPORT
1179	R	MRC31	MEDICINE LODGE CREEK - LOWER	44.29972000	-107.53806000	9/20/2000	17	17.59146	0.966378	FULL SUPPORT
38	R	MRC4	MEDICINE LODGE CREEK - UPPER	44.41500000	-107.38416670	09-27-1993	19	16.47544	1.153232	FULL SUPPORT
663	T	MRCI21	MIDDLE FK. CRAZY WOMAN CREEK - GREUB	44.05219167	-106.75221390	9/29/1998	17	14.5016	1.172285	FULL SUPPORT
43	T	MRCI21	MIDDLE FK. CRAZY WOMAN CREEK - GREUB	44.05219167	-106.75221390	10/31/1996	18	14.5016	1.241243	FULL SUPPORT
357	R	MRC6	MIDDLE FK. POWDER R. - LOWER CANYON A	43.60250000	-106.90500000	10-16-1997	17	17.09537	0.994422	FULL SUPPORT
644	RT	MRC6	MIDDLE FK. POWDER R. - LOWER CANYON A	43.60250000	-106.90500000	9/14/1998	18	17.08996	1.053250	FULL SUPPORT
359	R	MRC6A	MIDDLE FK. POWDER R. - LOWER CANYON B	43.60138889	-106.90944440	10-16-1997	16	17.60284	0.908944	FULL SUPPORT
643	T	MRC59	Middle Fork Crazy Woman Creek - Upper	44.10677222	-106.99445280	9/29/1998	15	20.0509	0.748096	INDETERMINATE
41	T	MRC8	MIDDLE FORK POWDER RIVER	43.60500000	-106.90111110	10/28/1993	17	18.20231	0.933947	FULL SUPPORT
55	T	MRCI30	MUDDY CREEK - LOWER	44.13237222	-106.71058060	10/5/1993	5	14.84194	0.336883	PARTIAL/NON SUPPORT
669	T	MRCI30	MUDDY CREEK - LOWER	44.13237222	-106.71058060	9/25/1998	7	14.94986	0.468232	PARTIAL/NON SUPPORT
51	T	MRCI29	MUDDY CREEK - MIDDLE	44.16810833	-106.80583330	10/13/1993	8	16.28113	0.491366	PARTIAL/NON SUPPORT
53	T	MRCI29	MUDDY CREEK - MIDDLE	44.16810833	-106.80583330	9/28/1995	11	16.35049	0.672763	INDETERMINATE
838	T	MRCI29	MUDDY CREEK - MIDDLE	44.16810833	-106.80583330	9/17/1999	10	14.27257	0.700645	INDETERMINATE
326	T	MRCI29	MUDDY CREEK - MIDDLE	44.16810833	-106.80583330	9/24/1997	12	16.93821	0.708457	INDETERMINATE
52	T	MRCI29	MUDDY CREEK - MIDDLE	44.16810833	-106.80583330	9/27/1994	14	17.01	0.823045	INDETERMINATE

Appendix B (cont.) - O/E scores and narrative ratings for samples by ecoregion/sub-region. Samples outside model experience are noted with an asterisk.

54	T	MRCI29	MUDDY CREEK - MIDDLE	44.16810833	-106.80583330	9/23/1996	12	13.78334	0.870616		FULL SUPPORT
668	T	MRCI29	MUDDY CREEK - MIDDLE	44.16810833	-106.80583330	9/24/1998	14	14.26484	0.981434		FULL SUPPORT
1075	T	MRCI29	MUDDY CREEK - MIDDLE	44.16811000	-106.80583000	9/13/2001	10	14.79347	0.675974		INDETERMINATE
50	T	MRCI28	MUDDY CREEK - UPPER	44.15870000	-106.90964720	10/6/1993	9	15.96216	0.563834	*	PARTIAL/NON SUPPORT
667	T	MRCI28	MUDDY CREEK - UPPER	44.15870000	-106.90964720	9/16/1998	10	16.79187	0.595526		PARTIAL/NON SUPPORT
645	R	MRC60	North Clear Creek - Above Hunter Creek	44.32090833	-106.95058610	09-18-1998	22	19.90701	1.105139		FULL SUPPORT
646	R	MRC61	North Clear Creek - Below Hunter Creek	44.32104722	-106.95060280	09-18-1998	25	19.94141	1.253672		FULL SUPPORT
1048	T	MRC61	North Clear Creek - Below Hunter Creek	44.32091000	-106.95059000	9/28/2000	21	19.97524	1.051302		FULL SUPPORT
57	T	MRCI32	NORTH FORK CRAZY WOMAN CREEK - LOWER	44.17159167	-106.69842220	10/13/1993	9	14.49808	0.620772		PARTIAL/NON SUPPORT
671	T	MRCI32	NORTH FORK CRAZY WOMAN CREEK - LOWER	44.17159167	-106.69842220	9/25/1998	12	14.93976	0.803226		INDETERMINATE
56	T	MRCI31	NORTH FORK CRAZY WOMAN CREEK - MIDDLE	44.19673056	-106.76899440	10/13/1993	17	18.32476	0.927707		FULL SUPPORT
670	T	MRCI31	NORTH FORK CRAZY WOMAN CREEK - MIDDLE	44.19673056	-106.76899440	9/24/1998	18	15.87502	1.133857		FULL SUPPORT
648	T	MRC63	North Fork Crazy Woman Creek - Pole Creek Road	44.15616944	-106.97225830	9/17/1998	21	20.0387	1.047972		FULL SUPPORT
26	RT	MRC26	NORTH FORK CRAZY WOMAN CREEK - UPPER	44.16877500	-106.91521670	9/24/1996	13	19.98092	0.650621		PARTIAL/NON SUPPORT
23	RT	MRC26	NORTH FORK CRAZY WOMAN CREEK - UPPER	44.16877500	-106.91521670	10/6/1993	14	20.00243	0.699915		INDETERMINATE
25	RT	MRC26	NORTH FORK CRAZY WOMAN CREEK - UPPER	44.16877500	-106.91521670	9/26/1995	17	20.01531	0.849350		FULL SUPPORT
24	RT	MRC26	NORTH FORK CRAZY WOMAN CREEK - UPPER	44.16877500	-106.91521670	9/28/1994	17	19.99591	0.850174		FULL SUPPORT
327	RT	MRC26	NORTH FORK CRAZY WOMAN CREEK - UPPER	44.16877500	-106.91521670	9/25/1997	17	19.98494	0.850641		FULL SUPPORT
830	RT	MRC26	NORTH FORK CRAZY WOMAN CREEK - UPPER	44.16877500	-106.91521670	9/16/1999	18	19.99917	0.900038		FULL SUPPORT
620	RT	MRC26	NORTH FORK CRAZY WOMAN CREEK - UPPER	44.16877500	-106.91521670	9/17/1998	23	19.98105	1.151091		FULL SUPPORT
27	R	MRC26	NORTH FORK CRAZY WOMAN CREEK - UPPER	44.16877500	-106.91521670	10-06-1993	16	13.87905	1.152817		FULL SUPPORT
1072	R	MRC26	NORTH FORK CRAZY WOMAN CREEK - UPPER	44.16878000	-106.91522000	9/10/2001	19	20.0224	0.948937		FULL SUPPORT
317	R	MRCI35	NORTH FORK POWDER RIVER - CROSSING	44.10694444	-107.09000000	09-12-1997	20	20.07699	0.996165		FULL SUPPORT
40	T	MRC7	NORTH FORK POWDER RIVER - LOWER	44.03083333	-107.09444440	9/29/1994	18	20.02722	0.898777		FULL SUPPORT
35	T	MRC35	NORTH FORK POWDER RIVER - UPPER	44.03416667	-107.09444440	9/29/1994	16	20.03769	0.798495		INDETERMINATE
649	T	MRC64	North Fork Rock Creek - Upper	44.46629167	-106.90634720	10/19/1998	13	13.77785	0.943543		FULL SUPPORT
376	R	MRC34	NORTH OTTER CREEK	43.86277778	-107.29694440	09-05-1997	15	17.7977	0.842805		FULL SUPPORT
617	RT	MRC22	NORTH TONGUE RIVER - HIDEOUT	44.75550278	-107.63309440	9/10/1998	17	17.89559	0.949955		FULL SUPPORT
375	R	MRC22	NORTH TONGUE RIVER - HIDEOUT	44.76650278	-107.63309440	09-18-1997	17	17.85835	0.951936		FULL SUPPORT
650	T	MRC65	North Tongue River - Highw ay 14A Crossing	44.75953333	-107.62000000	9/10/1998	15	17.92232	0.836945		FULL SUPPORT
4	T	MRC12	NORTH TONGUE RIVER - LOWER	44.78192222	-107.53440280	9/15/1993	12	17.99772	0.666751		INDETERMINATE
615	T	MRC12	NORTH TONGUE RIVER - LOWER	44.78192222	-107.53440280	9/10/1998	14	18.00431	0.777592		INDETERMINATE
3	T	MRC11	NORTH TONGUE RIVER - UPPER	44.74600833	-107.69480830	9/14/1993	14	17.72582	0.789808		INDETERMINATE
614	T	MRC11	NORTH TONGUE RIVER - UPPER	44.74600833	-107.69480830	9/10/1998	20	17.79839	1.123697		FULL SUPPORT
34	T	MRC33	OTTER CREEK	43.86444444	-107.30972220	10/21/1993	14	17.73072	0.789590		INDETERMINATE
14	R	MRC21	PAINTROCK CREEK	44.28833333	-107.48583330	09-28-1993	16	15.40722	1.038474		FULL SUPPORT
651	T	MRC66	Poison Creek - Dam	44.12352500	-106.97546110	9/16/1998	14	20.03443	0.698797		INDETERMINATE
652	R	MRC67	Pole Creek - Low er	44.18931389	-106.92474170	09-15-1998	10	20.01405	0.499649		PARTIAL/NON SUPPORT
653	R	MRC68	Pole Creek - Upper	44.19956667	-106.94156940	09-15-1998	14	20.04703	0.698358		INDETERMINATE
8	T	MRC17	PORCUPINE CREEK	44.83944444	-107.86861110	9/15/1993	19	17.58153	1.080680		FULL SUPPORT
1068	T	MRC17	PORCUPINE CREEK	44.83944000	-107.86861000	8/22/2001	21	17.4014	1.2068		FULL SUPPORT
1094	T	MRC93	Porcupine Creek above Deer Creek	44.98677000	-108.10095000	8/22/2001	14	16.47862	0.849586		FULL SUPPORT
1095	T	MRC94	Porcupine Creek below Porcupine Falls	44.85831000	-107.91772000	8/23/2001	14	17.76106	0.788241		INDETERMINATE
30	T	MRC3	PROSPECT CREEK	44.64277778	-107.50861110	9/16/1993	13	17.51004	0.742431		INDETERMINATE
632	R	MRC48	Prune Creek - Above Sibley Lake	44.75787222	-107.43633060	08-05-1998	21	17.54867	1.196672		FULL SUPPORT
673	T	MRCI39	PRUNE CREEK - PRUNE CAMPGROUND	44.76888889	-107.46722220	8/6/1998	16	16.54498	0.967061		FULL SUPPORT
61	T	MRCI39	PRUNE CREEK - PRUNE CAMPGROUND	44.76888889	-107.46722220	8/24/1995	18	16.50415	1.090635		FULL SUPPORT
672	T	MRCI38	PRUNE CREEK - SIBLEY LAKE	44.76028333	-107.44562780	8/6/1998	11	16.64903	0.660699		PARTIAL/NON SUPPORT
60	T	MRCI38	PRUNE CREEK - SIBLEY LAKE	44.76028333	-107.44562780	8/24/1995	12	17.50538	0.685503		INDETERMINATE
59	T	MRCI36	RAPID CREEK	44.61666667	-107.18166670	10/7/1996	8	17.38306	0.460218		PARTIAL/NON SUPPORT
627	T	MRC43	Rock Creek	43.57639722	-107.14254170	8/19/1998	13	20.04775	0.648452		PARTIAL/NON SUPPORT
654	T	MRC69	Rock Creek - USGS Gage	44.45502778	-106.87456110	10/20/1998	18	18.22893	0.987442		FULL SUPPORT
626	T	MRC42	Saw mill Creek	43.89464167	-107.03122500	8/20/1998	10	15.8501	0.630911		PARTIAL/NON SUPPORT
5	T	MRC13	SHELL CREEK	44.57972222	-107.68833330	9/16/1993	12	14.8857	0.806143		INDETERMINATE
1180	T	MRC79	Soldier Creek Buck	44.25348000	-107.27258000	9/19/2000	18	17.12869	1.050869		FULL SUPPORT
1181	T	MRC80	Soldier Creek Camp	44.23352000	-107.29973000	9/19/2000	20	17.32128	1.154649		FULL SUPPORT
833	T	MRC77	Soldier Creek - PK Ranch	44.73435278	-107.21830280	9/7/1999	4	11.10781	0.360107		PARTIAL/NON SUPPORT
834	T	MRC78	Soldier Creek - Upper	44.77768611	-107.17624440	9/8/1999	13	11.28931	1.151532		FULL SUPPORT
655	T	MRC70	Sourdough Creek - Low er	44.27500556	-106.92260830	9/23/1998	12	19.95184	0.601448		PARTIAL/NON SUPPORT
656	T	MRC71	Sourdough Creek - Upper	44.24016111	-106.96542780	9/23/1998	22	20.03723	1.097956		FULL SUPPORT
13	R	MRC2	SOUTH BEAVER CREEK	44.75111111	-107.76694440	09-15-1993	13	17.29205	0.751791		INDETERMINATE
39	R	MRC5	SOUTH FORK CLEAR CREEK	44.27388889	-106.96833330	09-20-1993	22	20.02774	1.098476		FULL SUPPORT
36	T	MRC37	SOUTH FORK PINEY CREEK	44.55433333	-106.94287220	9/30/1996	13	16.16477	0.804218		INDETERMINATE
621	T	MRC37	SOUTH FORK PINEY CREEK	44.55433333	-106.94287220	9/30/1998	18	16.16196	1.113726		FULL SUPPORT
33	R	MRC32	SOUTH FORK WEST PASS CREEK	44.94555556	-107.52305560	10-26-1993	17	16.35262	1.039589		FULL SUPPORT
58	T	MRCI33	SOUTH PAINTROCK CREEK	44.21444444	-107.30555560	9/29/1993	8	16.76379	0.477219		PARTIAL/NON SUPPORT
1182	T	MRCI33	SOUTH PAINTROCK CREEK	44.21444000	-107.30556000	9/19/2000	10	16.7085	0.598498		PARTIAL/NON SUPPORT
377	T	MRCI34	SOUTH PAINTROCK CREEK - UPPER	44.21222222	-107.30333330	9/11/1997	11	16.5225	0.665759		INDETERMINATE
1183	T	MRCI34	SOUTH PAINTROCK CREEK - UPPER	44.21222000	-107.30333000	9/19/2000	10	16.60272	0.602311		PARTIAL/NON SUPPORT
657	T	MRC72	South Piney Creek - Above Willow Park Reservoir	44.45150556	-107.04796670	9/30/1998	19	20.07751	0.946333		FULL SUPPORT
658	T	MRC73	South Rock Creek	44.45471389	-106.87862220	10/21/1998	17	16.98736	1.000744		FULL SUPPORT
618	RT	MRC23	SOUTH TONGUE RIVER	44.76693611	-107.47208330	9/9/1998	17	17.11575	0.993237		FULL SUPPORT
16	R	MRC23	SOUTH TONGUE RIVER	44.76693611	-107.47208330	08-25-1995	18	16.92334	1.063620		FULL SUPPORT
15	RT	MRC23	SOUTH TONGUE RIVER	44.76693611	-107.47208330	9/14/1993	19	15.95552	1.190810		FULL SUPPORT
674	T	MRCI41	SOUTH TONGUE RIVER - LOWER	44.78247222	-107.47566390	9/9/1998	15	15.85286	0.946201		FULL SUPPORT
63	T	MRCI41	SOUTH TONGUE RIVER - LOWER	44.78247222	-107.47566390	8/25/1995	17	15.84555	1.072856		FULL SUPPORT
62	T	MRCI40	SOUTH TONGUE RIVER - MIDDLE	44.76916667	-107.46888890	8/24/1995	15	17.02713	0.880947		FULL SUPPORT
647	T	MRC62	South Tongue River - Upper	44.68644444	-107.44615000	9/8/1998	17	16.74901	1.014986		FULL SUPPORT
659	T	MRC74	Sucker Creek - Low er	44.72298889	-107.44583060	9/8/1998	16	17.37301	0.920969		FULL SUPPORT
660	T	MRC75	Sucker Creek - Upper	44.70938889	-107.41121940	9/2/1998	20	16.73714	1.194947		FULL SUPPORT
6	R	MRC15	TENSLEEP CREEK	44.14055556	-107.24638890	10/12/1993	10	16.50386	0.605919		PARTIAL/NON SUPPORT
345	RT	MRC24	TONGUE RIVER	44.84662500	-107.33068330	10/13/1997	13	14.79878	0.878451		FULL SUPPORT
828	RT	MRC24	TONGUE RIVER	44.84662500	-107.33068330	10/12/1999	13	14.75034	0.881336		FULL SUPPORT
18	RT	MRC24	TONGUE RIVER	44.84662500	-107.33068330	10/20/1994	14	14.8414	0.943307		FULL SUPPORT
19	RT	MRC24	TONGUE RIVER	44.84662500	-107.33068330	10/16/1995	14	14.76045	0.948481		FULL SUPPORT
17	R	MRC24	TONGUE RIVER	44.84662500	-107.33068330	10-19-1993	14	14.49892	0.965589		FULL SUPPORT
20	RT	MRC24	TONGUE RIVER	44.84662500	-107.33068330	9/26/1996	15	14.8003	1.013493		FULL SUPPORT
619	RT	MRC24	TONGUE RIVER	44.84662500	-107.33068330	10/13/1998	16	14.73608	1.085770		FULL SUPPORT
998	R	MRC24	TONGUE RIVER	44.84662000	-107.33068000	9/20/2000	13	14.69088	0.884903		FULL SUPPORT
1122	R	MRC24	TONGUE RIVER	44.84662000	-107.33068000	10/10/2001	14	14.67655	0.953903		FULL SUPPORT
1057	T	MRC92	Unnamed Tributary to Little Bighorn Rive	44.84333000	-107.75722000	9/13/2000	10	17.31204	0.577633		PARTIAL/NON SUPPORT
984	T	MRC85	Wagon Box Creek Above Little Bighorn Riv	44.88514000	-107.75177000	9/14/2000	14	16.27884	0.860012		FULL SUPPORT

Appendix B (cont.) - O/E scores and narrative ratings for samples by ecoregion/sub-region. Samples outside model experience are noted with an asterisk.

