

Impairment Verification Monitoring-Volume 2: Biological and Habitat Components Upper Frio River, Texas September 2004



Ecological Communications Corporation Austin, TX

By: Jeremy Walther and Victor Palma

Ecological Communications Corporation 3355 Bee Caves Road Suite 700 Austin, TX 78746 512/329-0031 jwalther@ecommcorporation.com

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ABSTRACT

As part of an impairment verification monitoring project for the Upper Frio River (Segment 2113), Ecological Communications Corporation (EComm) conducted biological data collections and analyses. Segment 2113 appears on the State of Texas' 303(d) list as impaired for exceptional aquatic life based on low dissolved oxygen concentrations previously identified by the Texas Commission on Environmental Quality (TCEQ). Due to insufficient 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 biological information on the water body to support a use reclassification if it is found that the water quality standard is inappropriate and the change can be supported through agency regulations.

A separate but related assessment (CBI 2004) was simultaneously conducted by the Texas Engineering Experiment Station (TEES) and the Conrad Blucher Institute for Surveying and Science (CBI). 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 (TCEQ Contract 582-4-58897), 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.

The biological and habitat data (Regional Index of Biotic Integrity (IBI), Rapid Bioassessment Protocol, and Habitat Quality Index) generally resulted in scores which indicate that Segment 2113 has supports "High" aquatic life use. One exception to this was the Statewide Index of Biotic Integrity Scores which generally indicated an "Intermediate" aquatic life use designation. The Regional IBI, Rapid Bioassessment Protocol, and Habitat Quality Index scores for Segment 2113 all indicate that the existing use for this water body is high aquatic life and should be reassessed for the 2006 305(b) Water Quality Assessment.

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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 305(b) Water Quality Inventory as part of a total daily maximum load (TMDL) program. The segments are included on the 1999 State of Texas Clean Water Act 303(d) list as impaired due to concentration levels of dissolved oxygen or bacteria or both. One of these water bodies was



Figure 1. Station 13007

Segment 2113, Upper Frio River, and is included on the State's 303(d) list as impaired for its exceptional aquatic life use designation. The impairment to this portion of the Frio River was caused by an exceedance of the established dissolved oxygen criteria. As an initial phase for TMDL development, Segment 2113 was assessed to verify the aquatic life impairment. This 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 three 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 2113, the Upper Frio River, is formed by the union of the East and West Frio Rivers in Real County, and extends 47 miles downstream to just above the crossing at U.S. Highway 90 in Uvalde County. This portion of the river experiences significant levels of recreation during the summer months and represents a large part of the regional economy. A location map of the segment is provided in Figure 2. Site 17892 (previously designated internally as site "10000"), known as "Frio River at Apache Bluffs," is located in Real County and falls approximately one kilometer above the impaired segment. Because of heavy recreational activity at the upper portion of the impaired segment, this site was chosen to limit interference during sampling, and to decrease the exposure of the sampling equipment to the general public. Site 13007, Frio River at Magers Crossing, is near the middle of the impaired segment in Uvalde County located just below Garner State Park. Site 13006, Frio River at SH 127 east of Concan, is also located in Uvalde County approximately seven miles south of Garner State Park.



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 "Receiving Water Assessment (RWA) Procedures Manual," (Texas Natural Resource Conservation Commission [TNRCC] 1999b). As specified in the RWA manual, EComm

evaluated fish sampled in accordance with statewide criteria of Indices of Biotic Integrity Additionally, EComm generated IBI (IBI). scores 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 within Texas. As a result, the regional IBI criteria "provide a better representation of the integrity of fish assemblage" as compared to statewide criteria.



Figure 3. Station 13006

In addition to data collection via RWA guidelines and Surface Water Quality Monitoring (SWQM) Procedures Manual (TNRCC 1999a), EComm captured data for 14 previously uncoded biological and habitat parameters. These new 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 2113 had not previously been designated as a segment requiring either a Use Attainability Analysis (UAA) or an Aquatic Life Assessment (ALA). Although the main purpose of the study was to verify impairment, a sampling regime satisfying the minimum UAA data requirements was attempted for this segment. UAA requirements include at least three complete sampling events over two consecutive index periods. One event is required in the early portion of the Index Period (March 15-October 15) in either Year 1 or Year 2, and the other two efforts must be conducted during the Critical Period (July 1 - September 30), including one sampling event during Year 1 and the other during Year 2. Although the required level of effort was met to satisfy UAA requirements, the timing of sampling events do not suffice for a UAA. Biological sampling for Segment 2113 was conducted during the early portion of an Index Period.

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)
00800	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
00812	Statewide IBI	98003	Number of fish species
00833	Habitat Quality Index	89905	Number of minutes debris was sampled
84161	Stream order	89851	Percent grass
84159	Percent instream cover	89854	Percentage tree canopy
00813	Number of cyprinidae species	89859	Drainage area
00814	Number of benthic invertebrates	89860	Length of reach
72052	Streambed slope	89861	Average stream width
00816	Percent that are tolerant species, excluding G.affinis	89862	Average stream depth
00817	Number of individuals per seine haul	89864	Maximum pool width
00818	Number of individuals per minute electroshocking	89865	Maximum pool depth
00819	Percentage of individuals as non-native	89866	Average width of riparian vegetation
00820	- Regional IBI	90010	Dominant functional feeding group percentag
00832	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
00834	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	00835	Benthic invertebrate taxa richness
89850	Percent as shrubs	00836	Number instream cover types
98004	Total number of darter species	89904	Minutes spent kicknetting

 Table 1. STORET Codes

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

Biological sampling included the collection of benthic macroinvertebrates, fish and habitat data at each site within the segment (Figure 2).



Figure 4. Macroinvertebrate Collection

Benthic Macroinvertebrate Collections

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. Intervals were repeated until the minimum sample size of 100 specimens was approached, met, or exceeded. All individuals collected were transferred from the net 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 RBP 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 Smith-Root LR-24 backpack electrofishing gear powered by either 7 amp-hour or 12 amp-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 and collected fish with dip nets. Collected fish were temporarily placed in a five gallon plastic 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 1010 seconds. Upon

completion of electrofishing, fish were immediately identified, recorded, and returned to the stream in order to minimize mortality. Any fish that could not be identified in the field was preserved in either formalin or ethanol for later identification in the laboratory. If more than one fish exhibiting the same characteristics could not be field identified, then only one representative specimen was preserved. Additionally, one individual from each field-identified species was retained as a voucher specimen.



Figure 5. Seining Fish ID

Electrofishing collections were complemented by seining at all sites where seining was possible. A straight seine measuring 30 ft x 4 ft with 1/8 inch mesh was used. Six seine hauls, each approximately 10 meters long, were taken during each sampling event. Only successful seine hauls were counted. Those that encountered obstacles that could have resulted in the escape of fish (heavy snags or rocks that, 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, above.

Collections were analyzed using metrics defined by TNRCC 1999 to generate Statewide IBI. Regional IBI were also calculated using the TPWD 2002. 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 the RWA 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 ensure that all crew members 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 2113. 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 given 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 be considered having an "Limited-Intermediate" Aquatic Life Use subcategory.

Aquatic Life Use 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. Aquatic Life Use Score Ranges and Subcategories for Each Component

Results of the biological and habitat analyses for the three sites over three sampling events are provided in Table 3. Raw data is provided in Appendix A.

FY02	Statewide IBI	Regional IBI	RBP	HQI
17892	42 Intermediate	39 Intermediate	33 High	23 High
13007	38 Limited/Intermediate	42 High	34 High	25 High
13006	40 Intermediate	47 High	33 High	24 High
FY03	Statewide IBI	Regional IBI	RBP	HQI
17892	46 High	51 High	31 High	24 High
13007	38 Limited/Intermediate	46 High	36 High	22 High
13006	44 Intermediate	49 High	31 High	23 High
	_			
FY04	Statewide IBI	Regional IBI	RBP	HQI
17892	42 Intermediate	50 High	38 Exceptional	24 High
13007	42 Intermediate	41 Intermediate	36 High	21 High
13006	42 Intermediate	46 High	30 High	23 High

Table 3. Results of Biological and Habitat Sampling for Segment 2113, Upper Frio River

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 "Exceptional" agreed with the designated aquatic life use value for the segment. A subcategory of "Limited", "Limited-Intermediate", "Intermediate", "Intermediate-High" or "High" was considered substandard, as it reflects a poorer level of water quality than that for which the segment is designated. Statewide IBI scores averaged approximately 42 (Intermediate) across all sites over all sampling events. This result was in poor agreement with the designated aquatic life use, which was determined as "Exceptional" (0.0% overall) according the Water Quality Inventory. Regional IBI scores averaged approximately 46 (High), which would still be considered less than

the designated aquatic life use. RBP scores averaged approximately 34 (High), while HQI averaged 23 (High) both considered below the established aquatic life use.

4.0 DISCUSSION

All analyses generally reflected an aquatic life use designation less than the established standard. Of the 36 aquatic life use calculations generated for Segment 2113, one (3%) scored "Exceptional", which is the designated aquatic life use. The Statewide IBI calculation resulted in an "Intermediate" aquatic life use designation. This is, however, not unexpected, as the criteria used to calculate the Statewide IBI scores generally tends to underestimate the aquatic life use when compared to other assessment methods (TPWD 2002). Therefore, the Statewide IBI score may be best be used to indicate the need for further study using more refined calculations, such as the Regional IBI. In this case the Regional IBI, along with the RBP and HQI scores appear to indicate that the existing use is lower than the water quality standard.

A gap is present in the field data collected from Station ID 13007 during the September 2002 sampling event. No data was collected regarding riparian vegetation composition and aesthetic appraisal. However, vegetation composition was not a requirement for the HQI calculations, and the aesthetic appraisal gap was addressed using site photos. Aesthetics at the site were determined to be "2) Natural", resulting in an HQI score of 25, the maximum value within the "High" category. According to the Part I Stream Physical Characteristics Worksheet (TNRCC 1999) for this site, stream uses include agriculture and recreation; therefore, an aesthetic appraisal of "1) Wilderness" would be highly unlikely. An aesthetic appraisal of "3) Common" may be considered, resulting in a score of 24. The change in scoring from 25 to 24 would not affect the aquatic life use based on the HQI, which would remain in the "High" category.

Segment 2113 did show some spatial and temporal variation in aquatic life use scores among and within sites, although there are other stream segments within the overall TMDL project that exhibited this to a greater degree. EComm is currently investigating the causes for this, but it is hypothesized that several factors may contribute including stream flow, time of day of fish sampling, time of year of sampling, temperature, and dissolved oxygen levels.

5.0 CONCLUSION

Based on the Regional IBI, RBP, and HQI scores, the biological and habitat data appear to support the conclusion that existing aquatic life uses are lower than the established standards. It is likely that this segment will be identified as impaired due to the presence of nekton and benthic communities exhibiting aquatic life uses below the established standard. This segment will be reassessed during the 2006 305(b) Water Quality Assessment and a determination of the course of action will be made at that time.

REFERENCES

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APPENDIX A COMPLETE RAW DATA SET SEGMENT 2113-UPPER FRIO RIVER SEPTEMBER 2002 AUGUST 2003 OCTOBER 2003



Ecological Communications Corporation Austin, TX

BIOTIC ASSESSMENT – FISH

Species Lists and Preliminary Data Manipulation



Stream	Date	ID	Species	N=	Туре	Method	Tolerance	Trophic Gp		
Upper Frio	9/4/02	10000	Central Stoneroller	12		E	-	Н	KEY:	Sunfich
			Central Stoneroller	2		S	-	Н	D	Darter
			Channel Catfish	13		Е	Т	0	SU	Sucker
Order=5			Flathead Catfish	1		Е	-	Р	E	Electroshock
			Gambusia affinis	3		Е	Т	IF	S	Seine Visually Observed
			Gambusia affinis	5		S	Т	IF	V T	Intolerant
			Greenthroat Darter	20	D	E	I	IF	Ť	Tolerant
			Guadalupe Bass	3		E	I	Р	-	Intermediate
			Largemouth Bass	1		S	-	Р	0	Omnivore
			Longear Sunfish	3	SF	E	-	IF	IF P	Piscivore
			Longear Sunfish	2	SF	S	-	IF	H	Herbivore
			Mexican Tetra	2		Е	-	IF		
			Rio Grande Cichlid	5		Е	-	IF		
			Rio Grande Cichlid	3		S	-	IF		
			Roundnose Minnow	1		Е	I	0		
			Texas Shiner	7		E	-	IF		
			Total	83						
Stream	Date	ID	Species	N=	Туре	Method	Tolerance	Trophic Gp		
Upper Frio	9/5/02	13007	Blacktail Shiner	1		E	-	IF		
			Central Stoneroller	3		E	-	Н		
			Channel Catfish	20		E	Т	0		
Order=5			Green Sunfish	3	SF	E	Т	Р		
			Greenthroat Darter	3	D	E	I	IF		
			Longear Sunfish	25	SF	E	-	IF		
			Red Shiner	5		E	Т	IF		
			Redbreast Sunfish	1	SF	E	-	IF		
			Rio Grande Cichlid	12		E	-	IF		
			Roundnose Minnow	1		E	I	0		
		-	Yellow Bullhead	6		E	-	0		
			Total	80						

Stream	Date	ID	Species	N=	Туре	Method	Tolerance	Trophic Gp
Upper Frio	9/3/02	13006	Blacktail Shiner	12		Е	-	IF
			Blacktail Shiner	26		S	-	IF
			Central Stoneroller	18		Е	-	Н
Order=5			Central Stoneroller	3		S	-	Н
			Channel Catfish	42		E	Т	0
			Gambusia affinis	4		Е	Т	IF
			Gambusia affinis	31		S	Т	IF
			Greenthroat Darter	2	D	E	I	IF
			Longear/Spotted Sunfish	9	SF	E	-	IF
			Longear Sunfish	43	SF	S	-	IF
			Red Shiner	23		E	Т	IF
			Red Shiner	9		S	Т	IF
			Redbreast Sunfish	1	SF	S	-	IF
			Rio Grande Cichlid	10		E	-	IF
			Rio Grande Cichlid	1		S	-	IF
			Roundnose Minnow	13		Е	I	0
			Roundnose Minnow	7		S	I	0
			Texas Shiner	10		E	-	IF
			Texas Shiner	157		S	-	IF
			Yellow Bullhead	1		E	-	0
			Total	422				

Stream: U.Frio	Species	N=	Туре	Method	Tolerance	Trophic Gp.
Date: 8/4/03	Bass	1		V	~	Р
Location: 17892	Blacktail shiner	7	CY	Е	~	IF
	Blacktail shiner	11	CY	S	~	IF
Stream Order: 5	Central stoneroller	2	CY	E	~	Н
	Central stoneroller	11	CY	S	~	Н
	Channel catfish	13		E	Т	0
	Channel catfish	1		S	Т	0
	Gambusia	4		S	Т	IF
	Gambusia	14		S	Т	IF
	Green sunfish	1	SF	E	Т	Р
	Greenthroat darter	1	D	E	I	IF
	Greenthroat darter	1	D	S	I	IF
	Guadalupe bass	1		S	I	Р
	Lepomis sp.	1	SF	E	~	IF
	Lepomis sp.	3	SF	S	~	IF
	Longear sunfish	3	SF	E	~	IF
	Nueces roundnose minnow	3	CY	E	I	0
	Nueces roundnose minnow	3	CY	S	I	0
	Rio Grande cichlid	4		E	~	IF
	Rio Grande cichlid	1		S	~	IF
	Texas shiner	3	CY	E	~	IF
	Texas shiner	520	CY	S	~	IF
	Unknown shiner	4	CY	E	~	IF
	Unknown shiner	2	CY	S	~	IF
	Yellow bullhead	2		E	~	0

