Impairment Verification Monitoring Biological and Habitat Components Segment 1806A, Camp Meeting Creek, Texas May 2005



Ecological Communications Corporation Austin, TX



## Impairment Verification Monitoring-Volume 2: Biological and Habitat Components Segment 1806A, Camp Meeting Creek, Texas

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### ABSTRACT

Ecological Communications Corporation (EComm) conducted biological data collection and analysis as part of an impairment verification monitoring project for Camp Meeting Creek (Segment 1806A). Segment 1806A appears on the State of Texas' 303(d) list as impaired for high aquatic life based on low dissolved oxygen concentrations previously reported by or to the Texas Commission on Environmental Quality (TCEQ) or its predecessor agencies. Due to an insufficient amount of data to support a re-assessment, this water body remained on the draft 2002 303(d) list. The objective of EComm's data assessment was to assemble enough information on the water body to support an Aquatic Life Assessment if it was determined that the designated aquatic life use was incorrect.

A separate but related assessment was simultaneously conducted by the Texas Engineering Experiment Station (TEES) and the Conrad Blucher Institute for Surveying and Science (CBI) to facilitate the objective. The TEES/CBI effort included physical and chemical data collection and analysis in an attempt to provide a comprehensive assessment of the water quality within the stream segment. As part of the overriding TMDL project, the combined biological, physical, and chemical data collection and analytical activities will result in one of four outcomes:

- 1. Removal of the water body from the 303(d) list,
- 2. An evaluation of applicable water quality standards (aquatic life use impairments only),
- 3. Development of a TMDL, or
- 4. Additional monitoring to better characterize the impairment.

This segment is an unclassified water body with a presumed aquatic life use of "Limited" based upon the intermittent with perennial pools flow regime as determined by SWQM staff. However, based on field observations and conversations with local residents, the presumption may need to be changed to an aquatic life use of "High" due to perennial flow conditions for Segment 1806A. Based on data collected by EComm and TEES from 2002 to 2004, this water body appears to be meeting a "High" aquatic life use and exceeding the presumed "Limited" aquatic life use designated in the Texas Water Quality Standards (TCEQ 2000).

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### **1.0 INTRODUCTION**

In 2000 the Texas Commission on Environmental Quality (TCEQ) initiated a study to investigate water quality impairments in 11 water bodies in Basin Groups D & E identified through the 1999

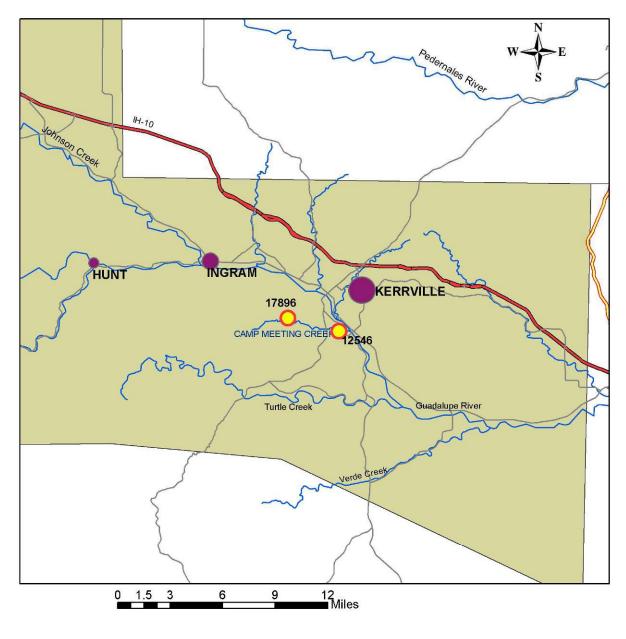


Figure 1. Station 17896

305(b) Water Quality Inventory as part of a total daily maximum load (TMDL) program. The segments were included on the 1999 State of Texas Clean Water Act 303(d) list as impaired due to concentrations of dissolved oxygen or bacteria or both which exceed established criteria. One of these water bodies was Camp Meeting Creek (Segment 1806A). The impairment to Segment 1806A was caused by an exceedance of the established dissolved oxygen criteria as indicated by data collected through the statewide monitoring program. Because an insufficient number of 24-hour dissolved oxygen values were available in 2002 to determine if the aquatic life use criterion is supported, Segment 1806A remained on the impaired waters list. As an initial

phase in TMDL development, the aquatic life use impairment to Segment 1806A was verified using the latest sampling techniques. The initial assessment was performed so that resources within the program can be efficiently utilized for truly impaired water bodies, preventing TMDL development for a water body that may be delisted or subject to a water quality standards revision at a later date. Chemical, physical, and biological data were collected at two sites within the segment in an effort to determine what course of action, if any, needed to be taken to address impairments. Data collection activities would result in one of four outcomes: 1) Removal of the water body from the 303(d) list, 2) An evaluation of applicable water quality standards (aquatic life use impairments only), 3) TMDL, or 4) Additional monitoring to better characterize the impairment.

Segment 1806A begins at the headwaters of Camp Meeting Creek above Ranchero Road in Kerrville, TX. It flows for approximately 9 miles prior to the confluence with the Guadalupe River in Kerr County, near the State Highway 173 crossing. The creek flows through mostly residential areas and a private golf course. A location map of the segment is provided in Figure 2. Site 17896 is located approximately 0.5 mile upstream from the Ranchero Road crossing. Site 12546 is located at the Hwy 173 crossing, approximately 0.1 mile upstream of the confluence with the Guadalupe in Kerrville.



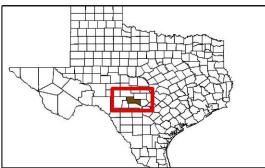


Figure 2. Location Map for Segment 1806A, Camp Meeting Creek Kerr County, TX

### 2.0 BIOLOGICAL AND HABITAT METHODOLOGY

Biological data (including fish, benthic macroinvertebrates, and habitat) were collected under strict interpretation of the Biological Component and Stream Physical Habitat Component

sections of the Receiving Water Assessment (RWA) Procedures Manual (Texas Natural Resource Conservation Commission [TNRCC] As specified in the RWA manual, 1999b). EComm evaluated fish sampled in accordance with statewide criteria of Indices of Biotic Integrity (IBIs). Additionally, EComm generated IBIs for all stations using regional criteria developed by Texas Parks and Wildlife Department (2002). The regional criteria consider differences in landforms, soil types, vegetation. climatic conditions, and zoogeographic factors among the ecoregions and thus "provide a better representation of the integrity of fish assemblage" as compared to statewide criteria.



Figure 3. Station 12546

In addition to data collection via RWA guidelines and TCEQ Surface Water Quality Monitoring (SWQM) Procedures Manual (TNRCC 1999a), EComm captured data for approximately 14 previously uncoded biological and habitat parameters. These parameters include: the various metrics used in determining regional IBI scores; the final scores for aquatic life use values for both statewide and regional IBI criteria; the final scores for Rapid Bioassessment Protocol (RBP) for benthic macroinvertebrates; and the final scores for Habitat Quality Indices (HQIs). All 14 parameters were assigned unique STORET codes in an effort to create maximum efficiency for data management. The new STORET codes and descriptions, along with other STORET codes captured for this segment, are provided in Table 1.

Segment 1806A, an unclassified water body, had not previously been designated as a segment requiring a standards change to reflect site specific conditions. Studies which examine site specific conditions and recommend changes to established or presumed uses are referred to as Use Attainability Analyses (UAA) and Aquatic Life Assessment (ALA), respectively. Although the main purpose of the physical/chemical component of the study was to verify the aquatic life impairment based upon exceedences of the dissolved oxygen criteria, a biological sampling regime satisfying the minimum ALA data requirements for biological data was conducted. Biological ALA requirements include at least four complete sampling events over two consecutive index periods. Nekton, benthos, and habitat data are collected and analyzed for each sampling event. Two events must be conducted during Year 1 and two events must be conducted during Year 2. Each year, one event must be from the Critical Period (July 1 – September 30), and one from outside the Critical Period, but during the Index Period (March 15 – October 15). Biological sampling for Segment 1806A was conducted in September 2002,

October 2002, June 2003, and August 2003. Therefore, sufficient data exists to make the determination, should an ALA be required.

### Table 1. STORET Codes

(New STORET codes captured are temporarily assigned to the "00800" series (in italics)

STORET Code	Description	STORET Code	Description
89832	Number of lateral transects	90008	EPT index
89847	Average bank slope	98009	Total number of sucker species
89846	Average bank erosion potential	98010	Total number of intolerant species
89845	Percent of substrate that is gravel or larger	98016	Percent individuals as tolerants (fish)
800	Channel flow status	98017	Percent individuals as omnivores
89844	Dominant substrate	98021	Percent individuals as insectivores
89843	Total number of riffles	98022	Percent individuals as piscivores
89842	Number of poorly defined stream bends	98023	Total number of individuals in fish sample
89841	Number of moderately defined stream bends	98024	Percent individuals as hybrid
89840	Number of well defined stream bends	98030	Percent with disease
812	Statewide IBI	98003	Number of fish species
833	Habitat Quality Index	89905	Number of minutes debris was sampled
84161	Stream order	89851	Percent grass
84159	Percent instream cover	89854	Percentage tree canopy
813	Number of cyprinidae species	89859	Drainage area
814	Number of benthic invertebrates	89860	Length of reach
72052	Streambed slope	89861	Average stream width
816	Percent that are tolerant species, excluding G.affinis	89862	Average stream depth
817	Number of individuals per seine haul	89864	Maximum pool width
818	Number of individuals per minute electroshocking	89865	Maximum pool depth
819	Percentage of individuals as non-native	89866	Average width of riparian vegetation
820	Regional IBI	90010	Dominant functional feeding group percentag
832	Total RBP score	89899	Biological rpt unit
89853	Percent other as riparian vegetation	90009	Number of functional feeding groups
89839	Total number of stream bends	89906	Number of individuals in RBA sample
98008	Total number of sunfish species	89941	Seine length
90025	Percentage benthic gatherers	89943	Electrofishing method
90030	Percentage benthic filterers	89944	Electrofishing duration
90035	Percentage benthic shredders	89946	Average mesh size
90036	Percentage benthic predators	89948	Number of seine hauls
834	Percentage benthic scrapers	89950	Benthic sampling code
90042	Percentage benthic inverts individuals in dominant taxon	89961	Texas ecoregion
90050	Ratio of intolerant to tolerant taxa	89976	Area seined
90052	Number of non-insects	90007	Hilsenhoff biotic index
90054	Percentage of Elmidae	89849	Percent trees
92266	Percentage of Trichoptera that are Hydropsychidae	89867	Aesthetics
92491	Percent Chironomidae	835	Benthic invertebrate taxa richness
89850	Percent as shrubs	836	Number instream cover types
98004	Total number of darter species	89904	Minutes spent kicknetting

\* STORET Codes beginning with 8 have yet to be formally established

### **Benthic Macroinvertebrate Collections**

Biological sampling included fish and benthic macroinvertebrate data collection at each site within the segment. A location map of the segment, as well as the two site locations within the segment, is provided in Figure 2. Collection of benthic macroinvertebrates in the field was conducted using a 12-inch D-frame kicknet in riffle areas traveling a zigzag pattern across the bed in five-minute intervals. In the event that no riffles were present, snags, leaf packs, and other debris were picked for macroinvertebrates. Intervals were repeated until the minimum sample size of 100 specimens was approached, met, or exceeded. All individuals collected within the net or through picking were transferred and stored in 70% ethanol for lab analysis and identification. The collection of all individuals within a sample assured that no biases were present for larger, more active, or otherwise more obvious species captured in the net. Most individuals were identified to genus, or as otherwise suggested by the RWA manual. Collections from sites were analyzed using the 12 metrics defined in the Rapid Bioassessment Protocol in Appendix B of the RWA manual. These metrics include parameters such as species diversity and composition, trophic structure, and species tolerance to adverse environmental conditions.

### **Nekton Collections**

Collection of fish in the field was conducted using both electrofishing and seine methods to ensure a representative sample was collected at each site. Electrofishing was conducted using Smith-Root LR-24 backpack electrofishers powered by either 7 amp-hour or 12 am-hour 24 volt deep-cycle batteries. Each sampling team consisted of three field personnel, including a field director and two technicians. One team member served as the backpack operator while the other two flanked the operator with dip nets. Collected fish were temporarily placed in a five-gallon bucket partially filled with water for later identification. Sampling teams moved in an upstream direction, focusing pulses on snags, along vegetated banks, within large boulders or gravel-based riffles, and any other location most likely to contain fish. Active sampling (instances when current was applied to the water) was conducted for a minimum of 900 seconds. Field teams used best judgment to gauge if enough active sampling had been conducted to collect an accurate representation of present species; therefore, the minimum sampling time was exceeded at some sites. Maximum active sampling time for any site was approximately 1,000 seconds. Upon completion of electrofishing, fish were immediately identified, recorded, and returned to the water in order to minimize mortality. Any fish that could not be identified in the field was preserved in either formalin solution or ethanol. If more than one fish exhibiting the same characteristics could not be field identified, then only one representative specimen was preserved for later lab identification. Additionally, one individual from each field-identified species was retained as a voucher.

Electrofishing was complemented by seining at all sites where seining was possible. A straight seine measuring 30' x 4' with 1/8" mesh was used. Six seine hauls, each approximately 10 meters long, were taken during each sampling event and each site. Only successful seine hauls were counted. Those that encountered obstacles that could have resulted in the escape of fish (heavy snags or rocks that prevented or otherwise significantly impaired the lead line from traveling across the bottom substrate) were not included. After each successful haul, collected specimens were identified, recorded, and immediately returned to the stream in an effort to

minimize mortality. Species which could not be field-identified were handled in the manner described in the electrofishing section.

Collections were analyzed using metrics defined by TNRCC 1999 to generate Statewide IBI. Regional IBI were also calculated using the TPWD 2002 criteria. Both calculations use metrics that capture parameters such as species diversity and composition, community trophic structure, and fish abundance and condition.

### Habitat Assessment

Various habitat data were collected at each site, including primary attributes (instream channel measurements), secondary attributes (stream morphology), and tertiary attributes (riparian environment) of each site. Data were used to generate a Habitat Quality Index (HQI), which serves the same function as the RBP for macroinvertebrates and IBIs for fish.

Descriptions of the various data collected are provided in Table 1.

Several other subjective habitat parameters were used as required by RWA Procedures Manual (TNRCC 1999). These include bank erosion potential, aesthetics, dominant types of riparian vegetation, and to a lesser degree, percent instream cover and percent gravel or larger. For the purpose of this project, EComm attempted to standardize such measurements by using the same crews for each segment during as many sampling events as possible. Because this was not always possible, and because individuals within a crew may have different duties for any given sampling event, a training session was conducted prior to fieldwork to help assure that all crewmembers were given identical background and similar interpretation of the subjective measurements.

## 3.0 RESULTS

Aquatic life use determinations were based upon scores for each of the three ecosystem components (fish, benthic macroinvertebrates, and habitat) analyzed for Segment 1806A. The fish component resulted in Statewide and Regional IBI scores, the macroinvertebrate component resulted in a RBP score, and the habitat resulted in a HQI score. The scores from each of these calculations in turn relates to a specific Aquatic Life Use designation: limited, intermediate, high, or exceptional (Table 2). The Aquatic Life Use designation is used to assess existing uses according to the health of the sampled biological communities as compared to established water quality standards. It should be noted that the calculated scores of the Statewide IBI may fall in between two range subcategories (see ranges in Table 2). In these cases, subcategories were assigned as an intermediary between the two subcategories. For example, if a site received a Statewide IBI score of 38, it would fall between the "Limited" and "Intermediate" subcategories, and would be considered to have a "Limited-Intermediate" Aquatic Life Use subcategory.

Subcategory	Statewide IBI	Regional IBI (Region 30)	RBP	HQI						
Limited	<34	<30	<22	<14						
Intermediate	40-44	30-41	22-28	14-19						
High	48-52	42-51	29-36	20-25						
Exceptional	58-60	>51	>36	26-31						

Table 2. Ranges and Subcategories for each component	Table 2.	Ranges and Subcategories for ea	ach component
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Results of the biological and habitat analyses for the two sites over four sampling events are provided in Table 3. Raw data are provided in Appendix A.

	of biological and habita		-g	
FY02	Statewide IBI	Regional IBI	RBP	HQI
17896	38-Limited/Intermediate	37-Intermediate	30-High	22-High
12546	40-Intermediate	41-Intermediate	24-Intermediate	19-Intermediate
17896	44-Intermediate	47-High	31-High	20-High
12546	44-Intermediate	46-High	28-Intermediate	18-Intermediate
FY03				
17896	42-Intermediate	47-High	28-Intermediate	21-High
12546	42-Intermediate	48-High	26-Intermediate	18-Intermediate
17896	42-Intermediate	45-High	30-High	21-High
12546	46-Intermediate/High	48-High	21-Limited	21-High

Table 3	Results of Biolog	gical and Habitat Sa	moling for Sean	nent 1806 <mark>Δ-</mark> Camr	Meeting Creek
Table J.	Results of Diolog	gical and habitat Se	ampining ior begin	nem 1000A-Camp	weeting creek

For each component, an average score was calculated using scores from every sampling event. Scores for sampling events for each component that scored within the subcategory "Limited" agreed with the designated aquatic life use value for the segment. A subcategory of "Limited-Intermediate", "Intermediate", or "Intermediate-High", "High", "High-Exceptional", or "Exceptional" was considered above standard, as it reflects a improved level of water quality than that for which the segment is designated. All scores for each component were well above the standard. Statewide IBI scores averaged approximately 42.3 (Intermediate) across all sites over all sampling events, and indicated a poor agreement with the presumed high aquatic life use of "Limited" (0%, 100% above standard). Regional IBI scores averaged 44.9 (High), and represented a similar agreement (0%; 1000% above standard). RBP scores averaged 27.3 (Intermediate), a 0% agreement (100% above standard), while HQI averaged approximately 20 (High) in 0% agreement with the aquatic life use (100% above standard).

## 4.0 DISCUSSION

Average scores of all biological components reflected the high aquatic life use designation for Segment 1806A. However, based on field observations of discussions with local residents familiar with the water body, perennial flow, as opposed to the current assumption of intermittent flow with perennial pools, may be a more appropriate flow regime designation for Segment 1806A. A change to perennial flow regime would raise the aquatic life use standard to "High." Based on biological data collected for this project from 2002 to 2004, Segment 1806a appears to

be meeting the "High" standard. Dissolved oxygen concentrations throughout the study generally exceeded standards, indicating poor water quality.

### 5.0 CONCLUSION

Based on the Regional IBI, RBP, and HQI scores, the biological and habitat data appear to indicate that the designated aquatic life use of "High" in the Texas Water Quality Standards is being met for Segment 1806A; thus, aquatic life use appears to be above the current assumed standard of "Limited." A change to the assumed flow regime designation may be appropriate for this segment.

### REFERENCES

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\_\_\_\_\_. 1999b. *Receiving Water Assessment Procedures Manual*. Water Quality Division, Surface Water Quality Monitoring Program. GI-253. June 1999.