625	T	MRC41	Webb Creek	44.10951389	-107.11024720	9/16/1998	17	20.08849	0.846256		FULL SUPPORT
64	T	MRCI42	WEST FORK BIG GOOSE CREEK - LOWER	44.61198056	-107.29875560	9/16/1996	13	15.32556	0.848256		FULL SUPPORT
675	T	MRCI42	WEST FORK BIG GOOSE CREEK - LOWER	44.61198056	-107.29875560	9/11/1998	13	15.12079	0.859743		FULL SUPPORT
297	T	MRCI42	WEST FORK BIG GOOSE CREEK - LOWER	44.61198056	-107.29875560	10/6/1997	17	16.29734	1.043115		FULL SUPPORT
65	T	MRCI43	WEST FORK BIG GOOSE CREEK - UPPER	44.61081111	-107.30042220	9/16/1996	13	16.07715	0.808601		INDETERMINATE
676	T	MRCI43	WEST FORK BIG GOOSE CREEK - UPPER	44.61081111	-107.30042220	9/11/1998	13	15.37523	0.845516		FULL SUPPORT
298	T	MRCI43	WEST FORK BIG GOOSE CREEK - UPPER	44.61081111	-107.30042220	9/17/1997	16	16.91576	0.945863		FULL SUPPORT
1	T	MRC1	WEST FORK LITTLE BIGHORN RIVER	44.99888889	-107.62777780	10/27/1993	15	13.82702	1.084832		FULL SUPPORT
989	T	MRC88	West Pass Creek - Low er	44.98778000	-107.48222000	9/21/2000	8	10.53494	0.759378		INDETERMINATE
990	T	MRC89	West Pass Creek at X-X Ranch	44.95606000	-107.51105000	9/21/2000	14	15.58605	0.898239		FULL SUPPORT
7	R	MRC16	WEST TENSLEEP CREEK	44.23861111	-107.22444440	10/12/1993	16	20.06335	0.797474		INDETERMINATE
MIDDLE ROCKIES EAST											
83	T	MREI5	BEAVER CREEK	44.57250000	-104.40666670	10/3/1996	6	8.749885	0.685723		INDETERMINATE
1034	T	MRE14	Beaver Creek - Above Cook Lake	44.56232000	-104.40585000	10/18/2000	7	8.749875	0.800011		INDETERMINATE
1033	T	MRE15	Beaver Creek - Above Faw n Creek	44.64112000	-104.38391000	10/18/2000	3	8.749798	0.342865		PARTIAL/NON SUPPORT
1032	T	MRE16	Beaver Creek - Above Little Creek	44.60758000	-104.39847000	8/31/2000	5	8.249863	0.606071		PARTIAL/NON SUPPORT
365	T	MRE6	BEAVERDAM CREEK	44.71500000	-104.38638890	10/22/1997	4	8.24993	0.484853		PARTIAL/NON SUPPORT
76	T	MRE8	BLACKTAIL CREEK	44.56027778	-104.47694440	10/4/1996	8	8.249925	0.969706		FULL SUPPORT
1046	T	MRE19	Blacktail Creek - Below Hershey Creek	44.58301000	-104.49026000	10/25/2000	8	8.249691	0.969733		FULL SUPPORT
379	R	MRE11	COLD SPRINGS CREEK	44.25277778	-104.17833330	10-02-1997	8	8.247486	0.969993		FULL SUPPORT
1045	T	MRE17	Faw n Creek - Above F.S. Boundary	44.63751000	-104.37569000	10/17/2000	4	8.249939	0.484852		PARTIAL/NON SUPPORT
336	T	MRE10	INYAN KARA CREEK	44.22583333	-104.42500000	10/2/1997	4	8.249016	0.484906		PARTIAL/NON SUPPORT
1031	R	MRE18	Little Creek - F.S. Boundary	44.60747000	-104.39073000	8/30/2000	10	8.249867	1.212141		FULL SUPPORT
380	T	MRE5	NORTH FORK SUNDANCE CREEK	44.40638889	-104.38805560	10/22/1997	5	8.249912	0.606067		PARTIAL/NON SUPPORT
82	T	MREI4	NORTH REDWATER CREEK	44.58222222	-104.29777780	10/18/1995	7	8.249939	0.848491		FULL SUPPORT
364	R	MRE13	SAND CREEK - CROSSING	44.41305556	-104.09583330	10-21-1997	11	8.749896	1.257158		FULL SUPPORT
73	R	MRE3	SAND CREEK - LOWER	44.49222222	-104.10861110	09-20-1994	8	8.248404	0.969885		FULL SUPPORT
72	R	MRE2	SAND CREEK - UPPER	44.49027778	-104.10694440	09-20-1994	9	8.24847	1.091111		FULL SUPPORT
381	R	MREI3	SPOTTED TAIL CREEK	44.36861111	-104.08694440	10-21-1997	8	9.249968	0.864868		FULL SUPPORT
81	T	MREI2	STOCKADE BEAVER CREEK - LOWER	43.81250000	-104.11250000	10/6/1994	4	8.244734	0.485158		PARTIAL/NON SUPPORT
1078	T	MREI2	STOCKADE BEAVER CREEK - LOWER	43.81250000	-104.11250000	9/19/2001	7	8.245932	0.848903		FULL SUPPORT
334	R	MRE12	STOCKADE BEAVER CREEK - MALLO CAMP	44.08166667	-104.05888890	10-01-1997	7	8.24986	0.848499		FULL SUPPORT
1076	R	MRE12	STOCKADE BEAVER CREEK - MALLO CAMP	44.08167000	-104.05889000	9/17/2001	9	8.249864	1.090927		FULL SUPPORT
74	R	MRE4	STOCKADE BEAVER CREEK - UPPER	43.88722222	-104.09722220	10-19-1995	7	8.247296	0.848763		FULL SUPPORT
1077	R	MRE4	STOCKADE BEAVER CREEK - UPPER	43.88722000	-104.09722000	9/18/2001	8	8.248185	0.96991		FULL SUPPORT
75	R	MRE7	TOGUS CREEK	44.54416667	-104.41277780	10-03-1996	8	8.249962	0.969701		FULL SUPPORT
80	T	MREI1	WHITELAW CREEK - LOWER	44.50722222	-104.42055560	10/3/1996	9	8.749879	1.028586		FULL SUPPORT
79	T	MREI1	WHITELAW CREEK - LOWER	44.50722222	-104.42055560	9/2/1994	9	8.749855	1.028588		FULL SUPPORT
78	T	MREI1	WHITELAW CREEK - LOWER	44.50722222	-104.42055560	9/22/1993	9	8.749813	1.028593		FULL SUPPORT
333	RT	MRE1	WHITELAW CREEK - UPPER	44.50500000	-104.43241110	10/1/1997	8	8.749887	0.914297		FULL SUPPORT
70	RT	MRE1	WHITELAW CREEK - UPPER	44.50500000	-104.43241110	10/18/1995	8	8.749883	0.914298		FULL SUPPORT
69	RT	MRE1	WHITELAW CREEK - UPPER	44.50500000	-104.43241110	9/23/1994	8	8.749841	0.914302		FULL SUPPORT
71	RT	MRE1	WHITELAW CREEK - UPPER	44.50500000	-104.43241110	10/3/1996	9	9.249889	0.972985		FULL SUPPORT
68	R	MRE1	WHITELAW CREEK - UPPER	44.50500000	-104.43241110	09-23-1993	10	8.749887	1.142872		FULL SUPPORT
840	RT	MRE1	WHITELAW CREEK - UPPER	44.50500000	-104.43241110	10/8/1999	10	8.249922	1.212133		FULL SUPPORT
679	RT	MRE1	WHITELAW CREEK - UPPER	44.50500000	-104.43241110	9/10/1998	12	8.749907	1.371443		FULL SUPPORT
1030	R	MRE1	WHITELAW CREEK - UPPER	44.50500000	-104.43241000	10/19/2000	8	8.749856	0.914301		FULL SUPPORT
1067	R	MRE1	WHITELAW CREEK - UPPER	44.50500000	-104.43241000	10/2/2001	9	8.749843	1.02859		FULL SUPPORT
MIDDLE ROCKIES WEST											
1186	T	MRW113	Alice Creek White Saddle	42.41389000	-110.72361000	9/6/2000	12	13.67869	0.877277		FULL SUPPORT
126	R	MRW58	ANTELOPE CREEK	44.86944444	-110.38361110	09-14-1994	9	12.32985	0.729936		INDETERMINATE
861	T	MRW91	Bear Creek (Upper) Bear Basin	43.73471389	-109.44759720	9/13/1999	11	11.81181	0.931271		FULL SUPPORT
860	T	MRW90	Bear Creek Middle (Campground)	43.64443056	-109.49986940	9/14/1999	9	9.26869	0.971011		FULL SUPPORT
863	T	MRW93	Beaver Creek Upper (Iron Mtn)	42.56602778	-108.73459720	8/13/1999	11	11.38174	0.966461		FULL SUPPORT
864	T	MRW94	Beaver Creek middle (Thomsen, Miners Delight)	42.53511111	-108.65072500	8/11/1999	5	11.1197	0.449652		PARTIAL/NON SUPPORT
181	R	MRWI41	BIG SANDY RIVER	42.57250000	-109.29111110	09-27-1996	21	14.58455	1.439879		FULL SUPPORT
164	T	MRWI25	BLACKTAIL DEER CREEK	44.95694444	-110.58611110	9/9/1994	10	12.85191	0.778095		INDETERMINATE
147	R	MRW9	BUFFALO FORK RIVER	43.85472222	-110.23833330	08-31-1994	13	11.25937	1.154594		FULL SUPPORT
130	R	MRW61	CABIN CREEK	44.12750000	-109.64388890	09-17-1996	16	13.33705	1.199666		FULL SUPPORT
86	RT	MRW1	CACHE CREEK - LOWER - USGS STREAM GAGE	43.45244722	-110.70362780	9/7/1995	11	13.16643	0.835458		INDETERMINATE
680	RT	MRW1	CACHE CREEK - LOWER - USGS STREAM GAGE	43.45244722	-110.70362780	10/6/1998	11	13.02959	0.844232		FULL SUPPORT
87	RT	MRW1	CACHE CREEK - LOWER - USGS STREAM GAGE	43.45244722	-110.70362780	9/4/1996	13	13.41772	0.968868		FULL SUPPORT
84	R	MRW1	CACHE CREEK - LOWER - USGS STREAM GAGE	43.45244722	-110.70362780	08-27-1993	14	13.37999	1.046338		FULL SUPPORT
85	RT	MRW1	CACHE CREEK - LOWER - USGS STREAM GAGE	43.45244722	-110.70362780	9/1/1994	15	13.29984	1.127833		FULL SUPPORT
320	RT	MRW1	CACHE CREEK - LOWER - USGS STREAM GAGE	43.45244722	-110.70362780	9/16/1997	15	13.04682	1.149705		FULL SUPPORT
841	RT	MRW1	CACHE CREEK - LOWER - USGS STREAM GAGE	43.45244722	-110.70362780	9/1/1999	16	13.81849	1.157869		FULL SUPPORT
1184	R	MRW1	CACHE CREEK - LOWER - USGS STREAM GAGE	43.45245000	-110.70363000	8/30/2000	14	13.37087	1.047053		FULL SUPPORT
1185	R	MRW1	CACHE CREEK - LOWER - USGS STREAM GAGE	43.45245000	-110.70363000	9/5/2001	14	13.24377	1.057101		FULL SUPPORT
90	R	MRW12	CACHE CREEK - UPPER	43.45083333	-110.70083330	09-01-1994	15	13.30811	1.127132		FULL SUPPORT
862	T	MRW92	Castle Creek (culvert)	43.67677222	-109.37787220	9/14/1999	15	13.02545	1.151592		FULL SUPPORT
315	T	MRWI19	CHERRY CREEK - YOUNG BASIN	42.62444444	-108.70916670	9/11/1997	4	9.595404	0.416866		PARTIAL/NON SUPPORT
145	R	MRW76	CLEARWATER CREEK (ABOVE)	44.46305556	-104.67083330	09-20-1996	15	14.07882	1.065430	*	FULL SUPPORT
278	RT	MRW76	CLEARWATER CREEK (ABOVE)	44.46305556	-109.67083330	9/10/1997	16	13.46962	1.187859		FULL SUPPORT
277	T	MRWI11	CLEARWATER CREEK (BELOW)	44.46416667	-109.67194440	9/10/1997	13	13.43531	0.967600		FULL SUPPORT
150	T	MRWI11	CLEARWATER CREEK (BELOW)	44.46416667	-109.67194440	9/20/1996	16	13.43119	1.191257		FULL SUPPORT
280	RT	MRW72	CLOCKTOWER CREEK (ABOVE)	44.46027778	-109.57500000	9/10/1997	8	13.06687	0.612235		PARTIAL/NON SUPPORT
141	R	MRW72	CLOCKTOWER CREEK (ABOVE)	44.46027778	-109.57500000	09-20-1996	13	13.11326	0.991363		FULL SUPPORT
279	T	MRWI7	CLOCKTOWER CREEK (BELOW)	44.46222222	-109.57388890	9/10/1997	8	13.08262	0.611498		PARTIAL/NON SUPPORT
184	T	MRWI7	CLOCKTOWER CREEK (BELOW)	44.46222222	-109.57388890	9/20/1996	13	13.09449	0.992784		FULL SUPPORT
154	T	MRWI15	COAL CREEK	42.24055556	-110.85861110	9/25/1996	7	12.23587	0.572088	*	PARTIAL/NON SUPPORT
177	T	MRWI38	COAL CREEK	42.39000000	-110.95194440	10/3/1995	10	18.501	0.540511		PARTIAL/NON SUPPORT
689	T	MRW80	COAL CREEK - LOWER	42.23439444	-110.86624720	9/23/1998	8	10.13513	0.789334	*	INDETERMINATE
688	T	MRW79	COAL CREEK - UPPER	42.25938056	-110.84340000	9/22/1998	8	13.33284	0.600022	*	PARTIAL/NON SUPPORT
690	T	MRW81	COANTAG CREEK - BRIDGE (BEAR RIVER)	42.37116111	-110.78874720	9/24/1998	20	20.80368	0.961369		FULL SUPPORT
96	R	MRW18	CROW CREEK	44.51313889	-109.97328060	09-02-1993	10	11.85109	0.843804		FULL SUPPORT
856	RT	MRW18	CROW CREEK	44.51313889	-109.97328060	8/31/1999	13	12.49847	1.040128		FULL SUPPORT
98	RT	MRW18	CROW CREEK	44.51313889	-109.97328060	9/22/1995	13	12.42068	1.046642		FULL SUPPORT
301	RT	MRW18	CROW CREEK	44.51313889	-109.97328060	8/26/1997	14	12.45102	1.124406		FULL SUPPORT
682	RT	MRW18	CROW CREEK	44.51313889	-109.97328060	9/4/1998	14	12.44841	1.124642		FULL SUPPORT
97	RT	MRW18	CROW CREEK	44.51313889	-109.97328060	9/7/1994	14	11.90567	1.175910		FULL SUPPORT
99	RT	MRW18	CROW CREEK	44.51313889	-109.97328060	9/18/1996	16	11.90298	1.344201		FULL SUPPORT
1003	R	MRW18	CROW CREEK	44.51314000	-109.97328000	9/6/2000	12	11.83753	1.013725		FULL SUPPORT

Appendix B (cont.) - O/E scores and narrative ratings for samples by ecoregion/sub-region. Samples outside model experience are noted with an asterisk.