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Stream: U.Frio	Species	N=	Туре	Method	Tolerance	Trophic Gp.
Date: 8/5/03	Blacktail shiner	12	CY	Е	~	IF
Location: 13007	Blacktail shiner	33	CY	S	~	IF
	Central stoneroller	19	CY	Е	~	Н
Stream Order:	Central stoneroller	13	CY	S	~	Н
	Channel catfish	9		Е	Т	0
	Gambusia	4		S	Т	IF
	Green sunfish	1	SF	Е	Т	Р
	Lepomis sp.	19	SF	Е	~	IF
	Lepomis sp.	1	SF	S	~	IF
	Longear sunfish	15	SF	Е	~	IF
	Mexican tetra	2		Е	~	IF
	Nueces roundnose minnow	2	CY	Е	I	IF
	Red shiner	11	CY	Е	Т	IF
	Red shiner	14	CY	S	Т	IF
	Rio Grande cichlid	16		Е	~	IF
	Rio Grande cichlid	3		S	~	IF
	Texas shiner	16	CY	S	~	IF
	Unknown minnow	3	CY	Е	~	IF
	Unknown minnow	4	CY	S	~	IF
	Yellow bullhead	2		Е	~	0
		199				

Stream: U.Frio Date: 8/5/03 Location: 13006

Stream Order:

Species	N=	Туре	Method	Tolerance	Trophic Gp.
Blacktail shiner	5	CY	Е	~	IF
Blacktail shiner	16	CY	S	~	IF
Central stoneroller	4	CY	Е	~	Н
Channel catfish	4		Е	Т	0
Channel catfish	1		S	Т	0
Flathead catfish	2		Е	~	Р
Gambusia	1		Е	Т	IF
Gambusia	1		S	Т	IF
Greenthroat darter	2	D	Е	I	IF
Lepomis	3	SF	E	~	IF
Lepomis	3	SF	S	~	IF
Longear sunfish	7	SF	Е	~	IF
Longear sunfish	1	SF	S	~	IF
Nueces roundnose minnow	2	CY	Е	I	IF
Nueces roundnose minnow	1	CY	S	I	IF
Red shiner	6	CY	S	Т	IF
Redbreast sunfish	1	SF	Е	~	IF
Rio Grande cichlid	2		E	~	IF
Texas shiner	5	CY	Е	~	IF
Texas shiner	27	CY	S	~	IF
Unknown shiner	5	CY	Е	~	IF
Unknown shiner	36	CY	S	~	IF

Stream: U.Frio	Species	N=	Туре	Method	Tolerance	Trophic Gp.
Date: 10/9/03	Blacktail Shiner	6	CY	Е		IF
Location: 17892	Blacktail Shiner	71	CY	S		IF
	Central Stoneroller	24	CY	Е		Н
Stream Order: 5	Central Stoneroller	7	CY	S		Н
	Channel Catfish	15		Е	Т	0
	Flathead Catfish	1		Е		Р
	Greenthroat Darter	4	D	Е	I	IF
	Longear Sunfish	11	SF	Е		IF
	Mexican Tetra	1		Е		IF
	Nueces Roundnose Minnow	24	CY	Е	I	0
	Nueces Roundnose Minnow	14	CY	S	I	0
	Orangethroat Darter	1	D	Е		IF
	Red Shiner	8	CY	S	Т	IF
	Rio Grande Cichlid	15		Е		IF
	Rio Grande Cichlid	1		S		IF
	Texas Shiner	6	CY	Е		IF
	Texas Shiner	349	CY	S		IF
	Western Mosquitofish	3		Е	Т	IF
	Western Mosquitofish	4		S	Т	IF
	Yellow Bullhead	2		Е		0
		567		454	30	55
		567		454 113	30	55 480
	Ornaniaa	567	Turne	454 113	30	55 480
Stream: U.Frio	Species	567 N=	Type	454 113 Method	30 Tolerance	55 480 Trophic Gp.
Stream: U.Frio Date: 10/9/03	Species Blacktail Shiner	567 N= 2	Type CY	454 113 Method E	30 Tolerance	55 480 Trophic Gp. IF
Stream: U.Frio Date: 10/9/03 Location: 13007	Species Blacktail Shiner Blacktail Shiner	567 N= 2 26	Type CY CY	454 113 Method E S	30 Tolerance	55 480 Trophic Gp. IF IF
Stream: U.Frio Date: 10/9/03 Location: 13007	Species Blacktail Shiner Blacktail Shiner Central Stoneroller	567 N= 2 26 22	Type CY CY CY	454 113 Method E S E	30 Tolerance	55 480 Trophic Gp. IF IF O
Stream: U.Frio Date: 10/9/03 Location: 13007 Stream Order:	Species Blacktail Shiner Blacktail Shiner Central Stoneroller Channel Catfish	567 N= 2 26 22 2	Type CY CY CY	454 113 Method E S E E	30 Tolerance T	55 480 Trophic Gp. IF IF O O
Stream: U.Frio Date: 10/9/03 Location: 13007 Stream Order:	Species Blacktail Shiner Blacktail Shiner Central Stoneroller Channel Catfish Longear Sunfish	567 N= 2 26 22 2 31	Type CY CY CY SF	454 113 Method E S E E E	30 Tolerance T	55 480 Trophic Gp. IF O O IF
Stream: U.Frio Date: 10/9/03 Location: 13007 Stream Order:	Species Blacktail Shiner Blacktail Shiner Central Stoneroller Channel Catfish Longear Sunfish Longear Sunfish	567 N= 2 26 22 2 31 7	Type CY CY CY SF SF	454 113 Method E S E E E S	30 Tolerance T	55 480 Trophic Gp. IF O O IF IF
Stream: U.Frio Date: 10/9/03 Location: 13007 Stream Order: *25 Gambusia with	Species Blacktail Shiner Blacktail Shiner Central Stoneroller Channel Catfish Longear Sunfish Longear Sunfish Nueces Roundnose Minnow	567 N= 2 26 22 2 31 7 7	Type CY CY CY SF SF CY	454 113 Method E S E E E S S	30 Tolerance T I	55 480 Trophic Gp. IF O O IF IF O
Stream: U.Frio Date: 10/9/03 Location: 13007 Stream Order: *25 Gambusia with spots	Species Blacktail Shiner Blacktail Shiner Central Stoneroller Channel Catfish Longear Sunfish Longear Sunfish Nueces Roundnose Minnow Orangethroat Darter	567 N= 2 26 22 2 31 7 7 2 2	Type CY CY CY SF SF CY D	454 113 Method E S E E S S E	30 Tolerance T I	55 480 Trophic Gp. IF O IF IF O IF
Stream: U.Frio Date: 10/9/03 Location: 13007 Stream Order: *25 Gambusia with spots	Species Blacktail Shiner Blacktail Shiner Central Stoneroller Channel Catfish Longear Sunfish Longear Sunfish Nueces Roundnose Minnow Orangethroat Darter Red Shiner	567 N= 2 26 22 2 31 7 7 2 2 5	Type CY CY CY SF SF CY D CY	454 113 Method E S E E S S E S S	30 Tolerance T I T	55 480 Trophic Gp. IF O IF IF IF IF
Stream: U.Frio Date: 10/9/03 Location: 13007 Stream Order: *25 Gambusia with spots	Species Blacktail Shiner Blacktail Shiner Central Stoneroller Channel Catfish Longear Sunfish Longear Sunfish Nueces Roundnose Minnow Orangethroat Darter Red Shiner Redbreast Sunfish	567 N= 2 26 22 2 31 7 7 2 2 5	Type CY CY CY SF SF CY D CY SF	454 113 Method E S E E S S E S E	30 Tolerance T I T	55 480 Trophic Gp. IF IF O IF IF IF IF IF
Stream: U.Frio Date: 10/9/03 Location: 13007 Stream Order: *25 Gambusia with spots	Species Blacktail Shiner Blacktail Shiner Central Stoneroller Channel Catfish Longear Sunfish Longear Sunfish Nueces Roundnose Minnow Orangethroat Darter Red Shiner Redbreast Sunfish Rio Grande Cichlid	567 N= 2 26 22 2 31 7 7 2 2 5 6	Type CY CY CY SF SF CY D CY SF	454 113 Method E S E E S S E S E E	30 Tolerance T I T	55 480 Trophic Gp. IF IF O IF IF IF IF IF
Stream: U.Frio Date: 10/9/03 Location: 13007 Stream Order: *25 Gambusia with spots	Species Blacktail Shiner Blacktail Shiner Central Stoneroller Channel Catfish Longear Sunfish Longear Sunfish Nueces Roundnose Minnow Orangethroat Darter Red Shiner Red Shiner Redbreast Sunfish Rio Grande Cichlid Rio Grande Cichlid	567 N= 2 26 22 2 31 7 7 2 2 5 6 1	Type CY CY CY SF SF CY D CY SF	454 113 Method E S E E S S E S E S E S S E S S S S E S	30 Tolerance T I T	55 480 Trophic Gp. IF IF O IF IF IF IF IF IF
Stream: U.Frio Date: 10/9/03 Location: 13007 Stream Order: *25 Gambusia with spots	Species Blacktail Shiner Blacktail Shiner Central Stoneroller Channel Catfish Longear Sunfish Longear Sunfish Nueces Roundnose Minnow Orangethroat Darter Red Shiner Redbreast Sunfish Rio Grande Cichlid Rio Grande Cichlid Texas Shiner	567 N= 2 26 22 2 31 7 7 2 2 5 6 1 101	Type CY CY CY SF SF CY D CY SF	454 113 Method E S E E S S E S E S S C	30 Tolerance T I T	55 480 Trophic Gp. IF IF O IF IF IF IF IF IF IF
Stream: U.Frio Date: 10/9/03 Location: 13007 Stream Order: *25 Gambusia with spots	Species Blacktail Shiner Blacktail Shiner Central Stoneroller Channel Catfish Longear Sunfish Longear Sunfish Nueces Roundnose Minnow Orangethroat Darter Red Shiner Red Shiner Redbreast Sunfish Rio Grande Cichlid Rio Grande Cichlid Texas Shiner Western Mosquitofish	567 N= 2 26 22 2 31 7 7 2 2 5 6 1 101 73 2	Type CY CY CY SF SF CY D CY SF	454 113 Method E S E E S S E S S E S S S S S S	30 Tolerance T I T T	55 480 Trophic Gp. IF IF O IF IF IF IF IF IF IF IF
Stream: U.Frio Date: 10/9/03 Location: 13007 Stream Order: *25 Gambusia with spots	Species Blacktail Shiner Blacktail Shiner Central Stoneroller Channel Catfish Longear Sunfish Longear Sunfish Nueces Roundnose Minnow Orangethroat Darter Red Shiner Redbreast Sunfish Rio Grande Cichlid Rio Grande Cichlid Texas Shiner Western Mosquitofish Yellow Bullhead	567 N= 2 26 22 2 31 7 2 2 5 6 1 101 73 3 200	Type CY CY SF SF CY D CY SF	454 113 Method E S E E S S E S S E S S E S S E	30 Tolerance T I T T	55 480 Trophic Gp. IF IF O IF IF IF IF IF IF IF IF IF
Stream: U.Frio Date: 10/9/03 Location: 13007 Stream Order: *25 Gambusia with spots	Species Blacktail Shiner Blacktail Shiner Central Stoneroller Channel Catfish Longear Sunfish Longear Sunfish Nueces Roundnose Minnow Orangethroat Darter Red Shiner Redbreast Sunfish Rio Grande Cichlid Rio Grande Cichlid Texas Shiner Western Mosquitofish Yellow Bullhead	567 N= 2 26 22 2 31 7 2 2 5 6 1 101 73 3 290	Type CY CY SF SF CY D CY SF	454 113 Method E S E E S S E S S E S S E 217	30 Tolerance T I T T	55 480 Trophic Gp. IF IF O IF IF IF IF IF IF IF IF IF IF O 256

Stream: U.Frio
Date: 10/9/03
Location: 13006

Stream Order:

Species	N=	Туре	Method	Tolerance	Trophic Gp.
Blacktail Shiner	8	CY	Е		IF
Blacktail Shiner	9	CY	S		IF
Central Stoneroller	29	CY	Е		Н
Channel Catfish	5		Е	Т	0
Green Sunfish	1	SF	Е	Т	Р
Greenthroated Darter	1	D	Е		IF
Longear Sunfish	12	SF	Е		IF
Mexican Tetra	4		Е		IF
Nueces Roundnose Minnow	4	CY	Е	I	0
Orangethroated Darter	3	D	Е		IF
Rebreast Sunfish	5	SF	Е		IF
Red Shiner	48	CY	Е	Т	IF
Red Shiner	31	CY	S	Т	IF
Rio Grande Cichlid	13		Е		IF
Texas Shiner	6	CY	Е		IF
Texas Shiner	25	CY	S		IF
Western Mosquitofish	1		Е	Т	IF
Yellow Bullhead	1		Е		0
	206		65	86	166
			141		

BIOTIC ASSESSMENT – FISH

Indices of Biotic Integrity – Statewide Criteria



Stream: U. Frio	Date: 9/4/02 Location: 10000	County: Real	
Category	Metric	Value	Score
Species Richness and Composition	1. Total number of fish species	12	3
	2. Number of darter species	1	3
	3. Number of sunfish species (exc. bass)	1	3
	4. Number of sucker speices	0	1
	5. Number of intolerant species	3	5
	6. Percentage of individuals as tolerants	25	1
	7. Percentage of individuals as omnivores	17	5
Trophic Composition	8. Percentage of individuals as insectivores	60	3
	9. Percentage of individuals as piscivores	6	5
	10. Number of individuals in sample	83	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:	42

Stream: U. Frio	Date: 9/5/02 Location: 13007	County: Uvalde	
Category	Metric	Value	Score
Species Richness and Composition	1. Total number of fish species	11	3
	2. Number of darter species	1	3
	3. Number of sunfish species (exc. bass)	3	5
	4. Number of sucker speices	0	1
	5. Number of intolerant species	2	3
	6. Percentage of individuals as tolerants	36	1
	7. Percentage of individuals as omnivores	34	3
Trophic Composition	8. Percentage of individuals as insectivores	59	3
	9. Percentage of individuals as piscivores	4	3
	10. Number of individuals in sample	80	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: LIMITED-INTERMEDIATE	Total Points:	38

Stream: U. Frio	Date: 9/3/02 Location: 13006	County: Uvalde	
Category	Metric	Value	Score
Species Richness and Composition	1. Total number of fish species	12	3
	2. Number of darter species	1	3
	3. Number of sunfish species (exc. bass)	2	5
	4. Number of sucker speices	0	1
	5. Number of intolerant species	2	3
	6. Percentage of individuals as tolerants	26	1
	7. Percentage of individuals as omnivores	15	5
Trophic Composition	8. Percentage of individuals as insectivores	80	3
	9. Percentage of individuals as piscivores	0	1
	10. Number of individuals in sample	422	5
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:	40

Date: 8/5/03 Location: 17892	County: Real	
Metric	Value	Score
1. Total # of fish species	15	3
2. Number of darter species	1	3
3. Number of sunfish species (exc. bass)	3	5
4. Number of sucker species	0	1
5. Number of intolerant species	3	5
6. Percentage of individuals as tolerants	5.35	3
7. Percentage of individuals as omnivores	3.57	5
8. Percentage of individuals as insectivores	93.8	5
9. Percentage of individuals as piscivores	0.49	1
10. Number of individuals in sample	617	5
11. Percentage of individuals as hybrids	0	5
12. Percentage of individuals with disease/anomolies	0	5
Aquatic Life Use: HIGH	Total Points:	46