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Appendix A Complete Raw Data Set Biological and Habitat Components Segment 1806A-Camp Meeting Creek, Texas September 2002 October 2002 June 2003 August 2003



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## BIOTIC ASSESSMENT – FISH

# Species Lists and Preliminary Data Manipulation



Total

Intolerant/Tolerant

113

0.77

92

5.1684783

tive)
1

Stream	Date	ID	Таха	N=	Func.Gp.	Tolerance	HBI
Camp Meeting	9/3/02	17896	Odonata-Coenagrionidae-Argia	10	Р	6	0.6122449
			Odonata-Calopterygidae-Hetaerina	16	Р	6	0.9795918
			Odonata-Libellulidae-Brechmorhoga	4	Р	6	0.244898
Func.Gp	%		Odonata-Libellulidae-Erythemis	1	Р	5	0.0510204
Р	41.6667		Ephemeroptera-Tricorythidae-Tricorythodes	4	CG	5	0.2040816
SCR	4.32692		Ephemeroptera-Tricorythidae-Leptohypes	2	CG/SCR	2	0.0408163
CG	10.4167		Ephemeroptera-Heptageniidae-Stenonema	1	SCR/CG	4	0.0408163
FC	42.6282		Ephemeroptera-Baetidae-Baetis	2	SCR/CG	4	0.0816327
SHR	1		Hemiptera-Veliidae-Rhagovelia	3	Р	-	-
	100.038		Hemiptera-Gerridae-Limnoporus	2	-	-	-
			Hemiptera-Gerridae-Neogerris	1	-	-	-
			Megaloptera-Corydalidae-Corydalus	2	Р	6	0.122449
P-Predator			Megaloptera-Sialidae-Sialis	1	Р	4	0.0408163
SCR-Scrape			Trichoptera-Hydropsychidae-Cheumatopsyche	18	FC	6	1.1020408
CG-Collector			Trichoptera-Philopotamidae-Chimarra	19	FC	3	0.5816327
FC-Filtering Collector SHR-Shredder			Trichoptera-Hydrophilidae (Hydropsychidae)-Hydropsyche	2	FC	5	0.1020408
	01		Coleoptera-Hydrophilidae-Tropisternus (A) (Berosus)	1	Р	9	0.0918367
HBI-Hilsenhoff Biotic Index: =sum(nt/N) where n=number of ind. of a particular taxa, t=tolerance value of that			Coleoptera-Hydrophilidae-Helobata (A)	1	-	-	-
			Coleoptera-Scirtidae-Cyphon (L)	3	CR/CG/SH	-	-
			Diptera-Chironomidae	4	P/CG/FC	6	0.244898
taxon, N=nur			Diptera-Tabanidae-Tabanus	4	Р	7	0.2857143
in sample.	0		Diptera-Simulidae-Simulium	4	FC	4	0.1632653
			Gastropoda (Limnophila)-Physidae-Physella	1	SCR	9	0.0918367
			Amphipoda-Hyallelidae-Hyallela (CG-8)	2	CG	8	0.1632653
			Total	104	98		5.244898
			Intolerant/Tolerant	0.58			
Stream	Date	ID	Таха	NI	Euro Cr	Tolerance	HBI
Camp Meeting		12546	Odonata-Coenagrionidae-Argia	<b>N=</b> 13	Punc.op.	6	пы 0.8478261
amp weeting	9/4/02	12540	Odonata-Calopterygidae-Hetaerina	13	P	6	0.0652174
			Odonata-Libellulidae-Perithemis	1	P	4	0.0434783
Euro Co	%		Odonata-Libellulidae-Brechmorhoga		P	4 6	0.130434783
Func.Gp P	<sup>%</sup> 50.1475		Odonata-Aeschnidae-Boveria	2	P		
				1		3	0.0326087
SCR	14.4543		Ephemeroptera-Tricorythidae-Tricorythodes Ephemeroptera-Heptageniidae-Stenonema	1 0	CG	C A	0.0543478
CG FC	21.2389 13.8643		Ephemeroptera-Baetidae-Baetis	2 28	SCR/CG SCR/CG	4	0.0869565
SHR			Hemiptera-Naucoridae-Ambrysus		P	4	1.2175915
	0.29499 100			1		-	-
Onix			Hemiptera-Naucoridae-Cryphocricos Hemiptera-Veliidae- <i>Rhagovelia</i>	5	P	-	-
Onix	100		Tieniptera-veilidae- <i>Khagovella</i>	14	P	-	-
Unix	100		Magalantara Carudalidaa Carudalus				0.326087
onix	100		Megaloptera-Corydalidae-Corydalus	5	P	6	0.000000
Grift	100		Trichoptera-Hydropsychidae-Cheumatopsyche	4	FC	6	
Grinx	100		Trichoptera-Hydropsychidae-Cheumatopsyche Coleoptera-Elmidae-Hexacylloepus (A)	4 1	FC CG/SCR	6 2	0.0217391
U IIX	100		Trichoptera-Hydropsychidae- <i>Cheumatopsyche</i> Coleoptera-Elmidae- <i>Hexacylloepus</i> (A) Coleoptera-Elmidae <i>Microcylloepus</i> (A)	4 1 1	FC CG/SCR CG/SCR	6 2 2	
Grinx			Trichoptera-Hydropsychidae- <i>Cheumatopsyche</i> Coleoptera-Elmidae- <i>Hexacylloepus</i> (A) Coleoptera-Elmidae <i>Microcylloepus</i> (A) Coleoptera-Scirtidae- <i>Cyphon</i> (L)	4 1 1 1	FC CG/SCR CG/SCR CR/CG/SH	6 2 2 -	0.0217391 0.0217391 -
Grinx			Trichoptera-Hydropsychidae- <i>Cheumatopsyche</i> Coleoptera-Elmidae- <i>Hexacylloepus</i> (A) Coleoptera-Elmidae <i>Microcylloepus</i> (A) Coleoptera-Scirtidae- <i>Cyphon</i> (L) Diptera-Chironomidae	4 1 1 1 20	FC CG/SCR CG/SCR CR/CG/SH P/CG/FC	6 2 - 6	0.0217391 0.0217391 - 1.3043478
Grift			Trichoptera-Hydropsychidae- <i>Cheumatopsyche</i> Coleoptera-Elmidae- <i>Hexacylloepus</i> (A) Coleoptera-Elmidae <i>Microcylloepus</i> (A) Coleoptera-Scirtidae- <i>Cyphon</i> (L) Diptera-Chironomidae Diptera-Tabanidae- <i>Tabanus</i>	4 1 1 20 6	FC CG/SCR CG/SCR CR/CG/SH P/CG/FC P	6 2 - 6 7	0.0217391 - 1.3043478 0.4565217
Unix			Trichoptera-Hydropsychidae- <i>Cheumatopsyche</i> Coleoptera-Elmidae- <i>Hexacylloepus</i> (A) Coleoptera-Elmidae <i>Microcylloepus</i> (A) Coleoptera-Scirtidae- <i>Cyphon</i> (L) Diptera-Chironomidae	4 1 1 1 20	FC CG/SCR CG/SCR CR/CG/SH P/CG/FC	6 2 2 - 6	0.0217391 0.0217391 - 1.3043478

### Benthic Macroinvertrebrates, Kick Sample (Qualitative)

Stream	Date	ID	Таха	N=	Func.Gp.	Tolerance	HBI
mp Meeting 2	10/3/02	17896	Odonata-Coenagrionidae-Argia	13	Р	6	0.9512
			Odonata-Calopterygidae-Hetaerina	1	Р	6	0.0732
Func.Gp	%		Odonata-Libellulidae-Brechmorhoga	2	Р	6	0.1463
Р	28.1746		Ephemeroptera-Tricorythidae-Tricorythodes	15	CG	5	0.9146
SCR	9.52381		Ephemeroptera-Tricorythidae-Leptohypes	1	CG	2	0.0244
CG	31.74603		Ephemeroptera-Leptophlebiidae-Thraulodes	1	CG/SCR	2	0.0244
FC	30.55556		Ephemeroptera-Heptageniidae-Stenonema	2	SCR/CG	4	0.0976
SHR	0		Ephemeroptera-Baetidae-Baetis	5	SCR/CG	4	0.2439
	100		Ephemeroptera-Baetidae-Camelobaetidius (Dactylobaetis)	2	SCR/CG	4	0.097
			Hemiptera-Veliidae-Rhagovelia	1	Р	-	-
P-Predator			Trichoptera-Hydropsychidae-Cheumatopsyche	3	FC	6	0.219
SCR-Scraper			Trichoptera-Hydropsychidae-Hydropsyche	3	FC	5	0.182
CG-Collecto			Trichoptera-Philopotamidae-Chimarra	10	FC	3	0.365
FC-Filtering Collector SHR-Shredder			Trichoptera-Polycentropidae-Polyplectropus	2	FC/P	6	0.1463
			Trichoptera-Hydroptilidae-Leucotrichia	2	CG/SCR	3	0.0732
HBI-Hilsenhoff Biotic Index: =sum(nt/N) where n=number		dex:	Coleoptera-Lutrochidae (Limnichidae)-Lutrochus	1	CG	-	-
		ımber	Diptera-Chironomidae	11	P/CG/FC	6	0.8049
of ind. of a p			Diptera-Simulidae-Simulium	5	FC	4	0.2439
t=tolerance			Diptera-Stratiomyidae-Caloparyphus	1	-	-	-
taxon, N=number organisms in sample.		1131113	Hirudinea	1	Р	8	0.097
			Tricladida (Degusia)	1	Р	7.5	0.091
			Gastropoda (Limnophila)-Physidae-Physella	2	SCR	9	0.219
		.	Total	84	82		5.0183
L			Intolerant/Tolerant	1.278			

Stream	Date	ID	Таха	N=	Func.Gp.	Tolerance	HBI
Camp Meeting 2	10/3/02	12546	Odonata-Coenagrionidae-Argia	5	Р	6	0.3333
			Odonata-Calopterygidae-Hetaerina	3	Р	6	0.2
			Odonata-Libellulidae-Brechmorhoga	5	Р	6	0.3333
Func.Gp	%		Odontata-Gomphidae-Erpetogomphus	1	Р	1	0.0111
Р	37.3913		Ephemeroptera-Baetidae-Baetis	11	SCR/CG	4	0.4889
SCR	6.956522		Hemiptera-Naucoridae-Ambrysus	1	Р	-	-
CG	11.30435		Hemiptera-Naucoridae-Cryphocricos	1	Р	-	-
FC	44.34783		Hemiptera-Veliidae-Rhagovelia	9	Р	-	-
SHR	0		Megaloptera-Corydalidae-Corydalus	6	Р	6	0.4
	100		Trichoptera-Hydropsychidae-Cheumatopsyche	25	FC	6	1.6667
			Trichoptera-Hydrophilidae (Hydropsychidae)-Hydropsyche	1	FC	5	0.0556
			Trichoptera-Hydropsychidae-Smicridea	3	FC	4	0.1333
			Coleoptera-Elmidae-Hexacylloepus	3	CG/SCR	2	0.0667
			Coleoptera-Staphylinidae-Stenus	4	Р	-	-
			Diptera-Chironomidae	15	P/CG/FC	6	1
			Diptera-Tabanidae-Tabanus	1	Р	7	0.0778
			Diptera-Tabanidae-Hypomitra	1	-	-	-
			Diptera-Simulidae-Simulium	17	FC	4	0.7556
			Oligochaeta	1	CG	8	0.0889
			Tricladida (Dugesia)	2	Р	7.5	0.1667
		_	Gastropoda (Limnophila)-Physidae-Physella	1	SCR	9	0.1
		-	Total	115	90		5.8778
			Intolerant/Tolerant	0.563			

### FISH COLLECTED

Stream: Camp Meeting	Species	N=	Туре	Method	Tolerance	Trophic Gp.
Date: 6/11/03	Bluegill	11	SF	Е	Т	IF
Location: 12546	Bluegill	15	SF	S	Т	IF
	Bluegill/longear hybrid	1	SF	S	~	IF
Stream Order:	Central stoneroller	75	CY	Е	~	Н
	Central stoneroller	5	CY	S	~	Н
	Etheostoma sp.	5	D	Е		IF
	Etheostoma sp.	3	D	S		IF
	Gambusia affinis	1		E	т	IF
	Gambusia affinis	33		S	т	IF
**Bluegill hybrid with	Green sunfish	2	SF	E	Ť	P
parasites	Green sunfish hybrid	4	SF	E	Ť	P
parasites	Guadalupe bass	4	01	E	1	P
	Guadalupe bass	19		S	1	P
		19	SF	E	۲ ~	IF
	Longear sunfish			⊑ S		IF
	Longear sunfish	13	SF		~	
	Mexican tetra	1		E	~	IF
	Mexican tetra	1	~-	S	~	IF
	Redbreast	5	SF	E	~	IF
	Redbreast	1	SF	S	~	IF
	Spottail	18	CY	E	~	IF
	Spottail	50	CY	S	~	IF
	Texas shiner	1	CY	S	~	IF
	Warmouth	7	SF	Е	Т	Р
	Yellow bullhead	8		Е	~	0
	Yellow bullhead	1		S	~	0
		293				
Stream: Camp Meeting	Species	N=	Туре	Method	Tolerance	Trophic Gp.
Date: 6/11/03	Bluegill	5	SF	Е	т	IF .
Location: 17896	Bluegill	5	SF	S	т	IF
	Central stoneroller	1	CY	Е	~	Н
Stream Order:	Gambusia affinis	6		Е	т	IF
	Gambusia affinis	45		S	т	IF
	Green sunfish	12	SF	E	т	Р
	Guadalupe bass	4	-	Е	1	Р
	Guadalupe bass	14		S	Ť	P
	Lepomis sp.	5	SF	E	~	IF
	Longear sunfish	24	SF	E	~	IF
	Longear sunfish	12	SF	S	~	 IF
	Mexican tetra	9	01	F	~	IF
	Mexican tetra	1		S	~	 IF
	Redbreast	2	SF	E	-	IF
	Rio Grande cichlid	2 1	0	E	~	IF
	Warmouth	2	SF	E	~ T	IF P
			эг	E	I	Р 0
	Yellow bullhead	2			~	0
		150				

### FISH COLLECTED

Stream: Camp Meeting	Species	N=	Туре	Method	Tolerance	Trophic Gp.
Date: 8/6/03	Blacktail shiner	46	CY	Е	~	IF
Location: 12546	Blacktail shiner	57	CY	S	~	IF
	Bluegill	9	SF	Е	~	IF
	Bluegill	1	SF	S	~	IF
	Central stoneroller	193	CY	Е	~	Н
	Central stoneroller	18	CY	S	~	Н
	Gambusia	10		E	Т	IF
	Gambusia	21		S	Т	IF
	Green sunfish	4	SF	E	Т	Р
	Greenthroat darter	3	D	Е	I	IF
	Greenthroat darter	4	D	S	I	IF
	Guadalupe bass	3		Е	I	Р
	Lepomis	3	SF	Е	~	IF
	Lepomis	3	SF	S	~	IF
	Longear sunfish	6	SF	Е	~	IF
	Longear sunfish	2	SF	S	~	IF
	Mexican tetra	1		Е	~	IF
	Mexican tetra	2		S	~	IF
	Orangethroat darter	6	D	E	~	IF
	Orangethroat darter	3	D	S	~	IF
	Rio Grande cichlid	1		E	~	IF
	Warmouth	3	SF	E	Т	Р
	Yellow bullhead	3		E	~	0
	Yellow bullhead	3		S	~	0
		405				
Stream: Camp Meeting	Species	N=	Туре	Method	Tolerance	Trophic Gp.
Date: 8/6/03	Gambusia	16		Е	т	IF
Location: 17896	Gambusia	63		S	т	IF
	Green sunfish	6	SF	Е	т	Р
Stream Order:	Guadalupe bass	2		Е	I	Р
	Guadalupe bass	4		S	I	Р
	Lepomis	8	SF	Е	~	IF
	Lepomis	1	SF	S	~	IF
	Longear sunfish	17	SF	Е	~	IF
	Longear sunfish	3	SF	S	~	IF
	Mexican tetra	10		E	~	IF
	Mexican tetra	4		S	~	IF
	Rio Grande cichlid	1		Е	~	IF
	Rio Grande cichlid	8		S	~	IF
		8 2	SF	Е	~ T	IF P
	Rio Grande cichlid		SF			

150

# BIOTIC ASSESSMENT – FISH

Indices of Biotic Integrity – Statewide Criteria



Stream: Camp Meeting	Date: 9/3/02 Location: 17896	County: Kerr	
Category	Metric	Value	Score
Species Richness and Composition	1. Total number of fish species	12	5
	2. Number of darter species	0	1
	3. Number of sunfish species (exc. bass)	6	5
	4. Number of sucker speices	0	1
	5. Number of intolerant species	0	1
	6. Percentage of individuals as tolerants	30	1
	7. Percentage of individuals as omnivores	19	5
Trophic Composition	8. Percentage of individuals as insectivores	69	3
	9. Percentage of individuals as piscivores	12	5
	10. Number of individuals in sample	67	3
Fish Abundance and Condition	11. Percentage of individuals as hybrids	1	3
	12. Percentage of individuals with disease/anomalies	0	5
	Aquatic Life Use: LIMITED-INTERMEDIATE	Total Points:	38

Stream: Camp Meeting	Date: 9/4/02 Location: 12546	County: Kerr	
Category	Metric	Value	Score
Species Richness and Composition	1. Total number of fish species	14	5
	2. Number of darter species	1	3
	3. Number of sunfish species (exc. bass)	6	5
	4. Number of sucker speices	0	1
	5. Number of intolerant species	1	3
	6. Percentage of individuals as tolerants	47	1
	7. Percentage of individuals as omnivores	13	5
Trophic Composition	8. Percentage of individuals as insectivores	68	3
	9. Percentage of individuals as piscivores	18	5
	10. Number of individuals in sample	78	3
Fish Abundance and Condition	11. Percentage of individuals as hybrids	3	1
	12. Percentage of individuals with disease/anomalies	0	5
	Aquatic Life Use: INTERMEDIATE	Total Points:	40

Stream: Camp Meeting	Date: 10/03/02 Location: 17896	County: Kerr	
Category	Metric	Value	Score
Species Richness and Composition	1. Total number of fish species	12	5
	2. Number of darter species	0	1
	3. Number of sunfish species (exc. bass)	6	5
	4. Number of sucker speices	0	1
	5. Number of intolerant species	1	3
	6. Percentage of individuals as tolerants	55	1
	7. Percentage of individuals as omnivores	3	5
Trophic Composition	8. Percentage of individuals as insectivores	86	5
	9. Percentage of individuals as piscivores	11	5
	10. Number of individuals in sample	154	3
Fish Abundance and Condition	11. Percentage of individuals as hybrids	0	5
	12. Percentage of individuals with disease/anomalies	0	5
	Aquatic Life Use: INTERMEDIATE	Total Points:	44

Stream: Camp Meeting	Date: 10/03/02 Location: 12546	County: Kerr	
Category	Metric	Value	Score
Species Richness and Composition	1. Total number of fish species	15	5
	2. Number of darter species	2	3
	3. Number of sunfish species (exc. bass)	7	5
	4. Number of sucker speices	0	1
	5. Number of intolerant species	1	3
	6. Percentage of individuals as tolerants	20	3
	7. Percentage of individuals as omnivores	9	5
Trophic Composition	8. Percentage of individuals as insectivores	72	3
	9. Percentage of individuals as piscivores	4	3
	10. Number of individuals in sample	123	3
Fish Abundance and Condition	11. Percentage of individuals as hybrids	0	5
	12. Percentage of individuals with disease/anomalies	0	5
	Aquatic Life Use: INTERMEDIATE	Total Points:	44

Stream: Camp Meeting	Date: 6/11/03	Location: 12546	County: Kerr	
Category	Metric		Value	Score
Species Richness and Composition	1. Total # of fish species		13	5
	2. Number of darter species		1	3
	3. Number of sunfish species (exc.	bass)	5	5
	4. Number of sucker species		0	1
	5. Number of intolerant species		1	3
	6. Percentage of individuals as tole	rants	25	1
	7. Percentage of individuals as omr	nivores	3	5
Trophic Composition	8. Percentage of individuals as inse	ectivores	58	3
	9. Percentage of individuals as pisc	civores	9	5
	10. Number of individuals in sample	e	293	5
Fish Abundance and Condition	11. Percentage of individuals as hy	brids	2	1
	12. Percentage of individuals with c	lisease/anomolies	0	5
	Aquatic Life Use: INTERMEDIATE		Total Points:	42

Stream: Camp Meeting	Date: 6/11/03 Locat	on: 17896	County: Kerr	
Category	Metric		Value	Score
Species Richness and Composition	1. Total # of fish species		12	5
	2. Number of darter species		0	1
	3. Number of sunfish species (exc. bass)		6	5
	4. Number of sucker species		0	1
	5. Number of intolerant species		1	3
	6. Percentage of individuals as tolerants		59	1
	7. Percentage of individuals as omnivores		0.6	5
Trophic Composition	8. Percentage of individuals as insectivores		77	3
	9. Percentage of individuals as piscivores		21	5
	10. Number of individuals in sample		150	3
Fish Abundance and Condition	11. Percentage of individuals as hybrids		0	5
	12. Percentage of individuals with disease/	anomolies	0	5
	Aquatic Life Use: INTERMEDIATE		Total Points:	42

Stream: Camp Meeting	Date: 8/6/03	_ocation:12546	County: Kerr	
Category	Metric		Value	Score
Species Richness and Composition	1. Total # of fish species		14	5
	2. Number of darter species		2	3
	3. Number of sunfish species (exc. bas	ss)	5	5
	4. Number of sucker species		0	1
	5. Number of intolerant species		2	3
	6. Percentage of individuals as toleran	ts	9.4	3
	7. Percentage of individuals as omnivo	ores	1.48	5
Trophic Composition	8. Percentage of individuals as insectiv	vores	44	3
	9. Percentage of individuals as piscivo	res	2.47	3
	10. Number of individuals in sample		405	5
Fish Abundance and Condition	11. Percentage of individuals as hybrid	ls	0	5
	12. Percentage of individuals with dise	ase/anomolies	0	5
	Aquatic Life Use: INTERMEDIATE-HIC	GH	Total Points:	46

Stream: Camp Meeting	Date: 8/6/03 Location: 17896	County: Kerr	
Category	Metric	Value	Score
Species Richness and Composition	1. Total # of fish species	9	3
	2. Number of darter species	0	1
	3. Number of sunfish species (exc. bass)	4	5
	4. Number of sucker species	0	1
	5. Number of intolerant species	1	3
	6. Percentage of individuals as tolerants	58	1
	7. Percentage of individuals as omnivores	3.3	5
Trophic Composition	8. Percentage of individuals as insectivores	87.3	5
	9. Percentage of individuals as piscivores	9.3	5
	10. Number of individuals in sample	150	3
Fish Abundance and Condition	11. Percentage of individuals as hybrids	0	5
	12. Percentage of individuals with disease/anomolies	0	5
	Aquatic Life Use: INTERMEDIATE	Total Points:	42

## BIOTIC ASSESSMENT – FISH

# Indices of Biotic Integrity – Regional Criteria



2\*

Stream:Camp Meeting	Date: 09/03/02	Location: 17896	County: Kerr	
	Metric		Value	Score
1. Total number of fish spec	es		12	5
2. Number of native cyprinid	species		0	1
3. Number of benthic invertive	vore species		0	1
4. Number of sunfish specie	S		6	5
5. Number of intolerant spec	ies		0	1
6. Percentage of individuals	as tolerants (exc. G. af	finis)	11.9	5
7. Percentage of individuals	as omnivores		19	1
8. Percentage of individuals	as insectivores		69	5
9. Percentage of individuals	as piscivores		12	5
10. Number of individuals in	sample		67	-
a. number of ind/seine h	aul		1.5	1
b. number of ind/min ele	ctrofishing		3.9	3
11. Percentage of ind. as no	n-native species		8.96	1
12. Percentage of individual	s with disease/anomalie	es	0	5
Aquatic Life Use: INTER	MEDIATE		Total Points:	37

\*Average of 10a and 10b

Drainage area upstream of 17896 ~ 11.62 sq. km.