1111	R	MRW18	CROW CREEK	44.51314000	-109.97328000	8/27/2001	12	11.90968	1.007584	FULL SUPPORT
88	R	MRW10	CRYSTAL CREEK	43.55833333	-110.40555560	09-05-1996	13	10.61416	1.224778	FULL SUPPORT
1083	T	MRW117	Dead Indian Creek below Dead Indian Camp	44.75567000	-109.41618000	8/29/2001	12	12.8753	0.932017	FULL SUPPORT
866	T	MRW96	Deep Creek Canyon Mouth	42.63156111	-108.63651940	8/17/1999	9	9.712046	0.926684	FULL SUPPORT
129	R	MRW60	DEER CREEK	44.16055556	-109.62083330	09-17-1996	15	12.86952	1.165545	FULL SUPPORT
843	T	MRW101	East Fork Wind River Alkali Confluence	43.63082500	-109.38665830	9/16/1999	9	10.79928	0.833389	INDETERMINATE
868	T	MRW99	East Fork Wind River Upper/Below Lean-to Creek	43.69077222	-109.36136110	9/14/1999	13	12.09859	1.074506	FULL SUPPORT
842	T	MRW100	East Fork Wind River Bluff	43.59073333	-109.44307780	9/16/1999	8	10.74759	0.744353	INDETERMINATE
284	R	MRW73	ELK FORK CREEK (ABOVE)	44.49500000	-109.93305560	09-10-1997	14	12.41752	1.127439	FULL SUPPORT
142	RT	MRW73	ELK FORK CREEK (ABOVE)	44.46472222	-109.62777780	9/20/1996	14	11.7144	1.195110	FULL SUPPORT
185	T	MRWI8	ELK FORK CREEK (BELOW)	44.46611111	-109.62722220	9/20/1996	13	11.72173	1.109051	FULL SUPPORT
281	T	MRWI8	ELK FORK CREEK (BELOW)	44.46611111	-109.62722220	9/10/1997	14	11.69984	1.196597	FULL SUPPORT
106	R	MRW31	ELK FORK RIVER	44.45777778	-109.63250000	09-07-1994	12	11.66865	1.028396	FULL SUPPORT
113	T	MRW42	FALLS RIVER	44.13472222	-110.82083330	8/31/1993	8	10.78258	0.741938	INDETERMINATE
172	T	MRWI33	FISH CREEK - STATION 1	43.49277778	-110.87277780	9/7/1995	8	12.35464	0.647530	PARTIAL/NON SUPPORT
173	T	MRWI34	FISH CREEK - STATION 2	43.52194444	-110.86333330	9/6/1995	10	11.57524	0.863913	FULL SUPPORT
174	T	MRWI35	FISH CREEK - STATION 3	43.54555556	-110.84583330	9/6/1995	5	13.38043	0.373680	PARTIAL/NON SUPPORT
175	T	MRWI36	FISH CREEK - STATION 4	43.58527778	-110.82555560	9/6/1995	4	14.58189	0.274313	PARTIAL/NON SUPPORT
127	R	MRW59	FONTENELLE CREEK - UPPER	42.28777778	-110.57472220	09-26-1996	21	18.9136	1.110312	FULL SUPPORT
695	T	MRW86	FONTENELLE CREEK - UPPER (GREEN RIVER)	42.24008333	-110.55520560	9/1/1998	21	20.1833	1.040464	FULL SUPPORT
692	T	MRW83	GIRAFFE CREEK - BAUMAN	42.40370833	-110.99915830	10/8/1998	14	20.67661	0.677094	INDETERMINATE
121	R	MRW50	GREEN RIVER 1 - LOWER	43.25722222	-110.02416670	10-03-1996	18	14.46806	1.244120	FULL SUPPORT
111	R	MRW4	GREEN RIVER 1 - UPPER	43.36611111	-109.98055560	10-03-1996	10	9.645717	1.036730	FULL SUPPORT
383	R	MRW21	GREYBULL RIVER - JACK CREEK	44.11111111	-109.35333330	08-28-1997	10	9.985476	1.001455	FULL SUPPORT
307	T	MRW32	GREYBULL RIVER - MIDDLE	44.10583333	-108.97333330	9/4/1997	11	13.49563	0.815078	INDETERMINATE
101	T	MRW23	GREYS RIVER	43.14305556	-110.97611110	9/1/1993	16	17.53965	0.912219	FULL SUPPORT
289	R	MRW67	GRINNEL CREEK (ABOVE)	44.49277778	-109.99333330	09-09-1997	12	11.88519	1.009660	FULL SUPPORT
135	RT	MRW67	GRINNEL CREEK (ABOVE)	44.49500000	-109.93305560	9/19/1996	16	12.41638	1.288620	FULL SUPPORT
283	T	MRWI2	GRINNEL CREEK (BELOW)	44.49500000	-109.93305560	9/9/1997	14	12.90888	1.084525	FULL SUPPORT
156	T	MRWI2	GRINNEL CREEK (BELOW)	44.49500000	-109.93305560	9/19/1996	16	12.39483	1.290861	FULL SUPPORT
698	T	MRW89	HAMS FORK - DITCH	42.10602778	-110.68584440	9/17/1998	13	17.48489	0.743499	INDETERMINATE
697	T	MRW88	HAMS FORK - FOREST	42.19278056	-110.73752780	9/17/1998	13	20.64418	0.629717	PARTIAL/NON SUPPORT
146	R	MRW8	HAMS FORK RIVER - BELOW	42.20944444	-110.73222220	10-05-1995	24	20.97134	1.144419	FULL SUPPORT
123	R	MRW53	HAMS FORK RIVER - CAMPGROUND	42.25416667	-110.72972220	10-05-1995	24	19.68518	1.219191	FULL SUPPORT
1053	R	MRW53	HAMS FORK RIVER - CAMPGROUND	42.25417000	-110.72972000	9/25/2000	19	20.18375	0.941351	FULL SUPPORT
1192	R	MRW53	HAMS FORK RIVER - CAMPGROUND	42.25417000	-110.72972000	10/2/2001	13	19.54047	0.665286	INDETERMINATE
1193	R	MRW53	HAMS FORK RIVER - CAMPGROUND	42.25417000	-110.72972000	9/25/2000	16	20.1902	0.792464	INDETERMINATE
92	R	MRW15	HOBBLE CREEK	42.36500000	-110.84527780	09-25-1996	22	21.26664	1.034484	FULL SUPPORT
867	T	MRW98	Horse Creek Upper/Below Burroughs Confluence	43.66446667	-109.63343060	9/21/1999	12	10.82482	1.108564	FULL SUPPORT
367	R	MRW52	LABARGE CREEK	42.40638889	-110.56083330	09-17-1997	26	19.55038	1.329898	FULL SUPPORT
138	R	MRW7	LABARGE CREEK - LOWER	42.40305556	-110.56055560	09-28-1996	21	19.64733	1.068848	FULL SUPPORT
100	R	MRW22	LABARGE CREEK - UPPER	42.52111111	-110.69888890	09-28-1996	12	14.39552	0.833592	INDETERMINATE
163	T	MRWI24	LAMAR RIVER - LOWER	44.90083333	-110.25555560	9/13/1994	10	13.9038	0.719228	INDETERMINATE
112	T	MRW41	LAMAR RIVER - UPPER	44.86083333	-110.18638890	9/13/1994	12	13.78741	0.870359	FULL SUPPORT
114	R	MRW44	LAVA CREEK	44.93555556	-110.62416670	09-14-1994	9	12.12367	0.742350	INDETERMINATE
286	RT	MRW68	LIBBY CREEK (ABOVE)	44.46055556	-109.86166670	9/9/1997	13	12.64122	1.028382	FULL SUPPORT
136	R	MRW68	LIBBY CREEK (ABOVE)	44.46055556	-109.86166670	09-19-1996	13	12.63191	1.029140	FULL SUPPORT
285	T	MRWI3	LIBBY CREEK (BELOW)	44.45972222	-109.86416670	9/9/1997	14	12.59543	1.111515	FULL SUPPORT
89	T	MRW11	LITTLE GRANITE CREEK	43.29888889	-110.52583330	9/1/1993	12	10.51365	1.141373	FULL SUPPORT
685	R	MRW47	LITTLE POPO AGIE RIVER - RED CANYON	42.69141667	-108.66380280	10-14-1998	16	14.79789	1.081236	FULL SUPPORT
314	RT	MRW47	LITTLE POPO AGIE RIVER - RED CANYON	42.69141667	-108.66380280	9/11/1997	20	15.33817	1.303936	FULL SUPPORT
696	T	MRW87	LITTLE SANDY - UPPER	42.53233056	-109.21099720	9/1/1998	15	12.52653	1.197459	FULL SUPPORT
134	R	MRW66	LITTLE SANDY CREEK	42.53305556	-109.20555560	09-27-1996	15	12.49461	1.200517	FULL SUPPORT
299	R	MRW71	M.FK. SHOSHONE RIVER (ABOVE)	41.26972222	-107.19916670	09-09-1997	11	17.0359	0.645695	PARTIAL/NON SUPPORT
140	RT	MRW71	M.FK. SHOSHONE RIVER (ABOVE)	44.49222222	-109.99583330	9/19/1996	15	11.8922	1.261331	FULL SUPPORT
290	R	MRWI6	M.FK. SHOSHONE RIVER (BELOW)	44.49222222	-109.99583330	09-09-1997	14	11.89014	1.177447	FULL SUPPORT
183	RT	MRWI6	M.FK. SHOSHONE RIVER (BELOW)	44.49277778	-109.99333330	9/19/1996	14	11.87114	1.179330	FULL SUPPORT
858	RT	MRW45	MIDDLE CREEK	44.47776667	-110.03559170	9/1/1999	7	11.5353	0.606833	PARTIAL/NON SUPPORT
684	RT	MRW45	MIDDLE CREEK	44.47776667	-110.03559170	9/3/1998	10	11.52889	0.867387	FULL SUPPORT
116	RT	MRW45	MIDDLE CREEK	44.47776667	-110.03559170	9/2/1993	12	11.92159	1.006577	FULL SUPPORT
386	RT	MRW45	MIDDLE CREEK	44.47776667	-110.03559170	8/25/1997	12	11.54457	1.039450	FULL SUPPORT
119	RT	MRW45	MIDDLE CREEK	44.47776667	-110.03559170	9/18/1996	12	11.54156	1.039721	FULL SUPPORT
118	RT	MRW45	MIDDLE CREEK	44.47776667	-110.03559170	9/21/1995	12	11.50595	1.042939	FULL SUPPORT
117	R	MRW45	MIDDLE CREEK	44.47776667	-110.03559170	09-07-1994	15	11.96089	1.254087	FULL SUPPORT
999	R	MRW45	MIDDLE CREEK	44.47777000	-110.03559000	9/7/2000	10	11.94326	0.837293	FULL SUPPORT
1070	R	MRW45	MIDDLE CREEK	44.47777000	-110.03559000	8/30/2001	11	11.45332	0.960421	FULL SUPPORT
325	T	MRW64	MIDDLE PINEY CREEK	42.60833333	-110.48166670	9/18/1997	12	13.09135	0.916636	FULL SUPPORT
132	T	MRW64	MIDDLE PINEY CREEK	42.60833333	-110.48166670	10/1/1996	14	13.61722	1.028110	FULL SUPPORT
312	R	MRW48	MIDDLE POPO AGIE RIVER - BRUCE'S BRIDGE	42.72972222	-108.85888890	09-10-1997	16	14.84168	1.078045	FULL SUPPORT
694	T	MRW85	MILL CREEK - State (BEAR RIVER)	41.06551111	-110.89613890	10/22/1998	14	22.06643	0.634448	PARTIAL/NON SUPPORT
288	RT	MRW69	MORMON CREEK (ABOVE)	44.47305556	-109.89638890	9/9/1997	13	12.603	1.031500	FULL SUPPORT
137	R	MRW69	MORMON CREEK (ABOVE)	44.47305556	-109.89638890	09-19-1996	15	12.60029	1.190449	FULL SUPPORT
287	T	MRWI4	MORMON CREEK (BELOW)	44.47277778	-109.89888890	9/9/1997	15	12.57404	1.192934	FULL SUPPORT
179	T	MRWI4	MORMON CREEK (BELOW)	44.47277778	-109.89888890	9/19/1996	15	12.56927	1.193387	FULL SUPPORT
144	T	MRW75	N.FK. SHOSHONE RIVER (SITE 1) (ABOVE)	44.46111111	-109.66388890	9/20/1996	14	13.94446	1.003983	FULL SUPPORT
292	T	MRW75	N.FK. SHOSHONE RIVER (SITE 1) (ABOVE)	44.46111111	-109.66388890	9/10/1997	15	13.93104	1.076732	FULL SUPPORT
149	T	MRWI10	N.FK. SHOSHONE RIVER (SITE 1) (BELOW)	44.46722222	-109.65916670	9/20/1996	14	13.95811	1.003001	FULL SUPPORT
291	T	MRWI10	N.FK. SHOSHONE RIVER (SITE 1) (BELOW)	44.46722222	-109.65916670	9/10/1997	14	13.93496	1.004668	FULL SUPPORT
139	R	MRW70	N.FK. SHOSHONE RIVER (SITE 2) (ABOVE)	44.45972222	-109.56694440	09-19-1996	13	13.12827	0.990230	FULL SUPPORT
294	RT	MRW70	N.FK. SHOSHONE RIVER (SITE 2) (ABOVE)	44.50305556	-109.96055560	9/9/1997	10	9.98559	1.001443	FULL SUPPORT
182	T	MRWI5	N.FK. SHOSHONE RIVER (SITE 2) (BELOW)	44.50000000	-109.95444440	9/19/1996	11	10.00227	1.099751	FULL SUPPORT
293	T	MRWI5	N.FK. SHOSHONE RIVER (SITE 2) (BELOW)	44.50000000	-109.95444440	9/9/1997	11	10.00227	1.099751	FULL SUPPORT
296	T	MRW74	N.FK. SHOSHONE RIVER (SITE 3) (ABOVE)	44.45972222	-109.56694440	9/10/1997	12	13.12827	0.914058	FULL SUPPORT
143	T	MRW74	N.FK. SHOSHONE RIVER (SITE 3) (ABOVE)	44.45972222	-109.56694440	9/20/1996	11	10.57319	1.040367	FULL SUPPORT
186	T	MRWI9	N.FK. SHOSHONE RIVER (SITE 3) (BELOW)	44.46055556	-109.55305560	9/20/1996	13	13.12351	0.990589	FULL SUPPORT
295	T	MRWI9	N.FK. SHOSHONE RIVER (SITE 3) (BELOW)	44.46055556	-109.55305560	9/10/1997	13	13.11306	0.991378	FULL SUPPORT
131	R	MRW63	NEW FORK RIVER - UPPER	43.07833333	-109.99527780	10-02-1996	7	9.787623	0.715189	INDETERMINATE
387	T	MRW46	NORTH FORK POPO AGIE RIVER - PUBLIC FISHING ACCESS	42.88000000	-108.72694440	10/22/1997	19	17.16673	1.106792	FULL SUPPORT
122	T	MRW51	NORTH FORK SHOSHONE RIVER - SCOUT CAMP	44.45750000	-109.86277780	9/3/1993	11	10.9735	1.002415	FULL SUPPORT
178	R	MRWI39	NORTH FORK SMITHS FORK RIVER	42.48722222	-110.83583330	10-04-1995	17	13.59529	1.250433	FULL SUPPORT
162	T	MRWI22	NORTH FORK SPREAD CREEK - LOWER	43.77750000	-110.25527780	9/4/1996	9	10.83569	0.830588	INDETERMINATE
161	T	MRWI22	NORTH FORK SPREAD CREEK - LOWER	43.77750000	-110.25527780	8/30/1994	10	10.82679	0.923635	FULL SUPPORT

Appendix B (cont.) - O/E scores and narrative ratings for samples by ecoregion/sub-region. Samples outside model experience are noted with an asterisk.