Date: 8/5/03 Location: 13007	County: Uvalde)
Metric	Value	Score
1. Total # of fish species	14	3
2. Number of darter species	0	1
3. Number of sunfish species (exc. bass)	3	5
4. Number of sucker species	0	1
5. Number of intolerant species	1	3
6. Percentage of individuals as tolerants	19.6	3
7. Percentage of individuals as omnivores	5.53	5
8. Percentage of individuals as insectivores	77.89	3
9. Percentage of individuals as piscivores	0.5	1
10. Number of individuals in sample	199	3
11. Percentage of individuals as hybrids	0	5
12. Percentage of individuals with disease/anomolies	0	5
Aquatic Life Use: INTERMEDIATE-LIMITED	Total Points:	38

Date: 8/4/03	Location: 13006	County: Uvalde)
Metric	•	Value	Score
1. Total # of fish species		14	3
2. Number of darter species		1	3
3. Number of sunfish species (exc. ba	iss)	3	5
4. Number of sucker species		0	1
5. Number of intolerant species		2	3
6. Percentage of individuals as tolerar	9.6	3	
7. Percentage of individuals as omniv	3.7	5	
8. Percentage of individuals as insectivores		91.9	5
9. Percentage of individuals as piscivo	1.48	3	
10. Number of individuals in sample		135	3
11. Percentage of individuals as hybrids		0	5
12. Percentage of individuals with dise	ease/anomolies	0	5
Aquatic Life Use: INTERMEDIATE		Total Points:	44

Stream: U.Frio	Date: 10/9/03	Location: 17892	County: Real	
Category	Metrie	2	Value	Score
Species Richness and Composition	1. Total # of fish species		14	3
	2. Number of darter species		2	3
	3. Number of sunfish species (ex	c. bass)	1	3
	4. Number of sucker species		0	1
	5. Number of intolerant species		2	3
	6. Percentage of individuals as to	olerants	5.291005291	3
	7. Percentage of individuals as o	mnivores	9.700176367	5
Trophic Composition	8. Percentage of individuals as in	sectivores	84.65608466	5
	9. Percentage of individuals as p	iscivores	0.176366843	1
	10. Number of individuals in sam	ple	567	5
Fish Abundance and Condition	11. Percentage of individuals as	hybrids	0	5
	12. Percentage of individuals with	h disease/anomolies	0	5
	Aquatic Life Use: INTERMEDIAT	Ē	Total Points:	42

Stream: U.Frio	Date: 10/9/03	Location:	13007	County: Uvalde	
Category	Metric			Value	Score
Species Richness and Composition	1. Total # of fish species			12	3
	2. Number of darter species			1	3
	3. Number of sunfish species (exc	c. bass)		2	5
	4. Number of sucker species			0	1
	5. Number of intolerant species			1	3
	6. Percentage of individuals as tol	lerants		26.55172414	1
	7. Percentage of individuals as on	nnivores		11.72413793	5
Trophic Composition	8. Percentage of individuals as ins	sectivores		88.27586207	5
	9. Percentage of individuals as pis	scivores		0	1
	10. Number of individuals in samp	ble		290	5
Fish Abundance and Condition	11. Percentage of individuals as h	nybrids		0	5
	12. Percentage of individuals with	i disease/anon	nolies	0	5
	Aquatic Life Use: INTERMEDIATE	E		Total Points:	42

Stream: U.Frio	Date: 10/9/03	Location: 13006	County: Uvalde	
Category	Metric	;	Value	Score
Species Richness and Composition	1. Total # of fish species		15	3
	2. Number of darter species		2	3
	3. Number of sunfish species (ex	c. bass)	3	5
	4. Number of sucker species		0	1
	5. Number of intolerant species		1	3
	6. Percentage of individuals as to	lerants	41.74757282	1
	7. Percentage of individuals as or	mnivores	4.854368932	5
Trophic Composition	8. Percentage of individuals as in	sectivores	80.58252427	5
	9. Percentage of individuals as piscivores		0.485436893	1
	10. Number of individuals in same	ple	206	5
Fish Abundance and Condition	11. Percentage of individuals as h	nybrids	0	5
	12. Percentage of individuals with disease/anomolies		0	5
	Aquatic Life Use: INTERMEDIAT	E	Total Points:	42

BIOTIC ASSESSMENT – FISH

Indices of Biotic Integrity – Regional Criteria



Stream: U. Frio	Date: 9/4/02	Location: 17892	County: Real	
	Metric		Value	Score
1. Total number of fis	sh species		12	3
2. Number of native of	cyprinid species		3	3
3. Number of benthic	invertevore species		1	3
4. Number of sunfish	species		1	1
5. Number of intolera	int species		3	5
6. % of individuals as	tolerant species (exc	:. G. affinis)	16	5
7. % individuals as or	mnivores		17	1
8. % of individuals as invertevores			60	3
9. % of individuals as	piscivores		6	3
10. Number of indivuduals in a sample		83	-	
a. Number of indi	viduals/seine hual		2	1
b. Number of ind./min. electrofishing		4.6	3	
11. % of individuals a	as non-native species		0	5
12. % of individuals w	vith disease or other a	anomaly	0	5
Aquatic Life Use:	INTERMEDIATE		Total Points:	39

Stream: U. Frio	Date: 9/5/02	Location: 13007	County: Uvalde		
	Metric		Value	Score	
1. Total number of fis	sh species	11	3		
2. Number of native of	cyprinid species		4	3	
3. Number of benthic	invertevore species		1	3	
4. Number of sunfish	species		3	3	
5. Number of intolera	int species		2	5	
6. % of individuals as	tolerant species (exc	:. G. affinis)	35	3	
7. % individuals as or	mnivores	34	1		
8. % of individuals as	invertevores		59	3	
9. % of individuals as	piscivores		4	3	
10. Number of indivu	duals in a sample		80	-	
a. Number of indi	viduals/seine hual		No seine	5	
b. Number of ind.	/min. electrofishing		5.3	5	
11. % of individuals a	as non-native species	1.25	5		
12. % of individuals with disease or other anomaly 0					
Aquatic Life Use:	HIGH		Total Points:	42	

Stream: U. Frio	Date: 9/3/02	Location: 13006	County: Real	
	Metric		Value	Score
1. Total number of fis	sh species	12	3	
2. Number of native of	cyprinid species		5	5
3. Number of benthic	invertevore species		1	3
4. Number of sunfish	species		2	3
5. Number of intolera	int species		2	5
6. % of individuals as	s tolerant species (exc	. G. affinis)	17.3	5
7. % individuals as o	mnivores	15	3	
8. % of individuals as	s invertevores		80	5
9. % of individuals as	s piscivores		0	1
10. Number of indivu	duals in a sample		422	-
a. Number of indi	ividuals/seine hual		46.33	3
b. Number of ind.	/min. electrofishing		9.6	5
11. % of individuals a	as non-native species		0.24	5
12. % of individuals w	with disease or other a	anomaly	0	5
Aquatic Life Use:	HIGH		Total Points:	47

Stream: U.Frio (30) Date: 8/4/03 Location:17892	County: Real	
Metric	Value	Score
1. Total # of fish species	15	5
2.Total Number of cyprinid species	5	5
3. Number of benthic invertivore species	1	3
4. Number of sunfish species (exc. bass)	3	3
5. Number of intolerant species	3	5
6. Percentage of individuals as tolerants (exc. G.affinis)	2.4	5
7. Percentage of individuals as omnivores	3.57	5
8. Percentage of individuals as insectivores	93.8	5
9. Percentage of individuals as piscivores	0.49	1
10. Number of individuals in sample	~	~
a. Number of individuals/seine hual	95.3	5
b. Number of individuals/min. electroshocking	2.93	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:	51
Stream: U Frio (30) Date:8/5/03 Location:13007	County: Uvalde	
Metric	Value	Score
1 Total # of fish species	14	5
2. Total Number of cyprinid species	6	5
3. Number of benthic invertivore species	0	1
4. Number of sunfish species (exc. bass)	3	3
5. Number of intolerant species	1	3
6. Percentage of individuals as tolerants (exc. <i>G.affinis</i>)	17.6	5
7 Percentage of individuals as omnivores	5.5	5
8. Percentage of individuals as insectivores	77.9	5
9. Percentage of individuals as piscivores	0.5	1
10. Number of individuals in sample	~	~
a. Number of individuals/seine hual	14.7	1
b. Number of individuals/min. electroshocking	7.3	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: U.Frio (30) Date: 8/5/03 Location: 13006	County: Uvalde	
Metric	Value	Score
1. I Otal # OT fish species	14	5
2. I otal Number of cyprinid species	6	5
3. Number of bentnic invertivore species	1	3
4. Number of sunfish species (exc. bass)	3	3
5. Number of intolerant species	2	5
b. Percentage of individuals as tolerants (exc. <i>G.attinis</i>)	8.1	5
7. Percentage of individuals as omnivores	3.7	5
8. Percentage of individuals as insectivores	91.9	5
9. Percentage of individuals as piscivoles	1.40	I
a. Number of individuals in sample	~ 15.2	~
a. Number of individuals/serie riual	2.87	3
11. Percentage of individuals as non-native species	2.07	5
12 Percentage of individuals as non-native species	0.74	5
	Total Dainta:	40
	TOTAL POINTS:	49

Stream: U.Frio (30) Date: 10/9/03 Location: 17892	County: Real	
Metric	Value	Score
1. Total # of fish species	14	5
2.Total Number of cyprinid species	5	5
3. Number of benthic invertivore species	2	5
4. Number of sunfish species (exc. bass)	1	1
5. Number of intolerant species	2	5
Percentage of individuals as tolerants (exc. G.affinis)	4.05643739	5
7. Percentage of individuals as omnivores	9.700176367	3
8. Percentage of individuals as insectivores	84.65608466	5
9. Percentage of individuals as piscivores	0.176366843	1
10. Number of individuals in sample		~
a. Number of individuals/seine hual	75.66666667	5
 b. Number of individuals/min. electroshocking 	7.533333333	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:	50

Stream: U.Frio (30) Date: 10/9/03 Location:13007	County: Uvalde	
Metric	Value	Score
1. Total # of fish species	12	3
2.Total Number of cyprinid species	5	5
3. Number of benthic invertivore species	1	3
4. Number of sunfish species (exc. bass)	2	3
5. Number of intolerant species	1	3
6. Percentage of individuals as tolerants (exc. G.affinis)	1.379310345	5
7. Percentage of individuals as omnivores	11.72413793	3
8. Percentage of individuals as insectivores	88.27586207	5
9. Percentage of individuals as piscivores	0	1
10. Number of individuals in sample		~
a. Number of individuals/seine hual	36.16666667	1
 b. Number of individuals/min. electroshocking 	4.866666667	3
11. Percentage of individuals as non-native species	1.724137931	3
12. Percentage of individuals with disease/anomolies	0	5
Aquatic Life Use: INTERMEDIATE	Total Points:	41

Stream: U.Frio (30) Date: 10/9/03 Location: 13006	County: Uvalde	
Metric	Value	Score
1. Total # of fish species	15	5
2.Total Number of cyprinid species	5	5
3. Number of benthic invertivore species	2	5
4. Number of sunfish species (exc. bass)	3	3
5. Number of intolerant species	1	3
Percentage of individuals as tolerants (exc. G.affinis)	41.26213592	3
7. Percentage of individuals as omnivores	4.854368932	5
8. Percentage of individuals as insectivores	80.58252427	5
9. Percentage of individuals as piscivores	0.485436893	1
10. Number of individuals in sample		~
a. Number of individuals/seine hual	10.83333333	1
 b. Number of individuals/min. electroshocking 	9.4	5
11. Percentage of individuals as non-native species	2.427184466	3
12. Percentage of individuals with disease/anomolies	0	5
Aquatic Life Use: HIGH	Total Points:	46

BIOTIC ASSESSMENT – BENTHIC MACROINVERTEBRATES

Species Lists and Preliminary Data Manipulation



Benthic Macroinvertrebrates - Kick Sample (Qualitative)

Stream	Date	ID	Таха	N=	Func.Gp.	Tolerance	HBI
U.Frio	9/4/02	10000	Odonata-Coenagrionidae-Argia	5	Р	6	0.3370787
			Ephemeroptera-Tricorythidae-Leptohypes	5	CG/SCR	2	0.1123596
			Ephemeroptera-Leptophlebiidae-Thraulodes	28	CG/SCR	2	0.6292135
Func.Gp	N=		Ephemeroptera-Heptageniidae-Stenonema	2	SCR/CG	4	0.0898876
Р	10		Ephemeroptera-Baetidae-Baetis	11	SCR/CG	4	0.494382
SCR	31		Hemiptera-Naucoridae-Ambrysus	3	Р	-	-
CG	34		Trichoptera-Hydropsychidae-Cheumatopsyche	9	FC	6	0.6067416
FC	17		Trichoptera-Philopotamidae-Chimarra	8	FC	3	0.2696629
SHR	0		Coleoptera-Elmidae-Macrelmis (L) (Elsianus)	3	CG/SCR	2	0.0674157
			Coleoptera-Elmidae-Hexacylloepus (A)	6	CG/SCR	2	0.1348315
			Coleoptera-ElmidaeMicrocylloepus (A)	6	CG/SCR	2	0.1348315
			Coleoptera-Elmidae-Neoelmis (A)	1	CG/SCR	2	0.0224719
			Diptera-Athericeridae-Atherix	1	Р	4	0.0449438
			Oligochaeta	1	CG	8	0.0898876
			Tricladida (Oligochaeta)	2	CG	8	0.1797753
			Gastropoda (Limnophila)-Planorbidae-Drepanotrema	2	-	-	-
		_	Hydracarina	1	Р	6	0.0674157
			Total	92	89		3.2808989
			Intolerant/Tolerant	3.94			

Stream	Date	ID	Таха	N=	Func.Gp.	Tolerance	HBI
U.Frio	9/5/02	13007	Odonata-Coenagrionidae-Argia	6	Р	6	0.3564356
			Ephemeroptera-Leptophlebiidae-Thraulodes	36	CG/SCR	2	0.7128713
			Ephemeroptera-Baetidae-Baetis	8	SCR/CG	4	0.3168317
Func.Gp	N=		Ephemeroptera-Baetidae-Camelobaetidius (Dactylobaetis)	2	SCR/CG	4	0.0792079
Р	20		Hemiptera-Naucoridae-Ambrysus	3	Р	-	-
SCR	37		Hemiptera-Naucoridae-Cryphocricos	2	Р	-	-
CG	37		Megaloptera-Corydalidae-Corydalus	5	Р	6	0.2970297
FC	10		Trichoptera-Hydropsychidae-Cheumatopsyche	1	FC	6	0.0594059
SHR	2		Trichoptera-Philopotamidae-Chimarra	9	FC	3	0.2673267
			Trichoptera-Odonticeridae-Marilia	2	SHR	0	0
			Coleoptera-Elmidae-Macrelmis (L) (Elsianus)	13	CG/SCR	2	0.2574257
			Coleoptera-Elmidae-Macrelmis (A) (Elsianus)	2	CG/SCR	2	0.039604
			Coleoptera-Elmidae-Hexacylloepus (A)	1	CG/SCR	2	0.019802
			Coleoptera-Elmidae Microcylloepus (A)	1	CG/SCR	2	0.019802
			Diptera-Chironomidae	11	SCR/CG	4	0.4356436
			Diptera-Tabanidae-Tabanus	1	Р	7	0.0693069
			Tricladida (Dugesia)	3	Р	7.5	0.2227723
			Total	106	101		3.1534653
			Intolerant/Tolerant	5.31			