2\*

Stream:Camp Meeting	Date: 09/04/02	Location: 12546	County: Ke	rr
	Metric		Value	Score
1. Total number of fish spec	ies		14	5
2. Number of native cyprinic	l species		1	1
3. Number of benthic inverti-	vore species		1	3
4. Number of sunfish specie	S		6	5
5. Number of intolerant spec	cies		1	3
6. Percentage of individuals	as tolerants (exc. G.	affinis)	47.4	3
7. Percentage of individuals	as omnivores		13	3
8. Percentage of individuals	as insectivores		68	5
9. Percentage of individuals	as piscivores		18	5
10. Number of individuals in	sample		78	-
a. number of ind/seine h	aul		5.3	1
b. number of ind/min ele	ctrofishing		3.1	3
11. Percentage of ind. as no	on-native species		8.97	1
12. Percentage of individual	s with disease/anoma	alies	0	5
Aquatic Life Use: INTER	MEDIATE		Total Points:	41

\*Average of 10a and 10b

Drainage area upstream of 12546 ~ 25.88 sq. km.

Stream:Camp Meeting2	Date: 10/03/02	Location: 17896	County: Ke	rr
	Metric		Value	Score
1. Total number of fish specie	es		12	5
2. Number of native cyprinid	species		0	1
3. Number of benthic invertive	ore species		0	1
4. Number of sunfish species			6	5
5. Number of intolerant speci	es		1	3
6. Percentage of individuals a	as tolerants (exc. G. a	ffinis)	10.39	5
7. Percentage of individuals a	as omnivores		3	5
8. Percentage of individuals a	as insectivores		86	5
9. Percentage of individuals a	as piscivores		11	5
10. Number of individuals in s	ample		154	-
a. number of ind/seine ha	ul		16.17	1
b. number of ind/min elec	trofishing		3.8	3
11. Percentage of ind. as nor	-native species		0	5
12. Percentage of individuals	with disease/anomali	ies	0	5
Aquatic Life Use: HIGH			Total Points:	47

2\*

\*Average of 10a and 10b

Drainage area upstream of 17896 ~ 11.62 sq. km.

Stream:Camp Meeting2	Date: 10/03/02	Location: 12546	County: Ke	rr
	Metric		Value	Score
1. Total number of fish specie	es		15	5
2. Number of native cyprinid	species		3	3
3. Number of benthic invertiv	ore species		2	5
4. Number of sunfish species	;		7	5
5. Number of intolerant speci	es		1	3
6. Percentage of individuals	as tolerants (exc. G. a	ffinis)	17.1	5
7. Percentage of individuals	as omnivores		9	3
8. Percentage of individuals	as insectivores		72	5
9. Percentage of individuals	as piscivores		4	3
10. Number of individuals in	sample		123	
a. number of ind/seine ha	iul		1	1
b. number of ind/min elec	trofishing		7.8	5
11. Percentage of ind. as nor	n-native species		4.07	1
12. Percentage of individuals	with disease/anomali	es	0	5
Aquatic Life Use: HIGH			Total Points:	46

3\*

\*Average of 10a and 10b

Drainage area upstream of 12546 ~ 25.88 sq. km.

Stream: Camp Meeting (30) Date: 6/11/03 Location: 12546	County: Kerr	
Metric	Value	Score
1. Total # of fish species	13	5
2.Total Number of cyprinid species	3	3
3. Number of benthic invertivore species	1	3
4. Number of sunfish species (exc. bass)	5	5
5. Number of intolerant species	1	3
6. Percentage of individuals as tolerants (exc. G.affinis)	13	5
7. Percentage of individuals as omnivores	3	5
8. Percentage of individuals as insectivores	58.4	3
9. Percentage of individuals as piscivores	11.3	5
10. Number of individuals in sample	~	~
a. Number of individuals/seine hual	23.8	1
b. Number of individuals/min. electroshocking	10	5
11. Percentage of individuals as non-native species	2	3
12. Percentage of individuals with disease/anomolies	0	5
Aquatic Life Use: HIGH	Total Points:	48

\*Average of 10a and 10b

Drainage area upstream of 12546 ~ 25.88 sq. km.

Stream: Camp Meeting (30) Date: 6/11/03 Location: 17896	County: Kerr	
Metric	Value	Score
1. Total # of fish species	12	5
2.Total Number of cyprinid species	1	1
3. Number of benthic invertivore species	0	1
4. Number of sunfish species (exc. bass)	6	5
5. Number of intolerant species	1	3
6. Percentage of individuals as tolerants (exc. G.affinis)	16	5
7. Percentage of individuals as omnivores	1.3	5
8. Percentage of individuals as insectivores	76.7	5
9. Percentage of individuals as piscivores	20	5
10. Number of individuals in sample	~	~
a. Number of individuals/seine hual	12.8	1
b. Number of individuals/min. electroshocking	4.9	3
11. Percentage of individuals as non-native species	1.3	5
12. Percentage of individuals with disease/anomolies	0	5
Aquatic Life Use: HIGH	Total Points:	47

\*Average of 10a and 10b

Drainage area upstream of 17896 ~ 11.62 sq. km.

3\*

Stream: Camp Meeting (30) Date: 8/6/03 Location: 12546	6	County: Kerr
Metric	Value	Score
1. Total # of fish species	14	5
2.Total Number of cyprinid species	2	1
3. Number of benthic invertivore species	2	5
4. Number of sunfish species (exc. bass)	5	5
5. Number of intolerant species	2	5
6. Percentage of individuals as tolerants (exc. G.affinis)	1.7	5
7. Percentage of individuals as omnivores	1.5	5
8. Percentage of individuals as insectivores	44	3
9. Percentage of individuals as piscivores	2.5	1
10. Number of individuals in sample		~
a. Number of individuals/seine hual	19	1
b. Number of individuals/min. electroshocking	19.5	5
11. Percentage of individuals as non-native species	0	5
12. Percentage of individuals with disease/anomolies	0	5
Aquatic Life Use: HIGH	Total Points:	46

Stream:Camp Meeting (30) Date: 8/5/03 Location: 17896		County: Kerr
Metric	Value	Score
1. Total # of fish species	9	3
2.Total Number of cyprinid species	0	1
3. Number of benthic invertivore species	0	1
4. Number of sunfish species (exc. bass)	4	5
5. Number of intolerant species	1	3
6. Percentage of individuals as tolerants (exc. G.affinis)	5.3	5
7. Percentage of individuals as omnivores	3.3	5
8. Percentage of individuals as insectivores	88.7	5
9. Percentage of individuals as piscivores	9.3	5
10. Number of individuals in sample		~
a. Number of individuals/seine hual	13.8	1
b. Number of individuals/min. electroshocking	4.67	3
11. Percentage of individuals as non-native species	0	5
12. Percentage of individuals with disease/anomolies	0	5
Aquatic Life Use: HIGH	Total Points:	47

## BIOTIC ASSESSMENT – BENTHIC MACROINVERTEBRATES

# Species Lists and Preliminary Data Manipulation



Stream	Date	ID	Таха	N=	Func.Gp.	Tolerance	НВІ
Camp Meeting	9/3/02	17896	Odonata-Coenagrionidae-Argia	10	Р	6	0.6122449
			Odonata-Calopterygidae-Hetaerina	16	Р	6	0.9795918
			Odonata-Libellulidae-Brechmorhoga	4	Р	6	0.244898
Func.Gp	%		Odonata-Libellulidae-Erythemis	1	Р	5	0.0510204
Р	41.6667		Ephemeroptera-Tricorythidae-Tricorythodes	4	CG	5	0.2040816
SCR	4.32692		Ephemeroptera-Tricorythidae-Leptohypes	2	CG/SCR	2	0.0408163
CG	10.4167		Ephemeroptera-Heptageniidae-Stenonema	1	SCR/CG	4	0.0408163
FC	42.6282		Ephemeroptera-Baetidae-Baetis	2	SCR/CG	4	0.0816327
SHR	1		Hemiptera-Veliidae-Rhagovelia	3	Р	-	-
	100.038		Hemiptera-Gerridae-Limnoporus	2	-	-	-
			Hemiptera-Gerridae-Neogerris	1	-	-	-
			Megaloptera-Corydalidae-Corydalus	2	Р	6	0.122449
			Megaloptera-Sialidae-Sialis	1	Р	4	0.0408163
			Trichoptera-Hydropsychidae-Cheumatopsyche	18	FC	6	1.1020408
			Trichoptera-Philopotamidae-Chimarra	19	FC	3	0.5816327
			Trichoptera-Hydrophilidae (Hydropsychidae)-Hydropsyche	2	FC	5	0.1020408
			Coleoptera-Hydrophilidae-Tropisternus (A) (Berosus)	1	Р	9	0.0918367
			Coleoptera-Hydrophilidae-Helobata (A)	1	-	-	-
			Coleoptera-Scirtidae-Cyphon (L)	3	CR/CG/SH	-	-
			Diptera-Chironomidae	4	P/CG/FC	6	0.244898
			Diptera-Tabanidae-Tabanus	4	Р	7	0.2857143
			Diptera-Simulidae-Simulium	4	FC	4	0.1632653
			Gastropoda (Limnophila)-Physidae-Physella	1	SCR	9	0.0918367
			Amphipoda-Hyallelidae-Hyallela (CG-8)	2	CG	8	0.1632653
			Total	104	98		5.244898
			Intolerant/Tolerant	0.58			

Stream	Date	ID	Таха	N=	Func.Gp.	Tolerance	HBI
Camp Meeting	9/4/02	12546	Odonata-Coenagrionidae-Argia	13	Р	6	0.8478261
			Odonata-Calopterygidae-Hetaerina	1	Р	6	0.0652174
			Odonata-Libellulidae-Perithemis	1	Р	4	0.0434783
Func.Gp	%		Odonata-Libellulidae-Brechmorhoga	2	Р	6	0.1304348
Р	50.1475		Odonata-Aeschnidae-Boyeria	1	Р	3	0.0326087
SCR	14.4543		Ephemeroptera-Tricorythidae-Tricorythodes	1	CG	5	0.0543478
CG	21.2389		Ephemeroptera-Heptageniidae-Stenonema	2	SCR/CG	4	0.0869565
FC	13.8643		Ephemeroptera-Baetidae-Baetis	28	SCR/CG	4	1.2173913
SHR	0.29499		Hemiptera-Naucoridae-Ambrysus	1	Р	-	-
	100		Hemiptera-Naucoridae-Cryphocricos	5	Р	-	-
			Hemiptera-Veliidae-Rhagovelia	14	Р	-	-
			Megaloptera-Corydalidae-Corydalus	5	Р	6	0.326087
			Trichoptera-Hydropsychidae-Cheumatopsyche	4	FC	6	0.2608696
			Coleoptera-Elmidae-Hexacylloepus (A)	1	CG/SCR	2	0.0217391
			Coleoptera-Elmidae Microcylloepus (A)	1	CG/SCR	2	0.0217391
			Coleoptera-Scirtidae-Cyphon (L)	1	CR/CG/SH	-	-
			Diptera-Chironomidae	20	P/CG/FC	6	1.3043478
			Diptera-Tabanidae-Tabanus	6	Р	7	0.4565217
			Diptera-Simulidae-Simulium	5	FC	4	0.2173913
			Tricladida (Dugesia)	1	Р	7.5	0.0815217
			Total	113	92		5.1684783
			Intolerant/Tolerant	0.77			