159	T	MRWI21	NORTH FORK SPREAD CREEK - MIDDLE	43.77722222	-110.24972220	8/30/1994	9	10.8641	0.828416		INDETERMINATE
160	T	MRWI21	NORTH FORK SPREAD CREEK - MIDDLE	43.77722222	-110.24972220	9/4/1996	10	10.88569	0.918637		FULL SUPPORT
157	T	MRWI20	NORTH FORK SPREAD CREEK - UPPER	43.77611111	-110.24250000	8/31/1994	9	10.94169	0.822542		INDETERMINATE
158	T	MRWI20	NORTH FORK SPREAD CREEK - UPPER	43.77611111	-110.24250000	9/4/1996	13	10.95382	1.186801		FULL SUPPORT
1187	T	MRW121	North Horse Creek- Merna Butte	42.94663000	-110.39611000	9/26/2001	9	11.03619	0.815499		INDETERMINATE
128	R	MRW6	NORTH PINEY CREEK #1	42.66166667	-110.49055560	10-01-1996	13	13.62503	0.954126		FULL SUPPORT
93	R	MRW16	NORTH PINEY CREEK #2	42.66138889	-110.49000000	10-01-1996	9	13.62899	0.660357		PARTIAL/NON SUPPORT
108	T	MRW37	OBSIDIAN CREEK	44.87944444	-110.73666670	9/15/1994	6	12.18779	0.492296		PARTIAL/NON SUPPORT
302	T	MRWI26	OLIVER GULCH CREEK	44.84361111	-109.62555560	8/27/1997	3	12.92238	0.232155		PARTIAL/NON SUPPORT
368	R	MRW62	PEBBLE CREEK	44.91777778	-110.11055560	08-26-1997	11	12.02134	0.915039		FULL SUPPORT
304	T	MRW33	PICKETT CREEK	44.16722222	-109.28638890	8/29/1997	11	12.41266	0.886192		FULL SUPPORT
1194	T	MRW97	Pine Creek Above Highw ay 28	42.45132000	-108.86040000	8/17/2000	2	7.333333	0.272727	*	PARTIAL/NON SUPPORT
324	T	MRW78	PINE GROVE CREEK	42.43305556	-110.37555560	9/18/1997	5	11.34752	0.440625		PARTIAL/NON SUPPORT
865	T	MRW95	Pole Creek Upper/Below Gagin Stn.	42.88075556	-109.71809440	10/6/1999	13	12.64021	1.028464		FULL SUPPORT
107	T	MRW36	RAYMOND CREEK	42.27666667	-111.02138890	9/24/1996	8	9.27828	0.862229	*	FULL SUPPORT
352	RT	MRW17	ROARING FORK	43.35821667	-109.92280280	10/15/1997	11	11.34701	0.969419		FULL SUPPORT
681	R	MRW17	ROARING FORK	43.35821667	-109.92280280	08-31-1998	12	10.94759	1.096132		FULL SUPPORT
855	RT	MRW17	ROARING FORK	43.35821667	-109.92280280	10/7/1999	13	11.37071	1.143289		FULL SUPPORT
94	RT	MRW17	ROARING FORK	43.35821667	-109.92280280	10/3/1996	12	10.4872	1.144252		FULL SUPPORT
1188	R	MRW17	ROARING FORK	43.35822000	-109.92280000	9/26/2000	10	10.61267	0.94227		FULL SUPPORT
1189	R	MRW17	ROARING FORK	43.35822000	-109.92280000	9/25/2001	10	10.61671	0.941911		FULL SUPPORT
322	R	MRW35	ROCK CREEK	42.28861111	-110.42861110	09-17-1997	16	16.75801	0.954767		FULL SUPPORT
306	T	MRW77	ROCK CREEK - LOWER	43.69472222	-109.10861110	9/3/1997	15	12.3087	1.218650		FULL SUPPORT
305	T	MRWI42	ROCK CREEK - UPPER	43.73055556	-109.13944440	9/3/1997	12	11.40236	1.052414		FULL SUPPORT
691	T	MRW82	SALT CREEK - 89 CANYON	42.40358056	-111.03118890	10/8/1998	15	18.28177	0.820489		INDETERMINATE
155	T	MRWI16	SALT CREEK - LOWER	42.40388889	-111.02916670	10/3/1995	16	18.47982	0.865809		FULL SUPPORT
176	T	MRWI37	SALT CREEK - UPPER	42.40194444	-110.99027780	8/3/1995	11	21.2659	0.517260		PARTIAL/NON SUPPORT
384	R	MRW25	SALT RIVER	42.52500000	-110.88194440	10-16-1997	21	18.43551	1.139106		FULL SUPPORT
382	R	MRW20	SILAS CREEK - SHOSHONE NATL. FOREST	42.61611111	-108.87888890	09-10-1997	12	10.98988	1.091914		FULL SUPPORT
109	R	MRW38	SLOUGH CREEK	44.95333333	-110.29944440	09-13-1994	8	10.74425	0.744585		INDETERMINATE
693	T	MRW84	SMITHS FORK - CLARKS (BEAR RIVER)	42.22642778	-110.87692780	9/23/1998	15	18.23395	0.822641		INDETERMINATE
120	R	MRW5	SMITHS FORK RIVER	42.47722222	-110.83361110	09-25-1996	21	18.74838	1.120097		FULL SUPPORT
124	R	MRW55	SMITHS FORK RIVER - LOWER	42.34569444	-110.87277500	09-25-1996	20	18.38395	1.087905		FULL SUPPORT
153	T	MRWI14	SMITHS FORK RIVER - LOWER	42.34611111	-110.87250000	10/12/1994	16	18.49274	0.865205		FULL SUPPORT
686	T	MRWI14	SMITHS FORK RIVER - LOWER	42.34569444	-110.87277500	9/22/1998	20	18.49301	1.081489		FULL SUPPORT
1047	T	MRWI14	SMITHS FORK RIVER - LOWER	42.34611000	-110.87250000	9/22/1998	12	18.44228	0.650679		PARTIAL/NON SUPPORT
171	R	MRWI32	SMITHS FORK RIVER - UPPER	42.37944444	-110.85527780	10-12-1994	21	19.5311	1.075208		FULL SUPPORT
125	T	MRW57	SNAKE RIVER - ALPINE	43.20416667	-111.83000000	9/1/1994	12	14.99758	0.800129		INDETERMINATE
321	RT	MRW3	SNAKE RIVER - FLAGG RANCH	44.10078333	-110.66946110	9/16/1997	9	11.4575	0.785512		INDETERMINATE
857	RT	MRW3	SNAKE RIVER - FLAGG RANCH	44.10078333	-110.66946110	9/1/1999	11	12.46377	0.882558		FULL SUPPORT
105	T	MRW3	SNAKE RIVER - FLAGG RANCH	44.10078333	-110.66946110	9/5/1996	11	11.46048	0.959820		FULL SUPPORT
683	RT	MRW3	SNAKE RIVER - FLAGG RANCH	44.10078333	-110.66946110	10/7/1998	12	12.47558	0.961879		FULL SUPPORT
104	R	MRW3	SNAKE RIVER - FLAGG RANCH	44.10078333	-110.66946110	09-08-1995	12	11.96636	1.002811		FULL SUPPORT
102	RT	MRW3	SNAKE RIVER - FLAGG RANCH	44.10078333	-110.66946110	8/31/1993	12	11.47781	1.045495		FULL SUPPORT
103	RT	MRW3	SNAKE RIVER - FLAGG RANCH	44.10078333	-110.66946110	8/31/1994	15	13.00462	1.153436		FULL SUPPORT
1190	R	MRW3	SNAKE RIVER - FLAGG RANCH	44.10078000	-110.66946000	8/30/2000	10	12.45221	0.80307		INDETERMINATE
1191	R	MRW3	SNAKE RIVER - FLAGG RANCH	44.10078000	-110.66946000	9/5/2001	13	11.97478	1.085615		FULL SUPPORT
110	R	MRW39	SNAKE RIVER - YELLOWSTONE	44.13666667	-110.66416670	09-08-1995	10	11.48552	0.870662		FULL SUPPORT
169	T	MRWI30	SODA BUTTE CREEK	44.99277778	-110.05194440	9/13/1994	12	12.07858	0.993494		FULL SUPPORT
133	T	MRW65	SOUTH FORK BEAVER CREEK	42.44583333	-110.38305560	9/30/1996	13	15.04421	0.864120		FULL SUPPORT
166	T	MRWI28	SOUTH FORK SHOSHONE RIVER - LOWER	44.41000000	-109.26777780	9/19/1996	9	14.10067	0.638268		PARTIAL/NON SUPPORT
165	R	MRWI27	SOUTH FORK SHOSHONE RIVER - UPPER	44.20722222	-109.55527780	09-19-1996	17	13.19853	1.288023		FULL SUPPORT
180	R	MRWI40	SOUTH PINEY CREEK	42.50611111	-110.27777780	10-01-1996	15	14.94589	1.003620		FULL SUPPORT
385	R	MRW28	STRAWBERRY CREEK	42.90666667	-110.88666670	10-15-1997	11	15.9518	0.689577		INDETERMINATE
1082	T	MRW118	Sunlight Creek above Little Sunlight Cre	44.71605000	-109.58838000	8/28/2001	13	14.40256	0.902618		FULL SUPPORT
1081	T	MRW119	Sunlight Creek at White Mountain	44.75228000	-109.49077000	8/28/2001	11	13.18253	0.834438		INDETERMINATE
319	R	MRW19	TORREY CREEK - WHISKEY MOUNTAIN	43.42777778	-109.55833330	09-15-1997	15	13.79834	1.087088		FULL SUPPORT
849	T	MRW107	Trappers Creek Low er/Above Warm Springs Confluence	43.57345000	-109.88067780	9/9/1999	14	14.04409	0.996861	*	FULL SUPPORT
167	T	MRWI29	TROUT CREEK	44.48055556	-109.34361110	9/18/1996	10	11.69312	0.855204		FULL SUPPORT
170	T	MRWI31	TROUT CREEK	44.64138889	-110.45750000	9/14/1994	3	12.53745	0.239283		PARTIAL/NON SUPPORT
850	T	MRW108	Unnamed Tributary to Brooks Lake	43.75533611	-110.01166670	9/2/1999	15	13.61057	1.102085		FULL SUPPORT
852	T	MRW110	Warm Springs Creek Green	43.58450278	-109.91686670	9/10/1999	9	11.16256	0.806267		INDETERMINATE
851	T	MRW109	Warm Springs Creek Upper/Above Coyote Creek	43.59199722	-109.98405560	9/8/1999	11	12.27246	0.896316		FULL SUPPORT
853	T	MRW111	Warm Springs Creek Fish	43.58584722	-109.96773610	9/8/1999	11	10.97362	1.002404		FULL SUPPORT
854	T	MRW112	Warm Springs Creek Low er/Above Trappers Creek	43.57235833	-109.88076390	9/9/1999	13	11.58732	1.121916		FULL SUPPORT
360	RT	MRW56	WEST FORK SMITHS FORK	41.03005000	-110.47426390	10/22/1997	14	14.87177	0.941381		FULL SUPPORT
687	RT	MRW56	WEST FORK SMITHS FORK	41.03005000	-110.47426390	10/8/1998	21	20.35276	1.031801		FULL SUPPORT
859	R	MRW56	WEST FORK SMITHS FORK	41.03005000	-110.47426390	10-18-1999	23	19.53616	1.177304		FULL SUPPORT
318	R	MRW49	WIGGINS FORK - THUNDERHEAD	43.55638889	-109.47666670	09-15-1997	13	12.50572	1.039524		FULL SUPPORT
91	T	MRW13	WILLOW CREEK	43.29138889	-110.67166670	9/1/1994	14	15.67069	0.893388		FULL SUPPORT
355	R	MRW26	WILLOW CREEK	42.84500000	-110.87888890	10-16-1997	12	14.51368	0.826806		INDETERMINATE
366	T	MRW54	WILLOW CREEK	41.11222222	-110.46694440	10/22/1997	14	16.83619	0.831542		INDETERMINATE
844	T	MRW102	Willow Creek Upper (RR Crossing)	42.47286111	-108.81522220	8/4/1999	9	13.66582	0.658577		PARTIAL/NON SUPPORT
845	T	MRW103	Willow Creek Middle -Shields Mine	42.46330278	-108.78414720	8/5/1999	14	15.31166	0.914336		FULL SUPPORT
848	T	MRW106	Wind River BLM	43.60637500	-109.80206390	9/22/1999	9	9.949138	0.904601		FULL SUPPORT
847	T	MRW105	Wind River Stoney Point	43.59121667	-109.77480830	9/23/1999	16	12.40422	1.289884		FULL SUPPORT
846	T	MRW104	Wind River USFS	43.62967778	-109.88528890	9/24/1999	8	9.467028	0.845038		FULL SUPPORT
NORTHWESTERN GREAT PLAINS											
873	T	NGP44	Beaver Creek - Low er	43.98680278	-106.68656940	10/27/1999	11	12.02754	0.914568	*	FULL SUPPORT
1092	T	NGP141	Beaver Creek below Stockade Beaver Creek	43.54044000	-104.12263000	9/26/2001	6	8.99999	0.666667	*	INDETERMINATE
1091	T	NGP140	Beaver Creek near South Dakota state lin	43.50334000	-104.05908000	9/27/2001	5	8.999975	0.555557	*	PARTIAL/NON SUPPORT
189	R	NGP3	BELLE FOURCHE RIVER - BLM	44.75277778	-104.49055560	10-05-1994	10	8.999999	1.111111		FULL SUPPORT
197	R	NGPI17	BELLE FOURCHE RIVER - DEVILS TOWER	44.58916667	-104.70055560	09-21-1994	11	8.999999	1.222222		FULL SUPPORT
745	T	NGPI38	BELLE FOURCHE RIVER - DOWNSTREAM OF DONKEY CREEK	44.29051111	-104.97133330	10/1/1998	7	8.999949	0.777782		INDETERMINATE
748	T	NGPI40	BELLE FOURCHE RIVER - DOWNSTREAM OF HULETT WWTF	44.69906944	-104.59213890	9/2/1998	10	8.999999	1.111111		FULL SUPPORT
746	T	NGPI39	BELLE FOURCHE RIVER - DOWNSTREAM OF RUSH CREEK	44.27652500	-104.97213890	9/23/1998	7	8.999979	0.777780		INDETERMINATE
749	T	NGPI41	BELLE FOURCHE RIVER - UPSTREAM OF HULETT WWTF	44.69428611	-104.59465830	9/2/1998	8	8.999999	0.888889		FULL SUPPORT
699	T	NGP12	BELLE FOURCHE RIVER - UPSTREAM OF RAVEN CREEK	44.18029444	-105.09141940	9/24/1998	7	8.999982	0.777779		INDETERMINATE
994	T	NGP116	Belle Fourche River Below Caballo Creek	44.07906000	-105.23782000	8/24/2000	7	8.88357	0.787972		INDETERMINATE
202	T	NGPI21	BIG GOOSE CREEK	44.79522222	-106.96559440	10/25/1994	10	7.807511	1.280818	*	FULL SUPPORT
737	T	NGPI21	BIG GOOSE CREEK	44.79522222	-106.96559440	10/29/1998	11	7.575201	1.452107	*	FULL SUPPORT
755	T	NGPI47	Big Goose Creek - Beckton	44.74544722	-107.12875000	10/22/1998	12	11.05444	1.085536		FULL SUPPORT

Appendix B (cont.) - O/E scores and narrative ratings for samples by ecoregion/sub-region. Samples outside model experience are noted with an asterisk.

756	T	NGPI49	Big Goose Creek - Normative Services	44.77363056	-107.01981390	10/23/1998	13	13.89009	0.935919		FULL SUPPORT
702	T	NGP15	Billy Creek - Lower	44.12734167	-106.71169720	9/25/1998	8	8.095262	0.988232	*	FULL SUPPORT
703	T	NGP16	Boxelder Creek - Lower	44.56475833	-106.59185560	10/8/1998	9	7.333332	1.227273		FULL SUPPORT
704	T	NGP17	Boxelder Creek - Upper	44.44059444	-106.69419440	10/8/1998	4	7.333128	0.545470		PARTIAL/NON SUPPORT
705	T	NGP18	Bull Creek - Lower (Near Buffalo)	44.34747500	-106.67572500	10/9/1998	9	9.452728	0.952106		FULL SUPPORT
997	T	NGP105	Caballo Creek Below Belle Ayr Mine	44.09231000	-105.29985000	8/23/2000	2	7.333333	0.272727	*	PARTIAL/NON SUPPORT
996	T	NGP106	Caballo Creek Below Bone Pile Creek	44.08970000	-105.44541000	8/23/2000	1	8.999593	0.111116		PARTIAL/NON SUPPORT
995	T	NGP107	Caballo Creek Below Hwy 59	44.08027000	-105.46274000	8/23/2000	2	7.333333	0.272727	*	PARTIAL/NON SUPPORT
190	T	NGP7	CASPER CREEK	42.91666667	-106.43027780	10/10/1995	4	14.53862	0.275129	*	PARTIAL/NON SUPPORT
911	T	NGP82	Castle Creek above Salt Creek	43.39738611	-106.27962780	7/27/1999	2	14.55535	0.137407	*	PARTIAL/NON SUPPORT
874	T	NGP45	Clear Creek - Above Buffalo WWTP	44.36211111	-106.65299720	10/18/1999	13	11.2139	1.159276		FULL SUPPORT
876	T	NGP47	Clear Creek - Above Clearmont WWTF	44.63513056	-106.37624720	10/15/1999	8	8.999961	0.888893		FULL SUPPORT
877	T	NGP48	Clear Creek - Above Piney Creek	44.56335000	-106.52516390	9/29/1999	8	13.40595	0.596750		PARTIAL/NON SUPPORT
198	T	NGPI18	CLEAR CREEK - BELOW BUFFALO	44.40208611	-106.60941390	10/24/1995	6	12.86723	0.466301		PARTIAL/NON SUPPORT
913	T	NGPI18	CLEAR CREEK - BELOW BUFFALO	44.40208611	-106.60941390	9/30/1999	8	12.75922	0.626997		PARTIAL/NON SUPPORT
875	T	NGP46	Clear Creek - Below Buffalo WWTP	44.36378611	-106.65109720	9/28/1999	10	12.52389	0.798474		INDETERMINATE
878	T	NGP49	Clear Creek - Below Clearmont WWTP	44.64153889	-106.37142220	10/15/1999	9	8.999964	1.000004		FULL SUPPORT
879	T	NGP50	Clear Creek - Below Piney Creek Confluence	44.56547500	-106.52126390	9/29/1999	8	8.999763	0.888912		FULL SUPPORT
880	T	NGP51	Clear Creek - County 70 Bridge	44.75009167	-106.22308890	10/14/1999	8	8.999973	0.888892		FULL SUPPORT
881	T	NGP52	Clear Creek - Foate	44.85438889	-106.09777780	10/13/1999	7	8.999974	0.777780		INDETERMINATE
882	T	NGP53	Clear Creek - Leiter (14/16 Bridge)	44.71565278	-106.28318890	10/14/1999	8	8.999971	0.888892		FULL SUPPORT
883	T	NGP54	Clear Creek - Rowley's	44.87215278	-106.08090560	10/13/1999	7	8.999981	0.777779		INDETERMINATE
884	T	NGP55	Clear Creek - Texaco	44.52253056	-106.54833060	10/20/1999	7	12.9807	0.539262		PARTIAL/NON SUPPORT
1008	T	NGP104	Clear Creek Above Powder River	44.87863000	-106.06968000	10/9/2000	6	8.999986	0.666668		INDETERMINATE
218	T	NGPI8	COLUMBUS CREEK - LOWER	44.89305556	-107.23611110	10/8/1996	9	8.396782	1.071839	*	FULL SUPPORT
346	T	NGPI8	COLUMBUS CREEK - LOWER	44.89305556	-107.23611110	10/14/1997	8	7.163569	1.116762		FULL SUPPORT
191	R	NGP8	CRAZY WOMAN CREEK	44.48611111	-106.13416670	10-26-1995	7	8.999963	0.777781		INDETERMINATE
885	T	NGP56	Crazy Woman Creek - State Section	44.12973333	-106.48351110	10/25/1999	7	13.84154	0.505724		PARTIAL/NON SUPPORT
886	T	NGP57	Crazy Woman Creek - Upper	44.06397222	-106.59203060	10/26/1999	7	13.82404	0.506364		PARTIAL/NON SUPPORT
974	T	NGP109	Donkey Creek - State Section	44.29697000	-105.29127000	8/29/2000	4	7.333333	0.545455	*	PARTIAL/NON SUPPORT
978	T	NGP110	Donkey Creek Above Adon Rd.	44.28454000	-105.20598000	8/29/2000	2	7.333333	0.272727	*	PARTIAL/NON SUPPORT
980	T	NGP112	Donkey Creek Above Stonepile Creek	44.26267000	-105.46320000	8/29/2000	2	7.333333	0.272727	*	PARTIAL/NON SUPPORT
979	T	NGP115	Donkey Creek Above Wyodak	44.27000000	-105.42000000	8/30/2000	3	8.685754	0.345393		PARTIAL/NON SUPPORT
975	T	NGP114	Donkey Creek at Belle Fourche Confluence	44.28593000	-104.97417000	8/31/2000	8	8.999832	0.888905		FULL SUPPORT
976	T	NGP113	Donkey Creek Below Well Creek	44.28302000	-105.06368000	8/31/2000	4	9.499929	0.421056		PARTIAL/NON SUPPORT
977	T	NGP111	Donkey Creek Below Wyodak	44.28927000	-105.37454000	8/30/2000	1	7.333333	0.136364		PARTIAL/NON SUPPORT
343	T	NGPI9	FIVE MILE CREEK	44.90638889	-107.16888890	10/10/1997	8	13.07989	0.611626	*	PARTIAL/NON SUPPORT
219	T	NGPI9	FIVE MILE CREEK	44.90638889	-107.16888890	10/8/1996	8	7.333328	1.090910	*	FULL SUPPORT
707	T	NGP20	French Creek - Buffalo	44.35528056	-106.68565830	9/28/1998	6	7.243672	0.828309		INDETERMINATE
199	T	NGPI19	GOOSE CREEK	44.82686944	-106.96301390	10/26/1994	6	11.15242	0.538000		PARTIAL/NON SUPPORT
735	T	NGPI19	GOOSE CREEK	44.82686944	-106.96301390	10/30/1998	8	13.42222	0.596027		PARTIAL/NON SUPPORT
758	T	NGPI50	Goose Creek - Above KOA	44.83426111	-106.96352500	10/26/1998	7	13.65072	0.512793		PARTIAL/NON SUPPORT
759	T	NGPI51	Goose Creek - Above Sheridan W.W.T.F.	44.82091389	-106.96194170	10/29/1998	7	13.29407	0.526550		PARTIAL/NON SUPPORT
708	T	NGP21	Goose Creek - Below KOA	44.83533889	-106.96133890	10/26/1998	7	13.82484	0.506335		PARTIAL/NON SUPPORT
709	T	NGP22	Goose Creek - Lower	44.91205833	-106.98058890	10/29/1998	6	13.74691	0.436462		PARTIAL/NON SUPPORT
731	T	NGPI10	JENKS CREEK	44.61743333	-106.84260000	10/6/1998	4	7.31196	0.547049	*	PARTIAL/NON SUPPORT
736	T	NGPI20	LITTLE GOOSE CREEK - ABOVE SHERIDAN	44.77080833	-106.95066390	10/26/1998	9	13.95245	0.645048	*	PARTIAL/NON SUPPORT
201	T	NGPI20	LITTLE GOOSE CREEK - ABOVE SHERIDAN	44.77080833	-106.95066390	10/24/1994	9	11.05881	0.813831	*	INDETERMINATE
743	T	NGPI36	LITTLE GOOSE CREEK - COFFEEN	44.78533889	-106.94336670	10/27/1998	7	14.11712	0.495852		PARTIAL/NON SUPPORT
374	T	NGPI36	LITTLE GOOSE CREEK - COFFEEN	44.78533889	-106.94336670	10/8/1997	8	14.30235	0.559349		PARTIAL/NON SUPPORT
760	T	NGPI52	Little Goose Creek - Highway 87	44.71161111	-106.95876940	10/27/1998	11	13.11176	0.838941		FULL SUPPORT
369	T	NGPI26	LITTLE GOOSE CREEK - SHERIDAN	44.78624444	-106.94205000	10/8/1997	7	14.25003	0.491227	*	PARTIAL/NON SUPPORT
739	T	NGPI26	LITTLE GOOSE CREEK - SHERIDAN	44.78624444	-106.94205000	10/27/1998	8	13.62179	0.587294	*	PARTIAL/NON SUPPORT
205	T	NGPI26	LITTLE GOOSE CREEK - SHERIDAN	44.78624444	-106.94205000	10/25/1994	8	6.86795	1.164831	*	FULL SUPPORT
372	T	NGPI34	LITTLE NORTH FORK SHELL CREEK	44.48222222	-106.83000000	9/24/1997	4	7.333333	0.545455	*	PARTIAL/NON SUPPORT
187	R	NGP1	LITTLE POWDER RIVER	44.43888889	-105.45916670	10-17-1995	9	7.206982	1.248789		FULL SUPPORT
370	T	NGPI29	LITTLE POWDER RIVER - ABOVE	44.61555556	-105.29000000	10/29/1997	6	8.999921	0.666673		INDETERMINATE
208	T	NGPI29	LITTLE POWDER RIVER - ABOVE	44.61555556	-105.29000000	10/17/1995	8	8.999744	0.888914		FULL SUPPORT
887	T	NGP58	Little Powder River - Above Dry Creek	44.95077500	-105.35013610	10/6/1999	8	8.999968	0.888892		FULL SUPPORT
888	T	NGP59	Little Powder River - Above Olmstead Creek	44.92005833	-105.35407780	10/5/1999	5	8.999959	0.555558		PARTIAL/NON SUPPORT
210	T	NGPI30	LITTLE POWDER RIVER - BELOW	44.61583333	-105.29000000	10/17/1995	2	8.999747	0.222228		PARTIAL/NON SUPPORT
362	T	NGPI30	LITTLE POWDER RIVER - BELOW	44.61583333	-105.29000000	10/20/1997	7	8.999928	0.777784		INDETERMINATE
890	T	NGP61	Little Powder River - Below 85 Creek	44.92292222	-105.34710280	10/4/1999	6	8.999958	0.666670		INDETERMINATE
889	T	NGP60	Little Powder River - Below Dry Trail Creek	44.98878889	-105.34000000	10/6/1999	6	8.999981	0.666668		INDETERMINATE
706	T	NGP19	Meade Creek	44.70448611	-106.85769170	10/7/1998	7	8.08214	0.866107	*	FULL SUPPORT
213	T	NGPI32	MEADOW CREEK - OIL TREATER	43.59888889	-106.21555560	10/14/1996	4	7.333333	0.545455		PARTIAL/NON SUPPORT
212	T	NGPI32	MEADOW CREEK - OIL TREATER	43.59888889	-106.21555560	4/1/1996	5	7.333333	0.681818		INDETERMINATE
211	T	NGPI31	MEADOW CREEK (do not use, outside Oct 31 window)	43.56111111	-106.16388890	4/1/1996	4	7.333333	0.545455		PARTIAL/NON SUPPORT
701	T	NGP14	Meadow Creek above Salt Creek	43.57903056	-106.34678610	10/14/1998	4	8.093623	0.494216	*	PARTIAL/NON SUPPORT
870	T	NGP14	Meadow Creek above Salt Creek	43.57903056	-106.34678610	9/1/1999	5	7.196792	0.694754		INDETERMINATE
912	T	NGP83	Meadow Creek below Linch	43.60098333	-106.22516110	9/13/1999	1	7.589169	0.131767		PARTIAL/NON SUPPORT
44	R	NGPI37	MIDDLE FK. CRAZY WOMAN CREEK - HIGH. 87	44.05157778	-106.69582220	10-31-1996	11	10.9791	1.001904	*	FULL SUPPORT
744	RT	NGPI37	MIDDLE FK. CRAZY WOMAN CREEK - HIGH. 87	44.05157778	-106.69582220	9/29/1998	15	13.07116	1.147565		FULL SUPPORT
904	T	NGP75	Middle Fork Powder River above South Fork	43.67000000	-106.51337220	10/6/1999	8	8.997969	0.889090		FULL SUPPORT
188	R	NGP2	MOYER SPRING	44.37638889	-105.44527780	09-13-1995	7	7.331837	0.954740	*	FULL SUPPORT
730	T	NGP43	North Fork Crazy Woman Creek - Below Muddy Creek	44.12371944	-106.69895830	9/25/1998	10	14.06744	0.710862		INDETERMINATE
710	T	NGP23	North Fork Crazy Woman Creek - Middle Fork Road	44.08656389	-106.67151110	9/28/1998	9	14.11616	0.637567		PARTIAL/NON SUPPORT
206	T	NGPI27	NORTH FORK POWDER RIVER - ABOVE	43.76722222	-106.60972220	10/9/1995	8	8.998573	0.889030		FULL SUPPORT
207	T	NGPI28	NORTH FORK POWDER RIVER - BELOW	43.76666667	-106.60972220	10/9/1995	5	8.998665	0.555638		PARTIAL/NON SUPPORT
742	T	NGPI35	NORTH FORK SHELL CREEK	44.48929167	-106.80926390	10/21/1998	5	7.211008	0.693384		INDETERMINATE
373	T	NGPI35	NORTH FORK SHELL CREEK	44.48929167	-106.80926390	9/24/1997	6	7.331806	0.818352		INDETERMINATE
371	T	NGPI33	NORTH PRONG SHELL CREEK	44.50255278	-106.79099440	9/24/1997	9	8.506744	1.057984	*	FULL SUPPORT
741	T	NGPI33	NORTH PRONG SHELL CREEK	44.50255278	-106.79099440	10/21/1998	10	8.49469	1.177206	*	FULL SUPPORT
891	T	NGP62	Piney Creek - Clear Creek Confluence	44.56386111	-106.52603610	10/29/1999	6	9.498785	0.631660		PARTIAL/NON SUPPORT
711	T	NGP24	Poison Creek - Johnson	44.07953611	-106.77396670	10/2/1998	6	7.332326	0.818294		INDETERMINATE
712	T	NGP25	Poison Creek - Lower	44.08490000	-106.71369440	10/1/1998	8	9.170249	0.872386		FULL SUPPORT
713	T	NGP26	Poison Creek - Upper	44.07893056	-106.76377220	10/1/1998	8	7.333317	1.090912		FULL SUPPORT
714	T	NGP27	Pole Creek - Greub Road	43.97700833	-106.76485000	10/1/1998	10	12.09224	0.826977	*	INDETERMINATE
899	T	NGP70	Posey Creek above South Fork Powder River	43.51705000	-106.63971110	10/14/1999	4	9.10261	0.439434	*	PARTIAL/NON SUPPORT
1025	T	NGP90	Powder River - BLM Land	44.97118000	-105.92261000	10/11/2000	6	8.999996	0.666667		INDETERMINATE
1013	T	NGP88	Powder River Above Barber Creek	44.29879000	-106.15624000	10/17/2000	2	8.999986	0.222223		PARTIAL/NON SUPPORT
908	T	NGP79	Powder River above Burger Draw	44.14721944	-106.14250280	10/21/1999	7	8.99999	0.777779		INDETERMINATE