Benthic Macroinvertrebrates - Kick Sample (Qualitative)

Stream	Date	ID	Таха	N=	Func.Gp.	Tolerance	HBI
U.Frio	9/3/02	13006	Odonata-Coenagrionidae-Argia	18	Р	6	1.3170732
			Ephemeroptera-Tricorythidae-Leptohypes	1	CG/SCR	2	0.0243902
			Ephemeroptera-Leptophlebiidae-Thraulodes	11	CG/SCR	2	0.2682927
Func.Gp	N=		Ephemeroptera-Heptageniidae-Stenonema	2	SCR/CG	4	0.097561
Р	28		Hemiptera-Naucoridae-Ambrysus	1	Р	-	-
SCR	21.5		Hemiptera-Naucoridae-Cryphocricos	1	Р	-	-
CG	21.5		Megaloptera-Corydalidae-Corydalus	8	Р	6	0.5853659
FC	12		Trichoptera-Hydropsychidae-Cheumatopsyche	2	FC	6	0.1463415
SHR	1		Trichoptera-Philopotamidae-Chimarra	9	FC	3	0.3292683
			Trichoptera-Odonticeridae-Marilia	1	SHR	0	0
			Coleoptera-Elmidae-Macrelmis (A) (Elsianus)	13	CG/SCR	2	0.3170732
			Coleoptera-Elmidae-Macrelmis (L) (Elsianus)	10	CG/SCR	2	0.2439024
			Coleoptera-Elmidae-Neoelmis	2	CG/SCR	2	0.0487805
			Diptera-Chironomidae	4	SCR/CG	4	0.195122
		_	Diptera-Simulidae-Simulium	1	FC	4	0.0487805
			Total	84	82		3.6219512
			Intolerant/Tolerant	1.93			
Benthic Macroinvertebrates - Kick Sample (Qualitative)

Stream: U.Frio			Species	N=	Tolerance	FFG	НВІ
Date: 08/05/03			Argia	5	6	Р	0.309278351
Location: 17892			Hetaerina	4	6	Р	0.24742268
			Tricorythodes	12	5	CG	0.618556701
	Р	20	Leptohypes	2	2	CG/SCR	0.041237113
	SCR	20.5	Baetis	8	4	SCR/CG	0.329896907
	CG	34.5	Isonychia	7	3	FC	0.216494845
	FC	28	Thraulodes	16	2	CG/SCR	0.329896907
	SHR	3	Ambrysus	5	-	Р	-
		106	Cryphocricos	2	-	Р	-
			Cheumatopsyche	19	6	FC	1.175257732
			Chimarra	2	3	FC	0.06185567
			Marilia	3	0	SHR	0
			Microcylloepus (A)	4	2	CG/SCR	0.082474227
			Hexacylloepus (A)	1	2	CG/SCR	0.020618557
			Macrelmis (L)	6	2	CG/SCR	0.12371134
			Macrelmis (A)	3	2	CG/SCR	0.06185567
			Celina (A)	1	-	Р	-
			Lutrochus (A)	1	-	CG	-
			Helichus (A)	1	4	SCR/CG	0.041237113
			Hydracarina	1	6	Р	0.06185567
			Oligochaeta	1	8	CG	0.082474227
			Tricladida	2	7.5	Р	0.154639175
				106	2.03125		3.958762887
Stream: U.Frio Date: 08/05/03			Species Argia	N= 19	Tolerance 6	FFG P	HBI 1.151515152
Location: 13007			Brechmorhoga	1	6	Р	0.060606061
			Tricorythodes	2	5	CG	0.101010101
	Р	30.6666667	Camelobaetidius	1	4	SCR/CG	0.04040404
	SCR	25	Isonychia	3	3	FC	0.090909091
	CG	13.6666667	Cryphocricos	1	-	Р	-
	FC	32.6666667	Corydalus	8	6	Р	0.484848485
	SHR	0	Cheumatopsyche	2	6	FC	0.121212121
		102	Chimarra	26	3	FC	0.787878788
			Microcylloepus (A)	4	2	CG/SCR	0.080808081
			Microcylloepus (L)	2	2	CG/SCR	0.04040404
			Hexacylloepus (A)	1	2	CG/SCR	0.02020202
			Macrelmis (L)	8	2	CG/SCR	0.161616162
			Macrelmis (A)	2	2	CG/SCR	0.04040404
			Lutrochus (A)	1	-	CG	-
			Lutrochus (L)	1	-	CG	-
			Chironomidae	2	6	P/CG/FC	0.121212121
			Simulium	1	4	FC	0.04040404
			Atherix	1	7	Р	0.070707071
			Physella	15	9	SCR	1.363636364
			Planorbula	1	7	SCR	0.070707071
		-		102	1.02040816		3 181818182

Stream: U.Frio			Species	N=	Tolerance	FFG	HBI
Date: 08/06/03			Argia	15	6	Р	1.011235955
Location: 13006			Tricorythodes	4	5	CG	0.224719101
			Leptohypes	1	2	CG/SCR	0.02247191
	Ρ	39.6666667	Camelobaetidius	9	4	SCR/CG	0.404494382
S	CR	13.5	Baetodes	1	4	SCR	0.04494382
	CG	23.5	Isonychia	3	3	FC	0.101123596
	FC	30.6666667	Ambrysus	2	-	Р	-
S	HR	0.66666667	Cryphocricos	11	-	Р	-
		108	Corydalus	4	6	Р	0.269662921
			Cheumatopsyche	12	6	FC	0.808988764
			Hydropsyche	1	5	FC	0.056179775
			Chimarra	12	3	FC	0.404494382
			Cyrnellus	1			-
			Neureclipsis	2	4	FC/SHR/P	0.08988764
			Microcylloepus (A)	8	2	CG/SCR	0.179775281
			Microcylloepus (L)	5	2	CG/SCR	0.112359551
			Lutrochus (A)	1	-	CG	-
			Lutrochus (L)	5	-	CG	-
			Chironomidae	6	6	P/CG/FC	0.404494382
			Atherix	5	7	Р	0.393258427
			Physella	1	9	SCR	0.101123596
		-		108	1.06976744		4.629213483

Benthic Macroinvertebrates - Kick Sample (Qualitative)

Stream: U.Frio			Species	N=	Tolerance	FFG	HBI
Date: 10/9/03			Argia	9	6	Р	0.519230769
Location: 17892			Tricorythodes	11	5	CG	0.528846154
			Camelobaetidius	4	4	SCR/CG	0.153846154
	Р	20.333333	Fallceon	10	4	SCR/CG	0.384615385
:	SCR	20	Baetodes	1	4	SCR	0.038461538
	CG	30.333333	Stenonema	3	4	SCR/CG	0.115384615
	FC	38.333333	Isonychia	16	3	FC	0.461538462
:	SHR	0	Thraulodes	17	2	SCR/CG	0.326923077
		109	Ambrysus	3	-	Р	-
			Cryphocricos	2	-	Р	-
			Corydalus	2	6	Р	0.115384615
			Cheumatopsyche	2	6	FC	0.115384615
			Chimarra	15	3	FC	0.432692308
			Cernotina	2	6	Р	0.115384615
			Helichus (A)	4	4	SCR/CG	0.153846154
			Chironomidae	1	6	P/CG/FC	0.057692308
			Simulium	5	4	FC	0.192307692
			Hirudinea	1	8	Р	0.076923077
		_	Tricladida	1	7.5	Р	0.072115385
				104	4.77777778		3.860576923
-							
Stream: U.Frio			Species	N=	Tolerance	FFG	HBI
Date: 10/9/03			Argia	17	6	Р	0.910714286
Location: 13007			Tricorythodes	2	5	CG	0.089285714
	_		Leptohypes	1	2	CG	0.017857143
	Р	24.666667	Camelobaetidius	2	4	SCR/CG	0.071428571
Ś	SCR	17	Fallceon	3	4	SCR/CG	0.107142857
	CG	22.666667	Stenonema	8	4	SCR/CG	0.285714286
	FC	48.666667	Isonychia	7	3	FC	0.1875
Ś	SHR	0	Thraulodes	1	2	SCR/CG	0.017857143
		113	Corydalus	2	6	Р	0.107142857
			Chimarra	32	3	FC	0.857142857
			Microcylloepus (A)	1	2	SCR/CG	0.017857143
			Macrelmis	19	2	SCR/CG	0.339285714
			Lutrochus (L)	1	-	CG	-
			Chironomidae	2	6	P/CG/FC	0.107142857
			Simulium	9	4	FC	0.321428571
			Oligochaeta	1	8	CG	0.071428571
			Tricladida	5	7.5	Р	0.334821429
		-		112	3.14814815		3.84375

Stream: U.Frio		Species	N=	Tolerance	FFG	HBI
Date: 10/9/03		Argia	27	6	Р	1.62
Location: 13006		Leptohypes	1	2	CG	0.02
		Camelobaetidius	2	4	SCR/CG	0.08
F	45.333333	Fallceon	6	4	SCR/CG	0.24
SCF	27.5	Stenonema	13	4	SCR/CG	0.52
CG	29.833333	Isonychia	2	3	FC	0.06
FC	9.3333333	Thraulodes	17	2	SCR/CG	0.34
SHF	с О	Choroterpes	1	2	SCR/CG	0.02
	112	Caenis	1	7	CG/SCR	0.07
		Ambrysus	7	-	Р	-
		Cryphocricos	4	-	Р	-
		Corydalus	2	6	Р	0.12
		Cheumatopsyche	6	6	FC	0.36
		Chimarra	1	3	FC	0.03
		Macrelmis (L)	14	2	SCR/CG	0.28
		Lutrochus (L)	1	-	CG	-
		Helichus (A)	1	4	SCR/CG	0.04
		Chironomidae	1	6	P/CG/FC	0.06
		Tricladida	5	7.5	Р	0.375
	_		100	1.38095238		4.235

BIOTIC ASSESSMENT – BENTHIC MACROINVERTEBRATES

Rapid Bioassessment Protocol



Stream: U.Frio Date: 9/4/02 Location: 10000	County: Real	
Metric	Value	Score
1. Taxa Richness	17	3
2. EPT Taxa Abundance	6	2
3. Biotic Index (HBI)	3.28	4
4. % Chironomidae	0	1
5. % Dominant Taxon	30.43478261	3
6. % Dominant FFG	36.95652174	3
7. % Predators	10.86956522	4
8. Ratio of Intolerant: Tolerant Taxa	3.94	3
9. % of Total Trichoptera as Hydropsychidae	52.94117647	2
10. # of Non-insect Taxa	4	3
11. % Collector-Gatherers	36.95652174	2
12. % of Total Number as Elmidae	14.13043478	3
Aqautic Life Use: HIGH	Total Score:	33

Stream: U.Frio Date: 9/5/02 Location: 13007	County: Uvald	е
Metric	Value	Score
1. Taxa Richness	16	3
2. EPT Taxa Abundance	6	2
3. Biotic Index (HBI)	3.15	4
4. % Chironomidae	10.37735849	2
5. % Dominant Taxon	33.96226415	2
6. % Dominant FFG	34.90566038	4
7. % Predators	18.86792453	3
8. Ratio of Intolerant:Tolerant Taxa	5.31	4
9. % of Total Trichoptera as Hydropsychidae	8.333333333	4
10. # of Non-insect Taxa	1	1
11. % Collector-Gatherers	34.90566038	2
12. % of Total Number as Elmidae	16.03773585	3
Aqautic Life Use: HIGH	Total Score:	34

Stream: U.Frio Date: 9/3/02 Location: 13006 County: Uvalde			de		
		Metric		Value	Score
1. Taxa Richness				14	2
2. EPT Taxa Abund	dance			6	2
3. Biotic Index (HB	I)			3.62	4
4. % Chironomidae	9			4.761904762	3
5. % Dominant Taxon				21.42857143	4
6. % Dominant FFG			33.33333333	4	
7. % Predators				33.33333333	2
8. Ratio of Intolerar	nt:Tolerant Taxa			1.93	2
9. % of Total Tricho	optera as Hydrops	ychidae		16.66666667	4
10. # of Non-insect Taxa			0	1	
11. % Collector-Gatherers			25.5952381	3	
12. % of Total Num	nber as Elmidae			29.76190476	2
Aqautic Life Use:	HIGH			Total Score:	33

Stream: U.Frio Date: 8/5/03 Location: 17892	County: Real	
Metric	Value	Score
1. Taxa Richness	21	3
2. EPT Taxa Abundance	8	3
3. Biotic Index (HBI)	3.96	3
4. % Chironomidae	0	1
5. % Dominant Taxon	17.9245283	4
6. % Dominant FFG	32.54716981	4
7. % Predators	18.86792453	3
8. Ratio of Intolerant:Tolerant Taxa	2.03	2
9. % of Total Trichoptera as Hydropsychidae	79.16666667	1
10. # of Non-insect Taxa	3	2
11. % Collector-Gatherers	32.54716981	2
12. % of Total Number as Elmidae	13.20754717	3
Aqautic Life Use: HIGH	Total Score:	31

Stream: U.Frio Date: 8/5/03 Location: 13007	County: Uvald	е
Metric	Value	Score
1. Taxa Richness	18	3
2. EPT Taxa Abundance	5	2
3. Biotic Index (HBI)	3.18	4
4. % Chironomidae	1.960784314	4
5. % Dominant Taxon	25.49019608	3
6. % Dominant FFG	32.02647059	4
7. % Predators	30.06568627	2
8. Ratio of Intolerant:Tolerant Taxa	1.02	1
9. % of Total Trichoptera as Hydropsychidae	7.142857143	4
10. # of Non-insect Taxa	2	2
11. % Collector-Gatherers	13.39901961	4
12. % of Total Number as Elmidae	16.66666667	3
Aqautic Life Use: HIGH	Total Score:	36

Stream: U.Frio Date: 8/6/03 Location: 13006	County: Uval	de
Metric	Value	Score
1. Taxa Richness	19	3
2. EPT Taxa Abundance	10	4
3. Biotic Index (HBI)	4.63	2
4. % Chironomidae	5.555555556	3
5. % Dominant Taxon	13.88888889	4
6. % Dominant FFG	36.7287037	3
7. % Predators	36.7287037	1
8. Ratio of Intolerant:Tolerant Taxa	1.07	1
9. % of Total Trichoptera as Hydropsychidae	46.42857143	3
10. # of Non-insect Taxa	1	1
11. % Collector-Gatherers	21.75925926	3
12. % of Total Number as Elmidae	12.03703704	3
Aqautic Life Use: HIGH	Total Score:	31

Stream: U.Frio Date: 10/9/03 Location: 17892	County: Real	
Metric	Value	Score
1. Taxa Richness	19	3
2. EPT Taxa Abundance	10	4
3. Biotic Index (HBI)	3.86	3
4. % Chironomidae	0.917431193	4
5. % Dominant Taxon	15.59633028	4
6. % Dominant FFG	35.13761468	4
7. % Predators	18.65137615	3
8. Ratio of Intolerant:Tolerant Taxa	4.78	3
9. % of Total Trichoptera as Hydropsychidae	10.52631579	4
10. # of Non-insect Taxa	2	2
11. % Collector-Gatherers	27.79816514	3
12. % of Total Number as Elmidae	0	1
Aqautic Life Use: EXCEPTIONAL	Total Score:	38