Stream	Date	ID	Таха	N=	Func.Gp.	Tolerance	HBI
Camp Meeting 2	10/3/02	17896	Odonata-Coenagrionidae-Argia	13	Р	6	0.9512
			Odonata-Calopterygidae-Hetaerina	1	Р	6	0.0732
Func.Gp	%		Odonata-Libellulidae-Brechmorhoga	2	Р	6	0.1463
Р	28.1746		Ephemeroptera-Tricorythidae-Tricorythodes	15	CG	5	0.9146
SCR	9.52381		Ephemeroptera-Tricorythidae-Leptohypes	1	CG	2	0.0244
CG	31.74603		Ephemeroptera-Leptophlebiidae-Thraulodes	1	CG/SCR	2	0.0244
FC	30.55556		Ephemeroptera-Heptageniidae-Stenonema	2	SCR/CG	4	0.0976
SHR	0		Ephemeroptera-Baetidae-Baetis	5	SCR/CG	4	0.2439
	100		Ephemeroptera-Baetidae-Camelobaetidius (Dactylobaetis)	2	SCR/CG	4	0.0976
			Hemiptera-Veliidae-Rhagovelia	1	Р	-	-
			Trichoptera-Hydropsychidae-Cheumatopsyche	3	FC	6	0.2195
			Trichoptera-Hydropsychidae-Hydropsyche	3	FC	5	0.1829
			Trichoptera-Philopotamidae-Chimarra	10	FC	3	0.3659
			Trichoptera-Polycentropidae-Polyplectropus	2	FC/P	6	0.1463
			Trichoptera-Hydroptilidae-Leucotrichia	2	CG/SCR	3	0.0732
			Coleoptera-Lutrochidae (Limnichidae)-Lutrochus	1	CG	-	-
			Diptera-Chironomidae	11	P/CG/FC	6	0.8049
			Diptera-Simulidae-Simulium	5	FC	4	0.2439
			Diptera-Stratiomyidae-Caloparyphus	1	-	-	-
			Hirudinea	1	Р	8	0.0976
			Tricladida (Degusia)	1	Р	7.5	0.0915
		_	Gastropoda (Limnophila)-Physidae-Physella	2	SCR	9	0.2195
			Total	84	82		5.0183
			Intolerant/Tolerant	1.278			
Stroom	Data	Л	Taxa	NI	Euro Cr	Toloronoo	цы
Stream	Date	ID	Taxa	<b>N=</b>	-	Tolerance	HBI
Stream Camp Meeting 2	<b>Date</b> 10/3/02	<b>ID</b> 12546	Odonata-Coenagrionidae-Argia	5	Р	6	0.3333
			Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina	5 3	P P	6 6	0.3333 0.2
Camp Meeting 2	10/3/02		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga	5 3 5	P P P	6 6 6	0.3333 0.2 0.3333
Camp Meeting 2 Func.Gp	10/3/02 %		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus	5 3 5 1	P P P	6 6 1	0.3333 0.2 0.3333 0.0111
Camp Meeting 2 Func.Gp P	10/3/02 % 37.3913		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis	5 3 5 1 11	P P P SCR/CG	6 6 6	0.3333 0.2 0.3333
Camp Meeting 2 Func.Gp P SCR	10/3/02 % 37.3913 6.956522		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis Hemiptera-Naucoridae-Ambrysus	5 3 5 1 11 1	P P P SCR/CG P	6 6 1	0.3333 0.2 0.3333 0.0111
Camp Meeting 2 Func.Gp P SCR CG	10/3/02 % 37.3913 6.956522 11.30435		Odonata-Coenagrionidae- <i>Argia</i> Odonata-Calopterygidae- <i>Hetaerina</i> Odonata-Libellulidae- <i>Brechmorhoga</i> Odontata-Gomphidae- <i>Erpetogomphus</i> Ephemeroptera-Baetidae- <i>Baetis</i> Hemiptera-Naucoridae- <i>Ambrysus</i> Hemiptera-Naucoridae- <i>Cryphocricos</i>	5 3 5 1 11 1 1	P P P SCR/CG P P	6 6 1	0.3333 0.2 0.3333 0.0111
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis Hemiptera-Naucoridae-Ambrysus Hemiptera-Naucoridae-Cryphocricos Hemiptera-Veliidae-Rhagovelia	5 3 5 1 11 1 9	P P P SCR/CG P P P	6 6 1	0.3333 0.2 0.3333 0.0111 0.4889 - - -
Camp Meeting 2 Func.Gp P SCR CG	10/3/02 % 37.3913 6.956522 11.30435 44.34783 0		Odonata-Coenagrionidae- <i>Argia</i> Odonata-Calopterygidae- <i>Hetaerina</i> Odonata-Libellulidae- <i>Brechmorhoga</i> Odontata-Gomphidae- <i>Erpetogomphus</i> Ephemeroptera-Baetidae- <i>Baetis</i> Hemiptera-Naucoridae- <i>Ambrysus</i> Hemiptera-Naucoridae- <i>Cryphocricos</i> Hemiptera-Veliidae- <i>Rhagovelia</i> Megaloptera-Corydalidae-Corydalus	5 3 1 11 1 9 6	P P P SCR/CG P P P P	6 6 1 4 - - 6	0.3333 0.2 0.3333 0.0111 0.4889 - - - 0.4
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783		Odonata-Coenagrionidae- <i>Argia</i> Odonata-Calopterygidae- <i>Hetaerina</i> Odonata-Libellulidae- <i>Brechmorhoga</i> Odontata-Gomphidae- <i>Erpetogomphus</i> Ephemeroptera-Baetidae- <i>Baetis</i> Hemiptera-Naucoridae- <i>Ambrysus</i> Hemiptera-Naucoridae- <i>Cryphocricos</i> Hemiptera-Veliidae- <i>Rhagovelia</i> Megaloptera-Corydalidae-Corydalus Trichoptera-Hydropsychidae- <i>Cheumatopsyche</i>	5 3 5 1 11 1 1 9 6 25	P P SCR/CG P P P P FC	6 6 1 4 - - 6 6	0.3333 0.2 0.3333 0.0111 0.4889 - - - 0.4 1.6667
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783 0		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis Hemiptera-Naucoridae-Ambrysus Hemiptera-Naucoridae-Cryphocricos Hemiptera-Veliidae-Chagovelia Megaloptera-Corydalidae-Corydalus Trichoptera-Hydropsychidae-Cheumatopsyche	5 3 5 1 11 1 9 6 25 1	P P SCR/CG P P P P FC FC	6 6 1 4 - - 6 5	0.3333 0.2 0.3333 0.0111 0.4889 - - - 0.4 1.6667 0.0556
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783 0		Odonata-Coenagrionidae- <i>Argia</i> Odonata-Calopterygidae- <i>Hetaerina</i> Odonata-Libellulidae- <i>Brechmorhoga</i> Odontata-Gomphidae- <i>Erpetogomphus</i> Ephemeroptera-Baetidae- <i>Baetis</i> Hemiptera-Naucoridae- <i>Ambrysus</i> Hemiptera-Naucoridae- <i>Cryphocricos</i> Hemiptera-Veliidae- <i>Rhagovelia</i> Megaloptera-Corydalidae-Corydalus Trichoptera-Hydropsychidae- <i>Cheumatopsyche</i> Trichoptera-Hydropsychidae- <i>Smicridea</i>	5 3 5 1 1 1 1 9 6 25 1 3	P P SCR/CG P P P P FC FC FC	6 6 1 4 - - 6 5 4	0.3333 0.2 0.3333 0.0111 0.4889 - - - 0.4 1.6667 0.0556 0.1333
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783 0		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis Hemiptera-Naucoridae-Ambrysus Hemiptera-Naucoridae-Cryphocricos Hemiptera-Veliidae-Cryphocricos Hemiptera-Veliidae-Chagovelia Megaloptera-Corydalidae-Corydalus Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae)-Hydropsyche Trichoptera-Hydropsychidae-Smicridea Coleoptera-Elmidae-Hexacylloepus	5 3 5 1 1 1 1 9 6 25 1 3 3 3	P P SCR/CG P P P P FC FC FC CG/SCR	6 6 1 4 - - 6 5	0.3333 0.2 0.3333 0.0111 0.4889 - - - 0.4 1.6667 0.0556
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783 0		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis Hemiptera-Naucoridae-Ambrysus Hemiptera-Naucoridae-Cryphocricos Hemiptera-Veliidae-Rhagovelia Megaloptera-Corydalidae-Corydalus Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Smicridea Coleoptera-Elmidae-Hexacylloepus Coleoptera-Staphylinidae-Stenus	5 3 5 1 11 1 1 9 6 25 1 3 3 4	P P SCR/CG P P P FC FC FC FC CG/SCR P	6 6 1 4 - - 6 6 5 4 2 -	0.3333 0.2 0.3333 0.0111 0.4889 - - - 0.4 1.6667 0.0556 0.1333 0.0667 -
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783 0		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis Hemiptera-Naucoridae-Ambrysus Hemiptera-Naucoridae-Cryphocricos Hemiptera-Veliidae-Chybocricos Hemiptera-Veliidae-Corydalus Trichoptera-Hydropsychidae-Corydalus Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Smicridea Coleoptera-Elmidae-Hexacylloepus Coleoptera-Staphylinidae-Stenus Diptera-Chironomidae	5 3 5 1 1 1 1 9 6 25 1 3 3 4 15	P P SCR/CG P P P FC FC FC CG/SCR P P/CG/FC	6 6 1 4 - - 6 5 4 2 - 6	0.3333 0.2 0.3333 0.0111 0.4889 - - 0.4 1.6667 0.0556 0.1333 0.0667 - 1
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783 0		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis Hemiptera-Naucoridae-Ambrysus Hemiptera-Naucoridae-Cryphocricos Hemiptera-Veliidae-Rhagovelia Megaloptera-Corydalidae-Corydalus Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Smicridea Coleoptera-Elmidae-Hexacylloepus Coleoptera-Staphylinidae-Stenus Diptera-Tabanidae-Tabanus	5 3 5 1 11 1 1 9 6 25 1 3 3 4	P P SCR/CG P P P FC FC FC FC CG/SCR P	6 6 1 4 - - 6 6 5 4 2 -	0.3333 0.2 0.3333 0.0111 0.4889 - - - 0.4 1.6667 0.0556 0.1333 0.0667 -
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783 0		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis Hemiptera-Naucoridae-Ambrysus Hemiptera-Naucoridae-Cryphocricos Hemiptera-Veliidae-Cheumatopsyche Megaloptera-Corydalidae-Corydalus Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Smicridea Coleoptera-Elmidae-Hexacylloepus Coleoptera-Staphylinidae-Stenus Diptera-Tabanidae-Tabanus	5 3 5 1 1 1 1 9 6 25 1 3 3 4 15 1 1	P P SCR/CG P P P FC FC FC CG/SCR P /CG/FC P	6 6 1 4 - - 6 5 4 2 - 6 7	0.3333 0.2 0.3333 0.0111 0.4889 - - - 0.4 1.6667 0.0556 0.1333 0.0667 - 1 0.0778 -
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783 0		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis Hemiptera-Naucoridae-Ambrysus Hemiptera-Naucoridae-Cryphocricos Hemiptera-Veliidae-Rhagovelia Megaloptera-Corydalidae-Corydalus Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Smicridea Coleoptera-Elmidae-Hexacylloepus Coleoptera-Staphylinidae-Stenus Diptera-Tabanidae-Tabanus Diptera-Tabanidae-Hypomitra	5 3 5 1 1 1 1 9 6 25 1 3 3 4 15 1 1 1 7	P P SCR/CG P P P FC FC CG/SCR P P/CG/FC P	6 6 1 4 - - 6 5 4 2 - 6 7 - 4	0.3333 0.2 0.3333 0.0111 0.4889 - - 0.4 1.6667 0.0556 0.1333 0.0667 - 1 0.0778 - 0.0778
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783 0		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis Hemiptera-Naucoridae-Ambrysus Hemiptera-Naucoridae-Cryphocricos Hemiptera-Veliidae-Rhagovelia Megaloptera-Corydalidae-Corydalus Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Smicridea Coleoptera-Elmidae-Hexacylloepus Coleoptera-Staphylinidae-Stenus Diptera-Tabanidae-Tabanus Diptera-Tabanidae-Tabanus Diptera-Tabanidae-Simulium Diptera-Simulidae-Simulium	5 3 5 1 11 1 9 6 25 1 3 4 15 1 1 17 1	P P SCR/CG P P P FC FC FC CG/SCR P P/CG/FC P	6 6 1 4 - - 6 5 4 2 - 6 7 - 4 8	0.3333 0.2 0.3333 0.0111 0.4889 - - 0.4 1.6667 0.0556 0.1333 0.0667 - 1 0.0778 - 0.7556 0.0889
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783 0		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis Hemiptera-Naucoridae-Ambrysus Hemiptera-Naucoridae-Cryphocricos Hemiptera-Veliidae-Rhagovelia Megaloptera-Corydalidae-Corydalus Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Smicridea Coleoptera-Elmidae-Hexacylloepus Coleoptera-Staphylinidae-Stenus Diptera-Tabanidae-Tabanus Diptera-Tabanidae-Tabanus Diptera-Tabanidae-Hypomitra Diptera-Simulidae-Simulium Oligochaeta Tricladida (Dugesia)	5 3 5 1 1 1 1 9 6 25 1 3 3 4 15 1 1 17 1 2	P P P SCR/CG P P P FC FC CG/SCR P P/CG/FC P FC CG P	6 6 1 4 - - 6 5 4 2 - 6 7 - 4 8 7.5	0.3333 0.2 0.3333 0.0111 0.4889 - - 0.4 1.6667 0.0556 0.1333 0.0667 - 1 0.0778 - 0.7556 0.0889 0.1667
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783 0		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis Hemiptera-Naucoridae-Ambrysus Hemiptera-Naucoridae-Cryphocricos Hemiptera-Veliidae-Rhagovelia Megaloptera-Corydalidae-Corydalus Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Smicridea Coleoptera-Elmidae-Hexacylloepus Coleoptera-Staphylinidae-Stenus Diptera-Tabanidae-Tabanus Diptera-Tabanidae-Hypomitra Diptera-Simulidae-Simulium Oligochaeta Tricladida (Dugesia) Gastropoda (Limnophila)-Physidae-Physella	5 3 5 1 11 1 9 6 25 1 3 3 4 15 1 1 17 1 2 1	P P P SCR/CG P P P FC FC CG/SCR P P/CG/FC P FC CG CG CG P	6 6 1 4 - - 6 5 4 2 - 6 7 - 4 8	0.3333 0.2 0.3333 0.0111 0.4889 - - 0.4 1.6667 0.0556 0.1333 0.0667 - 1 0.0778 - 0.7556 0.0889 0.1667 0.1
Camp Meeting 2 Func.Gp P SCR CG FC	10/3/02 % 37.3913 6.956522 11.30435 44.34783 0		Odonata-Coenagrionidae-Argia Odonata-Calopterygidae-Hetaerina Odonata-Libellulidae-Brechmorhoga Odontata-Gomphidae-Erpetogomphus Ephemeroptera-Baetidae-Baetis Hemiptera-Naucoridae-Ambrysus Hemiptera-Naucoridae-Cryphocricos Hemiptera-Veliidae-Rhagovelia Megaloptera-Corydalidae-Corydalus Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Cheumatopsyche Trichoptera-Hydropsychidae-Smicridea Coleoptera-Elmidae-Hexacylloepus Coleoptera-Staphylinidae-Stenus Diptera-Tabanidae-Tabanus Diptera-Tabanidae-Tabanus Diptera-Tabanidae-Hypomitra Diptera-Simulidae-Simulium Oligochaeta Tricladida (Dugesia)	5 3 5 1 1 1 1 9 6 25 1 3 3 4 15 1 1 17 1 2	P P P SCR/CG P P P FC FC CG/SCR P P/CG/FC P FC CG P	6 6 1 4 - - 6 5 4 2 - 6 7 - 4 8 7.5	0.3333 0.2 0.3333 0.0111 0.4889 - - 0.4 1.6667 0.0556 0.1333 0.0667 - 1 0.0778 - 0.7556 0.0889 0.1667

### Benthic Macroinvertrebrates, Kick Sample (Qualitative)

### Benthic Macroinvertebrates - (Qualitative) Kick Sample

Stream: Camp Meeting		Species	N=	Tolerance	FFG	HBI
Date: 6/11/03		Argia	32	6	Р	1.811320755
Location: 17896		Hetaerina	2	6	Р	0.113207547
		Erpetogomphus	1	1	Р	0.009433962
FFG	%	Tricorythodes	2	5	CG	0.094339623
Р	46.41745	Camelobaetidius	2	4	SCR/CG/SHR	0.075471698
SCR	0.778816	Rhagovelia	3	-	Р	-
CG	4.672897	Cheumatopsyche	12	6	FC	0.679245283
FC	46.41745	Hydropsyche	1	5	FC	0.047169811
SHR	1.713396	Chimarra	30	3	FC	0.849056604
	100	Microcylloepus (A)	1	2	CG/SCR	0.018867925
		Cyphon	1	-	SCR/CG/SHR	-
		Chironomidae	2	6	P/CG/FC	0.113207547
		Tabanus	1	7	Р	0.066037736
		Simulium	6	4	FC	0.226415094
		Hirudinea	1	8	Р	0.075471698
		Tricladida	9	7.5	Р	0.636792453
		Hyallela	3	8	CG/SHR	0.226415094
	_		109	0.69354839		5.04245283
Stream: Camp Meeting		Species	N=	Tolerance	FFG	HBI
Date: 6/11/03		Argia	23	6	Р	1.289719626
Location: 12546		Hetaerina	1	6	Р	0.056074766
Location: 12546		Hetaerina Brechmorhoga	1 3	6 6	P P	0.056074766 0.168224299
Location: 12546 FFG	%	Brechmorhoga				
	% 48.64865	Brechmorhoga Erpetogomphus	3	6 1	Р	0.168224299
FFG		Brechmorhoga	3 18	6	P P	0.168224299 0.168224299
FFG P	48.64865	Brechmorhoga Erpetogomphus Tricorythodes	3 18 17	6 1 5	P P CG	0.168224299 0.168224299
FFG P SCR	48.64865 12.16216	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus	3 18 17 1	6 1 5	P P CG P	0.168224299 0.168224299
FFG P SCR CG	48.64865 12.16216 19.81982	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos	3 18 17 1 1	6 1 5	P P CG P P	0.168224299 0.168224299
FFG P SCR CG FC	48.64865 12.16216 19.81982 18.91892	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos Rhagovelia	3 18 17 1 1 2	6 1 5 - -	P CG P P P	0.168224299 0.168224299 0.794392523 - - -
FFG P SCR CG FC SHR	48.64865 12.16216 19.81982 18.91892 0	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos Rhagovelia Corydalus	3 18 17 1 1 2 1	6 1 5 - - - 6	P CG P P P P	0.168224299 0.168224299 0.794392523 - - 0.056074766 1.121495327
FFG P SCR CG FC SHR SCAV	48.64865 12.16216 19.81982 18.91892 0 0.45045	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos Rhagovelia Corydalus Cheumatopsyche	3 18 17 1 2 1 20	6 1 - - 6 6	P CG P P P FC	0.168224299 0.168224299 0.794392523 - - - 0.056074766
FFG P SCR CG FC SHR SCAV P - Predator	48.64865 12.16216 19.81982 18.91892 0 0.45045	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos Rhagovelia Corydalus Cheumatopsyche Smicridea	3 18 17 1 2 1 20 1	6 1 - - 6 6 4	P CG P P P FC FC	0.168224299 0.168224299 0.794392523 - - 0.056074766 1.121495327 0.037383178
FFG P SCR CG FC SHR SCAV P - Predator SCR - Scraper	48.64865 12.16216 19.81982 18.91892 0 0.45045	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos Rhagovelia Corydalus Cheumatopsyche Smicridea Helicopsyche Petrophila	3 18 17 1 1 2 1 20 1 1	6 1 - - 6 6 4 2	P CG P P P FC FC SCR	0.168224299 0.168224299 0.794392523 - - 0.056074766 1.121495327 0.037383178 0.018691589
FFG P SCR CG FC SHR SCAV P - Predator SCR - Scraper CG - Collector/Gatherer	48.64865 12.16216 19.81982 18.91892 0 0.45045	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos Rhagovelia Corydalus Cheumatopsyche Smicridea Helicopsyche Petrophila Microcylloepus (A)	3 18 17 1 1 2 1 20 1 1 1	6 1 - - 6 6 4 2 5	P CG P P P FC FC SCR SCR	0.168224299 0.168224299 0.794392523 - - 0.056074766 1.121495327 0.037383178 0.018691589 0.046728972
FFG P SCR CG FC SHR SCAV P - Predator SCR - Scraper CG - Collector/Gatherer FC - Filtering Collector	48.64865 12.16216 19.81982 18.91892 0 0.45045	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos Rhagovelia Corydalus Cheumatopsyche Smicridea Helicopsyche Petrophila	3 18 17 1 2 1 20 1 1 1 3	6 1 5 - 6 6 4 2 5 2	P CG P P P FC FC SCR SCR CG/SCR	0.168224299 0.168224299 0.794392523 - - - 0.056074766 1.121495327 0.037383178 0.018691589 0.046728972 0.056074766
FFG P SCR CG FC SHR SCAV P - Predator SCR - Scraper CG - Collector/Gatherer	48.64865 12.16216 19.81982 18.91892 0 0.45045	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos Rhagovelia Corydalus Cheumatopsyche Smicridea Helicopsyche Petrophila Microcylloepus (A) Hexacylloepus (A)	3 18 17 1 1 20 1 1 1 3 2	6 1 5 - 6 6 4 2 5 2 2	P CG P P P FC FC SCR SCR CG/SCR CG/SCR	0.168224299 0.168224299 0.794392523 - - - 0.056074766 1.121495327 0.037383178 0.018691589 0.046728972 0.056074766 0.037383178
FFG P SCR CG FC SHR SCAV P - Predator SCR - Scraper CG - Collector/Gatherer FC - Filtering Collector	48.64865 12.16216 19.81982 18.91892 0 0.45045 100	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos Rhagovelia Corydalus Cheumatopsyche Smicridea Helicopsyche Petrophila Microcylloepus (A) Hexacylloepus (A) Macrelmis (L)	3 18 17 1 1 20 1 1 1 3 2 4	6 1 5 - 6 6 4 2 5 2 2 2 2	P CG P P P FC FC SCR SCR CG/SCR CG/SCR	0.168224299 0.168224299 0.794392523 - - - 0.056074766 1.121495327 0.037383178 0.018691589 0.046728972 0.056074766 0.037383178 0.074766355
FFG P SCR CG FC SHR SCAV P - Predator SCR - Scraper CG - Collector/Gatherer FC - Filtering Collector SHR - Shredder	48.64865 12.16216 19.81982 18.91892 0 0.45045 100	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos Rhagovelia Corydalus Cheumatopsyche Smicridea Helicopsyche Petrophila Microcylloepus (A) Hexacylloepus (A) Macrelmis (L) Tabanus	3 18 17 1 2 1 20 1 1 3 2 4 2	6 1 5 - 6 6 4 2 5 2 2 2 2 7	P P CG P P FC FC SCR SCR CG/SCR CG/SCR CG/SCR CG/SCR	0.168224299 0.168224299 0.794392523 - - - 0.056074766 1.121495327 0.037383178 0.018691589 0.046728972 0.056074766 0.037383178 0.074766355
FFG P SCR CG FC SHR SCAV P - Predator SCR - Scraper CG - Collector/Gatherer FC - Filtering Collector SHR - Shredder HBI=Hilsenhoff Biotic Ind	48.64865 12.16216 19.81982 18.91892 0 0.45045 100	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos Rhagovelia Corydalus Cheumatopsyche Smicridea Helicopsyche Petrophila Microcylloepus (A) Hexacylloepus (A) Macrelmis (L) Tabanus Ostracoda Tricladida	3 18 17 1 2 1 20 1 1 1 3 2 4 2 1 2	6 1 5 - 6 6 4 2 5 2 2 2 2 7 - 7.5	P P CG P P FC FC FC SCR SCR CG/SCR CG/SCR CG/SCR CG/SCAV P	0.168224299 0.168224299 0.794392523 - - - - 0.056074766 1.121495327 0.037383178 0.018691589 0.046728972 0.056074766 0.037383178 0.074766355 0.130841121 - 0.140186916
FFG P SCR CG FC SHR SCAV P - Predator SCR - Scraper CG - Collector/Gatherer FC - Filtering Collector SHR - Shredder HBI=Hilsenhoff Biotic Ind sum(nt/N) where n=num of a particular taxa, t= to value of that taxon, and	48.64865 12.16216 19.81982 18.91892 0 0.45045 100 dex= ber of ind. lerance N=total	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos Rhagovelia Corydalus Cheumatopsyche Smicridea Helicopsyche Petrophila Microcylloepus (A) Hexacylloepus (A) Macrelmis (L) Tabanus <b>Ostracoda</b>	3 18 17 1 2 1 20 1 1 1 3 2 4 2 1	6 1 5 - 6 6 4 2 5 2 2 2 2 7 -	P P CG P P P FC FC SCR SCR CG/SCR CG/SCR CG/SCR P CG/SCAV P SCR	0.168224299 0.168224299 0.794392523 - - - - 0.056074766 1.121495327 0.037383178 0.018691589 0.046728972 0.056074766 0.037383178 0.074766355 0.130841121
FFG P SCR CG FC SHR SCAV P - Predator SCR - Scraper CG - Collector/Gatherer FC - Filtering Collector SHR - Shredder HBI=Hilsenhoff Biotic Ind sum(nt/N) where n=num of a particular taxa, t= to	48.64865 12.16216 19.81982 18.91892 0 0.45045 100 dex= ber of ind. lerance N=total	Brechmorhoga Erpetogomphus Tricorythodes Ambrysus Cryphocricos Rhagovelia Corydalus Cheumatopsyche Smicridea Helicopsyche Petrophila Microcylloepus (A) Hexacylloepus (A) Macrelmis (L) Tabanus Ostracoda Tricladida	3 18 17 1 2 1 20 1 1 3 2 4 2 1 2 7	6 1 5 - 6 6 4 2 5 2 2 2 7 5 9	P P CG P P P FC FC SCR SCR CG/SCR CG/SCR CG/SCR P CG/SCAV P SCR	0.168224299 0.168224299 0.794392523 - - 0.056074766 1.121495327 0.037383178 0.018691589 0.046728972 0.056074766 0.037383178 0.074766355 0.130841121 - 0.140186916 0.588785047