Appendix B (cont.) - O/E scores and narrative ratings for samples by ecoregion/sub-region. Samples outside model experience are noted with an asterisk.

1017	T	NGP93	Pow der River Above Crazy Woman Creek	44.48241000	-106.13182000	10/23/2000	1	7.320673	0.136599	*	PARTIAL/NON SUPPORT
1015	T	NGP95	Pow der River Above Flying E Creek	44.27093000	-106.13058000	10/16/2000	1	8.999987	0.111111		PARTIAL/NON SUPPORT
1019	T	NGP98	Pow der River Above Ivy Creek	44.80898000	-106.08681000	10/11/2000	2	8.999992	0.222222		PARTIAL/NON SUPPORT
1024	T	NGP100	Pow der River Above LX Bar Creek	44.91338000	-106.03099000	10/10/2000	7	8.999994	0.777778		INDETERMINATE
700	T	NGP13	Pow der River above Salt Creek	43.69094444	-106.35653890	10/13/1998	4	14.16993	0.282288	*	PARTIAL/NON SUPPORT
869	T	NGP13A	Pow der River above Salt Creek	43.69077500	-106.35583060	10/15/1999	7	14.45142	0.484382	*	PARTIAL/NON SUPPORT
906	T	NGP77	Pow der River at Falxa Homestead	43.97460556	-106.16154720	10/25/1999	7	8.999767	0.777798		INDETERMINATE
907	T	NGP78	Pow der River at Red Draw	43.98698333	-106.17577220	10/22/1999	5	8.999619	0.555579		PARTIAL/NON SUPPORT
919	T	NGPI48	Pow der River at School Section Draw	43.91451667	-106.18020560	10/26/1999	0	7.333333	0.000000	*	PARTIAL/NON SUPPORT
1023	T	NGP87	Pow der River Below Arvada	44.73288000	-106.10177000	8/4/2000	0	7.333328	0	*	PARTIAL/NON SUPPORT
1012	T	NGP89	Pow der River Below Barber Creek	44.35249000	-106.14953000	10/18/2000	2	8.999985	0.222223		PARTIAL/NON SUPPORT
909	T	NGP80	Pow der River below Burger Draw	44.14731944	-106.14390560	10/21/1999	6	8.999971	0.666669		INDETERMINATE
1021	T	NGP91	Pow der River Below Clear Creek	44.88999000	-106.06514000	10/4/2000	6	8.999991	0.666667		INDETERMINATE
1011	T	NGP92	Pow der River Below Cottonw ood Creek	44.58481000	-106.08867000	10/24/2000	4	7.304286	0.547624	*	PARTIAL/NON SUPPORT
1018	T	NGP94	Pow der River Below Crazy Woman Creek	44.48588000	-106.11681000	10/23/2000	2	7.332327	0.272765	*	PARTIAL/NON SUPPORT
1014	T	NGP96	Pow der River Below Flying E Creek	44.27627000	-106.12615000	10/17/2000	4	8.999987	0.444445		PARTIAL/NON SUPPORT
1010	T	NGP97	Pow der River Below Indian Creek	44.18552000	-106.14245000	10/16/2000	2	8.99999	0.222222		PARTIAL/NON SUPPORT
1016	T	NGP99	Pow der River Below Ivy Creek	44.84562000	-106.06354000	10/3/2000	5	8.999995	0.555556		PARTIAL/NON SUPPORT
1022	T	NGP101	Pow der River Below LX Bar Creek	44.93500000	-105.96548000	10/10/2000	6	8.999994	0.666667		INDETERMINATE
754	T	NGPI46	Pow der River below Salt Creek	43.69715833	-106.30540560	10/15/1998	2	13.82029	0.144715	*	PARTIAL/NON SUPPORT
918	T	NGPI46A	Pow der River below Salt Creek	43.69350556	-106.30601940	10/15/1999	3	13.04479	0.229977	*	PARTIAL/NON SUPPORT
905	T	NGP76	Pow der River below South Fork Pow der River	43.67154444	-106.51265560	10/6/1999	5	14.18681	0.352440	*	PARTIAL/NON SUPPORT
1020	T	NGP102	Pow der River Below Spotted Horse Creek	44.86010000	-106.05667000	10/4/2000	5	8.99999	0.555556		PARTIAL/NON SUPPORT
1009	T	NGP103	Pow der River Near Taylor Draw	44.40582000	-106.14906000	10/19/2000	2	8.999987	0.222223		PARTIAL/NON SUPPORT
715	T	NGP28	Prairie Dog Creek - Above Cat Creek	44.84748889	-106.86436110	10/23/1998	5	7.333081	0.681842		INDETERMINATE
732	RT	NGPI11	PRAIRIE DOG CREEK - ABOVE JENKS CR.	44.61900833	-106.84316390	10/6/1998	3	7.289077	0.411575		PARTIAL/NON SUPPORT
734	T	NGPI13	PRAIRIE DOG CREEK - ABOVE MEADE CR.	44.69469722	-106.85270830	10/8/1998	5	7.613632	0.656717		PARTIAL/NON SUPPORT
716	T	NGP29	Prairie Dog Creek - Above Murphy Gulch	44.62999444	-106.83502220	10/7/1998	5	7.330448	0.682087		INDETERMINATE
717	T	NGP30	Prairie Dog Creek - Below Cat Creek	44.85013333	-106.86472500	10/23/1998	6	7.333061	0.818212		INDETERMINATE
718	T	NGP31	Prairie Dog Creek - Below Highw ay 14	44.73890833	-106.87871670	10/8/1998	8	8.388611	0.953674		FULL SUPPORT
733	T	NGPI12	PRAIRIE DOG CREEK - BELOW JENKS CR.	44.61991667	-106.84372500	10/6/1998	3	7.193594	0.417038	*	PARTIAL/NON SUPPORT
719	T	NGP32	Prairie Dog Creek - Below Meade Creek	44.70525278	-106.85844440	10/7/1998	6	7.616409	0.787773		INDETERMINATE
720	T	NGP33	Prairie Dog Creek - Below Murphy Gulch	44.65965556	-106.83676110	10/7/1998	4	7.53816	0.530633	*	PARTIAL/NON SUPPORT
337	R	NGPI22	REDWATER CREEK	44.54833333	-104.13138890	10-03-1997	7	7.333333	0.954545	*	FULL SUPPORT
721	T	NGP34	Rock Creek - Above Highw ay 87	44.38450833	-106.70562500	10/22/1998	11	13.40021	0.820882		INDETERMINATE
722	T	NGP35	Rock Creek - Below Sayles Creek	44.42450278	-106.78526110	10/21/1998	10	10.30804	0.970117		FULL SUPPORT
914	T	NGPI2	SALT CREEK - MIDDLE	43.40583333	-106.26277780	9/9/1999	2	7.86786	0.254199		PARTIAL/NON SUPPORT
200	T	NGPI2	SALT CREEK - MIDDLE	43.40583333	-106.26277780	10/17/1996	4	12.96337	0.308562	*	PARTIAL/NON SUPPORT
192	T	NGPI1	SALT CREEK - UPPER	43.32111111	-106.18361110	10/23/1996	3	8.763672	0.342322		PARTIAL/NON SUPPORT
753	T	NGPI45	Salt Creek above Cottonw ood	43.37459722	-106.22563610	8/26/1998	5	7.333333	0.681818	*	INDETERMINATE
917	T	NGPI45A	Salt Creek above Cottonw ood Creek	43.37475833	-106.22555280	9/13/1999	4	7.330657	0.545654	*	PARTIAL/NON SUPPORT
752	T	NGPI44	Salt Creek above Meadow Creek	43.57822222	-106.34775280	10/14/1998	1	14.47442	0.069087	*	PARTIAL/NON SUPPORT
916	T	NGPI44	Salt Creek above Meadow Creek	43.57822222	-106.34775280	8/31/1999	2	14.48568	0.138067	*	PARTIAL/NON SUPPORT
751	T	NGPI43	Salt Creek below Meadow Creek	43.58328056	-106.35564170	10/14/1998	1	14.41495	0.069372	*	PARTIAL/NON SUPPORT
872	T	NGPI43	Salt Creek below Meadow Creek	43.58328056	-106.35564170	8/30/1999	3	14.28751	0.209974	*	PARTIAL/NON SUPPORT
740	T	NGPI3	Salt Creek below Midw est	43.44474722	-106.28000280	10/15/1998	1	7.333333	0.136364	*	PARTIAL/NON SUPPORT
209	T	NGPI3	Salt Creek below Midw est	43.44474722	-106.28000280	10/17/1996	2	14.43868	0.138517	*	PARTIAL/NON SUPPORT
915	T	NGPI3	Salt Creek below Midw est	43.44474722	-106.28000280	9/9/1999	3	7.333333	0.409091	*	PARTIAL/NON SUPPORT
750	T	NGPI42	Salt Creek low er - Above Pow der River	43.68452500	-106.32767780	10/13/1998	2	14.39675	0.138920	*	PARTIAL/NON SUPPORT
871	T	NGPi42	Salt Creek low er - Above Pow der River	43.68452500	-106.32767780	9/1/1999	2	14.3044	0.139817	*	PARTIAL/NON SUPPORT
217	T	NGPI7	SMITH CREEK - LOWER	44.87805556	-107.26750000	10/9/1996	7	10.36487	0.675358	*	INDETERMINATE
342	T	NGPI7	SMITH CREEK - LOWER	44.87805556	-107.26750000	10/9/1997	9	10.41752	0.863929	*	FULL SUPPORT
892	T	NGP63	Soldier Creek - County Road 330	44.82090278	-107.02638890	9/9/1999	5	14.87187	0.336205	*	PARTIAL/NON SUPPORT
893	T	NGP64	Soldier Creek - Sheridan	44.81918333	-106.96322780	9/9/1999	7	11.657	0.600498	*	PARTIAL/NON SUPPORT
895	T	NGP66	South Fork Crazy Woman Creek - Above Purdy Reservoir	44.04223611	-106.64827780	10/26/1999	8	7.333333	1.090909	*	FULL SUPPORT
894	T	NGP65	South Fork Crazy Woman Creek - Below Purdy Reservoir	44.04223611	-106.64827780	10/26/1999	7	7.333333	0.954545	*	FULL SUPPORT
896	T	NGP67	South Fork Crazy Woman Creek - Low er	44.06347778	-106.60073610	10/26/1999	8	7.332372	1.091052	*	FULL SUPPORT
897	T	NGP68	South Fork Crazy Woman Creek - Plains Upper	43.93318889	-106.74090280	10/28/1999	7	7.333333	0.954545	*	FULL SUPPORT
901	T	NGP72	South Fork Pow der River above I-25	43.61820556	-106.57725280	10/11/1999	0	13.91497	0.000000	*	PARTIAL/NON SUPPORT
903	T	NGP74	South Fork Pow der River above Middle Fork Pow der R	43.67264444	-106.51668330	10/7/1999	5	14.10324	0.354528	*	PARTIAL/NON SUPPORT
898	T	NGP69	South Fork Pow der River above Posey Creek	43.51691667	-106.63911110	10/14/1999	4	7.628409	0.524356	*	PARTIAL/NON SUPPORT
902	T	NGP73	South Fork Pow der River below I-25	43.63245556	-106.57050280	10/11/1999	0	13.0305	0.000000	*	PARTIAL/NON SUPPORT
900	T	NGP71	South Fork Pow der River below Posey Creek	43.52010556	-106.64038610	10/13/1999	1	13.75432	0.072704	*	PARTIAL/NON SUPPORT
723	T	NGP36	South Fork Shell Creek	44.47359722	-106.80716940	10/21/1998	5	7.331488	0.681990	*	INDETERMINATE
992	T	NGP85	Spotted Horse Creek - Cresw ell State	44.83186000	-106.01752000	9/27/2000	3	7.188745	0.417319	*	PARTIAL/NON SUPPORT
991	T	NGP84	Spotted Horse Creek Above Cresw ell's Div	44.84644000	-106.04984000	9/27/2000	5	7.273336	0.687442	*	INDETERMINATE
1087	T	NGP135	Stockade Beaver Creek above Beaver Creek	43.56741000	-104.14640000	9/25/2001	3	8.999994	0.333334	*	PARTIAL/NON SUPPORT
1089	T	NGP137	Stockade Beaver Creek above Kinney Canyo	43.91117000	-104.10676000	9/18/2001	7	7.333331	0.954546		FULL SUPPORT
1088	T	NGP136	Stockade Beaver Creek below Salt Creek	43.80696000	-104.13942000	9/19/2001	7	9.491047	0.737537	*	INDETERMINATE
1090	T	NGP139	Stockade Beaver Creek below Whoopup Cree	43.63672000	-104.13306000	9/26/2001	4	9.499707	0.421066	*	PARTIAL/NON SUPPORT
981	T	NGP108	Stonepile Creek Below Gillette WWTP	44.26811000	-105.44114000	8/25/2000	2	8.674706	0.230555		PARTIAL/NON SUPPORT
724	R	NGP37	Tongue River - Above Dayton WWTF	44.88398889	-107.23905560	10-14-1998	15	12.78511	1.173239		FULL SUPPORT
725	T	NGP38	Tongue River - Above Ranchester WWTF	44.90493056	-107.14151110	10/13/1998	13	13.64116	0.952998		FULL SUPPORT
726	T	NGP39	Tongue River - Below Dayton WWTF	44.88291944	-107.23481940	10/12/1998	15	12.42237	1.207499		FULL SUPPORT
727	T	NGP40	Tongue River - Below Ranchester WWTF	44.90857778	-107.13948330	10/13/1998	12	13.88025	0.864538		FULL SUPPORT
728	T	NGP41	Tongue River - Decker Highw ay	44.94245833	-106.95067780	10/15/1998	6	13.41159	0.447374	*	PARTIAL/NON SUPPORT
738	RT	NGPI24	TONGUE RIVER - KLEENBURN	44.90649722	-107.01162780	10/15/1998	9	8.99965	1.000039		FULL SUPPORT
203	R	NGPI24	TONGUE RIVER - KLEENBURN	44.90649722	-107.01162780	09-12-1995	10	8.999531	1.111169		FULL SUPPORT
215	T	NGPI5	TONGUE RIVER - MIDDLE	44.89141944	-107.21133330	10/10/1996	13	13.29192	0.978038		FULL SUPPORT
349	T	NGPI5	TONGUE RIVER - MIDDLE	44.89141944	-107.21133330	10/14/1997	15	13.22467	1.134244		FULL SUPPORT
757	T	NGPI5	TONGUE RIVER - MIDDLE	44.89141944	-107.21133330	10/15/1998	15	12.77667	1.174015		FULL SUPPORT
350	T	NGPI4	TONGUE RIVER - RANCHESTER	44.90364444	-107.16658890	10/14/1997	11	13.5161	0.813844		INDETERMINATE
747	T	NGPI4	TONGUE RIVER - RANCHESTER	44.90364444	-107.16658890	10/12/1998	15	13.62583	1.100851		FULL SUPPORT
214	T	NGPI4	TONGUE RIVER - RANCHESTER	44.90364444	-107.16658890	10/11/1996	15	13.6157	1.101669		FULL SUPPORT
729	T	NGP42	Tongue River - State Line	45.01078611	-106.83659170	10/15/1998	8	8.999569	0.888931		FULL SUPPORT
204	R	NGPI25	WOLF CREEK	44.84250000	-107.18916670	10-25-1995	15	12.41734	1.207989	*	FULL SUPPORT
344	T	NGPI6	WOLF CREEK - LOWER	44.89833333	-107.17166670	10/10/1997	8	9.465115	0.845209		FULL SUPPORT
216	T	NGPI6	WOLF CREEK - LOWER	44.89833333	-107.17166670	10/10/1996	9	9.468349	0.950535		FULL SUPPORT
SOUTHERN ROCKIES											
391	R	SR25	BATES CREEK	42.52916667	-106.24722220	10-06-1997	8	8.204505	0.975074		FULL SUPPORT
1039	T	SR28	Bear Creek - Above F.S. Road 543	41.21391000	-106.27057000	9/27/2000	18	17.50643	1.028194		FULL SUPPORT
1040	T	SR29	Bear Creek - Below F.S. Road 500E	41.21300000	-106.29192000	9/27/2000	16	16.80721	0.951972		FULL SUPPORT