Stream: U.Frio	Date: 10/9/03	Location: 13007		County: Uvald	е
		Metric		Value	Score
1. Taxa Richness	1. Taxa Richness				3
2. EPT Taxa Abun	dance			8	3
3. Biotic Index (HB	81)			3.84	3
4. % Chironomidae	е			1.769911504	4
5. % Dominant Taxon			28.31858407	3	
6. % Dominant FFG			43.07079646	3	
7. % Predators			21.83185841	3	
8. Ratio of Intolera	nt:Tolerant Taxa			3.15	2
9. % of Total Trich	optera as Hydrop	sychidae		0	4
10. # of Non-insect Taxa			2	2	
11. % Collector-Gatherers			20.0619469	3	
12. % of Total Nur	12. % of Total Number as Elmidae				
Aqautic Life Use:	HIGH			Total Score:	36

Stream: U.Frio Date: 10/9/03 Location: 13006	County: Uval	de
Metric	Value	Score
1. Taxa Richness	19	3
2. EPT Taxa Abundance	10	4
3. Biotic Index (HBI)	4.24	3
4. % Chironomidae	0.892857143	4
5. % Dominant Taxon	24.10714286	3
6. % Dominant FFG	40.44642857	3
7. % Predators	40.44642857	1
8. Ratio of Intolerant:Tolerant Taxa	1.38	1
9. % of Total Trichoptera as Hydropsychidae	85.71428571	1
10. # of Non-insect Taxa	1	1
11. % Collector-Gatherers	26.63392857	3
12. % of Total Number as Elmidae	12.5	3
Aqautic Life Use: HIGH	Total Score:	30

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 (%)	1	halweg Depth:	Strea	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		Dom Left Righ	ninant Ty Bank: at Bank:	pes Ripar	ian Vege	etation:	<u> </u>				% Gravel or Larg	er
	Algae or Ma (Circle One) Abundant (Rare Absen	crophytes Common t	Width of Natura Vegetation (m) LB: RB:	l Buffer	Instre	am Cove	er Types:			v			¥)		% Instream Cover	F
Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	1	Stream Depths (m) at Points Across Transect Thalweg Depth:									Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)
	Habitat Typ	e (Circle	Dominant Subst	rate Type		Don	uinant Ty	pes Ripar	ian Veg	etation:				A	% 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 (%)	т	halweg D	epth:	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			Domin Left Ba Right I	ant Type ank: Bank:	s Riparia	m Vegel	ation:			-		% Gravel or Large	er
		Algae or Mac (Circle One) Abundant C Rare Absen	crophytes common	Width of Natura Vegetation (m) LB: RB:	l Buffer	I	Instream	n Cover 1	Гуреs:								% Instream Cover	
	Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)		Thalweg I	Depth:	Stream	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 H	ant Types ink: 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	Ŀ	nstrean	n Cover T	ſypes:								% Instream Cover	-
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9	and the second second	Habitat Type One) Riffle I Glide Pool	(Circle Run	Dominant Substr	rate Type			Domina Left Ba Right E	ant Types ink: Bank:	s Riparia	n Veget	ation:					% Gravel or Large	r
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		Algae or Mac (Circle One) Abundant C Rare Absent	crophytes ommon	Width of Natural Vegetation (m) LB: RB:	Natural Buffer Instream Cover Types:									% 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 (%)	1	halweg Depth:	Strea	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	crophytes Common t	Width of Natura Vegetation (m) LB: RB:	l Buffer	Instre	am Cove	er Types:			v			¥)		% Instream Cover	F
Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	1	Stream Depths (m) at Points Across Transect Thalweg Depth:									Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)
	Habitat Typ	e (Circle	Dominant Subst	rate Type		Don	uinant Ty	pes Ripar	ian Veg	etation:				A	% 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 (%)	т	halweg D	epth:	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 Absent	crophytes ommon	Width of Natural Vegetation (m) LB: RB:	Natural Buffer Instream Cover Types:									% 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 (%)	1	halweg Depth:	Strea	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		Dom Left Righ	ninant Ty Bank: at Bank:	pes Ripar	ian Vege	etation:	<u> </u>				% Gravel or Larg	er
	Algae or Ma (Circle One) Abundant (Rare Absen	crophytes Common t	Width of Natura Vegetation (m) LB: RB:	l Buffer	Instre	am Cove	er Types:			v			¥)		% Instream Cover	F
Location of Transect	Stream Width (m)	Left Bank Slope (°)	Left Bank Erosion Potential (%)	1	Stream Depths (m) at Points Across Transect Thalweg Depth:									Right Bank Slope (°)	Right Bank Erosion Potential (%)	Tree Canopy (%)
	Habitat Typ	e (Circle	Dominant Subst	rate Type		Don	uinant Ty	pes Ripar	ian Veg	etation:				A	% 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 (%)	т	halweg D	epth:	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	crophytes common	Width of Natura Vegetation (m) LB: RB:	l Buffer	I	Instream	n Cover 1	Гуреs:								% Instream Cover	
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9	and the second second	Habitat Type One) Riffle I Glide Pool	(Circle Run	Dominant Substr	rate Type			Domina Left Ba Right E	ant Types ink: Bank:	s Riparia	n Veget	ation:					% Gravel or Large	r
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		Algae or Mac (Circle One) Abundant C Rare Absent	crophytes ommon	Width of Natural Vegetation (m) LB: RB:	Natural Buffer Instream Cover Types:									% Instream Cover				

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Part I - Stream Physical Characteristics Worksheet

WM -

Band

Run -

Pool

R. CPL - + Slide -

> Stream Ufre Location of site: some Length of stream reach MSand Observers: Ju R. Date: 2/9 Mine: Z Wenther conditions: 5

Stream Segment No .: _ Observed Stream Uses: 74.4. Acsthetics (circle one): (1) wilderness (2) maiurel (3) common (4) effensive

Stream Type (Circle One), perenulation intermittant w/ perenalal pools Stream Bends: No. Well Defined.; No. Moderately Defined.; No. Poorly Defined.

Channel Obstructions/Modifications: 16,200 P. No. of Riffles: ... Channel Flow Status (circle oue): Migh modesn't for no flow

Riparian Vegetation (%): Left Bauk: Trees_ Shivibs_Grasses, Forbs_Cuit, Fields_Other_ Richt Rank: Trees_Shivibs_Grasses, Forbs_Cuit, Fields_Other_

	Canopy Canopy (%)	14			Campy Campy (%)	5.1	1940	.340
	Right Bark Evosion Pergagint	10%	R Oravel or Lag	% Insteam Cerr	Bank Erstion Potential	2%	% General or La	% Insteam Co
	Right Bank Slope	190	-	5, Cal	Right Beck Signe	30		4
	Surrant Depths (m) at Points Across Thansact or Depth	100 0.10 0.18 0.12 0.13 0.28 0.98 0.10 000 8	Dominant Types Ripatian Vegesalion Left Bank, "Port", Left, "Solido" Right Bank, 1971, 2011, 600	tention Covertypes Colle, Roud Unel, Cornerl, Macumply be	Stream Depths (m) at Polices Across Transect Across Deptic	5 040 0.48 0.74 0.05 0.26 0.26 0.76 0.11 2.01	Dominant Types Riparian Vegentation: Lett Banks: Lost 4000 FF	Instream Cover Types
- Ollier	Table	0.06 200	ute Type	Briller	That	1.0 200	off are	Buffer
TON CALL FURD	Brack Erosion Potential	0%	Dominant Solver Cololy Is	Width of Menand Vegetation (m) LD: RB: 72	Bank Ension Percental	85%	Dominants Solution	Verention (m) Verention (m)
DJ 'esentito	Left Blatk Slope	5.	(Cletle tan	rophysis	Left Bank Signe	.69	(Circle	rephytes
""entrance ""e	Streem Width (m)	8.45m	Hable First	Algase or Mad (Circle One) Abundent O Rarf Misent	Stream	8.Bm	Habital Type One) Nume I Clifty Peel	Algae or Mac
SATE INVITE TANGET	Laccolen ef Transect		5		Location of Transect	102 100 M	darn frus	

Free toopy	N.			itte aopy Sol	m			Sile Sile	-5		Normal Party of Contract of Co	ation (S)	0% (85/17)		* of
Right Beek Erseion Potenlial	40% 5	is Grout or Largor 90%	5 Instream Cover 36°6	Bank Elevitan	20%	A Drivel or Linger	14 Innuseun Cower 145 1/2	Ratik Peerlen Cr	5% 2.	the Climited or Linger 100%	% Insurant Cores	Rank Erepisen Ca	25 5	S Gavel or Larger	Satesticam Cover
Stream Doplits (m) at Points Across Transcol Thereag Reptit: 0+756	0.63 0.57 0.53 0.53 0.51 0.10 0.21 0.18 0.13 0.02 50	Left Bendies I Types Riquitar Yegetalign: Left Bender Syr 65 to 1905	marine covertyper Cathole, Coravel, Rowls, Algue Art. A. H. A.	Streman Dayling (au) at Politish Acarean Transcot Range Singh	0.20 1.61 1.52 1.36 1.35 1.05 0.41 0.59 0.61 0.02 7	Douchent Types Repartien Version: 35 0 . Left Barks: One F 55 20 F 400	Burein Constrate Our of Underwork Algac	Stream Depths (au) at Points Averas Transact Barloos Deeth: 5.400	0.240.36 0.42 0.45 0.44 0.33 0. 30 020 .12 0.02 9	Dominant Types Unperior Veperations Left March 207 20 F	Algue, Cottole, Gravel	Sucom Depta (24) at Points Across Transcet Reals Thalwas Depts 1 4.0.1	74 115 153 119 92 50 28 46 60 70 150	Developent Types Represent Vogenatione Left Back "Yo "a trans 1 600" a struct. 10" a of her r Right Back 2." A trans 600" a struct 28" 2. " for b	mannana Cover Typux + Unablicit bank
Ladi Election Potential	80% 1.30	Dominant Substrate Type Coddiale	 Width of Nummel Beller Vegeoroop (10) UB , 27 BB : 72 O 	Bank Tronton Potentiat	19.0 7.52	Developent Sebarate Type Gravel	With of Nancel Buffer Vergension (no) L.St. A.B.B. ALO	Bank Broslon Parenica 1950	100 2010	Derviount Solaurie Type Cobble	$\left \begin{array}{c} {\rm Width of Newedd Buffer}\\ {\rm Vegetalion (nt)}\\ {\rm LB}_{{\rm T}}, {\rm RB}_{{\rm N}}, \mathcal{AL} \mathcal{D}\\ {\rm T}_{{\rm H}}, {\rm T}_{{\rm A}}, {\rm RB}, \mathcal{AL} \mathcal{D} \end{array}\right $	Left Heak Houlon Petersia	35 3	Domission Statemon Type 9702, V.C.	Vigital Matural Baffar Vegetation (m)
Stream Laft Widdli Bank Imb Slope	13 But 54	Habits Type (Circle One) Buttle Run Gildo Peel	Algon of Miscophyse ICircle One) Algoridant Conversa OTED Absent	Seeath Widda Bank and Signa	13.1m 118°	Holdin Type (Chebo One Billing Run Gilder Folly	Algae or Macrephyse ICircle Over Numbran Common Rure Absent	Savam Left Widds Bank Ond Signa	13.Im 12.	Cond Right TyperChoice Calles Post	Algas or Mecrophyter (Circle Cone) Aligndend Camman Aligndend Camman	Streams Left Width Hark (m) Slear	34 11	Hablar Type (Clecle One) Juille You Glide Poel	Aligne of Macrophysic (Clerk One) Abundant Commun
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Part I Strulo3

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

Part I - Stream Physical Characteristics Worksheet

P. bend

Pur

Slide

Bern 9001

RIMIL

n Date: \$14 Time: 8 Weather conditions: Observers: Jul 34

Location of site VFort Length of success reach, Stream: USria

Stream Segment No ... Observed Stream User: 1.4 4. Atsthetics (circle one); (1) wilderness (2) natural (3) common (4) offensive

Stwam Type (Circle One): persumial or intermittent w/ parennial pools Sueam Bender No. Well Defined_; i Na. Modennely Defined_; No. Poorly Defined_

No. of Riffless.... Channel Flow Status (circle one): high finderath low no flow Channel Obstructions/Modifications

Contrat Contrat Canopy (%) 111 18 % Convel or Larger % Gravel or Larger % Instream Covey % Instraits Cover Bank Beelon Potential Right Bark Einsion Potential 95% 00 0 0 Stopa Stopa 2 93 h of her Dominant Types Riparties Vegenties . 50%, of heav 08 Dominant Types Riparina Vegenation mavel, abble boulder, was, 100ths, a lig al 959, other Stream Depths (m) at Points Across Transet 30 Summu Depths (nu) at-Points Across Thansact Right Banks 5" b 4100. 2% alerts 64 0.55 90 2 1/1/14 200 Right Books 5º/5 thee 35 75 gravel, abbe, alone. S Indicate Cover Types: Inducent Cover Types: 19 C 30 Theires Depth Thubwer Drug 5 0 Riportan Vegenation (%): Left Bank: Trees_Shrubs_Grasses, Foths_Cult, Fields_Other_ Right Bank: Trees_Shrubs, Grasses, Foths_Cult, Fields_Other_ Width of Notural Buffer Vergelation (m) LBs / 200 Dominant Substitute Type Dominant Substitute Tyge beerock Width of Natural Buffer Vegetation (m) 010 3 Left Bank Broslon Possadal (%) Loft Back Ereston Potencial (%) COBDIE 200 Algee er Meczophytes (Clirole Ons)-Abundan (Centenen) Rare Abernet Algae et Maorophytes (Clircle One) Algardent Centrana Rarte Anstrut 日前の Sector -Hablant Type (Circle One) Bilding Boon Gilde Pool) Habitat Type (Circle One) Rithin Run Glide Fool) v Streem Width Scretch Width (m) 5 100 m under Lecriten of Transect Loenton of Transet @ Sar 2.5 õ 0 (/BWA 20

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and a state	Nev.	Ĩ	Night Peak Slope	E			A State	89	office .	phyles	March 1		other	Andor	
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Part I - Stream Physical Characteristics Worksheet

Colide

WD Bered

Bend

Louis

Pool

Length of stream reach. 700 Ar Observers: Jhos 5 12 Dates 6 7 mer A Wenther conditional S Strentm: L. L. r., " 1985 Location of site;

Stream Segment No.._ Observed Stream Uses._____Acathetics (circle ane); (1) wilderness (2) natural (3) common (4) offensive Stream Type (Circle One);//ferrenulai)or internuttent w/ persualal pools Stream Bends: No. Well Defined, ; No. Modernely Defined.; No. Foorly Defined,

Channel Obstructions/Modtherfour: Does No. of Riffles ... Channel Flow \$tatus (circle one); Mithynodesute for no Row

Riparlan Vegenation (%): Left Bauki: Trees, Sprubs, Grasses, Porbs, Oult Fields Other Bride Bauki: Trees, Condit Grasses, Porbs, Oult, Fields, Other