## Benthic Macroinvertebrates - (Qualitative) Kick Sample

Stream: Camp Meet	ing		Species	N=	Tolerance	FFG	HBI
Date: 8/7/03			Argia	29	6	Р	1.775510204
Location: 17896			Tricorythodes	5	5	CG	0.255102041
	ream: Camp Meeting te: 8/7/03 cation: 12546 FFG % P 66.9 SCR 11.1 CG 4.91 FC 16.9 SHR P - Predator SCR 3CR 11.1 CG 4.91 FC 16.9 SHR P - Predator SCR - Scraper CG - Collector/Gatherer FC - Filtering Collector SHR - Shredder HBI=Hilsenhoff Biotic Index=		Rhagovelia	2	-	Р	-
	FFG	%	Cheumatopsyche	14	6	FC	0.857142857
	P-	35.94771242	Chimarra	38	3	FC	1.163265306
	SCR-	2.941176471	Hexacylloepus (A)	2	2	CG/SCR	0.040816327
	CG-	9.477124183	Macrelmis (L)	2	2	CG/SCR	0.040816327
FC		51.63398693	Lutrochus (A)	2	-	CG	-
	SHR-		Chironomidae	2	6	P/CG/FC	0.12244898
		100	Hirudinea	1	8	Р	0.081632653
			Tricladida	4	7.5	Р	0.306122449
			Physella	1	9	SCR	0.091836735
				102	0.92156863		4.734693878
Stream: Camp Meet	ina		Species	N=	Tolerance	FFG	HBI
	"'y		Argia	25	6	P	1.546391753
			Hetaerina	6	6	P	0.371134021
			Brechmorhoga	2	6	P	0.12371134
			Erpetogomphus	5	1	P	0.051546392
	FEG	%	Tricorythodes	3	5	ĊG	0.154639175
	-	66.96428571	Ambrysus	2	-	P	-
		11.16071429	Cryphocricos	2	_	P	-
		4.910714286	Rhagovelia	10	_	P	-
		16.96428571	Cheumatopsyche	18	6	FC	1.113402062
	-		Cernotina	3	6	P	0.18556701
	•	100	Hexacylloepus (A)	1	2	CG/SCR	0.020618557
			Macrelmis (L)	4	2	CG/SCR	0.082474227
			Tropisternus (L)	1	9	P	-
	atherer		Petrophila	1	5	SCR	0.051546392
			Tricladida	19	7.5	Р	1.469072165
5			Physella	9	9	SCR	0.835051546
			Corbicula	1	6	FC	0.06185567
HBI=Hilsenhoff I	Biotic In	dex=		112			6.067010309
sum(nt/N) where of a particular ta value of that tax	xa, t= to on, and	olerance N=total					

number of organisms in a sample.

## **BIOTIC ASSESSMENT – BENTHIC MACROINVERTEBRATES**

Rapid Bioassessment Protocol



Stream: Camp Meeting	Date: 9/3/02	Location: 10006	County: Kerr					
	Metr	ic	Value	Score				
1. Taxa Richness			24	4				
2. EPT Taxa Abundance			6	2				
3. Biotic Index (HBI)			5.24	2				
4. % Chironomidae			3.84615384	6 4				
5. % Dominant Taxon			18.2692307	7 4				
6. % Dominant FFG			42.6282048	1 3				
7. % Predators			41.6666663	5 1				
8. Ratio of Intolerant:Tolera	nt Taxa		0.58	1				
9. % of Total Trichoptera as	Hydropsychidae		51.2820512	8 2				
10. # of Non-insect Taxa			2	2				
11. % Collector-Gatherers			10.4166663	5 4				
12. % of Total Number as E	Imidae		0					
Aqautic Life Use: HIGH			Total Score	: 30				

Stream: Camp Meeting	Date: 9/4/02	Location: 12546	County: Kerr	
	Metr	ic	Value	Score
1. Taxa Richness			20	3
2. EPT Taxa Abundance			4	2
3. Biotic Index (HBI)			5.17	2
4. % Chironomidae			17.69911504	1
5. % Dominant Taxon			24.77876106	3
6. % Dominant FFG			49.26253982	2
7. % Predators			49.26253982	1
8. Ratio of Intolerant:Tolera	nt Taxa		0.77	1
9. % of Total Trichoptera as	Hydropsychidae		100	1
10. # of Non-insect Taxa			1	1
11. % Collector-Gatherers			21.23893805	3
12. % of Total Number as E	Imidae		1.769911504	4
Aqautic Life Use: INTERM	EDIATE		Total Score:	24

Stream: Camp Meeting 2	Date: 10/3/02	Location: 10006	County: Kerr	
	Metric		Value	Score
1. Taxa Richness			22	4
2. EPT Taxa Abundance			11	4
3. Biotic Index (HBI)			5.02	2
4. % Chironomidae			13.0952381	2
5. % Dominant Taxon			17.85714286	4
6. % Dominant FFG			31.74607143	4
7. % Predators			28.17460714	2
8. Ratio of Intolerant:Tolerant Ta	аха		1.28	1
9. % of Total Trichoptera as Hyd	Iropsychidae		30	3
10. # of Non-insect Taxa			3	2
11. % Collector-Gatherers			31.74607143	2
12. % of Total Number as Elmid	ae		0	1
Aqautic Life Use: HIGH			Total Score:	31

Stream: Camp Meeting 2 Date: 10/3/02 Location: 12546	County: Kerr	
Metric	Value	Score
1. Taxa Richness	21	3
2. EPT Taxa Abundance	4	2
3. Biotic Index (HBI)	5.88	1
4. % Chironomidae	13.04347826	2
5. % Dominant Taxon	21.73913043	4
6. % Dominant FFG	44.34782609	3
7. % Predators	37.39130435	1
8. Ratio of Intolerant:Tolerant Taxa	0.56	1
9. % of Total Trichoptera as Hydropsychidae	100	1
10. # of Non-insect Taxa	3	2
11. % Collector-Gatherers	11.30434783	4
12. % of Total Number as Elmidae	2.608695652	4
Aqautic Life Use: INTERMEDIATE	Total Score:	28

Stream: Camp Meeting Date: 6/11/03 Location: 17896	County: Kerr	
Metric	Value	Score
1. Taxa Richness	17	3
2. EPT Taxa Abundance	5	2
3. Biotic Index (HBI)	5.04	2
4. % Chironomidae	1.834862385	4
5. % Dominant Taxon	29.35779817	3
6. % Dominant FFG	45.56605505	2
7. % Predators	45.56605505	1
8. Ratio of Intolerant:Tolerant Taxa	0.69	1
9. % of Total Trichoptera as Hydropsychidae	30.23255814	3
10. # of Non-insect Taxa	3	2
11. % Collector-Gatherers	4.587155963	1
12. % of Total Number as Elmidae	0.917431193	4
Aqautic Life Use: INT	Total Score:	28

Stream: Camp Meeting Date: 6/11/03 Location: 12546	County: Kerr	
Metric	Value	Score
1. Taxa Richness	20	3
2. EPT Taxa Abundance	4	2
3. Biotic Index (HBI)	4.79	2
4. % Chironomidae	No Chironomidae	1
5. % Dominant Taxon	20.72072072	4
6. % Dominant FFG	48.64864865	2
7. % Predators	48.64864865	1
8. Ratio of Intolerant:Tolerant Taxa	0.8	1
9. % of Total Trichoptera as Hydropsychidae	95.45454545	1
10. # of Non-insect Taxa	3	2
11. % Collector-Gatherers	19.81981982	3
12. % of Total Number as Elmidae	8.108108108	4
Aqautic Life Use: INTERMEDIATE	Total Score:	26

Stream: Camp Meeting 2 Date: 8/7/03 Location: 17896	County: Kerr	
Metric	Value	Score
1. Taxa Richness	12	2
2. EPT Taxa Abundance	5	2
3. Biotic Index (HBI)	4.73	2
4. % Chironomidae	1.960784314	4
5. % Dominant Taxon	31.37254902	2
6. % Dominant FFG	51.63431373	2
7. % Predators	35.94803922	2
8. Ratio of Intolerant:Tolerant Taxa	0.92	1
9. % of Total Trichoptera as Hydropsychidae	30.23255814	3
10. # of Non-insect Taxa	3	2
11. % Collector-Gatherers	9.47745098	4
12. % of Total Number as Elmidae	0.980392157	4
Aqautic Life Use: HIGH	Total Score:	30

Stream: Camp Meeting 2 Date: 8/7/03 Location: 12546	County: Kerr	
Metric	Value	Score
1. Taxa Richness	17	3
2. EPT Taxa Abundance	4	2
3. Biotic Index (HBI)	6.07	1
4. % Chironomidae	0	1
5. % Dominant Taxon	22.32142857	3
6. % Dominant FFG	66.96428571	1
7. % Predators	66.96428571	1
8. Ratio of Intolerant:Tolerant Taxa	0.17	1
9. % of Total Trichoptera as Hydropsychidae	95.45454545	1
10. # of Non-insect Taxa	3	2
11. % Collector-Gatherers	4.910714286	1
12. % of Total Number as Elmidae	8.035714286	4
Aqautic Life Use: LIMITED	Total Score:	21

# HABITAT ASSESSMENT

Part I – Stream Physical Characteristics Worksheet



Part I - Stream Physical Characteristics Worksheet

Observers: Date: \_\_\_\_ Time: \_\_\_ Weather conditions:

Glide Pool

Algae or Macrophytes (Circle One) Abundant Common Rare Absent

Location of site: \_\_\_\_\_ Length of stream reach: \_\_\_\_\_ Stream:

Stream Segment No.: Observed Stream Uses: Aesthetics (circle one): (1) wilderness (2) natural (3) common (4) offensive

Stream Type (Circle One): perennial or intermittent w/ perennial pools Stream Bends: No. Well Defined\_; No. Moderately Defined\_; No. Poorly Defined\_

Channel Obstructions/Modifications:\_\_\_\_\_\_ No. of Riffles:\_\_ Channel Flow Status (circle one): high moderate low no flow

Riparian Vegetation (%): Left Bank: Trees\_ Shrubs\_ Grasses, Forbs\_ Cult. Fields\_ Other\_ Right Bank: Trees\_ Shrubs\_ Grasses, Forbs\_ Cult. Fields\_ Other\_

Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	т	halweg Depth:		m Depths	; (m) at P	oints Ac	ross Trai	nsect			Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)
	Habitat Type One) Riffle Glide Pool	e (Circle Run	Dominant Subst	rate Type	te Type Dominant Types Riparian Vegetation: Left Bank: Right Bank:								% Gravel or Larger			
	Algae or Ma (Circle One) Abundant ( Rare Absen	Common	Width of Natura Vegetation (m) LB: RB:	l Buffer									% Instream Cover			
Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	г	Stream Depths (m) at Points Across Transect Thalweg Depth:							Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)		
	Habitat Type One) Riffle	e (Circle	Dominant Subst	rate Type	ype Dominant Types Riparian Vegetation: Left Bank:									% Gravel or Larg	ger	

	Right Bank:	
Width of Natural Buffer Vegetation (m) LB: RB:	Instream Cover Types:	

% Instream Cover

	Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	г	Thalweg	Depth:	Stream	Depths (	m) at Po	ints Acr	oss Tran	sect			Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)		
		Habitat Type One) Riffle I Glide Pool	(Circle Run	Dominant Substrate Type				Dominant Types Riparian Vegetation: Left Bank: Right Bank:									% Gravel or Larger			
		Algae or Mac (Circle One) Abundant C Rare Absen	ommon	Width of Natura Vegetation (m) LB: RB:	Left C Erosion In the stream Depths (m) at Points Across Transect Right Bank Stream Depths (m) at Points Across Transect							Width of Natural Buffer Instream Cover Types:							% Instream Cover	
	Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)								Right Bauk Erosion Potential (%)	Tree Canopy (%)							
		Habitat Type One) Riffle I Glide Pool	(Circle Run	Dominant Substrate Type     Dominant Types Riparian Vegetation: Left Bank: Right Bank:							<u> </u>	% Gravel or Large	n.							
		Algae or Mac (Circle One) Abundant C Rare Absent	crophytes onimon	Width of Natural Vegetation (m) LB: RB:	l Buffer		Instream	un Cover Types:									% Instream Cover			
	Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)		Thalwe	g Depth:	Stream	Depths	(m) at Po	oints Act	ross Trar	isect			Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)		
9	and the second second	Habitat Type One) Riffle I Glide Pool	(Circle Run	Dominant Substr	rate Type			Domin Left Ba Right H	ant Type: ink: Bank:	s Riparia	n Veget	ation:					% Gravel or Large	r		
		Algae or Mac (Circle One) Abundant C Rare Absent	ommon	Width of Natural Vegetation (m) LB: RB:	l Buffer		Instream	n Cover 7	Гуреs:					7			% Instream Cover			
	Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	n Stream Depths (m) at Points Across Transect Bank Slope Thalweg Depth:							Right Bank Erosion Potential (%)	Tree Canopy (%)							
	a ana ang ang ang ang ang ang ang ang an	Habitat Type One) Riffle I Glide Pool	(Circle Run	Dominant Substr	Left Bank:								% Gravel or Larger							
		Algae or Mac (Circle One) Abundant C Rare Absent	ommon	Width of Natural Vegetation (m) LB: RB:	l Buffer	ffer Instream Cover Types:								% Instream Cover						

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Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	т	halweg Depth:		m Depths	; (m) at P	oints Ac	ross Trai	nsect		Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)
	Habitat Type One) Riffle Glide Pool	e (Circle Run	Dominant Subst	rate Type			iinant Tyj Bank: it Bank:	pes Ripar	ian Vege	etation:				% Gravel or Larg	er
	Algae or Ma (Circle One) Abundant ( Rare Absen	Common	Width of Natura Vegetation (m) LB: RB:	l Buffer	Instre	am Cove	r Types:			v		¥)		% Instream Cover	
Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	г	halweg Depth:		m Depth	s (m) at P	Points Ac	cross Tra	nsect		Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)
	Habitat Type One) Riffle	e (Circle	Dominant Subst	rate Type		Don	uinant Ty Bank:	pes Ripar	ian Veg	etation:			N	% Gravel or Larg	ger

	Right Bank:	
Width of Natural Buffer Vegetation (m) LB: RB:	Instream Cover Types:	

% Instream Cover

	Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	г	Thalweg	Depth:	Stream	Depths (	m) at Po	ints Acr	oss Tran	sect			Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)
		Habitat Type One) Riffle I Glide Pool	(Circle Run	Dominant Subst	rate Type	1		Domin Left Bi Right I		s Riparia	m Vegel	ation:			-		% Gravel or Large	er
		Algae or Mac (Circle One) Abundant C Rare Absen	ommon	Width of Natura Vegetation (m) LB: RB:	l Buffer		Instream	n Cover 1	Types:								% Instream Cover	
	Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)		Thalwe	g Depth:	Strean	n Depths	(m) at Po	oints Ac	ross Trat	isect			Right Bank Slope (°)	Right Bauk Erosion Potential (%)	Tree Canopy (%)
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		Algae or Mac (Circle One) Abundant C Rare Absent	crophytes onimon	Width of Natural Vegetation (m) LB: RB:	l Buffer		Instream	n Cover 1									% Instream Cover	-
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		Algae or Mac (Circle One) Abundant C Rare Absent	ommon	Width of Natural Vegetation (m) LB: RB:	l Buffer		Instream	n Cover 1						7			% Instream Cover	

Part I - Stream Physical Characteristics Worksheet

Observers: Date: \_\_\_\_ Time: \_\_\_ Weather conditions:

Glide Pool

Algae or Macrophytes (Circle One) Abundant Common Rare Absent

Location of site: \_\_\_\_\_ Length of stream reach: \_\_\_\_\_ Stream:

Stream Segment No.: Observed Stream Uses: Aesthetics (circle one): (1) wilderness (2) natural (3) common (4) offensive

Stream Type (Circle One): perennial or intermittent w/ perennial pools Stream Bends: No. Well Defined\_; No. Moderately Defined\_; No. Poorly Defined\_

Channel Obstructions/Modifications:\_\_\_\_\_\_ No. of Riffles:\_\_ Channel Flow Status (circle one): high moderate low no flow

Riparian Vegetation (%): Left Bank: Trees\_ Shrubs\_ Grasses, Forbs\_ Cult. Fields\_ Other\_ Right Bank: Trees\_ Shrubs\_ Grasses, Forbs\_ Cult. Fields\_ Other\_

Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	т	halweg Depth:		m Depths	; (m) at P	oints Ac	ross Trai	nsect		Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)
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	Algae or Ma (Circle One) Abundant ( Rare Absen	Common	Width of Natura Vegetation (m) LB: RB:	l Buffer	Instre	am Cove	r Types:			v		¥)		% Instream Cover	
Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	г	halweg Depth:		m Depth	s (m) at P	Points Ac	cross Tra	nsect		Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)
	Habitat Type One) Riffle	e (Circle	Dominant Subst	rate Type		Don	uinant Ty Bank:	pes Ripar	ian Veg	etation:			N	% Gravel or Larg	ger

	Right Bank:	
Width of Natural Buffer Vegetation (m) LB: RB:	Instream Cover Types:	

% Instream Cover

	Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	г	Thalweg	Depth:	Stream	Depths (	m) at Po	ints Acr	oss Tran	sect			Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)
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	Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)		Thalwe	g Depth:	Strean	n Depths	(m) at Po	oints Ac	ross Trat	isect			Right Bank Slope (°)	Right Bauk Erosion Potential (%)	Tree Canopy (%)
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		Algae or Mac (Circle One) Abundant C Rare Absent	ommon	Width of Natural Vegetation (m) LB: RB:	l Buffer		Instream	n Cover 7	Гуреs:					7			% Instream Cover	
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Part I - Stream Physical Characteristics Worksheet

Observers: Date: \_\_\_\_ Time: \_\_\_ Weather conditions:

Glide Pool

Algae or Macrophytes (Circle One) Abundant Common Rare Absent

Location of site: \_\_\_\_\_ Length of stream reach: \_\_\_\_\_ Stream:

Stream Segment No.: Observed Stream Uses: Aesthetics (circle one): (1) wilderness (2) natural (3) common (4) offensive

Stream Type (Circle One): perennial or intermittent w/ perennial pools Stream Bends: No. Well Defined\_; No. Moderately Defined\_; No. Poorly Defined\_

Channel Obstructions/Modifications:\_\_\_\_\_\_ No. of Riffles:\_\_ Channel Flow Status (circle one): high moderate low no flow

Riparian Vegetation (%): Left Bank: Trees\_ Shrubs\_ Grasses, Forbs\_ Cult. Fields\_ Other\_ Right Bank: Trees\_ Shrubs\_ Grasses, Forbs\_ Cult. Fields\_ Other\_

Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	т	halweg Depth:		m Depths	; (m) at P	oints Ac	ross Trai	nsect		Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)
	Habitat Type One) Riffle Glide Pool	e (Circle Run	Dominant Subst	rate Type			iinant Tyj Bank: it Bank:	pes Ripar	ian Vege	etation:				% Gravel or Larg	er
	Algae or Ma (Circle One) Abundant ( Rare Absen	Common	Width of Natura Vegetation (m) LB: RB:	l Buffer	Instre	am Cove	r Types:			v		¥)		% Instream Cover	
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	Habitat Type One) Riffle	e (Circle	Dominant Subst	rate Type		Don	uinant Ty Bank:	pes Ripar	ian Veg	etation:			N	% Gravel or Larg	ger

	Right Bank:	
Width of Natural Buffer Vegetation (m) LB: RB:	Instream Cover Types:	