Appendix B (cont.) - O/E scores and narrative ratings for samples by ecoregion/sub-region. Samples outside model experience are noted with an asterisk.

225	R	SR17	DEEP CREEK	41.19083333	-107.22444440	08-22-1996	15	17.29123	0.867492		FULL SUPPORT
229	R	SR22	DEER CREEK - LOWER	42.72250000	-106.02555560	10-16-1996	12	14.80764	0.810392		INDETERMINATE
389	T	SR18	DEER CREEK - MIDDLE	42.57444444	-106.03666670	10/7/1997	10	9.360125	1.068362		FULL SUPPORT
388	T	SR13	DEER CREEK - UPPER	42.49916667	-106.07972220	10/6/1997	6	9.959081	0.602465		PARTIAL/NON SUPPORT
221	R	SR10	DIRTYMAN FORK	41.25916667	-107.23250000	08-27-1996	8	8.175388	0.978547		FULL SUPPORT
356	T	SRI13	DOUGLAS CREEK - DREDGE	41.12750000	-106.24611110	10/16/1997	17	21.04156	0.807925		INDETERMINATE
393	T	SRI12	DOUGLAS CREEK - JIM CREEK	41.16111111	-106.25500000	10/15/1997	16	21.01089	0.761510		INDETERMINATE
358	R	SRI14	DOUGLAS CREEK - PELTON	41.07583333	-106.30222220	10-16-1997	19	18.50848	1.026556		FULL SUPPORT
353	R	SRI11	DOUGLAS CREEK - WILDERNESS	41.13055556	-106.42527780	10-15-1997	17	15.47966	1.098215		FULL SUPPORT
300	R	SR26	EAST FORK SAVERY CREEK - CARRICO	41.44277778	-107.44833330	08-14-1997	12	10.71422	1.120007		FULL SUPPORT
230	R	SR23	ENCAMPMENT RIVER - IOOF	41.18277778	-106.79388890	08-29-1996	18	18.96722	0.949006		FULL SUPPORT
220	R	SR1	ENCAMPMENT RIVER - STATELINE	41.00472222	-106.81472220	09-04-1996	23	20.80119	1.105706		FULL SUPPORT
238	R	SR9	ENCAMPMENT RIVER - WATER VALLEY	41.12638889	-106.78722220	08-28-1996	22	21.33646	1.031099		FULL SUPPORT
309	RT	SR15	ENCAMPMENT RIVER - WILDERNESS	41.00703056	-106.81600000	9/9/1997	18	20.72372	0.868570		FULL SUPPORT
761	RT	SR15	ENCAMPMENT RIVER - WILDERNESS	41.00703056	-106.81600000	9/17/1998	23	21.41421	1.074053		FULL SUPPORT
920	R	SR15	ENCAMPMENT RIVER - WILDERNESS	41.00703056	-106.81600000	09-24-1999	23	20.81557	1.104942		FULL SUPPORT
223	RT	SR15	ENCAMPMENT RIVER - WILDERNESS	41.00703056	-106.81600000	9/5/1996	25	21.40564	1.167917		FULL SUPPORT
1027	R	SR15	ENCAMPMENT RIVER - WILDERNESS	41.00703000	-106.81600000	9/14/2000	23	20.80426	1.105543		FULL SUPPORT
1113	R	SR15	ENCAMPMENT RIVER - WILDERNESS	41.00703000	-106.81600000	9/6/2001	25	21.98949	1.136907		FULL SUPPORT
245	T	SRI7	GARDEN CREEK - 13TH STREET	42.83722222	-106.35916670	10/15/1996	3	7.422416	0.404181	*	PARTIAL/NON SUPPORT
244	T	SRI6	GARDEN CREEK - WYOMING BOULEVARD	42.80444444	-106.34722220	10/15/1996	5	7.763906	0.644006		PARTIAL/NON SUPPORT
242	T	SRI4	HAGGARTY CREEK - LOWER	41.15166667	-107.11805560	8/21/1996	4	20.07516	0.199251		PARTIAL/NON SUPPORT
1114	T	SRI4	HAGGARTY CREEK - LOWER	41.15167000	-107.11806000	9/26/2001	6	20.24729	0.296336		PARTIAL/NON SUPPORT
1125	T	SR35	Haggarty Creek - Rudefeha	41.18819000	-107.07174000	9/25/2001	11	15.98449	0.688167		INDETERMINATE
241	T	SRI3	HAGGARTY CREEK - UPPER	41.18305556	-107.07694440	8/21/1996	6	15.16717	0.395591		PARTIAL/NON SUPPORT
1115	T	SRI3	HAGGARTY CREEK - UPPER	41.18306000	-107.07694000	9/26/2001	2	15.95983	0.125315		PARTIAL/NON SUPPORT
234	R	SR5	JACK CREEK	41.28444444	-107.11916670	08-27-1996	22	17.67888	1.244423		FULL SUPPORT
390	R	SR19	LA BONTE CREEK - CURTIS GULCH	42.40694444	-105.62416670	10-08-1997	12	10.03006	1.196404		FULL SUPPORT
239	T	SRI10	LA PRELE CREEK - LOWER	42.73361111	-105.61444440	10/16/1996	10	14.94813	0.668980		INDETERMINATE
316	R	SR14	LARAMIE RIVER - JELM	41.07972222	-106.01194440	09-12-1997	16	14.70077	1.088378		FULL SUPPORT
246	R	SRI8	LOST CREEK - CAMPGROUND	41.14222222	-107.07444440	08-22-1996	17	16.65479	1.020727		FULL SUPPORT
1118	R	SRI8	LOST CREEK - CAMPGROUND	41.14222000	-107.07444000	9/27/2001	18	18.794	0.957753		FULL SUPPORT
235	R	SR6	MEDICINE BOW RIVER	41.52555556	-106.39111110	09-11-1996	28	20.35709	1.375442		FULL SUPPORT
228	T	SR21	MIDDLE FORK BIG CREEK	41.00833333	-106.57194440	9/4/1996	15	19.68704	0.761923		INDETERMINATE
1035	R	SR33	Middle Fork Mill Creek - Above F.S. Road	43.36424000	-106.13204000	9/8/2000	16	14.68935	1.089224		FULL SUPPORT
763	T	SR27	MUDDY CREEK - DELTA CLAIM	41.12500278	-106.23720000	7/29/1998	17	19.82859	0.857348		FULL SUPPORT
227	R	SR20	NORTH FORK BIG CREEK	41.04666667	-106.59805560	09-04-1996	19	20.53278	0.925349		FULL SUPPORT
233	R	SR4	NORTH FORK ENCAMPMENT RIVER - LOWER	41.15972222	-105.89055560	08-28-1996	24	20.52028	1.169575		FULL SUPPORT
236	R	SR7	NORTH FORK ENCAMPMENT RIVER - UPPER	41.15944444	-106.89222220	08-28-1996	23	20.51471	1.121147		FULL SUPPORT
226	R	SR2	NORTH FORK LITTLE LARAMIE RIVER	41.32916667	-106.16138890	09-12-1996	22	20.59975	1.067974		FULL SUPPORT
762	RT	SR16	NORTH FORK LITTLE SNAKE RIVER	41.01541667	-107.02159170	9/17/1998	21	21.31662	0.985147		FULL SUPPORT
310	RT	SR16	NORTH FORK LITTLE SNAKE RIVER	41.01541667	-107.02159170	9/9/1997	21	21.30433	0.985715		FULL SUPPORT
921	RT	SR16	NORTH FORK LITTLE SNAKE RIVER	41.01541667	-107.02159170	9/16/1999	23	20.78148	1.106755		FULL SUPPORT
224	R	SR16	NORTH FORK LITTLE SNAKE RIVER	41.01541667	-107.02159170	08-23-1996	24	21.39724	1.121640		FULL SUPPORT
231	R	SR24	NORTH PLATTE RIVER - CORRAL CREEK	41.25944444	-106.57361110	08-29-1996	15	15.04272	0.997160		FULL SUPPORT
348	R	SR12	NORTH PLATTE RIVER - PIKE POLE	41.14000000	-106.44583330	10-14-1997	15	15.04247	0.997176		FULL SUPPORT
351	T	SRI1	NORTH SYBILLE CREEK	41.74611111	-105.41055560	10/15/1997	12	14.04188	0.854586		FULL SUPPORT
392	R	SR3	ROCK CREEK	41.57673889	-106.22973610	09-11-1997	13	16.24444	0.800274		INDETERMINATE
922	RT	SR3	ROCK CREEK	41.57673889	-106.22973610	9/27/1999	14	16.24925	0.861578		FULL SUPPORT
764	RT	SR3	ROCK CREEK	41.57673889	-106.22973610	10/7/1998	16	17.63217	0.907432		FULL SUPPORT
232	RT	SR3	ROCK CREEK	41.57673889	-106.22973610	9/12/1996	17	16.96172	1.002257		FULL SUPPORT
1026	R	SR3	ROCK CREEK	41.57674000	-106.22974000	9/19/2000	22	17.08834	1.287428		FULL SUPPORT
1119	R	SR3	ROCK CREEK	41.57674000	-106.22974000	9/13/2001	18	16.89112	1.065649		FULL SUPPORT
1036	T	SR32	Smith/North Creek - Below Mouth of Canyo	41.11839000	-106.25194000	9/12/2000	16	18.35823	0.871544		FULL SUPPORT
1041	T	SR34	So. Fk. Little Laramie River-Below FS Ro	41.18701000	-106.15326000	9/29/2000	17	18.68254	0.909941		FULL SUPPORT
1038	T	SR31	South Fork Hog Park Creek-Revetments-Bel	41.01983000	-106.84406000	9/14/2000	22	21.46799	1.024781		FULL SUPPORT
237	R	SR8	SOUTH FRENCH CREEK	41.24250000	-106.45388890	08-29-1996	21	18.27581	1.149060		FULL SUPPORT
222	R	SR11	SOUTH SPRING CREEK	41.26305556	-107.95638890	09-05-1996	13	11.57155	1.123445		FULL SUPPORT
240	R	SRI2	WAGONHOUND CREEK	41.61305556	-106.30944440	09-11-1996	10	10.07435	0.992619		FULL SUPPORT
247	T	SRI9	WEST FORK BATTLE CREEK	41.09527778	-107.15638890	8/22/1996	16	20.02807	0.798879		INDETERMINATE
1124	T	SRI9	WEST FORK BATTLE CREEK	41.09528000	-107.15639000	9/27/2001	10	20.12248	0.496957		PARTIAL/NON SUPPORT
243	R	SRI5	WEST FORK GARDEN CREEK	42.76333333	-106.35444440	10-15-1996	10	8.283665	1.207195		FULL SUPPORT
WYOMING BASIN											
804	T	WB66	ALBERT CREEK - UPPER	41.47652500	-110.62250830	10/7/1998	8	14.66639	0.545465	*	PARTIAL/NON SUPPORT
773	T	WB35	ALKALI CREEK - LOWER (GREEN RIVER)	41.61753333	-109.57735280	10/14/1998	1	14.66217	0.068203		PARTIAL/NON SUPPORT
1103	T	WB134	Alkali Creek above Rd. 16	44.73061000	-108.89168000	10/24/2001	3	8.139046	0.368594	*	PARTIAL/NON SUPPORT
1102	T	WB133	Alkali Creek above Shoshone	44.71514000	-108.84962000	10/24/2001	8	7.740489	1.033526	*	FULL SUPPORT
935	T	WB84	Bear Creek Low er (Bearpole)	43.58562778	-109.45646670	9/15/1999	12	14.2095	0.844506		FULL SUPPORT
780	T	WB42	BEAR RIVER - BURTON	41.04343889	-110.93235560	10/21/1998	10	14.66185	0.682042		INDETERMINATE
781	T	WB43	BEAR RIVER - FIELD	41.16600278	-110.88062780	10/21/1998	13	14.66172	0.886663		FULL SUPPORT
783	T	WB45	BEAR RIVER - MARTIN RANCH	41.41576389	-111.01650560	10/21/1998	9	14.66626	0.613654	*	PARTIAL/NON SUPPORT
782	T	WB44	BEAR RIVER - State PARK	41.26036944	-110.93524440	10/20/1998	14	14.66618	0.954577	*	FULL SUPPORT
1195	T	WB104	Bear River Woodruff	41.52036000	-111.02234000	8/29/2000	10	14.66626	0.681837	*	INDETERMINATE
259	T	WBI17	BEAR RIVER 1 - LOWER	41.16777778	-110.87916670	10/11/1994	12	14.66005	0.818551		INDETERMINATE
257	T	WBI16	BEAR RIVER 1 - UPPER	41.04361111	-110.93166670	10/5/1995	11	14.66262	0.750207		INDETERMINATE
258	T	WBI16	BEAR RIVER 1 - UPPER	41.04361111	-110.93166670	9/24/1996	12	14.66213	0.818435		INDETERMINATE
256	T	WBI16	BEAR RIVER 1 - UPPER	41.04361111	-110.93166670	10/11/1994	12	14.66023	0.818541	*	INDETERMINATE
260	T	WBI18	BEAR RIVER 2 - LOWER	41.35277778	-111.00972220	10/13/1994	7	14.66631	0.477284	*	PARTIAL/NON SUPPORT
254	T	WBI1	BEAR RIVER 2 - UPPER (Nixon)	41.31480833	-111.00919720	10/11/1994	10	14.66617	0.681841	*	INDETERMINATE
816	T	WBI1	BEAR RIVER 2 - UPPER (Nixon)	41.31480833	-111.00919720	10/21/1998	11	14.66625	0.750022	*	INDETERMINATE
930	T	WB79	Bear River Border	42.19583333	-111.04194440	10/21/1999	11	14.66655	0.750006	*	INDETERMINATE
934	T	WB83	Beason Creek (Day) Above Willow Confluence	42.72676944	-108.70244170	10/27/1999	13	13.21591	0.983663	*	FULL SUPPORT
328	T	WBI9	BEAVER CREEK - WOOLERY RANCH	42.51694444	-108.40000000	9/26/1997	12	13.29724	0.902443		FULL SUPPORT
938	T	WB87	Beaver Creek Low er, Confluence	42.51862500	-108.49759170	8/12/1999	11	14.0085	0.785237		INDETERMINATE
797	T	WB59	BIG SANDY RIVER - LOWER	41.88551667	-109.77166110	9/10/1998	11	14.66633	0.750017		INDETERMINATE
796	T	WB58	BIG SANDY RIVER - MIDDLE	42.01117778	-109.58005830	9/9/1998	13	14.66357	0.886551		FULL SUPPORT
795	T	WB57	BIG SANDY RIVER - UPPER	42.07258056	-109.48381940	9/10/1998	13	14.66036	0.886745		FULL SUPPORT
771	T	WB33	BITTER CREEK - KANDA (MIDDLE)	41.52653056	-109.35785830	8/19/1998	0	7.333165	0.000000	*	PARTIAL/NON SUPPORT
770	T	WB32	BITTER CREEK - LOWER	41.51741389	-109.42852500	8/18/1998	2	14.53043	0.137642		PARTIAL/NON SUPPORT
772	T	WB34	BITTER CREEK - UPPER	41.59638889	-109.14615280	8/19/1998	5	14.52632	0.344203		PARTIAL/NON SUPPORT
810	T	WB73	BLACKS FORK - BELOW GRANGER (GREEN RIVER)	41.60287222	-109.91109440	10/27/1998	9	14.35379	0.627012		PARTIAL/NON SUPPORT
812	T	WB75	BLACKS FORK - FLAMING GORGE (GREEN RIVER)	41.41334444	-109.62971110	10/27/1998	9	13.29706	0.676841		INDETERMINATE

Appendix B (cont.) - O/E scores and narrative ratings for samples by ecoregion/sub-region. Samples outside model experience are noted with an asterisk.