		- 1	and a lotan "Son o		,										
Location of Transect	Stream Width (m)	Left Blank Slippe ('')	Left Baric Ergsjon Potenijal (%)		Thelwer L	April 1	Stream Dep	cha (m) #	N.55	Des Timaect			Right Bank Siope	Right Bank Resion Potential (%)	Canopy (%)
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	Habbin Type One) Ruffie GEde Pool	Run P	Dominant Subse Cobble	ady'r som			Dominant Left Bank	Types RI	Fread	25% 10 10	16. Sl	the offer	5	5 Gravel ev Large	
	Algae ov Ma (Corsig Oue) Almode of C Rare Alsern	arophytes Cemmon K	Witch of Nature Vegstation (m) LB: 23; 720/	LB uffer		Latern Conte	Cover Type	* Creat	konk	cobblo,	boul	Jer n	stra	% lenters in Control 35	
Location of Transect	Stream Width Umb	Left Brock Sloppe	Left Bank Eresion Pecential		Tabes	1	Stream Deg	dia (m) r	of Points Ac	52			Right Bank Steps	Right Bank Bresian Potential	Crospy Crospy (%)
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from DI	Hablan Typ One) Ruthe Gilde Pool	Ren	Dominent Subar Co hhite	and Type			Dominant Left Bank	Types B	Prese Vep	05 40 0	Huer .	2500.	61.15	% Gravel or Larg	z
	Alpee or Ma (Circle Dae) Abuedant (Rarr Abue	scrophyses Common	Width of Nation Vegetation (m)	it Buffer		Instrant Start	Cover Typ	a. 10 a	Honal	AC 1904.	Pulling.	wheek		% Instremi Cove	

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	Algre or Mon (Costa Ono) Abagotoni C MarcoMuserii	annun i	Voldth of Neuron B Versenion (10) UB: 20	helfiox 2_0	bould	Cover Type	n ble a lyn	e israq, al	tie.		9. Indiream Cove	
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1 100	22.6	40	0	1 19	27	10	21.	20 30 62	35 3	01-	0	0
or x ing	Mahimurya Conci Muria Conci Muria	h pClicke	Devition Butelin COB6 16	it Typo		Denfrunt Left Book	Dpea Righedian	Vegenation (ec. 85°/s 041	er 10 %.	forth.	\$ dimet or Level	
	Algar or Mo Iccurds One) Aburden C Aburden C	kreptig tea arganaa	With of Natural I Vegenation (at)	D.C.	human Cobb	Cover Tap	н 061 М	gravel	2010		the Internation Cover	
Location of Thenacci	Nicht Wich (m)	Steps Steps	LeA Back Boulon Feteralal (3)	Date	Se Depilt	Stream D	cytha (wi) at Pu	ion Acres Danesci		Ma	Rank Experien Proceeded	The Compy
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	Helder Translo) uniteda	Dominant Balanta	sta Type		Descinent Left Bank	Types Ripurta	A Vegetation:			6 Onvelor Lar	In
	Alpue or N televic One Alburdant Barr Abar	ocuphyses Comman	Whath of Natural Vegetation (10) LH: 201:	Doffer	freeze	II Cenar Ty	ck.				Se Instruction Cov	13

Location of Transect 100 m down 5 rom UI 5 rom UI	Transect	Observers: J.V. M.6 I Stream: U. Fylo Loc Stream Segment No.:_ (Stream Type (Circle One Channel Obstructions/M Riparian Vegetation (%): Left Bank: Tre Right Bank: Tre	Table B-12. Part
Stream Width (m) Left Sigpe One) Riffer One) Riffer Chrele One) Algae or Macrophytes (Circle One). A Dandant Courmon Rare Absent	Algae or Macrophytes (Circle One) Algae or Macrophytes	nte: 10 18 03 9 4 m nton of site: 128/1 Observed Stream Uses: Aperennial or interni Odifications: Device N odifications: Device N ses_Shrubs_Grasses, F	Ngo(07 1. Stream Physica
Bank Erision (%) 6.5% Stream Depths (m) at Points Across Tm Potential 50 10 105 10 50 10 105 10 50 10 105 10 50 10 105 10 50 10 105 10 50 10 105 10 50 10 105 10 50 10 105 10 50 10 105 10 50 10 105 10 50 10 105 10 50 10 10 10 50 10 10 10 50 10 10 10 50 10 10 10 50 10 10 10 50 10 10 10 50 10 10 50 10 10 50 10 10 50 10 10 50 10 10 50 10 10 50 10 10	Bank Erosion 6.19 Stream Depths (m) at Points Across T Potential Thalweg Depth: 0 .02 .02 .15 .17 Stream Depths (m) at Points Across T Dominant Substrate Type .02 .02 .15 .15 .19 .31 .30 Vidth of Natural Buffer KB; 20 RB; 20 Instream Cover Types: Right Bank: 10 + ree 156.46	Part I - Stream Physical Characteristics Workshee ather conditions:	1 Characteristics Worksheet
nnsect Right Bank Erosion Cano 103,01,01 3 0 1 4.57 's 85 atter 's 80 atter 's 80 atter 's 80 atter 's 80 atter 's 80 atter 's 80 atter 's 6 Gravel or Larger 100 % 's Instream Cover	Transect Sight Right Bank Erosion Can Sighe Bank Erosion Can (s) (s) (s) (s) (s) (s) (s) (s) (s) (s)	et ensive befined_: No. Poorly Defined_	Run-1 Riffle-111 bend - 11(well define Slide - 1 Post - 1

A LUCA	75.m down	CG	Location of Transcet	at access	90 m down	C U	Location of Transect		Suran U.S	UH	Location of Transect		Sum Cam	ເ ເນ	Location of Transect
Algae or blacrop (Chele One) Abundant Com Ikare Spisent	Habitat Type (Ci One) Pattie Run Glide Pool	16	Stream Width (m) S	Algae or Maeroph (Circle Oac) Abundant Camr Rare Absent	Habitat TyperCi One) Niffic Run Glide Pool	8.6	Stream Width (m)	Algae or Macroph (Chiese One) - Alsundam Comm Rure Alserit	Habiter Type: (Ch One (Riffle Jun) Glide Pool	9.65 1	Shreann I Width B S	Algae or Maeroph (Circle Ope) Abundin((Comm Rure Absent	Habitat Type (Cin One) Riffle Run Glide Rool	15,8 6	Sheant Width (m)
ohytes	ircle	ち	Lan Rank Slope	nnan 1	Jele	L	Left Bank Slope	non L	rele	8	Left Bank Hope	non L	cle D	02	Lope
Width of Natural Vegetation (m) LBSS (RB: O	Dominant Substr	30	Left Bank Brosion Polential	Width of Natural Vegetation (m)	Dominant Substra	0	Left Jank Erosion Potential (伝)	Viditi of Natural	Dominant Substra	σ	Left Pank Erosian Potential (\$1)	Vidth of Natural J (egetalion (18) 18:RB:	oorninant Substra	80	Loft Anit Elosion Potential (%)
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firstream		1.051	Wh Depth:	Instream		12,	A Depth:	Insteam		128.	eg Depth:	Instream (1.38 1.	1 Septh:
Cover Types: Srowel, (Obb	Donalonni Types Rijnarian Ve Left Bank: 30 Trock Right Bank: 95 5 Vo.55	1.101.1106.1	Stream Depths (m) at Points.	CoverTypes: Sravely cobbly	Dominuut Types Ripatian Ver Left Bank: Styce (18 39 40,50	Stream Depths (m) at Points ,	Caver Types: Marino, Stave	Dounlinnut Types Ripadian Ver Left Bank: 5 4 Vec W	57 .51 .49 .41	Sturam Depths (m) at Points /	overtypes noots	Continuent Types Riparlan Veg Loft Bank: 10 + Yee 1	07.1.05.95.65	ireant Depths (m) at Points Av
le, boulder, 5	Softer 60	CL' 0L' 16'0	Aeross Transeet	- snass, root	onler 905 as	511 581 501 3	veross Transect	1, cobble 1040	services 70 atua	01,16,09,03	t-right	Sravel, usb	ention: 10 Starss SSot	P0, 141.145.	trass Transect
Nass,	other	-65		re, und	550	1.03		Thang	es los	.01		res in the sh	ter NOS TO	101	
		100	Right Bank Slope	and	otion	Ś	Right Bank Slope	Veg	otlar	-55	Right Bank Slope	23	othor	(J	Right Sank Slope
e Instream Cov 10	& Gravel or Lar [06	30	Right Bank Erosion Potential	Les Insurann Cove	% Gravel or Larg	40	Right Bank Broslon Polential (55)	% Instream Cove	% Gravel or Lary	50	Right Bauk Erosion Potential (%)	% Instream Cove	な Gravel or Larg なる	a	Right Bank Erosion Potential (%)
Ċ	ger.	11	Tree Canopy (%)	н	ŝer.	2/17	Tree Canopy (%)		ţer	2.5/17	Tire Canopy (%)		<u>e</u> r	1.5/17	Tree Curropy (%)

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VZ POINT	from DI	to mot	Location of Transect	Aniad Hurado	acress grow		Location of Transect	Able B-12. Part 1. S able B-12. Part 1. S oservers: <u>AW MB</u> Date ream <u>D. Frie</u> Locado ream Segment No.:_ Obs ream Type (Circle One): tream Vegention (%): Left Bauk: Trees Right Bank: Trees
Algne or Maerc (Circle One). Abundant Cou Rare Absent	Habitat Type ((Oae) Ruffie Ru Glide Pool	10,910	Stream Width (m)	Algne or Macro (Circle One) Abundant Coi Rare Absent	Habitar Tyge ((One) Riffle Ru Glide Pool	5.4	Stream Width (nt)	Iream Phys Ineam Phys (104) Time: 100 on of site: 1300 erved Stream U erved Stream U erved Stream U shrubs Gras
phytes nuntori	1. Ale	08	Left Bank Slope (*)	pphytes mnon	Direle n	σī	Left Bauk Slope (°)	ical Ch Wenther Wenther ermlitten ermlitten
Width of Naturn Vegetation (m) LB:RB:	Donunnat Subst	50	Left Bank Eroslon Potential (%)	Width of Naturn Vegetation (m) LB: RB: >>D >>>	Dominant Subst	10	Left Bank Erosion Potential (%)	<i>LAPACTERISTIC.</i> Pe conditions: gth of stream tea gth of stream tea Aesthetics (c of Riffles:Chr of Riffles:Chr of SCult. Fields
l Buffer 20	rate Type	168.64	() .'91 Thalwe	l Buffer D	inte Type oVe	191, 50,	6,1 Thalwes	<i>Worksheet</i> <i>Worksheet</i> urt I - Stream J ch: ch: ch: ch: ch: ch: ch: ch: pools Stream Ben unnel Flow Statu
Instream Cover Types: Sravel, Lobole, boulder, a . Smas, roots, macura, algae, ove	Dominant Types Riparlan Vegenation: Left Bank: 15 tree 15 5ress 70 offer Right Bank: 5 tree 95 tree	10, P0, P1, SH, 28, 18, 37, 001 NS.	Depth: >1	Instream Cover Types: Srower whole bounder of said in	Dominant Types Riparian Vegetation: Left Bank: 15 tree 2000 bes westter Right Bank: 5 tree 500000 10 street	50, 50, 51, 51, 38, 13, 10, 50, 10,	Stream Depths (m) at Points Across Transect	Physical Characteristics Worksheet Ilderness (2) untuin(3) common (4) offensive ds: No. Well Defined_; No. Moderately Defined_; No. Poorly Defined s (circle one): high upderate low no flow
rhans		L.	Right Bank Slope (*)	auro		00	Right Bank Slope (°)	
15 Instream Cove	% Gravel or Larg	0	Right Bank Etosion Potential (%)	% Instream Cover	% Gravel or Larg	Ö	Right Bank Brosion Potential (%)	
н ,	, OL	L1/5'8	Tree Canopy (%)		ĥ	16/177	Tree Canopy (%)	

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		Location of Transect	From D4	Jo w Sh	Location of Transact		Evon DS	JS m up	2	Location of Transect	from lod	3 20	2	Location of Transect
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nerophyte Commun	e (Circle Run	Left Bank Slope (*)	rophytes	initele	Slope (')		ophytes	Circle	30	Left Bank Slope	allytes	Scle	UN-	iopa anti:
s Width of N Vegetation LB: RD	Dominant S	Jank Erosio Potentíni (%)	Width of Nat Vegetation (1 LB5 RB:	Dominant Sui	Dank Elosion Potential (5a)	And	Width of Nniu	Dominant Subs	0	Left Bank Erosion Potential (%)	Width of Natura Vegetailon (m) U3:	Dominant Substr	0	Loft Loft Bank Erosion Potential
atural Buffer (m)	ubstrate Type		mal Buffer N > えい	obble	0 	00	ini Bulfer	inate Type	70. 50'	0.25	(Duffer 20	niu Type	55: 20.	0.34 Thalweg
Instream		halweg Depth:	Instream C	ם בח	ilweg Depth:	- 810	Instream Cov		1.41 .60	Stre	Insiream Cove	Domi Left J Righ	Sh' 9h'	Streau Depth:
Cover Types:	Dominnu Types Left Bank: Right Bank:	Stream Depilts (#	sverTypes: Sae, Mo	in Bank: ST	16,35,4	Jael mo	er. Types:	in Bank: 5	1.54	am Depths (m) at	Types:	nati Types Riper	.52.144	Depths (m) at Pa
	Riparian Vegeta	t) at Points Acro	icro, Si	Partin Vegendic	S S4 S	C 10 10		arian Vegetation	5,34,2	Points Across T	oble, ba	Int Vegetation:	49.34	hinis Across Tru
and a second	llatt	ss Transect	and co	other	1 43 1	1 over 1	d star	nino 30	0, 01, 0	runsect	ander,	Sagres -	.33.36	Iseci
	-		loble, b	Sotre	50' 14	1.000	sunder	an oth	20,19		PNOC A	10.0H	0.04	
		Bank Slope	any pre		Slope (1)	ilight	2	er er	I	Right Bank Slope	. 10.9	her	2	Right Hank Slope
% Insucation	es Gravel or	Bank Erosio Potential (%)	1 S Instream O	% Gravel or L	Polential (%)	Right	% Instraint Car	So Gravel or Lau	0	Right Bank Brosion Potential (%)	sh Instream Cove	& Ginvel or Laik	10	Righr Banh Ecosion Potential (%)
Cover	Lniger	n Canop	over	> >	0	Tree	.cr	.ger	0	Canopy (%)		6	C	Canopy (%)