% Instream Cover

	Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	г	Thalweg	Depth:	Stream	Depths (	m) at Po	ints Acr	oss Tran	sect			Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)
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		Algae or Mac (Circle One) Abundant C Rare Absen	ommon	Width of Natura Vegetation (m) LB: RB:	l Buffer		Instream	n Cover 1	Types:								% Instream Cover	
	Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)		Thalwe	g Depth:	Strean	n Depths	(m) at Po	oints Ac	ross Trat	isect			Right Bank Slope (°)	Right Bauk Erosion Potential (%)	Tree Canopy (%)
		Habitat Type One) Riffle I Glide Pool	(Circle Run	Dominant Subst	rate Type			Domin Left Ba Right I	ant Type: ank: Bank:	s Riparia	n Veget	ation:				<u> </u>	% Gravel or Large	n.
		Algae or Mac (Circle One) Abundant C Rare Absent	crophytes onimon	Width of Natural Vegetation (m) LB: RB:	l Buffer		Instream	n Cover 1									% Instream Cover	-
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9	and the second second	Habitat Type One) Riffle I Glide Pool	(Circle Run	Dominant Substr	rate Type			Domin Left Ba Right H	ant Type: ink: Bank:	s Riparia	n Veget	ation:					% Gravel or Large	r
		Algae or Mac (Circle One) Abundant C Rare Absent	ommon	Width of Natural Vegetation (m) LB: RB:	l Buffer		Instream	n Cover 7	Гуреs:					7			% Instream Cover	
	Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)		Thalwe	g Depth:	Stream	n Depths	(m) at Po	oints Ac	ross Trar	isect			Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)
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		Algae or Mac (Circle One) Abundant C Rare Absent	ommon	Width of Natural Vegetation (m) LB: RB:	l Buffer		Instream	n Cover 1						7			% Instream Cover	

Part I - Stream Physical Characteristics Worksheet

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> Observers N. U.P. Dme: 4/1/Plme: 4 Weather conditions: 5 Stream CAA

Location of site; 1= 60 % Length of stream reach; 175

Sitenin Segment No.:\_ Observed Spream Uses: 7 ... Aesthetics (circle one): (1) wilderness (2) matural (3) common (4) offensive

Strenuh Type (Circle One): perenutation intermittent w/ poreinnial pools Stream Bends: No. Well Defined, i No. Moderniely DefinedL: No. Poorly Defined\_

Chamtel Obstructions/Modifications: 754 No. of Riffles: 4 Channel Flow Status (circle one): high Godeante low no flow

Riparlan Vegenation (%): Left Bluck: Trees Shruba // Ginsses, Forbs ( Cult. Fields\_Other l Pieht Bank: Trees Shrubs J Ginsses, Forbs 2004, Fields\_Other jo

1 nonline of							
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laun	Habitat Tupe (Circle Osc) Ruffle Tool Glide Tool	Ran	Dominant Substants Type	mis Type	15 - X Other	% Gravel or Larger	
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	Abundant Conserved	dimmon	199		set words,	% Instream Cover	
	L VII CAUSE		260 14		prever bouldes cobble manaphytes,	80%	
Location of Transect	Strenm Widzh (m)	Lief Bonk Sigpe	Bank Erosion Potential		Stream Depths (m) at Points Across Transfect Right	Bank Erosion	Tree Cancepy
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Same (	Habita Type (Circle One) Buth Run Glide Pool	Rub	Dominant Subatrion Type ジルビ T	ata Type	6, 70 Firl, 18 Mer	% Gmvel or Larger	
	Algae or Mac	trophytes	Width of Natural		National Talanta Land	1	
	(Cincle Que) Abundan(Cenumon Rare Absend	aomon.	Veptimien (=) LB: RB: > 2.0		conver.	5 Instramm Cover	
	and the sum of the local division of the		South Station	and	2 2001 Provel of burlde	0/01	ia.

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la	Algue or Mocrophyses (Cecte Cong. Alcore Cong.	crophyses benenses	Witht of Newal Buffer Vegetation of two Lines alls	obble, Son	15 Intram Corec	
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459	Algas er Mocrophytts Aleista Oro Aleista Oro Aleista Caraoan	crephytes Jonneon	With of Natural Buffer Venezation (red	mucan aver 17 por of the way and	S James Cover	
Location of Transcot	Recent Widds (m)	Single C.	Ratk Election Presented (%) That	Statem Daytha (pc) at Points Auriner Tranecci Back Back Slope Chalmer Daythe	Presch Englisht Programmer (*3)	Compt
	Heblint Type (Clecks One5 Runde Runs Office Poel	e (Circle Rum	Darolineat Solieitaite Tyyle	Developent Types Répendant Vegetations Left Banks Répts Banks	5 Chevrol or Largest	
	Algas et Macophytes (Click Osc) Abundant Cammun Rare Absent	Screphytes Common	Wight of Neoral Buffer Vegetation trut LH: 2.0.	Interested Clever Typex:	S. Insingen Coros	

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Table B-12. Part 1. Stream Physical Characteristics Worksheet

Part I - Stream Physical Characteristics Worksheet

Ruma -

Location of site: 125% Length of stream reach 200 Observerant W Date 2/14 Himas Weather conditions: Clerchy Stream: CAA

Stream Segment No.\_\_ Observed Stream User: Golf Anothetics (circle ane); (1) wildernass (2) natural (3) common (4) offensive

Stream Type (Circle One): perennial, erfusterusittent w/ perennial pools Stream Bends: No. Well Defined, : No. Modernely Defined, : No. Poorly Defined.

Chunnel Obstructions/Modifications. P.n. No. of Riffless 2. Catanel Flow Status (circle one): highdinodenale low no flow

Ripatian Vegetation (%): Left Bank: Trees@ Shrubs (Grasses, Forbér) Oult, Fields Other Piehr Rank: Trees@Shrubs Grasses, Forbil/POult, Fields Other Piehr Rank: TreesteShrubs Grasses, Forbil/POult, Fields

There were intra Terrar wereast full lice Tests with under	CROWNER-TE	UL "YORKINGO" LA	TRANS WIND TRANS	diamo "e			
Location of Transect	Stream Width (m)	Left Barik Slope (*)	Left Bank Erceion Potential (%)	L Tholweg Depth:	Surrent Depths (mbgt Polints Across Transect Brief) Briefly	Right Bank Erosion Potential (55)	Canopy (%)
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DI Hand	Habitat Type (Clecke Ose) Righte Run Glide (	e (Clecke Run	Dominant Substante Type 51//4	tute Type	Deminent Types Ziggsten Vegeneisen, Sella Sie 65, 15 64 Milen	6 Garrel or Larger	
the list	Algas er Matrophyses (Circla One) Alayndent Cenumon Eart Masent	serophyses Centrica	Width of Naturel Buffer Vegetation (m) LB: $833$ , $\gamma 2 D$		minum Cover Types: Grand, coldic, snapl, algel, on handlessed . a l	A Instream Cover 15 %	
Leention of Transet	Stream Widah (m)	Left Brink Sigge	Left Bank Brodon Pointin	Thatwee Dends	Stream Depths (m) at Points Across Transect 210 Bo	Bank Eresion Potential (%)	Canopy (%)
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pada	Algae or Macrophytes (Circle One) Alangdant Cennoon	Acrophytes Lemmon	Width of Natural Buffer Vegetation (m)		resseren Cover Types dutif wiel, or hage very .	5 Insuream Cover	

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Algae or Macrophytes (Circle Ona) Abugdent Centroon (Barred Intent

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Rev DC.	Cheba m,	Deminant Solvanate Type	Devicent Types Rightien Vegencion Left Barks: 75 Rese - 20 Arch - 25 Thur Right Barks: 30 Tree - 30 9 4466 - 10 8968 - 30 6744	S. Cavel or Lorger	
	safety and	Withh of Navard Buller Vygensine (må Lätt R.B. Z	in the	5 Innerna Const	
Lacetter of Strents Transret Width	Left Stope	Basik Franton Peterdod	Birght Bankes Decks 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Right Reak Freedom Potencial	Catelys Catelys
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Active of Advances		Withth of Neural Buffer Vegenation free LB: 5- RB: 5-	monon cover your growel, cabble, boulder, algal,	5. Internan Cover	
Location of Scretco Transect Width	Sheet C.	Left Rout Floation Protected That	Stream Depths (m) at Welnis Acress Transact Right Stream Depths (m) at Welnis Acress Transact Stream Cashera Depth	Bard Expelor Proceeded (45)	Concept Concept (%)
	Π	L			
Habber Tyre (Chick Chief Rithe Rum CHief Pool	Circle	Dondowst Substante Type	Denotemen Types Rigesten Vegetation: Left Benk: Right Benk:	\$ Carel & Lega	
Algae et hisrophyses (Clicic Ose) Abundated Common Rare Algebii	ophytes mumali	Width of Natural Buffler Vegetations (re) L.B.; R.B.	Autonom Cover Types	S Insteam Cover	

Ruy Rifte 1111 Fool ATT

Table B-12, Part 1. Stream Physical Characteristics Worksheet

E. I.

Part I - Stream Physical Characteristics Worksheet Observers: JU 241 Date: Time: Weather conditions: 5

mood Bench

Glide

Strenm: CurphUer Location of site: 10004 Length of stream teach. 150

Stream Segment No.:\_ Observed Stream Uses: Pee\_ Assthetics (circle one): (1) wilderness (2) matural(3) common/(4) offensive

Stream Type (Chrcle One): pereutifiel or intermittent w/ pereunial pools Stream Bends: No. Well Defined, i No. Moderately Defined\_; No. Poorly Defined\_

Channel Obstructions/Modifications: 2400 No. of Rifflest. Channel Flow Status (circle one): high wodefatiglow no flow

Ripatian Vegenation (%): Left Bank, Press, Shruby, Grasses, Poths, Cult. Fields, Other

NUZIIC DUINE: LIN	"Wonute "sa	Classes, Fo	MUZHE ZRINEL ITTERS_ SATURDS_ GRUSSES; FOUSS_ CHIE, FIELDS_ Office_	s_ 00%	J									and the second diversion of th			-
Lecotion of Transect	Stream Width Int)	Left Bank Slops ()	Bank Ercelon Potential (36)		Theles	Theireg Depth:		Depths (	nt) at Points A 0, 05	the Across	Stream Depths (m) at Points Across Transect			Right Back Sigpe	Right Bank Evesion Potential	tu	Crospy (%)
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@ dam	Hebiter Tope (Circle One) Rithy Run Glide Peel	e (Circle Run	Dominant Substants Type of for vie f	ands Type			Demis Left Br	and Type	Riparina 20.47a 5.47ve	Vegeeod	o year	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Deminent Types Riparian Vegetation: Left Barle Vg.O. 7:0-4:4:4: 5:0-2:4:4:4:4:4:4:4:4:4:4:4:4:4:4:4:4:4:4:4	Dominant Types Riparian Vegetation: Left Banke "90 %0-47a.4" "50 77655" 40 of the of a Right Banks (20 %47a.4. 20% & chow th. 25 March. 1, 14, al-14	R Oravel or Larger	Lauper	
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Location of Transeet	Stream	Left Beek	Dank Ereston				Stream	Depths (	n) at Pela	da Acros	Stream Depths (m) at Points Across Transect			Right	d Bank Bresica		Tres Cenopy

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Transee	Stream Width Cm0	Left Back Slore (*)	Left Promini (%)	Thaiweg Deptils		ream Depth	Stream Depths (m) at Points Acreas Transect 54	14 Across	Transect			Right Bank Stopa	Right Bank Bresion Postatial (%)	Canopy (%)
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	Algree or Mac Couche Qon) Abundarot C Rarre Absent	ctophyses antrean	Vighth of Nateral Vegetation (m) LD: RB:	Buffler 2.0	Insteam Core	physics	Sh.	10	Andesta	+ bu	. K. e	cave 1	% Instream Cove	

Transact	VPLANA VPLANA (ml)	Stored Stored	Left Boek Experior Potential (%)	The	Thalweg Depth:	Streen D	Birren Duptie (rol at Feina Acress Transoci $\mathcal{O}_{-1}/\frac{1}{2}$	Peina Acress	es Tronsoot				Right Renk Erreich Vetenich (55)	Cauepy (%)
	8.3	00	40	-	91 0	2.1	2 2	1 25	21 3	9 30		-	75	2/17
	Hadding Type (Circle Good Burney Done Circle Cool)	(Circle Rome	Durinant Salatania Typa bechoule	e Type.		Dentionel Ty Left Beets '	Dir. Tr	Her S	flott - SA No. S. Ch	153	Prings 10	10.04	& Chavel or Largor	10 L
	Ages of Macoophyses About One Day Abundan Damman Rare/Ulisted	conplutees burrens	Widh of Notorial R Vegetation that USI-24.59: 1.0	Buffler	10	C 1991, My	per crophyles	hister.	Steves	e, bucketer	der		15 Instream Owyr 7 O	
Los reijon ef Traunest	Streen Width Inst	Laft Brenk Slepe (-)	Laft Facility Facessol	4	Theberg Depth	Sheen I	Stream Deputs on a Point Acress Transet	Points Acr	o.25			Right Soppa	Right Bank Eresian Petential	Cheepy Cheepy (ch)
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	Algar of Morrephytts (Cleck Cost) Absequat Cansman (Bart/Mosted	crephytes Innerron	Width of Named Buffer Veptonion for LBI-725 RB- 1 20	huffer	Junean Co	2		the crophyl	d. algae	in lead pack		pere	\$ Introne Cover	
Lacellon ef Transou	States Niddh Imi	Left Brock Shops	Left Bank Entelon Poterolal (%)	Ê	Thelweg Depth		Steem Depth that in Police Access Transact 2.6	Peles Acres	the trees			AND COLOR	Rank Figelon Potential (%)	Canady
	25	02	90°60	4 10	2 20	2.5	41 14	113 CH	- 20	26 56	0	65	~05	2.5/17
	Halding Type (Clicks Deco Name Type (Clicks Click Foot	Bun Bun	Deminant Substante Type	u Typo L		Dordoor Left files	Dominant Pyrea Illippitan Vegetalian Lan Baski vig */ 37 te.A., 446 %, Bight Baski 1%, 1700, 37 %,	True 9	rendom Ligety, o m 9 5 22 de	or main indicate week 10%, allo	SI Gross		\$ dimet or Lings	
	Algar er Mincrophytea Scients Onth- Ahmmhorth Ommuna Rever Alfiffuit	congligates Sentrata	Verticities f Manual 1 Verticities from trail LEF 250 ()	buller	termine (	town Cover Types		مالوجه ماه	an eres plinte	He, snorg	5		6. Increase Contr	
Leestion of Thinkey	Steen Width feel	Steps Steps	Left Back Broolen Petersisk 75)	Ē	Thebygg Drpf	Steam	Seeam Depths (m) at Points Acress Traiseon	Polnus Act	out These			Right Back Elope	Right Rock Ereston Potential	Construction (Children (Ch
×	Nethine Type (Circle One) Nutlify Num	A Costs	Dominent Solomone Type	a Tipe		Duning Left For	Dateloant Typet Rijerina Vegnoriae Left Brais:	rdan Vegel	1				& Gorel or Lega	
	Alpee of Marraphyses (Citate Ord),	south year	Width of Natural Bofflor Vepetration (10)	Defiler	Intre	Right Resid	net.						G. Instronto Cores	

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Glide 7

Part I - Stream Physical Characteristics Worksheet 255416 Part I - Str Observerr 24, R.A. Done 2 Time: Weinher conditions: 5 Stream: Low High Location of site 144, 173 Length of stream reach. 180 3h5c) 2

Stream Segment No.:\_\_ Observed Stream User: Leik Aesthetics (circle one): (1) wilderness (2) matural (3) common(4) offensive

Stream Type (Circle One): gertunnial or intermittent w/ parennial peels Stream Bends: No. Well Defined, : No. Moderarity Defined\_: No. Foarly Defined\_

Channel Obstructions/Modifrentionst. No. of Rifflest. Channel Flow Status (circle one): high underlye tore up flow

Riptelan Vagetation (%): Left Bank: Trees\_ Shrubs\_ Grasses, Forbs, Cuilt, Fields, Other,

COUNTRY POINT LICES DIVIDE CITERS, FOTOL, CHILDER, URDER, CIRCLE	""entrain ""es	OUNSERS, LO	01.08" C4110, F1010	a Ultre	J												
Lectation of Transact	Stream Width [col]	Left Bank Slope (1)	Laft Baok Eresion Potential (%)		Thelws	Thelwag Depth:	Stream De	(m) stor	Stream Depths (m) M,Polinis Across Transect	COSS Trans	lect		Right Bank Siops	1	Right Potential 7045-014	Tree Cancepy (%)	
	6.9	170	95%	.9	49	515	60 50	-	2 40	49 53	A	1 01	5	1	95%	F1M	
	Mibilm Type (Chele One) Rufferen Glide Feat	Puis Uniteda	Dominant Substants Type	Type -	t		Deminant Types RI Left Baako 355	TYRE R	Dontinent Types Riperies Vegetation: Left Bank: 555 (5:15), 25 (6:15) Right Bank: 12/5, 4/16, 5/15, 6/16	Muthan 25 /a hyee SV 26 /6 /6		20% d1.ev		R	We dravel of Larger		1
	Algae et Mozrophyces (Ouele One) (Albundsull, Centanon Rare Albient	drophytes Centeries	Width of Natural Buffer Vegatalism (m) U.B. 720 ABI	A Buffler	0	linition a lega	adream Corrections collecte boulders, condepart bank	11 -110	ble, bo	ulete Whang	and y	detrut	bente	\$	% Instrem Cover		
Location of TinAset	Surrain Width (mu	Left Brick Sigge	Left Beack Eroston Prosected (%)		Thelweg Denth	Depth	Sutam De	pths (m)	Surtau Depths (m) at Peints Across Transect 0.12-	FDOS THAN	tia.			-	B stok Election Potential	Canopy (%)	-
	9.9	5	20	4	0	5	19	6	0 2 1	51	11	1 2	12		30	14.5	-
	Mabine Type (Circle One) Riffle Run Cilde Feal	Run)	Dominnes Sebatrate Type Grave 1	rate Type			Dominant Typ Laft Back: //	Types R	Dominant Types Riparian Vegetations Left Banks / D.S Free "Of square, 205, of the y Right Bank, 10% free 15% or and 205, of 1	etation:	Green D	2520 C	ner other	ŝ	% Gravel of Larger		· · · · ·
	Algee or Macrophyter (Carde Oac) Soundang/Centrion Rare Autient	scrophyles Countion	Width of Natural Boffer Vegetation (m) LB: RB: 72.0	d Better		limiters optimet C.O.	Intern Const Type optime 1, 8 p. 0 Collific, 0	Tolor o loor	roats					¥.	16 Indream Cover 6 <		-