809	T	WB72	BLACKS FORK - VERNE (GREEN RIVER)	41.58382778	-110.00424440	10/28/1998	7	14.62332	0.478688		PARTIAL/NON SUPPORT
811	T	WB74	BLACKS FORK -INTERState (GREEN RIVER)	41.53456111	-109.68764440	10/27/1998	9	14.13936	0.636521		PARTIAL/NON SUPPORT
1196	T	WB105	Cottonwood Creek 2411 Crossing	42.40022000	-107.69980000	8/22/2000	6	6.952824	0.862959		FULL SUPPORT
778	T	WB40	COTTONWOOD CREEK - BAIRD (MIDDLE)	43.85963611	-108.37281670	8/13/1998	6	11.39657	0.526474		PARTIAL/NON SUPPORT
777	T	WB39	COTTONWOOD CREEK - LEGEND ROCK (UPPER)	43.79353056	-108.60567500	8/12/1998	7	10.75307	0.650977		PARTIAL/NON SUPPORT
1230	T	WB39	COTTONWOOD CREEK - LEGEND ROCK (UPPER)	43.79353000	-108.60568000	8/21/2001	2	9.435427	0.211967		PARTIAL/NON SUPPORT
779	T	WB41	COTTONWOOD CREEK - LOWER	43.86739722	-108.33338890	8/13/1998	6	13.86403	0.432775		PARTIAL/NON SUPPORT
1212	T	WB151	Cottonwood Creek - Putney	43.74880000	-108.81085000	8/21/2001	7	12.93146	0.541316		PARTIAL/NON SUPPORT
1211	T	WB150	Cottonwood Creek - Rd 10 crossing	43.82822000	-108.51068000	8/22/2001	2	10.04757	0.199053		PARTIAL/NON SUPPORT
1086	T	WB131	Crooked Creek above Crooked Creek Bay	44.96344000	-108.27924000	8/21/2001	4	7.448339	0.537033	*	PARTIAL/NON SUPPORT
1085	T	WB132	Crooked Creek below Montana state line	44.98426000	-108.34983000	8/21/2001	8	7.699984	1.038963	*	FULL SUPPORT
400	T	WBI22	CROOKS CREEK - LOWER	42.40722222	-107.85444440	10/7/1997	5	7.657925	0.652918		PARTIAL/NON SUPPORT
340	T	WBI23	CROOKS CREEK - UPPER	42.40055556	-107.85638890	10/8/1997	10	10.41008	0.960607		FULL SUPPORT
1198	T	WB107	Currant Creek Gorge	41.25753000	-109.53789000	9/12/2000	12	14.66472	0.81829	*	INDETERMINATE
1197	T	WB106	Currant Creek Big Ridge	41.21569000	-109.38011000	9/12/2000	9	14.66318	0.613782		PARTIAL/NON SUPPORT
401	R	WBI4	DEWEESE CREEK	42.30210833	-106.96081390	10-01-1997	8	7.333321	1.090911		FULL SUPPORT
818	R	WBI4A	DEWEESE CREEK	42.30210833	-106.96081390	10-08-1998	8	7.333333	1.090909	*	FULL SUPPORT
952	RT	WBI4A	DEWEESE CREEK	42.30210833	-106.96081390	9/14/1999	9	7.959379	1.130741		FULL SUPPORT
1029	R	WBI4A	DEWEESE CREEK	42.30211000	-106.96081000	10/3/2000	8	7.990545	1.001183		FULL SUPPORT
1112	R	WBI4A	DEWEESE CREEK	42.30211000	-106.96081000	9/12/2001	6	7.725996	0.776599		INDETERMINATE
1098	T	WB144	Dry Creek above Bighorn River	44.50632000	-108.05737000	10/2/2001	3	11.8523	0.253115	*	PARTIAL/NON SUPPORT
1099	T	WB145	Dry Creek below Emblem Bench	44.50213000	-108.23568000	10/2/2001	6	9.922011	0.604716	*	PARTIAL/NON SUPPORT
308	R	WB19	DRY MEDICINE LODGE CREEK	44.30111111	-107.54055560	09-04-1997	7	8.369323	0.836388		FULL SUPPORT
791	T	WB53	DRY PINEY CREEK - LOWER (GREEN RIVER)	42.40741389	-110.18052500	10/2/1998	10	14.64333	0.682905		INDETERMINATE
790	T	WB52	DRY PINEY CREEK - UPPER (GREEN RIVER)	42.37699722	-110.28743330	10/1/1998	14	14.64794	0.955766		FULL SUPPORT
923	T	WB100	East Fork Wind River Lower (State) Above Harvey Dr	43.54801944	-109.45789720	9/15/1999	11	14.49512	0.758876		INDETERMINATE
1037	T	WB127	Encampment River - Above USGS Station 06	41.30321000	-106.71459000	9/13/2000	17	14.9882	1.134226		FULL SUPPORT
1218	T	WB157	Five Mile Creek - Lost Wells Butte	43.19407000	-108.36850000	8/30/2001	7	14.36701	0.487227		PARTIAL/NON SUPPORT
1219	T	WB158	Fivemile Creek - S7T3R3	43.24710000	-108.56293000	8/28/2001	7	14.26893	0.490576		PARTIAL/NON SUPPORT
1220	T	WB159	Fivemile Creek - Wyoming Canal Crossing	43.29892000	-108.69787000	8/28/2001	2	14.29226	0.139936		PARTIAL/NON SUPPORT
1217	T	WB156	Fivemile Creek- Boysen	43.20844000	-108.23720000	8/31/2001	10	14.10671	0.708883		INDETERMINATE
396	RT	WB23	FONTENELLE CREEK - LOWER	42.09743056	-110.19126670	10/14/1997	12	14.66147	0.818472		INDETERMINATE
249	RT	WB23	FONTENELLE CREEK - LOWER	42.09743056	-110.19126670	9/27/1996	14	14.66211	0.954842		FULL SUPPORT
765	R	WB23	FONTENELLE CREEK - LOWER	42.09743056	-110.19126670	09-01-1998	17	14.66127	1.159518		FULL SUPPORT
927	RT	WB23	FONTENELLE CREEK - LOWER	42.09743056	-110.19126670	10/7/1999	17	14.66045	1.159582		FULL SUPPORT
1051	R	WB23	FONTENELLE CREEK - LOWER	42.09743000	-110.19127000	9/27/2000	14	14.66147	0.954884		FULL SUPPORT
1226	R	WB23	FONTENELLE CREEK - LOWER	42.09743000	-110.19127000	9/24/2001	17	14.66124	1.15952		FULL SUPPORT
774	T	WB36	GRASS CREEK - LOWER (BIGHORN)	43.91300278	-108.56123610	8/12/1998	6	9.335979	0.642675		PARTIAL/NON SUPPORT
775	T	WB37	GRASS CREEK - MIDDLE (BIGHORN)	43.94713611	-108.70234720	8/11/1998	6	7.744921	0.774701		INDETERMINATE
776	T	WB38	GRASS CREEK - UPPER (BIGHORN)	43.89175278	-108.78619720	8/11/1998	9	8.903796	1.010805		FULL SUPPORT
248	R	WB2	GREEN RIVER - MIDDLE	43.07472222	-110.07805560	10-03-1996	12	14.6555	0.818805		INDETERMINATE
250	R	WB26	GREEN RIVER - NEAR NEW FORK RIVER	42.57055556	-109.94833330	09-30-1996	13	14.5107	0.895891		FULL SUPPORT
803	T	WB65	HAMS FORK - GRANGER (GREEN RIVER)	41.60952222	-110.00822500	9/16/1998	10	14.63764	0.683170		INDETERMINATE
802	T	WB64	HAMS FORK - LIONS PARK	41.82815833	-110.53085000	9/15/1998	14	14.66388	0.954727		FULL SUPPORT
817	T	WBI25	HAMS FORK - LOWER BRIDGE (HWY 30)	41.74995000	-110.53361940	9/16/1998	10	14.66272	0.682002		INDETERMINATE
926	T	WB103	Horse Creek Middle/S. 20	43.58929722	-109.60785000	10/13/1999	7	14.4997	0.482769		PARTIAL/NON SUPPORT
950	T	WB99	Horse Creek Lower/Dubois	43.54178056	-109.63209170	10/13/1999	10	14.57796	0.685967		INDETERMINATE
1222	T	WB161	Kirby Creek- Blue Springs	43.72604000	-107.95726000	9/11/2001	1	13.53458	0.073885		PARTIAL/NON SUPPORT
1221	T	WB160	Kirby Creek- Kirby Ditch	43.73839000	-108.13903000	9/11/2001	4	13.78336	0.290205		PARTIAL/NON SUPPORT
255	T	WBI15	LARAMIE RIVER - ABOVE	41.30111111	-105.60805560	9/13/1996	4	15.04514	0.265867		PARTIAL/NON SUPPORT
263	T	WBI20	LARAMIE RIVER - BELOW	41.33611111	-105.59611110	9/13/1996	4	15.0497	0.265786		PARTIAL/NON SUPPORT
1043	T	WB126	Laramie River - Below Laramie WWTF	41.36826000	-105.59404000	10/12/2000	2	15.0483	0.132905		PARTIAL/NON SUPPORT
1044	T	WB125	Laramie River - Monolith	41.25694000	-105.66710000	10/13/2000	5	15.00555	0.33321		PARTIAL/NON SUPPORT
937	T	WB86	Little Beaver Lower (confluence)	42.51672222	-108.49916110	8/12/1999	14	12.99662	1.077203		FULL SUPPORT
929	R	WB3	LITTLE LARAMIE RIVER	41.29971944	-105.99415560	09-23-1999	15	14.99389	1.000407		FULL SUPPORT
313	RT	WB3	LITTLE LARAMIE RIVER	41.29971944	-105.99415560	9/11/1997	15	14.93131	1.004600		FULL SUPPORT
767	RT	WB3	LITTLE LARAMIE RIVER	41.29971944	-105.99415560	9/16/1998	15	14.93032	1.004667		FULL SUPPORT
253	RT	WB3	LITTLE LARAMIE RIVER	41.29971944	-105.99415560	9/12/1996	16	14.95606	1.069800		FULL SUPPORT
1028	R	WB3	LITTLE LARAMIE RIVER	41.29972000	-105.99416000	10/4/2000	14	14.83563	0.943674		FULL SUPPORT
1117	R	WB3	LITTLE LARAMIE RIVER	41.29972000	-105.99416000	9/13/2001	13	14.79695	0.87856		FULL SUPPORT
398	T	WBI14	LITTLE MEDICINE BOW RIVER	42.32722222	-106.15361110	10/6/1997	6	10.83678	0.553670		PARTIAL/NON SUPPORT
814	T	WB77	LITTLE POPO AGIE RIVER - DALLAS	42.74747778	-108.61676390	10/14/1998	11	14.29823	0.769326		INDETERMINATE
815	T	WB78	LITTLE POPO AGIE RIVER - HAMILTON	42.89831389	-108.59018610	10/15/1998	10	14.1212	0.708155		INDETERMINATE
813	T	WB76	LITTLE POPO AGIE RIVER - YANKEE	42.73644167	-108.61871670	10/15/1998	16	12.69265	1.260572		FULL SUPPORT
798	T	WB60	LITTLE SANDY - LOWER	42.36778889	-109.23714170	9/2/1998	15	14.55301	1.030715		FULL SUPPORT
311	R	WB13	LITTLE SAVERY CREEK - GRIZZLY RANCH	41.33222222	-107.37694440	09-10-1997	8	9.587907	0.834384		INDETERMINATE
303	R	WBI24	LITTLEFIELD CREEK - MAC-02	44.88638889	-109.65555560	08-13-1997	13	13.96187	0.931107		FULL SUPPORT
395	R	WB14	MCCARTY CREEK	41.36722222	-107.33611110	09-10-1997	8	10.47602	0.763649		INDETERMINATE
1207	T	WB124	Medicine Lodge Creek - School	44.24655000	-107.60536000	9/20/2000	7	7.600817	0.920954		FULL SUPPORT
402	T	WBI7	MIDDLE FK. POGO AGIE - LANDER	42.85055556	-108.70166670	9/9/1997	16	13.57865	1.178321		FULL SUPPORT
785	T	WB47	MILL CREEK - ABOVE CULVERT (BEAR RIVER)	42.19163333	-110.90787220	9/22/1998	14	14.66576	0.954604	*	FULL SUPPORT
332	R	WB15	MORGAN CREEK	42.16111111	-106.92027780	10-01-1997	10	7.785663	1.284412		FULL SUPPORT
1210	R	WB15	MORGAN CREEK	42.16111000	-106.92028000	10/30/2001	8	8.296645	0.964245		FULL SUPPORT
1215	T	WB154	Muddy Creek - blw 431 crossing	43.28666000	-108.44958000	8/29/2001	7	14.36047	0.487449		PARTIAL/NON SUPPORT
1214	T	WB153	Muddy Creek - Boysen	43.28438000	-108.28534000	8/30/2001	6	14.34666	0.418216		PARTIAL/NON SUPPORT
801	T	WB63	MUDDY CREEK - LOWER (GREEN RIVER)	42.53967222	-110.07949440	9/30/1998	11	14.6555	0.750571		INDETERMINATE
800	T	WB62	MUDDY CREEK - MIDDLE (GREEN RIVER)	42.58702778	-110.07671110	9/30/1998	9	14.64578	0.614512		PARTIAL/NON SUPPORT
799	T	WB61	MUDDY CREEK - UPPER (GREEN RIVER)	42.73681667	-110.33405000	9/30/1998	5	14.61044	0.342221		PARTIAL/NON SUPPORT
1216	T	WB155	Muddy Creek -Wyoming Canal Crossing	43.36153000	-108.60171000	8/29/2001	8	14.35629	0.557247		PARTIAL/NON SUPPORT
793	T	WB55	NEW FORK - BELOW EAST FORK CONFLUENCE	42.68228333	-109.74050830	9/30/1998	14	14.66339	0.954759		FULL SUPPORT
794	T	WB56	NEW FORK - ROSS BUTTE	42.58597778	-109.91810830	9/30/1998	11	14.64934	0.750887		INDETERMINATE
251	R	WB27	NEW FORK RIVER	42.58444444	-109.92027780	09-30-1996	13	14.6351	0.888276		FULL SUPPORT
792	T	WB54	NEW FORK RIVER - AIRPORT	42.78154722	-109.80220560	9/29/1998	12	14.66315	0.818378		INDETERMINATE
252	R	WB28	NEW FORK RIVER - BULL PASTURE	42.90770556	-109.92388890	10-02-1996	16	14.66045	1.091372		FULL SUPPORT
347	RT	WB28	NEW FORK RIVER - BULL PASTURE	42.90770556	-109.92388890	10/14/1997	16	14.65592	1.091709		FULL SUPPORT
928	RT	WB28	NEW FORK RIVER - BULL PASTURE	42.90770556	-109.92388890	10/5/1999	16	14.6458	1.092464		FULL SUPPORT
766	RT	WB28	NEW FORK RIVER - BULL PASTURE	42.90770556	-109.92388890	10/1/1998	18	14.64647	1.228965		FULL SUPPORT
1054	R	WB28	NEW FORK RIVER - BULL PASTURE	42.90771000	-109.92389000	9/26/2000	19	14.64582	1.297299		FULL SUPPORT
1228	R	WB28	NEW FORK RIVER - BULL PASTURE	42.90771000	-109.92389000	10/3/2001	13	14.62441	0.888925		FULL SUPPORT
1229	R	WB28	NEW FORK RIVER - BULL PASTURE	42.90771000	-109.92389000	9/26/2000	19	14.65318	1.296647		FULL SUPPORT
808	T	WB71	NORTH FORK VERMILLION CREEK - LOWER	41.09373333	-108.79495560	8/27/1998	8	14.50044	0.551707		PARTIAL/NON SUPPORT
807	T	WB70	NORTH FORK VERMILLION CREEK - UPPER	41.10039167	-108.91217220	8/27/1998	10	14.37717	0.695547		INDETERMINATE

Appendix B (cont.) - O/E scores and narrative ratings for samples by ecoregion/sub-region. Samples outside model experience are noted with an asterisk.