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		from DI	100m upstream	Location of Transect	7	la spring		Location of Transect	iparian Vegetation (%): Laft Bank: Trees Right Bank: Tree	treann segment No.:oos treann Type (Circle One):(hannel Obstructions/Mod	bservers: <u>MB, UW</u> Date tream: <u>V. Fvie</u> Locadi		able B-12. Part 1. S	æ		
(Algae or Ma (Clircle One) Abundant C Rare Absen	Habitat Type One) Riffie Glide Pool	28	Stream Width (m)	Algae or Ma (Circle One) Abundant C Rare Absen	Habitat Type One) Riffle Glide Bool	13.95	Stream Width (m)	ShrubsG	persuntations: La	on of site: 13	2	hream Phy		5	
	crophytes Common	Run	20	Left Bank Slope	orophytes othrnon t	: (Circle Run	30	Left Bauk Slope (°)	rasses, Foi Grasses, F	intermitte	1 Let		isical C		1.901-	10200
	Width of Natura Vegetation (m) LB:15RB:>2	Dominant Subst	0	Left Bank Erosion Potential (%)	Width of Naturn Yegetation (m) LB: RB: SDO SS	Dominant Substi	0	Left Bank Erosion Potential (%)	orbs_ Cult, Fields orbs_ Cult, Field	of Riffles: Cha	r conditions: <u>R</u> ngth of stream rea	P	haracteristics			
	l Buffer 2.5	vate Type	1, 10,	1	l Buffer) (O	ate Type	1 20'	TI	Other	unnel Flow ;	ch: 500m	urt I - Stre	Worksh		-	
	Instre		50. 8	S.M Inlweg Depth	Instre		54 ,060	J, W H nlweg Depth		1 Bends: No Status (circle	1	am Physic	eet			
	source, Lobble, boulder, a	Dominant Types Riparian Vegention: Left Bank: Stree 105 hrub : Right Bank: Stree 105 hrub :	1.0 1.17 1.37.56.44.39	Stream Depths (m) at Polnts Across Transect	oravel, cobple, boniders,	Right Bank: 5 tyee 95 wher	58. 55. 16. 92. 06. 28.	Stream Depths (m) at Points Across Transect		iss (&) maturni (3) common (4) ottensive Well Defined, ; No. Moderntely Defined, ; No pone); high moderntelow no flow		al Characteristics Worksheet			21	
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	S Day	65atu	1 25	Right Bank Slope (*)	Should	5	04 3	Right Bank Slope (*)		Ined					-	
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and the second se	, IJ	90T	Li/S'IJ	Tree Canopy (%)	F;	,cr	10/17	Tree Canopy (%)								
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LWC MENDIN	Lacation of Transcet	of LWC	Location of Transact	from LNC	from D3	Location of Transact		Scom D2	Lecation of Transect
Habiat Type (Circle One) Rink Run Glide Coal Algae or Macrophytes (Circle One)	Sicram Left (m) Sigge (m) Sigge 38 3	Habitative (tiffie Tom Glidb Foul Algad of Macrophytes (Circle One) Haupdant Common Rarcy Usen!	Stream Width Inst God 7	Algae or Maccophyles (Chele Dav) . (Chele Dav) . (Chele Dav) . (Chele Dav) .	Habing Type: (Chele One Riffie tun Glide Road	Sheann Width Untr () () () () () () () () () () () () ()	Algae or Maerophytes (Circle Onu) Abwadinut Comunan Rure Absent	Habina TyperCircle One) RimeRim Glide Pool	Veraiti (m) Signer (v) Signer (v) Signer Si
Dominant Sulstrate Type	Dank Prosien Potential D. US 2	Denulnant Substrate Type Cobble Witch of Natural Buffer Vegetation (m) LB_22(W; O	Dank Frosien Potenician (5) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	With of Natural Buffer Vegetation (a) LB: >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	Dominant Substate Type	Pauk Emston Potential (%)	Width of Natural Buffer Vegetation (m) LB: \0 RB: 7 20	Dominant Substrate Type .	Bank Losion Porental (2)
Instream Cover Types:	Stream Depths (m) at Points Across Transact Right Bank miweg Depth	Dominiani Types Ripation Vegenation: Left Bank: 10 types Scorbes Sostier Right Bank: 50 proces SO offer Instream Cover Types: on the Click Scavel / cobols, bounder, vincler cut bu	Stream Depths (m) at Points Across Transact Rights (m) stream of the strea	Instrema Cover Types: boulder, alsac	Dominant Types Ripatian Vegetation: Left Dank: Styce Scolocs 90 offer Right Bank: 10 tree Scoloce 80 offer	Stream Depths (m) at Points Across Transect Nwag Depth: A 145 .40 .40 .53 .50 .42 .42 .43 .03 .03	Instream Cover Types: 6 row et, worble, bender, algae, root	Dominant Types Riparian Vegetallop: Left Bank: 15 tree Scorbes 60 other	Streams Joeulus (m) at Polans Across Transect Right Bank Slope veg Depul: 0 0 34 36 40 19 75
Sther 100	ni k Dank Erosion Potential Cfs)	% Gravel or Larger	n Bank Brolental	% Instream Caver	56 Gravel or Lavger	Bank Érosion Potential	% Insireant Cover	& Gravel or Larger	Potential (%)

6.93.

HABITAT ASSESSMENT

Part II – Summary of Physical Characteristics of Water Body



Stream name	U. Frio 10000
Date of assessment	9/4/2002
Stream bed slope over evaluated reach	0.0051
Approximate drainage area above transect furthest downstream	776km²
Stream order	5
Length of stream evaluated	360m
Number of lateral transects made	6
Average stream width	18.7m
Average stream depth	0.44m
Instantaneous flow	56.08 ft ³ /sec
Indicate flow measurement method	Current Meter
Channel flow status	High
Maximum pool width	10m
Maximum pool depth	>1m
Total number of stream bends	3
Number of well defined bends	1
Number of moderately defined bends Number of poorly defined bends	<u> </u>
Total number of riffles	3
Dominant substrate type	Gravel
Average percent of substrate gravel sized or larger	100%
Average percent instream cover	50%
Number of stream cover types	7
Average percent stream bank erosion potential	65%
Average stream bank slope	37°
Average width of vegetative buffer	>20m
Average riparian vegetation percent composition by: Trees Shrubs Grasses/Forbes Cultivated Fields	18.00% 4% 8.0%
Other	70%
Average percent tree canopy coverage	32%
Overall aesthetic appraisal of stream	Common

Stream name	U. Frio 13007
Date of assessment	9/5/2002
Stream bed slope over evaluated reach	0.0027
Approximate drainage area above transect furthest downstream	831km ²
Stream order	5
Length of stream evaluated	460m
Number of lateral transects made	6
Average stream width	32m
Average stream depth	0.31m
Instantaneous flow	78.28 ft ³ /sec
Indicate flow measurement method	Current Meter
Channel flow status	High
Maximum pool width	14m
Maximum pool depth	0.5 - 1m
Total number of stream bends	4
Number of well defined bends	0
Number of moderately defined bends Number of poorly defined bends	3
Total number of riffles	5
Dominant substrate type	Cobble
Average percent of substrate gravel sized or larger	97%
Average percent instream cover	52%
Number of stream cover types	6
Average percent stream bank erosion potential	73%
Average stream bank slope	36°
Average width of vegetative buffer	>20m
Average riparian vegetation percent composition by:	
Trees	
Grasses/Forbes	
Cultivated Fields	
Other	
Average percent tree canopy coverage	36%
Overall aesthetic appraisal of stream	Natural?

Stream name	U. Frio 13006
Date of assessment	9/3/2002
Stream bed slope over evaluated reach	0.0013
Approximate drainage area above transect furthest downstream	1,019km²
Stream order	5
Length of stream evaluated	460m
Number of lateral transects made	6
Average stream width	24.2m
Average stream depth	0.48m
Instantaneous flow	103.35 ft ³ /sec
Indicate flow measurement method	Current Meter
Channel flow status	High
Maximum pool width	35m
Maximum pool depth	>1m
Total number of stream bends	2
Number of well defined bends	1
Number of moderately defined bends Number of poorly defined bends	<u> </u>
Total number of riffles	4
Dominant substrate type	Boulder
Average percent of substrate gravel sized or larger	100%
Average percent instream cover	88%
Number of stream cover types	8
Average percent stream bank erosion potential	70%
Average stream bank slope	39°
Average width of vegetative buffer	>20m
Average riparian vegetation percent composition by: Trees Shrubs Grasses/Forbes Cultivated Fields Other	5% 5% 15%
Average percent tree canopy coverage	14%
Overall aesthetic appraisal of stream	Natural

Stream name	U. Frio 17892
Date of assessment	8/5/2003
Stream bed slope over evaluated reach	0.0051
Approximate drainage area above transect furthest downstream	776km²
Stream order	5
Length of stream evaluated	360m
Number of lateral transects made	6
Average stream width	11.9m
Average stream depth	0.47m
Instantaneous flow	
Indicate flow measurement method	Current Meter
Channel flow status	Moderate
Maximum pool width	13m
Maximum pool depth	>1m
Total number of stream bends	2
Number of well defined bends Number of moderately defined bends	2
Number of poorly defined bends	0
Total number of riffles	5
Dominant substrate type	Cobble
Average percent of substrate gravel sized or larger	83%
Average percent instream cover	27%
Number of stream cover types	8
Average percent stream bank erosion potential	32%
Average stream bank slope	42°
Average width of vegetative buffer	>20m
Average riparian vegetation percent composition by: Trees	15.00%
Shrubs Grasses/Forbes	2%
Cultivated Fields	500/
	25%
Average percent tree canopy coverage	35%
Overall aesthetic appraisal of stream	Natural

Stream name	U. Frio 13007
Date of assessment	8/6/2003
Stream bed slope over evaluated reach	0.0027
Approximate drainage area above transect furthest downstream	831km²
Stream order	5
Length of stream evaluated	460m
Number of lateral transects made	6
Average stream width	31m
Average stream depth	0.54m
Instantaneous flow	
Indicate flow measurement method	Current Meter
Channel flow status	Moderate
Maximum pool width	30m
Maximum pool depth	>1m
Total number of stream bends	1
Number of well defined bends Number of moderately defined bends	0 0
Number of poorly defined bends	1
Total number of riffles	3
Dominant substrate type	Cobble
Average percent of substrate gravel sized or larger	91%
Average percent instream cover	28%
Number of stream cover types	8
Average percent stream bank erosion potential	22%
Average stream bank slope	34°
Average width of vegetative buffer	>20m
Average riparian vegetation percent composition by: Trees	7%
Shrubs	0%
Grasses/Forbes	24%
Other	
Average percent tree canopy coverage	69%
Overall aesthetic appraisal of stream	Natural

Stream name	U. Frio 13006
Date of assessment	8/6/2003
Stream bed slope over evaluated reach	0.0013
Approximate drainage area above transect furthest downstream	1,019km²
Stream order	5
Length of stream evaluated	300m
Number of lateral transects made	5
Average stream width	16.0m
Average stream depth	0.30m
Instantaneous flow	
Indicate flow measurement method	Current Meter
Channel flow status	High
Maximum pool width	22m
Maximum pool depth	0.5m - 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	Cobble
Average percent of substrate gravel sized or larger	98%
Average percent instream cover	36%
Number of stream cover types	9
Average percent stream bank erosion potential	12%
Average stream bank slope	30°
Average width of vegetative buffer	>20m
Average riparian vegetation percent composition by:	
Trees	11%
Grasses/Forbes	0% 12%
Cultivated Fields	1270
Other	77%
Average percent tree canopy coverage	27%
Overall aesthetic appraisal of stream	Natural

Stream name	U. Frio 17892
Date of assessment	10/8/2003
Stream bed slope over evaluated reach	0.0051
Approximate drainage area above transect furthest downstream	776km²
Stream order	5
Length of stream evaluated	455m
Number of lateral transects made	6
Average stream width	12m
Average stream depth	0.51m
Instantaneous flow	
Indicate flow measurement method	Current Meter
Channel flow status	Moderate
Maximum pool width	16m
Maximum pool depth	1.4m
Total number of stream bends	2
Number of well defined bends Number of moderately defined bends Number of poorly defined bends	2 0 0
Total number of riffles	3
Dominant substrate type	Cobble
Average percent of substrate gravel sized or larger	97%
Average percent instream cover	27%
Number of stream cover types	9
Average percent stream bank erosion potential	26%
Average stream bank slope	39
Average width of vegetative buffer	>20m
Average riparian vegetation percent composition by: Trees Shrubs Grasses/Forbes Cultivated Fields Other	9.00% 3% 31.0% 57%
Average percent tree canopy coverage	42%
Overall aesthetic appraisal of stream	Natural

Stream name	U. Frio 13007
Date of assessment	10/9/2003
Stream bed slope over evaluated reach	0.0027
Approximate drainage area above transect furthest downstream	831km ²
Stream order	5
Length of stream evaluated	500m
Number of lateral transects made	6
Average stream width	42m
Average stream depth	0.48m
Instantaneous flow	
Indicate flow measurement method	Current Meter
Channel flow status	Moderate
Maximum pool width	62m
Maximum pool depth	1.4m
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	1
Dominant substrate type	Cobble
Average percent of substrate gravel sized or larger	100%
Average percent instream cover	18%
Number of stream cover types	9
Average percent stream bank erosion potential	22%
Average stream bank slope	38
Average width of vegetative buffer	>20m
Average riparian vegetation percent composition by: Trees Shrubs Grasses/Forbes Cultivated Fields Other	8% 1% 12% 79%
Average percent tree canopy coverage	28%
Overall aesthetic appraisal of stream	Natural
Stream name	U. Frio 13006
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Date of assessment	10/9/2003
Stream bed slope over evaluated reach	0.0013
Approximate drainage area above transect furthest downstream	1,019km²
Stream order	5
Length of stream evaluated	300m
Number of lateral transects made	5
Average stream width	13.9m
Average stream depth	0.35m
Instantaneous flow	
Indicate flow measurement method	Current Meter
Channel flow status	Moderate
Maximum pool width	19m
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 0 1
Total number of riffles	3
- Dominant substrate type	Cobble
Average percent of substrate gravel sized or larger	97%
Average percent instream cover	21%
Number of stream cover types	8
Average percent stream bank erosion potential	7%
Average stream bank slope	
Average width of vegetative buffer	>20m
Average riparian vegetation percent composition by: Trees Shrubs Grasses/Forbes Cultivated Fields Other	10% 1% 9% 80%
- Average percent tree canopy coverage	29%
Overall aesthetic appraisal of stream	Natural