B=29

Location of Transcet	Stream Widdla Iml	Left Slope	Bank Exonion Potential 1533	÷	Thebara Denti-	Strengt Depth	Stream Depilat (m) at Points Across Transact	i Transoci		Slight BArk Slight	Right Policies	Creeopy (%)
	4.2	610	55%	14 3	2	21. 23	21 30	36 28	23 3	34	20	2/17
	Habilat Type (Circla One, Right Run Oline Teat	e (Circia Run	Deminant Substrate Type	rale Type.		Domisers Ty Left Rasic Right Bask:	Damisert Types Ripacka Vegganlors Left Rasio 570 1725 Color	PEO SUNC	19.00 ST	hu other	& Onvel or Larger 55%	
	Alges or Macrophytes Réficie Ques Missioner Commun Rore Abvend	compluter Common i	Widm of Najord Buffer Veparation (ud UB: O RB: 2	. Buffer	htste G/N	hreenn Cover Types: Gravely algae,	week.	aut bur	e sharps		Staticum Cover	
Locraion of Transact	Sharm Widdh (red)	Laft Bank Sloye	Hank Erecton Poccalial (%)		that we beaut		Sittetin Dopilis (jui) at Polinis Across Transcos	1 Transce	-	Right Runk Slope	Right Bank, Ereston Propriot	Tire Croopy (%)
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	Algas et Mastophyca (Cissis Dao) - Abrud Sud-Celumon Physics (Simus	stophyca camen	Whith of Network Defice Ventralien (no) LB	Befflor	fisher Q. (	latina Const Types: O log a const	el bould	an rout			the heat cover CSC	
Lecation of Transce	Second Widels (H)	Left Brock Slope (1)	Left Barik Erosion Peterdick (%)	F	Thelves Depth:		Stream Deptire (no) 11 Yolinis Across Transet	17 Tanuari 10.05		Right Rock Slope	Brank Findlan Potential	Catopy Catopy (5)
	2.4	.2	0	-	15 5	5 5	4 4	8 8	1 2	. 50	30	4/52
ж 5	Holder Processing Over Rinde Roll	e rCirele Run	Darlined Substrate Type	ate Type		Dominent Ty Loft Bark: Rigis Bark:	Developed Types Riperford Vegetation: 15 % 01% Left Bark: 5 % 476.8 15 % 5 h10.6 % 6 Right Bark: 5 % 476.6 10%, 64.05, 9 % 67%	Star Sh	e other b. 66 hours.	13	Se chinel ar Linger	3
	Algas et Marrophytes (Corte One) Aberntenti Cemman flarp Alisent	drophytes emman	Withh of Natural Buffer Vertailen (M) LB:	1 Buffer	Interested	Cover Type No 0 11,	2	940			% Interest Cover 80	
Lection of Thansen	Steerin Wijdth (m)	Left flenk Slene	Left Rock Frondon Potensial (%)	1.4	Daherg Depth	Street Dept	Summa Deputin (m) at Points Acress Transcot	a Thereot		Right Blick Slaps	Right Rack Evenion Postention	Thes Campy (%)
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	Hebber Type (Circle One) Ruitle Runs Gilde Pool	e (Circlo Russ	Doninaut Substate Type	tate Type		Dumformt Ty Left Book: Right Book:	Dominant Types Rigerian Vegendian: Left Bank: Rieja Bank:	Dist.			5 Onwel et Largu	R.
	Algae er Miscusphyres (Circle One) Abundgar Comman	Keephyses Jomman	With of Nation Buffer Vegetation (m) LB: Rm:	i Buffer	lane	Internal Cover Types:					G Iransam Cover	

# HABITAT ASSESSMENT

Part II – Summary of Physical Characteristics of Water Body



Stream name	Camp Meeting 10006
Date of assessment	9/3/2002
Stream bed slope over evaluated reach	0.0055
Approximate drainage area above transect furthest downstream	12km <sup>2</sup>
Stream order	3
Length of stream evaluated	165m
Number of lateral transects made	5
Average stream width	5.3m
Average stream depth	0.22m
Instantaneous flow	1.56 ft <sup>3</sup> /sec
Indicate flow measurement method	Current Meter
Channel flow status	Moderate
Maximum pool width	10m
Maximum pool depth	>1m
Total number of stream bends	1
Number of well defined bends Number of moderately defined bends Number of poorly defined bends	0 1 0
Total number of riffles	5
Dominant substrate type	Boulder
Average percent of substrate gravel sized or larger	57%
Average percent instream cover	65%
Number of stream cover types	8
Average percent stream bank erosion potential	48%
Average stream bank slope	54°
Average width of vegetative buffer	14m
Average riparian vegetation percent composition by: Trees Shrubs Grasses/Forbes Cultivated Fields Other	18.5% 9.5% 43.5% 
Average percent tree canopy coverage	42.0%
Overall aesthetic appraisal of stream	Common

Stream name	Camp Meeting 12546
Date of assessment	9/4/2002
Stream bed slope over evaluated reach	0.0052
Approximate drainage area above transect furthest downstream	26km²
Stream order	3
Length of stream evaluated	175m
Number of lateral transects made	5
Average stream width	4.85m
Average stream depth	0.37m
Instantaneous flow	0.79 ft <sup>3</sup> /sec
Indicate flow measurement method	Current Meter
Channel flow status	Moderate
Maximum pool width	7m
Maximum pool depth	0.5 - 1m
Total number of stream bends	1
Number of well defined bends Number of moderately defined bends Number of poorly defined bends	0 0 1
Total number of riffles	4
Dominant substrate type	Gravel
Average percent of substrate gravel sized or larger	85%
Average percent instream cover	57%
Number of stream cover types	6
Average percent stream bank erosion potential	47.50%
Average stream bank slope	47°
Average width of vegetative buffer	8.2m
Average riparian vegetation percent composition by: Trees Shrubs Grasses/Forbes Cultivated Fields Other	14.50% 10% 25.50% 50%
Average percent tree canopy coverage	69%
Overall aesthetic appraisal of stream	Common

Stream name	Camp Meeting2 10006
Date of assessment	10/3/2002
Stream bed slope over evaluated reach	0.0055
Approximate drainage area above transect furthest downstream	12km²
Stream order	3
Length of stream evaluated	180m
Number of lateral transects made	5
Average stream width	4.6m
Average stream depth	0.23m
Instantaneous flow	0.63 ft <sup>3</sup> /sec
Indicate flow measurement method	Current Meter
Channel flow status	Moderate
Maximum pool width	10m
Maximum pool depth	>1m
Total number of stream bends	1
Number of well defined bends Number of moderately defined bends	0
Number of poorly defined bends	0
Total number of riffles	5
Dominant substrate type	Boulder
Average percent of substrate gravel sized or larger	41%
Average percent instream cover	51%
Number of stream cover types	6
Average percent stream bank erosion potential	48%
Average stream bank slope	54°
Average width of vegetative buffer	8m
Average riparian vegetation percent composition by: Trees	15%
Shrubs Crasses/Earbox	10%
Grasses/Forbes Cultivated Fields	45%
Other	30%
Average percent tree canopy coverage	59%
Overall aesthetic appraisal of stream	Common

Stream name	Camp Meeting2 12546
Date of assessment	10/3/2002
Stream bed slope over evaluated reach	0.0052
Approximate drainage area above transect furthest downstream	26km²
Stream order	3
Length of stream evaluated	180m
Number of lateral transects made	5
Average stream width	5.1m
Average stream depth	0.35m
Instantaneous flow	0.4 ft <sup>3</sup> /sec
Indicate flow measurement method	Current Meter
Channel flow status	Moderate
Maximum pool width	6m
Maximum pool depth	0.5 - 1m
Total number of stream bends	1
Number of well defined bends	0
Number of moderately defined bends Number of poorly defined bends	0 1
Total number of riffles	4
Dominant substrate type	Gravel
Average percent of substrate gravel sized or larger	72%
Average percent instream cover	62%
Number of stream cover types	8
Average percent stream bank erosion potential	55%
Average stream bank slope	50°
Average width of vegetative buffer	6m
Average riparian vegetation percent composition by:	
Trees Shrubs	<u> </u>
Grasses/Forbes	24%
Cultivated Fields	
Other	50%
Average percent tree canopy coverage	62%
Overall aesthetic appraisal of stream	Common

Stream name	Camp Meeting 17896
Date of assessment	6/11/2003
Stream bed slope over evaluated reach	0.0055
Approximate drainage area above transect furthest downstream	12km²
Stream order	3
Length of stream evaluated	165m
Number of lateral transects made	5
Average stream width	5.2m
Average stream depth	0.20m
Instantaneous flow	
Indicate flow measurement method	Current Meter
Channel flow status	Moderate
Maximum pool width	10m
Maximum pool depth	0.5m - 1m
Total number of stream bends	1
Number of well defined bends Number of moderately defined bends Number of poorly defined bends	0 1 0
Total number of riffles	4
Dominant substrate type	Cobble
Average percent of substrate gravel sized or larger	64%
Average percent instream cover	64%
Number of stream cover types	7
Average percent stream bank erosion potential	69%
Average stream bank slope	43°
Average width of vegetative buffer	15 - 20m
Average riparian vegetation percent composition by: Trees Shrubs Grasses/Forbes Cultivated Fields Other	15.0% 7.0% 63.0% 15.0%
Average percent tree canopy coverage	42.0%
Overall aesthetic appraisal of stream	Natural

Stream name	Camp Meeting 12546
Date of assessment	6/11/2003
Stream bed slope over evaluated reach	0.0052
Approximate drainage area above transect furthest downstream	26km²
Stream order	3
Length of stream evaluated	175m
Number of lateral transects made	5
Average stream width	4.73m
Average stream depth	0.33m
Instantaneous flow	
Indicate flow measurement method	Current Meter
Channel flow status	Moderate
Maximum pool width	7m
Maximum pool depth	0.5 - 1m
Total number of stream bends	1
Number of well defined bends Number of moderately defined bends Number of poorly defined bends	0 0 1
Total number of riffles	2
Dominant substrate type	Gravel
Average percent of substrate gravel sized or larger	58%
Average percent instream cover	32%
Number of stream cover types	8
Average percent stream bank erosion potential	47.00%
Average stream bank slope	62°
Average width of vegetative buffer	5-15m
Average riparian vegetation percent composition by: Trees Shrubs Grasses/Forbes Cultivated Fields	15.00% 10% 39.00%
Other	36%
Average percent tree canopy coverage	68%
Overall aesthetic appraisal of stream	Common

Stream name	Camp Meeting2 17896
Date of assessment	8/7/2003
Stream bed slope over evaluated reach	0.0055
Approximate drainage area above transect furthest downstream	12km²
Stream order	3
Length of stream evaluated	180m
Number of lateral transects made	5
Average stream width	4.2m
Average stream depth	0.23m
Instantaneous flow	
Indicate flow measurement method	Current Meter
Channel flow status	Moderate
Maximum pool width	10m
Maximum pool depth	>1m
Total number of stream bends	2
Number of well defined bends Number of moderately defined bends Number of poorly defined bends	0 2 0
Total number of riffles	4
Dominant substrate type	Boulder
Average percent of substrate gravel sized or larger	70%
Average percent instream cover	63%
Number of stream cover types	7
Average percent stream bank erosion potential	81%
Average stream bank slope	53°
Average width of vegetative buffer	20m
Average riparian vegetation percent composition by: Trees	19%
Shrubs Grasses/Forbes	13% 51%
Cultivated Fields	
Other	17%
Average percent tree canopy coverage	44%
Overall aesthetic appraisal of stream	Common

Stream name	Camp Meeting2 12546
Date of assessment	8/7/2003
Stream bed slope over evaluated reach	0.0052
Approximate drainage area above transect furthest downstream	26km²
Stream order	3
Length of stream evaluated	180m
Number of lateral transects made	5
Average stream width	4.5m
Average stream depth	0.11m
Instantaneous flow	
Indicate flow measurement method	Current Meter
Channel flow status	Moderate
Maximum pool width	7m
Maximum pool depth	0.5 - 1m
Total number of stream bends	1
Number of well defined bends Number of moderately defined bends Number of poorly defined bends	0 0 1
Total number of riffles	3
Dominant substrate type	Gravel
Average percent of substrate gravel sized or larger	54%
Average percent instream cover	70%
Number of stream cover types	8
Average percent stream bank erosion potential	54%
Average stream bank slope	63°
Average width of vegetative buffer	15m
Average riparian vegetation percent composition by:	
Trees Shrubs	<u>11%</u> 5%
Grasses/Forbes	32%
Cultivated Fields	
Other	52%
Average percent tree canopy coverage	69%
Overall aesthetic appraisal of stream	Common

# HABITAT ASSESSMENT



Habitat Parameter	Scoring Category		Location: 10006	Date: 9/3/02
Available Instream Cover	Abundant >50% of substrate favorable for colonization and fish cover; good mix of several stable (not new fall or transient) cover types such as snags, cobble, undercut banks, macrophytes	habitat for maintenance of populations; may be limited in the number of different habitat types	supports stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed	Absent <10% of substrate supports stable habitat; lack of habitat is obvious; substrate unstable or lacking
Score: 4	4	3	2	1
Bottom Substrate Stability	Stable >50% gravel or larger substrate, i.e., gravel, cobble, boulders; dominant substrate type is gravel or larger	Moderately Stable 30-50% gravel or larger substrate; dominant substrate type is mix of gravel with some finer sediments	substrate type is finer than gravel, but may still be in mix of sizes	
Score: 4	4	3	2	1
Number of Riffles To be counted, riffles must extend >50% the width of the channel and be at least as long as the channel width	Abundant ≥5 riffles	Common 2-4 riffles	Rare 1 riffle	Absent No riffles
Score: 4	4	3	2	1
Dimensions of Largest Pool	Large Pool covers more than 50% of the channel width; maximum depth is > 1m	50% or slightly less than the channel width; maximum depth is 0.5-1 meter	Small Pool covers approximately 25% of the channel width; maximum depth is <0.5 meter	Absent No existing pools; only shallow auxillary pockets
Score: 3	3	2	1	0
Channel Flow Status	High Water reaches the base of both the lower banks; <5% of channel substrate is exposed	Moderate Water fills <75% of the channel; or <25% of channel substrate is exposed	Low Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed	<b>No Flow</b> Very little water in the channel and mostly present in standing pools; or stream is dry
Score: 2	3	2	1	0
Bank Stability	Stable Little evidence (<10%) of erosion bank failure; bank angles average <30°	Moderately Stable Some evidence (10-29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average 30-39.9°	Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60°	Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60°
Score: 1	3	2	1	0
Channel Sinuosity	High ≥2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) are present	Moderate 1 well-defined bend OR ≥3 moderately-defined bends present	Low <3 moderately-defined bends OR only poorly- defined bends present	None Straight channel; may be channelized
Score: 1	3	2	1	0
Riparian Buffer Vegetation	Extensive Width of natural buffer is >20 meters	Wide Width of natural buffer is 10.1- 20 meters	<b>Moderate</b> Width of natural buffer is 5- 10 meters	<b>Narrow</b> Width of natural buffer is <5 meters
Score: 2	3	2	1	0
Aesthetics of Reach	Wilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptional	Natural Area Tree and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity may be slightly turbid	developed, but uncluttered such as in an urban park;	Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbid or discolored
Score: 1	3	2	1	0
		-	•	-

Habitat Parameter	Scoring Category		Location: 12546	Date: 9/4/02
Available Instream Cover	Abundant	Common	Rare	Absent
	>50% of substrate favorable	30-50% of substrate supports		<10% of substrate supports
	for colonization and fish cover;	a stable habitat; adequate	supports stable habitat;	stable habitat; lack of
	good mix of several stable	habitat for maintenance of	habitat availability less than	habitat is obvious; substrate
	(not new fall or transient)	populations; may be limited in		unstable or lacking
	· ,			anotable of laoking
	cover types such as snags,	the number of different	frequently disturbed or	
	cobble, undercut banks,	habitat types	removed	
	macrophytes			
Score: 4	4	3	2	1
Bottom Substrate Stability	Stable	Moderately Stable	Moderately Unstable	Unstable
Dottom Cubbindie Clabinty		-	-	
	>50% gravel or larger	30-50% gravel or larger	10-29.9% gravel or larger	<10% gravel or larger
	substrate, i.e., gravel, cobble,	substrate; dominant substrate	substrate; dominant	substrate; substrate is
	boulders; dominant substrate	type is mix of gravel with	substrate type is finer than	uniform sand, silt, clay, or
	type is gravel or larger	some finer sediments	gravel, but may still be in mix	
	type to graver or larger		of sizes	bourook
Score: 4	4	3	<u>2</u>	1
Number of Riffles	Abundant	Common	Rare	Absent
To be counted, riffles must extend	≥5 riffles	2-4 riffles	1 riffle	No riffles
>50% the width of the channel and be			-	
at least as long as the channel width				
Score: 3	4	3	2	1
Dimensions of Largest Pool	Large	Moderate	Small	Absent
	Pool covers more than 50% of		Pool covers approximately	No existing pools; only
				01 / 2
	the channel width; maximum	50% or slightly less than the	25% of the channel width;	shallow auxillary pockets
	depth is > 1m	channel width; maximum	maximum depth is <0.5	
		depth is 0.5-1 meter	meter	
Score: 2	3	2	1	0
Channel Flow Status	High	Moderate	Low	No Flow
	Water reaches the base of	Water fills <75% of the	Water fills 25-75% of the	Very little water in the
	both the lower banks; <5% of	channel; or <25% of channel	available channel and/or	channel and mostly present
	channel substrate is exposed	substrate is exposed	riffle substrates are mostly	in standing pools; or stream
	charmer substrate is exposed	substitute is exposed	exposed	is dry
Score: 2	3	2	1	0
Bank Stability	Stable	Moderately Stable	Moderately Unstable	Unstable
Durine Otability		-		
	Little evidence (<10%) of	Some evidence (10-29.9%) of		Large and frequent
	erosion bank failure; bank	erosion or bank failure; small	failure is common (30-50%);	evidence (>50%) of erosion
	angles average <30°	areas of erosion mostly	high potential of erosion	or bank failure; raw areas
		healed over; bank angles	during flooding; bank angles	frequent along steep banks;
		average 30-39.9°	average 40-60°	bank angles average >60°
				bank angles average + 00
Score: 1	3	2	1	0
Channel Sinuosity	High	Moderate	Low	None
	≥2 well-defined bends with	1 well-defined bend OR ≥3	<3 moderately-defined	Straight channel; may be
		ماميمه والمعرفة والمراجع والمراجع	bends OR only poorly-	channelized
	deep outside areas (cut	moderately-defined bends		
	deep outside areas (cut	moderately-defined bends		
	banks) and shallow inside	present	defined bends present	
		-		
Score: 1	banks) and shallow inside	-		0
Score: 1 Riparian Buffer Vegetation	banks) and shallow inside areas (point bars) are present	present		0 Narrow
	banks) and shallow inside areas (point bars) are present <u>3</u> Extensive	present 2 Wide	defined bends present 1 Moderate	Narrow
	banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20	present 2 Wide Width of natural buffer is 10.1-	defined bends present 1 Moderate Width of natural buffer is 5-	<b>Narrow</b> Width of natural buffer is <5
Riparian Buffer Vegetation	banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters	present 2 Wide Width of natural buffer is 10.1- 20 meters	defined bends present 1 Moderate	Narrow Width of natural buffer is <5 meters
Riparian Buffer Vegetation Score: 1	banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters 3	present 2 Wide Width of natural buffer is 10.1- 20 meters 2	defined bends present 1 Moderate Width of natural buffer is 5- 10 meters 1	Narrow Width of natural buffer is <5 meters 0
Riparian Buffer Vegetation	banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters 3 Wilderness	present 2 Wide Width of natural buffer is 10.1- 20 meters 2 Natural Area	defined bends present	Narrow Width of natural buffer is <5 meters 0 Offensive
Riparian Buffer Vegetation Score: 1	banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters 3 Wilderness Outstanding natural beauty;	present 2 Wide Width of natural buffer is 10.1- 20 meters 2 Natural Area Tree and/or native vegetation	defined bends present	Narrow Width of natural buffer is <5 meters 0 Offensive Stream does not enhance
Riparian Buffer Vegetation Score: 1	banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters 3 Wilderness	present 2 Wide Width of natural buffer is 10.1- 20 meters 2 Natural Area	defined bends present	Narrow Width of natural buffer is <5 meters 0 Offensive
Riparian Buffer Vegetation Score: 1	banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters 3 Wilderness Outstanding natural beauty; usually wooded or unpastured	present 2 Wide Width of natural buffer is 10.1- 20 meters 2 Natural Area Tree and/or native vegetation common; some development	defined bends present	Narrow Width of natural buffer is <5 meters 0 Offensive Stream does not enhance the aesthetics of the area;
Riparian Buffer Vegetation Score: 1	banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters 3 Wilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually	present 2 Wide Width of natural buffer is 10.1- 20 meters 2 Natural Area Tree and/or native vegetation common; some development evident (from fields, pastures,	defined bends present	Narrow Width of natural buffer is <5 meters 0 Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed;
Riparian Buffer Vegetation Score: 1	banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters 3 Wilderness Outstanding natural beauty; usually wooded or unpastured	present 2 Wide Width of natural buffer is 10.1- 20 meters 2 Natural Area Tree and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity may	defined bends present	Narrow Width of natural buffer is <5 meters 0 Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area;
Riparian Buffer Vegetation Score: 1	banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters 3 Wilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually	present 2 Wide Width of natural buffer is 10.1- 20 meters 2 Natural Area Tree and/or native vegetation common; some development evident (from fields, pastures,	defined bends present	Narrow Width of natural buffer is <5 meters 0 Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbid
Riparian Buffer Vegetation Score: 1	banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters 3 Wilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually	present 2 Wide Width of natural buffer is 10.1- 20 meters 2 Natural Area Tree and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity may	defined bends present	Narrow Width of natural buffer is <5 meters 0 Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area;
Riparian Buffer Vegetation Score: 1 Aesthetics of Reach	banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters 3 Wilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptional	Present 2 Wide Width of natural buffer is 10.1- 20 meters 2 Natural Area Tree and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity may be slightly turbid	defined bends present	Narrow Width of natural buffer is <5 meters 0 Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbid or discolored
Riparian Buffer Vegetation Score: 1	banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters 3 Wilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually	present 2 Wide Width of natural buffer is 10.1- 20 meters 2 Natural Area Tree and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity may	defined bends present	Narrow Width of natural buffer is <5 meters 0 Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbid

Habitat Parameter	Scoring Category		Location: 10006	Date: 10/3/02
Available Instream Cover	Abundant	Common	Rare	Absent
Available Instream Cover				
	>50% of substrate favorable	30-50% of substrate supports	10-29.9% of substrate	<10% of substrate supports
	for colonization and fish cover;	a stable habitat; adequate	supports stable habitat;	stable habitat; lack of habitat
	good mix of several stable	habitat for maintenance of	habitat availability less than	is obvious; substrate unstable
	0		-	,
	(not new fall or transient)	populations; may be limited in	desirable; substrate frequently	orlacking
	cover types such as snags,	the number of different habitat	disturbed or removed	
	cobble, undercut banks,	types		
		()pee		
	macrophytes			
Score: 4	4	3	2	1
Bottom Substrate Stability	Stable	Moderately Stable	Moderately Unstable	Unstable
···· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·	>50% gravel or larger	30-50% gravel or larger	10-29.9% gravel or larger	<10% gravel or larger
				• •
	substrate, i.e., gravel, cobble,	substrate; dominant substrate	substrate; dominant substrate	substrate; substrate is uniform
	boulders; dominant substrate	type is mix of gravel with	type is finer than gravel, but	sand, silt, clay, or bedrock
	type is gravel or larger	some finer sediments	may still be in mix of sizes	-
	type to graver et talget			
Score: 3	4	3	2	1
Number of Riffles	Abundant	Common	Rare	Absent
To be counted, riffles must	≥5 riffles	2-4 riffles	1 riffle	No riffles
extend >50% the width of the				
channel and be at least as				
long as the channel width				
Score: 4	4	3	2	1
Dimensions of Largest Pool	-	Moderate	Small	Absent
Dimensions of Largest Pool	Large			
	Pool covers more than 50% of	Pool covers approximately	Pool covers approximately	No existing pools; only
	the channel width; maximum	50% or slightly less than the	25% of the channel width;	shallow auxillary pockets
	depth is > 1m	channel width: maximum	maximum depth is <0.5 meter	· · · · · · · · · · · · · · · · · · ·
		,		
Secret 2	2	depth is 0.5-1 meter	4	0
Score: 3	3	2	1	-
Channel Flow Status	High	Moderate	Low	No Flow
	Water reaches the base of	Water fills <75% of the	Water fills 25-75% of the	Very little water in the channel
	both the lower banks; <5% of	channel; or <25% of channel	available channel and/or riffle	and mostly present in
		,		
	channel substrate is exposed	substrate is exposed	substrates are mostly	standing pools; or stream is
			exposed	dry
Score: 2	3	2	1	0
Bank Stability	Stable	Moderately Stable	Moderately Unstable	Unstable
	Little evidence (<10%) of	Some evidence (10-29.9%) of	Evidence of erosion bank	Large and frequent evidence
	. ,	. ,		
	erosion bank failure; bank	erosion or bank failure; small	failure is common (30-50%);	(>50%) of erosion or bank
	angles average <30°	areas of erosion mostly	high potential of erosion	failure; raw areas frequent
		healed over; bank angles	during flooding; bank angles	along steep banks; bank
		average 30-39.9°	average 40-60°	angles average >60°
Score: 1	3	2	1	0
Channel Sinuosity	High	Moderate	Low	None
onamic on doory	≥2 well-defined bends with			
		1 well-defined bend OR ≥3	<3 moderately-defined bends	Straight channel; may be
	deep outside areas (cut	moderately-defined bends	OR only poorly-defined bends	channelized
	banks) and shallow inside	present	present	
	areas (point bars) are present			
	areas (point bars) are present			
Score: 1	3	2	1	0
Riparian Buffer Vegetation	Extensive	Wide	Moderate	Narrow
Ripanan Buller vegetation				
	Width of natural buffer is >20	Width of natural buffer is 10.1-	Width of natural buffer is 5-10	Width of natural buffer is <5
	meters	20 meters	meters	meters
Score: 1	3	2	1	0
Aesthetics of Reach	Wilderness	Natural Area	Common Setting	Offensive
	Outstanding natural beauty;	Tree and/or native vegetation	Not offensive; area is	Stream does not enhance the
	<b>u</b>		-	
	usually wooded or unpastured	common; some development	developed, but uncluttered	aesthetics of the area;
	area; water clarity is usually	evident (from fields, pastures,	such as in an urban park;	cluttered; highly developed;
	exceptional	dwellings); water clarity may	water clarity may be turbid or	may be a dumping area; wate
	shoop lion u			
		be slightly turbid	discolored	clarity is usually turbid or
				discolored
		-		
Score: 1 Total Score: 20	3 HIGH	2	1	0

Habitat Parameter	Scoring Category		Location: 12546	Date: 10/3/02
Available Instream Cover	Abundant >50% of substrate favorable for colonization and fish cover; good mix of several stable (not new fall or transient) cover types such as snags, cobble, undercut banks, macrophytes	a stable habitat; adequate habitat for maintenance of	Rare 10-29.9% of substrate supports stable habitat; habitat availability less than desirable; substrate frequently	Absent <10% of substrate supports stable habitat; lack of habitat is obvious; substrate unstable
Score: 4	4	3	2	1
Bottom Substrate Stability	Stable >50% gravel or larger substrate, i.e., gravel, cobble, boulders; dominant substrate type is gravel or larger	Moderately Stable 30-50% gravel or larger substrate; dominant substrate type is mix of gravel with some finer sediments	Moderately Unstable 10-29.9% gravel or larger substrate; dominant substrate type is finer than gravel, but may still be in mix of sizes	Unstable <10% gravel or larger substrate; substrate is uniform sand, silt, clay, or bedrock
Score: 4	4	3	2	1
Number of Riffles To be counted, riffles must extend >50% the width of the channel and be at least as long as the channel width	Abundant ≥5 riffles	Common 2-4 riffles	Rare 1 riffle	Absent No riffles
Score: 3	4	3	2	1
Dimensions of Largest Pool	Large Pool covers more than 50% of the channel width; maximum depth is > 1m	Moderate Pool covers approximately 50% or slightly less than the channel width; maximum depth is 0.5-1 meter	Small Pool covers approximately 25% of the channel width; maximum depth is <0.5 meter	Absent No existing pools; only shallow auxillary pockets
Score: 2	3	2	1	0
Channel Flow Status	High Water reaches the base of both the lower banks; <5% of channel substrate is exposed	Moderate Water fills <75% of the channel; or <25% of channel substrate is exposed	Low Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed	No Flow Very little water in the channel and mostly present in standing pools; or stream is dry
Score: 2	3	2	1	0
Bank Stability	Stable Little evidence (<10%) of erosion bank failure; bank angles average <30°	-	Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60°	Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank andles average >60°
Score: 0	3	2	1	0
Channel Sinuosity	High ≥2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) are present	Moderate 1 well-defined bend OR ≥3 moderately-defined bends present	Low <3 moderately-defined bends OR only poorly-defined bends present	None Straight channel; may be channelized
Score: 1	3	2	1	0
Riparian Buffer Vegetation	Extensive Width of natural buffer is >20 meters	20 meters	Moderate Width of natural buffer is 5-10 meters	Narrow Width of natural buffer is <5 meters
Score: 1 Aesthetics of Reach	3 Wilderness	2 Natural Area	1 Common Setting	0 Offensive
	Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptional	Tree and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity may be slightly turbid	Not offensive; area is developed, but uncluttered such as in an urban park; water clarity may be turbid or discolored	Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbid or discolored
Score: 1	3	2	1	0
Total Score: 18	INTERMEDIATE			

Habitat Parameter	Scoring Category		Location: 17896	Date: 6/11/03
Available Instream Cover	Abundant	Common	Rare	Absent
	>50% of substrate favorable for colonization and fish cover; good mix of several stable	30-50% of substrate supports a stable habitat; adequate habitat for maintenance of	10-29.9% of substrate supports stable habitat; habitat availability less than	<10% of substrate supports stable habitat; lack of habitat is obvious; substrate
	(not new fall or transient) cover types such as snags, cobble, undercut banks, macrophytes	populations; may be limited in the number of different habitat types	frequently disturbed or removed	unstable or lacking
Score: 4	4	3	2	1
Bottom Substrate Stability	Stable	Moderately Stable	Moderately Unstable	Unstable
	>50% gravel or larger substrate, i.e., gravel, cobble, boulders; dominant substrate type is gravel or larger	30-50% gravel or larger substrate; dominant substrate type is mix of gravel with some finer sediments	substrate type is finer than gravel, but may still be in mix of sizes	
Score: 4	4	3	2	1
Number of Riffles To be counted, riffles must extend >50% the width of the channel and be at least as long as the channel width	Abundant ≥5 riffles	Common 2-4 riffles	Rare 1 riffle	Absent No riffles
Score: 3	4	3	2	1
Dimensions of Largest Pool	Large	Moderate	Small	Absent
	Pool covers more than 50% of the channel width; maximum depth is > 1m	Pool covers approximately 50% or slightly less than the channel width; maximum depth is 0.5-1 meter	Pool covers approximately 25% of the channel width; maximum depth is <0.5 meter	No existing pools; only shallow auxillary pockets
Score: 2	3	2	1	0
Channel Flow Status	High Water reaches the base of both the lower banks; <5% of channel substrate is exposed	Moderate Water fills <75% of the channel; or <25% of channel substrate is exposed	Low Water fills 25-75% of the available channel and/or riffle substrates are mostly	<b>No Flow</b> Very little water in the channel and mostly present in standing pools; or stream is dry
Score: 2	3	2	exposed 1	is dry 0
Bank Stability	Stable	Moderately Stable	Moderately Unstable	Unstable
	Little evidence (<10%) of erosion bank failure; bank angles average <30°	Some evidence (10-29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average 30-39.9°	Evidence of erosion bank	Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60°
Score: 1	3	2	1	0
Channel Sinuosity	High ≥2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) are present	Moderate 1 well-defined bend OR ≥3 moderately-defined bends present	Low <3 moderately-defined bends OR only poorly- defined bends present	None Straight channel; may be channelized
Score: 1	3	2	1	0
Riparian Buffer Vegetation	Extensive Width of natural buffer is >20 meters	Wide Width of natural buffer is 10.1- 20 meters	<b>Moderate</b> Width of natural buffer is 5- 10 meters	Narrow Width of natural buffer is <5 meters
Score: 2	3	2	1	0
Aesthetics of Reach	Wilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptional	Natural Area Tree and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity may be slightly turbid	Common Setting Not offensive; area is developed, but uncluttered such as in an urban park; water clarity may be turbid or discolored	Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbid or discolored
Score: 2	3	2	1	0

Habitat Parameter	Scoring Category		Location: 12546	Date: 6/11/03
Available Instream Cover	Abundant	Common	Rare	Absent
	>50% of substrate favorable for colonization and fish cover; good mix of several stable (not new fall or transient)	30-50% of substrate supports	10-29.9% of substrate supports stable habitat; habitat availability less than	<10% of substrate supports stable habitat; lack of habitat is obvious; substrate unstable or lacking
Score: 3	4	3	2	1
Bottom Substrate Stability		Moderately Stable	Moderately Unstable	Unstable
	>50% gravel or larger substrate, i.e., gravel, cobble,	30-50% gravel or larger substrate; dominant substrate type is mix of gravel with some finer sediments	10-29.9% gravel or larger substrate; dominant substrate type is finer than gravel, but may still be in mix of sizes	<10% gravel or larger substrate; substrate is uniform sand, silt, clay, or bedrock
Score: 4	4	3	2	1
Number of Riffles	Abundant	Common	Rare	Absent
To be counted, riffles must extend >50% the width of the channel and be at least as long as the channel width	≥5 riffles	2-4 riffles	1 riffle	No riffles
Score: 3	4	3	2	1
Dimensions of Largest Pool	Large Pool covers more than 50% of the channel width; maximum depth is > 1m	Moderate Pool covers approximately 50% or slightly less than the channel width; maximum depth is 0.5-1 meter	Small Pool covers approximately 25% of the channel width; maximum depth is <0.5 meter	Absent No existing pools; only shallow auxillary pockets
Score: 2	3	2	1	0
Channel Flow Status	High Water reaches the base of both the lower banks; <5% of channel substrate is exposed	Moderate Water fills <75% of the channel; or <25% of channel substrate is exposed	Low Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed	No Flow Very little water in the channel and mostly present in standing pools; or stream is dry
Score: 2	3	2	1	0
Bank Stability	Stable Little evidence (<10%) of erosion bank failure; bank angles average <30°	Moderately Stable Some evidence (10-29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average 30-39.9°	Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60°	Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60°
Score: 1	3	2	1	0
Channel Sinuosity	High ≥2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) are present	Moderate 1 well-defined bend OR ≥3 moderately-defined bends present	Low <3 moderately-defined bends OR only poorly- defined bends present	None Straight channel; may be channelized
Score: 1	3	2	1	0
Riparian Buffer Vegetation	Extensive Width of natural buffer is >20 meters	Wide Width of natural buffer is 10.1- 20 meters	Moderate Width of natural buffer is 5- 10 meters	Narrow Width of natural buffer is <5 meters
Score: 1	3 Wilderpese	2 Notural Area	Common Sotting	0 Offensive
Aesthetics of Reach	Outstanding natural beauty;	evident (from fields, pastures, dwellings); water clarity may	developed, but uncluttered such as in an urban park;	Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbid
		be slightly turbid	uscolored	or discolored
Score: 1	3	be slightly turbid	1	, , ,

Habitat Parameter	Scoring Category		Location: 17896	Date: 8/7/03
Available Instream Cover	Abundant >50% of substrate favorable for colonization and fish cover; good mix of several stable (not new fall or transient) cover types such as snags, cobble, undercut banks, macrophytes	<b>Common</b> 30-50% of substrate supports a stable habitat; adequate habitat for maintenance of populations; may be limited in the number of different habitat types	supports stable habitat; habitat availability less than	Absent <10% of substrate supports stable habitat; lack of habitat is obvious; substrate unstable or lacking
Score: 4	4	3	2	1
Bottom Substrate Stability	Stable >50% gravel or larger substrate, i.e., gravel, cobble, boulders; dominant substrate type is gravel or larger	Moderately Stable 30-50% gravel or larger substrate; dominant substrate type is mix of gravel with some finer sediments	Moderately Unstable 10-29.9% gravel or larger substrate; dominant substrate type is finer than gravel, but may still be in mix of sizes	Unstable <10% gravel or larger substrate; substrate is uniform sand, silt, clay, or bedrock
Score: 4	4	3	2	1
Number of Riffles To be counted, riffles must extend >50% the width of the channel and be at least as long as the channel width	<b>Abundant</b> ≥5 riffles	Common 2-4 riffles	<b>Rare</b> 1 riffle	Absent No riffles
Score: 3	4	3	2	1
Dimensions of Largest Pool	Large Pool covers more than 50% of the channel width; maximum depth is > 1m	Moderate Pool covers approximately 50% or slightly less than the channel width; maximum depth is 0.5-1 meter	Small Pool covers approximately 25% of the channel width; maximum depth is <0.5 meter	Absent No existing pools; only shallow auxillary pockets
Score: 3	3	2	1	0
Channel Flow Status	High Water reaches the base of both the lower banks; <5% of channel substrate is exposed	Moderate Water fills <75% of the channel; or <25% of channel substrate is exposed	Low Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed	No Flow Very little water in the channel and mostly present in standing pools; or stream is dry
Score: 2	3	2	1	0
Bank Stability	Stable Little evidence (<10%) of erosion bank failure; bank angles average <30°	Moderately Stable Some evidence (10-29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average 30-39.9°	failure is common (30-50%); high potential of erosion	Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60°
Score: 0	3	2	1	0
Channel Sinuosity	High ≥2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) are present	Moderate 1 well-defined bend OR ≥3 moderately-defined bends present	Low <3 moderately-defined bends OR only poorly- defined bends present	None Straight channel; may be channelized
Score: 1	3	2	1	0
Riparian Buffer Vegetation	Extensive Width of natural buffer is >20 meters	<b>Wide</b> Width of natural buffer is 10.1- 20 meters	<b>Moderate</b> Width of natural buffer is 5- 10 meters	<b>Narrow</b> Width of natural buffer is <5 meters
Score: 2	3	2	1	0
Aesthetics of Reach	Wilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptional	, v	Common Setting Not offensive; area is developed, but uncluttered such as in an urban park; water clarity may be turbid or discolored	Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbid or discolored
Score: 2	3	2	1	0
Total Score: 21	HIGH			

Habitat Parameter	Scoring Category		Location: 12546	Date: 8/7/03
Available Instream Cover	Abundant >50% of substrate favorable for colonization and fish cover; good mix of several stable (not new fall or transient) cover types such as snags, cobble, undercut banks, macrophytes	<b>Common</b> 30-50% of substrate supports a stable habitat; adequate habitat for maintenance of populations; may be limited in the number of different habitat types	supports stable habitat; habitat availability less than	Absent <10% of substrate supports stable habitat; lack of habitat is obvious; substrate unstable or lacking
Score: 4	4	3	2	1
Bottom Substrate Stability	Stable >50% gravel or larger substrate, i.e., gravel, cobble, boulders; dominant substrate type is gravel or larger	Moderately Stable 30-50% gravel or larger substrate; dominant substrate type is mix of gravel with some finer sediments	Moderately Unstable 10-29.9% gravel or larger substrate; dominant substrate type is finer than gravel, but may still be in mix of sizes	Unstable <10% gravel or larger substrate; substrate is uniform sand, silt, clay, or bedrock
Score: 4	4	3	2	1
Number of Riffles To be counted, riffles must extend >50% the width of the channel and be at least as long as the channel width	<b>Abundant</b> ≥5 riffles	Common 2-4 riffles	<b>Rare</b> 1 riffle	Absent No riffles
Score: 3	4	3	2	1
Dimensions of Largest Pool	Large Pool covers more than 50% of the channel width; maximum depth is > 1m	Moderate Pool covers approximately 50% or slightly less than the channel width; maximum depth is 0.5-1 meter	Small Pool covers approximately 25% of the channel width; maximum depth is <0.5 meter	Absent No existing pools; only shallow auxillary pockets
Score: 2	3	2	1	0
Channel Flow Status	High Water reaches the base of both the lower banks; <5% of channel substrate is exposed	Moderate Water fills <75% of the channel; or <25% of channel substrate is exposed	Low Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed	No Flow Very little water in the channel and mostly present in standing pools; or stream is dry
Score: 2	3	2	1	0
Bank Stability	Stable Little evidence (<10%) of erosion bank failure; bank angles average <30°	Moderately Stable Some evidence (10-29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average 30-39.9°	failure is common (30-50%); high potential of erosion	Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60°
Score: 0	3	2	1	0
Channel Sinuosity	High ≥2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) are present	Moderate 1 well-defined bend OR ≥3 moderately-defined bends present	Low <3 moderately-defined bends OR only poorly- defined bends present	None Straight channel; may be channelized
Score: 1	3	2	1	0
Riparian Buffer Vegetation	Extensive Width of natural buffer is >20 meters	<b>Wide</b> Width of natural buffer is 10.1- 20 meters	<b>Moderate</b> Width of natural buffer is 5- 10 meters	<b>Narrow</b> Width of natural buffer is <5 meters
Score: 3	3	2	1	0
Aesthetics of Reach	Wilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptional	Natural Area Tree and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity may be slightly turbid	Common Setting Not offensive; area is developed, but uncluttered such as in an urban park; water clarity may be turbid or discolored	Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbid or discolored
Score: 1	3	2	1	0
Total Score: 21	HIGH			