397	R	WB5	NORTH PLATTE RIVER - TREASURE ISLAND	41.33222222	-106.72694440	10-14-1997	14	15.04051	0.930819		FULL SUPPORT
1201	T	WB118	Nowood River Bel. Buffalo Ck.	44.12394000	-107.55057000	10/5/2000	5	10.27793	0.486479		PARTIAL/NON SUPPORT
1199	T	WB116	Nowood River Bluff	44.21079000	-107.73752000	10/4/2000	5	13.99422	0.35729	*	PARTIAL/NON SUPPORT
1200	T	WB117	Nowood River Manderson	44.26450000	-107.94917000	10/4/2000	3	13.99884	0.214303	*	PARTIAL/NON SUPPORT
1213	T	WB152	Owl Creek - Hwy 20 crossing	43.71579000	-108.17860000	8/22/2001	4	10.887	0.367411		PARTIAL/NON SUPPORT
769	T	WB31	PLEASANT VALLEY CREEK - CROMPTON	41.29153056	-110.94510830	10/20/1998	6	7.333333	0.818182	*	INDETERMINATE
939	T	WB88	Pole Creek Lower/191	42.79520833	-109.78832780	10/5/1999	12	14.6439	0.819454		INDETERMINATE
1105	T	WB136	Polecat Creek above Sage Creek	44.88263000	-108.54868000	10/16/2001	6	7.732875	0.775908	*	INDETERMINATE
1104	T	WB135	Polecat Creek above WAW Road	44.87296000	-108.65978000	10/16/2001	7	8.133964	0.860589	*	FULL SUPPORT
403	T	WBI8	POPO AGIE RIVER - WYPO BRIDGE	42.86361111	-108.68666670	9/9/1997	13	14.11783	0.920822		FULL SUPPORT
1101	T	WB143	Red Canyon Creek - Bison Ranch	43.60053000	-108.33244000	10/15/2001	7	12.26118	0.570907		PARTIAL/NON SUPPORT
1208	T	WB143	Red Canyon Creek - Bison Ranch	43.60053000	-108.33244000	8/13/2001	6	9.581727	0.626192	*	PARTIAL/NON SUPPORT
1209	T	WB149	Red Canyon Creek - Bison Ranch	43.60053000	-108.33244000	8/13/2001	7	13.19678	0.530432		PARTIAL/NON SUPPORT
1202	T	WB119	Red Creek Beef Steer	41.06943000	-109.16884000	9/13/2000	4	14.50105	0.275842		PARTIAL/NON SUPPORT
1204	T	WB121	Red Creek Pine Mountain	41.06851000	-109.07088000	9/14/2000	6	14.42004	0.416088		PARTIAL/NON SUPPORT
1042	T	WB120	Red Creek Richards Gap	41.04148000	-109.07930000	10/13/2000	7	14.6008	0.479426		PARTIAL/NON SUPPORT
1203	T	WB120	Red Creek Richards Gap	41.04148000	-109.07930000	9/13/2000	10	14.6008	0.684894		INDETERMINATE
1097	T	WB140	Sage Creek above Shoshone River	44.84604000	-108.41106000	10/17/2001	8	10.03338	0.797338	*	INDETERMINATE
1096	T	WB139	Sage Creek below Frannie	44.94044000	-108.59924000	10/18/2001	8	10.1216	0.790389	*	INDETERMINATE
1100	T	WB141	Sage Creek below Polecat Creek	44.88621000	-108.54861000	10/17/2001	8	11.99582	0.666899	*	INDETERMINATE
363	T	WB1	SALT WELLS CREEK	41.45916667	-108.94638890	10/21/1997	4	14.39467	0.277881		PARTIAL/NON SUPPORT
335	T	WBI12	SAND CREEK	42.26416667	-107.11694440	10/2/1997	9	8.31382	1.082535		FULL SUPPORT
1231	T	WBI12	SAND CREEK	42.26417000	-107.11694000	10/30/2001	7	7.426559	0.942563		FULL SUPPORT
1106	T	WB137	Shoshoene River above Yellowtail Reservo	44.86928000	-108.21741000	10/23/2001	6	14.72454	0.407483	*	PARTIAL/NON SUPPORT
936	T	WB85	Shoshone River (Corbett)	44.59247222	-108.94791670	10/21/1999	7	13.77233	0.508266		PARTIAL/NON SUPPORT
1093	T	WB138	Shoshone River above Sand Draw	44.85377000	-108.36824000	10/23/2001	6	14.65889	0.409308	*	PARTIAL/NON SUPPORT
768	T	WB30	SMITHS FORK - BRIDGE/HWY 80 (GREEN RIVER)	41.37297778	-110.20428060	10/27/1998	6	14.65341	0.409461		PARTIAL/NON SUPPORT
784	T	WB46	SMITHS FORK - ROCKY (BEAR RIVER)	42.09594167	-110.94309440	9/23/1998	13	14.66543	0.886438		FULL SUPPORT
261	T	WBI19	SOUTH FORK TWIN CREEK	41.80833333	-110.69555560	10/4/1995	5	14.66649	0.340913	*	PARTIAL/NON SUPPORT
789	T	WB51	SUBLETTE CREEK - THOMPSON RANCH	42.03605000	-110.91541110	10/14/1998	11	14.66485	0.750093	*	INDETERMINATE
949	T	WB98	Sulphur Creek Cornelison S. 20 T14N R119W	41.18322500	-110.86587220	10/20/1999	13	14.66505	0.886461		FULL SUPPORT
948	T	WB97	Sulphur Creek Upper/La Chapelle	41.12841111	-110.80844720	10/19/1999	11	14.66637	0.750015	*	INDETERMINATE
330	T	WB25	SWEETWATER RIVER - WILSON BAR	42.40638889	-108.53361110	9/26/1997	14	13.99933	1.000048		FULL SUPPORT
1055	T	WB25	SWEETWATER RIVER - WILSON BAR	42.40639000	-108.53361000	8/9/2000	11	13.65914	0.805322		INDETERMINATE
1227	T	WB25	SWEETWATER RIVER - WILSON BAR	42.40639000	-108.53361000	9/4/2001	14	13.75682	1.017677		FULL SUPPORT
925	T	WB102	Sweetwater River Lower/Haul Road	42.52488333	-107.78446670	10/19/1999	7	12.37834	0.565504		PARTIAL/NON SUPPORT
924	T	WB101	Sweetwater River Upper/Emigrant	42.52128611	-107.82255560	10/19/1999	10	12.23806	0.817123		INDETERMINATE
1205	T	WB122	Tin Cup Creek Canyon	42.62733000	-107.86494000	8/21/2000	4	13.12354	0.304796		PARTIAL/NON SUPPORT
262	T	WBI2	TWIN CREEK	41.80944444	-110.96833330	10/13/1994	8	14.6666	0.545457	*	PARTIAL/NON SUPPORT
265	T	WBI6	TWIN CREEK	42.70055556	-108.49111110	9/17/1996	9	13.29473	0.676960		INDETERMINATE
786	T	WB48	TWIN CREEK - LOWER (BEAR RIVER)	41.81057500	-110.98946390	9/16/1998	10	14.66661	0.681821	*	INDETERMINATE
787	T	WB49	TWIN CREEK - NUGGET (BEAR RIVER)	41.82366111	-110.85387780	9/16/1998	10	14.66646	0.681828	*	INDETERMINATE
940	T	WB89	Twin Creek Mckinney/Derby	42.69276944	-108.56403330	8/24/1999	6	14.12351	0.424823		PARTIAL/NON SUPPORT
943	T	WB92	Twin Creek Section 36	42.62335000	-108.49770000	8/24/1999	9	14.3227	0.628373		PARTIAL/NON SUPPORT
942	T	WB91	Twin Creek Upper/Section 16	42.58000000	-108.55000000	8/24/1999	12	11.51274	1.042324		FULL SUPPORT
951	T	WBI06	Twin Creek Old 287 Crossing	42.70136944	-108.49290000	8/25/1999	8	14.02101	0.570572		PARTIAL/NON SUPPORT
788	T	WB50	TWIN CREEK S.FORK - UPPER (BEAR RIVER)	41.80832500	-110.69616390	9/16/1998	9	14.66658	0.613640	*	PARTIAL/NON SUPPORT
941	T	WB90	Twin Creek Taft/Dallas	42.73629444	-108.61696670	8/24/1999	6	14.46624	0.414759		PARTIAL/NON SUPPORT
394	T	WB10	UPPER MARSH CREEK	41.15750000	-109.50194440	10/21/1997	4	14.65986	0.272854		PARTIAL/NON SUPPORT
806	T	WB69	VERMILLION CREEK - LOWER	41.00021389	-108.65420560	8/28/1998	12	14.60168	0.821823		INDETERMINATE
805	T	WB68	VERMILLION CREEK (UPPER)	41.02169444	-108.64267220	8/28/1998	10	14.62572	0.683727		INDETERMINATE
1223	T	WB162	West Fork Kirby Creek - Monument Hill	43.69625000	-107.89948000	9/11/2001	5	13.3411	0.374782		PARTIAL/NON SUPPORT
264	T	WBI3	WHISKEY CREEK	42.36027778	-107.40000000	9/17/1996	4	7.693388	0.519927		PARTIAL/NON SUPPORT
1206	T	WB123	Willow Creek Henry Peak	42.36150000	-107.59635000	8/22/2000	10	8.355855	1.196766		FULL SUPPORT
931	T	WB80	Willow Creek Lower (287)	42.75360833	-108.65374440	10/25/1999	6	7.647722	0.784547	*	INDETERMINATE
932	T	WB81	Willow Creek Upper (Day) Above Beason	42.72215278	-108.70733610	10/27/1999	8	13.1782	0.607063		PARTIAL/NON SUPPORT
933	T	WB82	Willow Creek Middle (Sacher, Blue Hill)	42.73520000	-108.68189440	10/26/1999	8	11.1983	0.714394		INDETERMINATE
1224	T	WB163	Wind River - Boysen	43.16652000	-108.19497000	9/18/2001	5	15.05191	0.332184		PARTIAL/NON SUPPORT
945	T	WB94	Wind River Dubois	43.53974444	-109.65515830	9/23/1999	11	14.57779	0.754573		INDETERMINATE
946	T	WB95	Wind River Fish Access	43.48119444	-109.49869440	9/30/1999	12	14.54868	0.824817		INDETERMINATE
944	T	WB93	Wind River Jakey's Fork	43.51920000	-109.56702780	9/29/1999	9	14.54863	0.618615		PARTIAL/NON SUPPORT
947	T	WB96	Wind River Schwinn/287 Crossing	43.44198333	-109.46164170	10/1/1999	11	14.51088	0.758052		INDETERMINATE
1225	T	WB164	Wind River- Neble Hill	43.12151000	-108.25588000	9/19/2001	4	15.0513	0.265758		PARTIAL/NON SUPPORT
WESTERN HIGH PLAINS											
958	T	WHP18	BEAR CREEK - ABOVE DATER CREEK (BC5)	41.65210278	-104.37569440	10/14/1999	9	9.496634	0.947704		FULL SUPPORT
1107	T	WHP18	BEAR CREEK - ABOVE DATER CREEK (BC5)	41.65210000	-104.37569000	10/17/2001	9	9.496675	0.9477		FULL SUPPORT
957	T	WHP17	BEAR CREEK - ABOVE FOX CREEK (BC4)	41.65861389	-104.32133890	10/15/1999	9	9.5	0.947368		FULL SUPPORT
961	R	WHP21	BEAR CREEK - ABOVE LITTLE BEAR CREEK (BC8)	41.61624167	-104.61689170	10-11-1999	9	9.5	0.947368		FULL SUPPORT
1108	T	WHP21	BEAR CREEK - ABOVE LITTLE BEAR CREEK (BC8)	41.61624000	-104.61689000	10/25/2001	5	9.5	0.526316		PARTIAL/NON SUPPORT
956	T	WHP16	BEAR CREEK - BELOW FOX CREEK (BC3)	41.65443056	-104.29721110	10/15/1999	8	9.5	0.842105		FULL SUPPORT
960	R	WHP20	BEAR CREEK - BELOW LITTLE BEAR CREEK (BC7)	41.61605556	-104.60957500	10-11-1999	11	9.499999	1.157895		FULL SUPPORT
1109	R	WHP20	BEAR CREEK - BELOW LITTLE BEAR CREEK (BC7)	41.61606000	-104.60958000	10/18/2001	8	9.499988	0.842106		FULL SUPPORT
955	T	WHP15	BEAR CREEK - BLW LOVERCHECK DIVERSION DITCH (BC2)	41.63886111	-104.22800560	10/13/1999	8	9	0.888889		FULL SUPPORT
959	T	WHP19	BEAR CREEK - BELOW SPRING RUN (BC6)	41.63595278	-104.47532500	10/18/1999	11	9.5	1.157895		FULL SUPPORT
962	T	WHP22	BEAR CREEK - HEADWATER (BC9)	41.63225278	-104.74628060	10/21/1999	7	9.5	0.736842		INDETERMINATE
954	T	WHP14	BEAR CREEK - NEAR MOUTH (BC1)	41.63653333	-104.22511390	10/12/1999	9	9.499756	0.947393		FULL SUPPORT
266	R	WHP5	CHUGWATER CREEK	42.04500000	-104.89611110	10-09-1996	8	9.5	0.842105		FULL SUPPORT
405	R	WHP7	CHUGWATER CREEK	41.61000000	-105.13333330	10/22/1997	10	9.499999	1.052632		FULL SUPPORT
820	T	WHP10	CHUGWATER CREEK - LOWER	42.10578889	-104.86513610	10/22/1998	4	9.499013	0.421096		PARTIAL/NON SUPPORT
819	T	WHP09	CHUGWATER CREEK - UPPER	42.02167222	-104.92333330	10/23/1998	9	9	1.000000		FULL SUPPORT
967	T	WHP27	CROW CREEK - ARCOLA	41.10328056	-104.45371670	10/26/1999	8	9	0.888889		FULL SUPPORT
824	T	WHPI08	CROW CREEK - DOWNSTREAM OF DRY CREEK	41.12920000	-104.70496670	9/28/1998	2	9	0.222222		PARTIAL/NON SUPPORT
972	T	WHPI11	CROW CREEK - DOWNSTREAM OF DRY CREEK	41.12920000	-104.70496670	10/27/1999	3	9.5	0.315789		PARTIAL/NON SUPPORT
968	T	WHP28	CROW CREEK - FAMCAMP	41.15613056	-104.87467500	10/29/1999	7	9	0.777778		INDETERMINATE
823	T	WHP13	CROW CREEK - HAPPY JACK ROAD	41.13576944	-104.84286110	9/28/1998	9	9	1.000000		FULL SUPPORT
822	T	WHP12	CROW CREEK - MORRIE AVENUE	41.12262500	-104.79537780	9/28/1998	6	9	0.666667		INDETERMINATE
269	T	WHPI1	CROW CREEK - STATION 1	41.10361111	-104.45416670	8/3/1994	4	9	0.444444		PARTIAL/NON SUPPORT
270	T	WHPI2	CROW CREEK - STATION 2	41.12638889	-104.65861110	8/4/1994	5	9.499998	0.526316		PARTIAL/NON SUPPORT
272	T	WHPI4	CROW CREEK - STATION 4	41.12222222	-104.79694440	8/4/1994	5	9	0.555556		PARTIAL/NON SUPPORT
273	T	WHPI4B	CROW CREEK - STATION 4B	41.12666667	-104.82361110	8/4/1994	4	9	0.444444		PARTIAL/NON SUPPORT
275	T	WHPI5	CROW CREEK - STATION 5	41.13194444	-104.82916670	8/4/1994	5	9	0.555556		PARTIAL/NON SUPPORT
276	T	WHPI6	CROW CREEK - STATION 6	41.14916667	-104.86333330	8/5/1994	9	9	1.000000		FULL SUPPORT

Appendix B (cont.) - O/E scores and narrative ratings for samples by ecoregion/sub-region. Samples outside model experience are noted with an asterisk.

282	R	WHPI6	CROW CREEK - STATION 6	44.46472222	-109.62777780	08-05-1994	14	11.67666	1.198973		FULL SUPPORT
821	T	WHP11	CROW CREEK - UPSTREAM OF DRY CREEK	41.12723889	-104.70533060	9/29/1998	3	9	0.333333		PARTIAL/NON SUPPORT
953	T	WHP11	CROW CREEK - UPSTREAM OF DRY CREEK	41.12723889	-104.70533060	10/27/1999	7	9.438557	0.741639		INDETERMINATE
267	R	WHP6	HORSE CREEK	41.42250000	-105.18666670	10-11-1996	7	9.499868	0.736852		INDETERMINATE
966	T	WHP26	HORSE CREEK - BELOW DRY CREEK (HC2)	41.87311944	-104.13921390	10/7/1999	10	9	1.111111		FULL SUPPORT
965	T	WHP25	HORSE CREEK - BELOW SO. HORSE CK. LATERAL CANAL	41.89321389	-104.09701110	10/6/1999	7	9	0.777778		INDETERMINATE
970	T	WHP30	Horse Shoe Creek above North Platte	42.44722222	-104.96591110	9/8/1999	5	9.5	0.526316		PARTIAL/NON SUPPORT
969	T	WHP29	Horse Shoe Creek above Pipeline	42.45833333	-105.10222220	9/7/1999	8	9	0.888889		FULL SUPPORT
971	T	WHP31	Horse Shoe Creek below Pipeline	42.45833333	-105.10222220	9/7/1999	8	9	0.888889		FULL SUPPORT
963	T	WHP23	NORTH BEAR CREEK - LOWER CANTLER (NBC1)	41.62488333	-104.77940830	10/21/1999	7	9.5	0.736842		INDETERMINATE
404	R	WHP8	SAGE CREEK - HAT CREEK STATION	42.93000000	-104.34500000	10-16-1997	5	7.333313	0.681820	*	INDETERMINATE
964	T	WHP24	SOUTH FORK BEAR CREEK - VOWER RANCH (SBC1)	41.62373056	-104.77034720	10/28/1999	10	9.5	1.052632		FULL SUPPORT
825	T	WHPI09	WHEATLAND CREEK - ABOVE WHEATLAND WWTF	42.08313056	-104.95088330	10/21/1998	4	9	0.444444		PARTIAL/NON SUPPORT
826	T	WHPI10	WHEATLAND CREEK - BELOW WHEATLAND WWTF	42.08466667	-104.95049170	10/20/1998	4	9	0.444444		PARTIAL/NON SUPPORT