HABITAT ASSESSMENT



Habitat Parameter	Scoring Category		Location: 10000	Date: 9/4/02
Available Instream Cover	Abundant	Common	Rare	Absent
	>50% of substrate favorable	30-50% of substrate	10-29.9% of substrate	<10% of substrate supports
	for colonization and fish cover;	supports a stable habitat;	supports stable habitat;	stable habitat; lack of
	good mix of several stable	adequate habitat for	habitat availability less than	habitat is obvious; substrate
	(not new fall or transient)	maintenance of	desirable; substrate	unstable or lacking
	cover types such as snags,	populations; may be	frequently disturbed or	_
	cobble, undercut banks,	limited in the number of	removed	
	macrophytes	different habitat types		
Score: 4	4 Stable	3 Modoratoly Stable	2 Mederately Unotable	1 Unotable
Bottom Substrate Stability		20 50% grovel or lorger	10.20.0% grovel or lorger	<10% grovel or lorger
	>50% graver of larger	substrate: deminant	10-29.9% graver of larger	
	substrate, i.e., gravel, cobble,	substrate; dominant	substrate; dominant	substrate; substrate is
	boulders, dominant substrate	substrate type is mix of		uniform sanu, siit, clay, or
	type is graver or larger	graver with some liner	gravel, but may suil be in mix	Dedrock
Score: 4	4	3	2	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	Pool covers approximately	No existing pools; only
	the channel width; maximum	50% or slightly less than	25% of the channel width;	shallow auxiliary pockets
	depth is > 1m	the channel width;	maximum depth is <0.5	
Score: 3	3	maximum depth is 0.5-1 2	meter 1	0
Channel Flow Status	Hiah	– 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	available channel and/or	channel and mostly present
	channel substrate is exposed	channel substrate is	riffle substrates are mostly	in standing pools: or stream
	channel substrate is exposed	channel substrate is exposed	riffle substrates are mostly exposed	in standing pools; or stream
Score: 3	channel substrate is exposed	channel substrate is exposed 2	riffle substrates are mostly exposed 1	in standing pools; or stream is dry 0
Score: 3 Bank Stability	channel substrate is exposed 3 Stable	channel substrate is exposed 2 Moderately Stable	riffle substrates are mostly exposed 1 Moderately Unstable	in standing pools; or stream is dry 0 Unstable
Score: 3 Bank Stability	channel substrate is exposed 3 Stable Little evidence (<10%) of	channel substrate is exposed 2 Moderately Stable Some evidence (10-	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank	in standing pools; or stream is dry 0 Unstable Large and frequent
Score: 3 Bank Stability	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank	channel substrate is exposed 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%);	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion
Score: 3 Bank Stability	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30°	channel substrate is exposed 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas
Score: 3 Bank Stability	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30°	channel substrate is exposed 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks;
Score: 3 Bank Stability	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30°	channel substrate is exposed 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60°	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60°
Score: 3 Bank Stability	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30°	channel substrate is exposed 2 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°	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60°	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60°
Score: 3 Bank Stability Score: 0	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30° 3	channel substrate is exposed 2 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° 2 Madasate	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Leui	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60° 0
Score: 3 Bank Stability Score: 0 Channel Sinuosity	channel substrate is exposed	channel substrate is <u>exposed</u> 2 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° 2 Moderate u well defined band OB >2	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low c 2 medorately defined	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60° 0 None Straight changel; may be
Score: 3 Bank Stability Score: 0 Channel Sinuosity	channel substrate is exposed	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 mederately defined bendor	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined hondo OD achu agentu	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60° 0 None Straight channel; may be abcanaciirad
Score: 3 Bank Stability Score: 0 Channel Sinuosity	channel substrate is exposed	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- dofined board present	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60° 0 None Straight channel; may be channelized
Score: 3 Bank Stability Score: 0 Channel Sinuosity	channel substrate is exposed	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends present	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60° 0 None Straight channel; may be channelized
Score: 3 Bank Stability Score: 0 Channel Sinuosity	channel substrate is exposed	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends present	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60° 0 None Straight channel; may be channelized
Score: 3 Bank Stability Score: 0 Channel Sinuosity Score: 2	channel substrate is exposed	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends present 2	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present 1	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60° 0 None Straight channel; may be channelized 0
Score: 3 Bank Stability Score: 0 Channel Sinuosity Score: 2 Riparian Buffer Vegetation	channel substrate is exposed	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends present 2 Wide	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present 1 Moderate	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60° 0 None Straight channel; may be channelized 0 Narrow
Score: 3 Bank Stability Score: 0 Channel Sinuosity Score: 2 Riparian Buffer Vegetation	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30° 3 High ≥2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends present 2 Wide Width of natural buffer is	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present 1 Moderate Width of natural buffer is 5-	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60° 0 None Straight channel; may be channelized 0 Narrow Width of natural buffer is <5
Score: 3 Bank Stability Score: 0 Channel Sinuosity Score: 2 Riparian Buffer Vegetation	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30° 3 High ≥2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters	channel substrate is <u>exposed</u> 2 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° 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends present 2 Wide Width of natural buffer is 10.1-20 meters	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present 1 Moderate Width of natural buffer is 5- 10 meters	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60° 0 None Straight channel; may be channelized 0 Narrow Width of natural buffer is <5 meters
Score: 3 Bank Stability Score: 0 Channel Sinuosity Score: 2 Riparian Buffer Vegetation Score: 3	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30° 3 High ≥2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters 3 Wildensee	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends present 2 Wide Width of natural buffer is 10.1-20 meters 2 Nature1 Area	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present 1 Moderate Width of natural buffer is 5- 10 meters 1 Camma 6 24/15	in standing pools; or stream is dry
Score: 3 Bank Stability Score: 0 Channel Sinuosity Score: 2 Riparian Buffer Vegetation Score: 3 Aesthetics of Reach	channel substrate is exposed	channel substrate is <u>exposed</u> 2 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° 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends present 2 Wide Width of natural buffer is 10.1-20 meters 2 Natural Area Tures end(ex = 5 the case)	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present 1 Moderate Width of natural buffer is 5- 10 meters 1 Common Setting Net offension cos is	in standing pools; or stream is dry
Score: 3 Bank Stability Score: 0 Channel Sinuosity Score: 2 Riparian Buffer Vegetation Score: 3 Aesthetics of Reach	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30° 3 High ≥2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) are present 3 Extensive Width of natural buffer is >20 meters 3 Wilderness Outstanding natural beauty;	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends present 2 Wide Width of natural buffer is 10.1-20 meters 2 Natural Area Tree and/or native moderately-defined bends	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low < 3 moderately-defined bends OR only poorly- defined bends present 1 Moderate Width of natural buffer is 5- 10 meters 1 Common Setting Not offensive; area is turneleating time.	in standing pools; or stream is dry
Score: 3 Bank Stability Score: 0 Channel Sinuosity Score: 2 Riparian Buffer Vegetation Score: 3 Aesthetics of Reach	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30° 3 High ≥2 well-defined bends with deep outside areas (cut 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	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends present 2 Wide Width of natural buffer is 10.1-20 meters 2 Natural Area Tree and/or native vegetation common; some	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present 1 Moderate Width of natural buffer is 5- 10 meters 1 Common Setting Not offensive; area is developed, but uncluttered with of an uncluttered	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60° 0 None Straight channel; may be channelized 0 Narrow Width of natural buffer is <5 meters 0 Offensive Stream does not enhance the aesthetics of the area;
Score: 3 Bank Stability Score: 0 Channel Sinuosity Score: 2 Riparian Buffer Vegetation Score: 3 Aesthetics of Reach	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30° 3 High ≥2 well-defined bends with deep outside areas (cut 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	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends 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	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present 1 Moderate Width of natural buffer is 5- 10 meters 1 Common Setting Not offensive; area is developed, but uncluttered such as in an urban park; mot of home the back	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60° 0 None Straight channel; may be channelized 0 Narrow Width of natural buffer is <5 meters 0 Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed;
Score: 3 Bank Stability Score: 0 Channel Sinuosity Score: 2 Riparian Buffer Vegetation Score: 3 Aesthetics of Reach	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30° 3 High ≥2 well-defined bends with deep outside areas (cut 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	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends 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,	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present 1 Moderate Width of natural buffer is 5- 10 meters 1 Common Setting Not offensive; area is developed, but uncluttered such as in an urban park; water clarity may be turbid or discretered	in standing pools; or stream is dry 0 Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60° 0 None Straight channel; may be channelized 0 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;
Score: 3 Bank Stability Score: 0 Channel Sinuosity Score: 2 Riparian Buffer Vegetation Score: 3 Aesthetics of Reach	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30° 3 High ≥2 well-defined bends with deep outside areas (cut 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	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends present 2 Wide Wide Widh of natural buffer is <u>10.1-20 meters</u> 2 Natural Area Tree and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present 1 Moderate Width of natural buffer is 5- 10 meters 1 Common Setting Not offensive; area is developed, but uncluttered such as in an urban park; water clarity may be turbid or discolored	in standing pools; or stream is dry
Score: 3 Bank Stability Score: 0 Channel Sinuosity Score: 2 Riparian Buffer Vegetation Score: 3 Aesthetics of Reach	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30° 3 High ≥2 well-defined bends with deep outside areas (cut 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	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends 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	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present 1 Moderate Width of natural buffer is 5- 10 meters 1 Commo Setting Not offensive; area is developed, but uncluttered such as in an urban park; water clarity may be turbid or discolored	in standing pools; or stream is dry
Score: 3 Bank Stability Score: 0 Channel Sinuosity Score: 2 Riparian Buffer Vegetation Score: 3 Aesthetics of Reach	channel substrate is exposed 3 Stable Little evidence (<10%) of erosion bank failure; bank angles average <30° 3 High ≥2 well-defined bends with deep outside areas (cut 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	channel substrate is <u>exposed</u> 2 Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average <u>30-39.9°</u> 2 Moderate 1 well-defined bend OR ≥3 moderately-defined bends 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	riffle substrates are mostly exposed 1 Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60° 1 Low <3 moderately-defined bends OR only poorly- defined bends present 1 Moderate Width of natural buffer is 5- 10 meters 1 Common Setting Not offensive; area is developed, but uncluttered such as in an urban park; water clarity may be turbid or discolored 1	in standing pools; or stream is dry

Habital Parameter Scoring Category Location: 1907 Desite 002 Available Instream Cover Advance Common Port 002 Absent Absent Available Instream Cover Advance Common Port 002 Substrate supports Absent Absent Available Instream Cover Advance Common Port 002 Substrate Substrate Substrate Substrate Absent Absent Absent Absent Substrate Substrate						
Available Instream Cover Available Instream Cover and Staff or dispersit staff. Abundant support subarts as stable in subarts of subarts supports abatta for instream cont (not new fail or transient) cover types suba as as ange, macephysics Rare Support subarts as subartale supports abathe tabilitat, adatta valisbility subartale subarts of cover press with as stable in subarts of different habits in transient cover types subarts as stable in subarts of different habits in transient cover types subarts as stable in subarts of different habits in transient cover types subarts as stable in subarts of different habits in transient cover types subarts as stable in subarts of different habits in transient cover types in a different habits in the second inter second	Habitat Parameter	Scoring Category		Location: 13007	Date: 9/5/02	
>50% of substrate favorable good mix of several stabile (not new fail or transition cooking and the hobits); cobile, undercut banks; macrophytes 10.2.98% of substrate supports stable habits; habitat is availability less than babtat for maintenance of populations; may be limited estrable; substrate to undercut banks; macrophytes 10.2.98% of substrate substrate (norm), disturbed or removed 10.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.	Available Instream Cover	Abundant	Common	Rare	Absent	
for colonization and fish cover a stable habitat; ack of (not new fail or transient) cover types such as such abitat available; substrate (bobins; may be limited in the number of different habitat substrate; substrate; cobble, undercut banks, macrophytes subper stable habitat; substrate; substrate; substrate; substrate; substrate; substrate; substrate; substrate; substrate; s		>50% of substrate favorable	30-50% of substrate supports	10-29.9% of substrate	<10% of substrate supports	
good mix of several stable (not new fail or transition cover types such as snage, macrophytes habitat for maintenance of populations; may be limited bersited; substrate the number of different habitat for quenty disturbed or removed habitat is obvious; substrate for quenty disturbed or removed habitat is obvious; usable or lacking Score: 4 3 2 1 Score: 4 3 0 2 1 Score: 4 3 0 102.95% gravel or larger substrate; commant substrate; commant substrate; being there than there sediments 102.95% gravel or larger substrate; being there than substrate; being there than the substrate; being there than the substrate; being there substrate; being there than the substrate; being there substrate; being there than the substrate; being there than the substrate; being there than the substrate; being there than the substrate; being there substrate; being there than the substrate; being there there substrate; being th		for colonization and fish cover;	a stable habitat; adequate	supports stable habitat;	stable habitat; lack of	
Induce Induce Instable Instable <thinstable< th=""> <thinstable< th=""> <thin< td=""><td></td><td>good mix of several stable</td><td>habitat for maintenance of</td><td>habitat availability less than</td><td>habitat is obvious; substrate</td></thin<></thinstable<></thinstable<>		good mix of several stable	habitat for maintenance of	habitat availability less than	habitat is obvious; substrate	
Score: 4 Stable Moderately Stability Unstable removed Score: 4 Stable Moderately Stability Unstable Stability Unstable (1) 20 9% gravel or larger substrate Stability Unstable Stability Score: 4 4 3 Score (2) 7% or larger substrate Stability Abstrate Stability No flow Water Stability Abstrate Stability No flow Water Stability Abstrate Water Stability No flow Water Stability No flow Water Stability No flow Water Stability No flow Water Stabi		(not new fall or transient)	populations; may be limited in	desirable; substrate	unstable or lacking	
Score: 4 Cobble, indercut banks, inder		cover types such as snags,	the number of different habitat	frequently disturbed or	_	
Score: 4 4 3 2 1 Bottom Substrate Stability Stable 30-50% gravel or targer 30-50% gravel or targer Stable -100 stable		cobble, undercut banks,	types	removed		
Sore: 4 4 3 2 1 Boltom Substrate Stability Stable 30-50% gravel or larger substrate, cominant substrate by is finer sediments with gravel or larger substrate, cominant substrate by period in the substrate by substrate. Unstable Score: 4 Abundant Common Rare Absent Number of Riffes Abundant Common Rare Absent Score: 4 Abundant Common Rare Absent Score: 4 Abundant Common Rare Absent Score: 4 Abundant Common Rare Absent Score: 2 3 0 covers approximately be in maximum deph No files Pool covers approximately be channel width, maximum Pool covers approximately channel width, maximum deph No Flow Score: 2 3 Covers approximately channel width, maximum deph No Flow Score: 3 3 2 No Flow		macrophytes				
Score: 4 4 Moderately Stable Instable 1 Bittom Substrate Stability Stable 30-50% gravel or larger 30-50% gravel or larger substrate, i.e., gravel, cobbe 10-29.9% gravel or larger Score: 4 4 3 gravel, lotter may sub to innue substrate is uniform send, sub, care, or gravel, lotter may sub to innue systil to in num systil to in num systil to innue systil to innu			-			
Balturi Subsistie Staturity Softe gravel or larger substrate, i.e., gravel, cobbie type is gravel or larger substrate, dominant substrate bype is gravel or larger 10.25% gravel or larger substrate, dominant substrate substrate, dominant substrate bype is gravel, but may substrate bype is gravel or larger 10.25% gravel or larger substrate, dominant substrate bype is gravel or larger 10.25% gravel or larger substrate, dominant substrate bype is gravel or larger 10.25% gravel or larger substrate, dominant finer sediments 10.25% gravel or larger substrate, dominant gravel, but may sub be in mix performant 10.25% gravel or larger substrate, dominant gravel, but may sub be in mix performant 10.25% gravel or larger substrate, dominant gravel, but may sub be in mix performant 10.25% gravel or larger substrate, dominant gravel, but may sub be in mix performant 10.25% gravel or larger substrate is substrate performant 10.25% gravel or larger substrate is mix performant 10.25% gravel or larger substrate is mix performant <td>Score: 4</td> <td>4 Stable</td> <td>3 Madarataly Stable</td> <td>2 Modorately Upstable</td> <td>1 Unotable</td>	Score: 4	4 Stable	3 Madarataly Stable	2 Modorately Upstable	1 Unotable	
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Score: 4 4 3 2 1 Number of Rfles 24 rifles 24 rifles 1 rifle No rifles Score: 4 4 3 2 1 Abundant 25 rifles 24 rifles 1 rifle No rifles Score: 4 3 2 1 Abundant 25 rifles 24 rifles 1 rifle No rifles Score: 4 4 3 2 1 Abundant 26 rifles 24 rifles 1 rifle No rifles Score: 2 4 3 2 1 Channel Flow Status High Moderate Pool covers approximately the channel width; maximum deph is <.05		substrate, i.e., graver, cobble,	substrate, dominant substrate	substrate, dominant	substrate, substrate is	
Score: 4 4 3 2 1 Number of Riffles Abundant 2 4 Absent To be counted, riffles must extend >50% the width of the channel and be at least as long as the channel width Score: 4 2 4 Absent Absent 2 Affles 1 1 Moderate Small Absent 2 1 Absent Absent Absent Absent 2 1 Absent Absent Absent Absent 2 1 Absent Absent Absent Absent 2 Absent Absent Absent Absent Absent 3 2 1 Absent Absent Absent 4 3 2 1 Absent Absent 5 50 5 1 Absent Absent Absent 5 1 3 2 1 Absent Absent 6 1 1 0 Absent Absent <td></td> <td>boulders, dominant substrate</td> <td>type is mix of graver with some</td> <td>substrate type is lifter than</td> <td>unitorini sanu, siit, clay, or</td>		boulders, dominant substrate	type is mix of graver with some	substrate type is lifter than	unitorini sanu, siit, clay, or	
Score: 4 4 3 Disks 2 1 Number of Riffes To be counted, riffles must extend >50% the width of the channel and be at least as long as the channel width Score: 4 24 riffles 1 Rare Absent 24 riffles 24 riffles 1 1 Riffles No riffles 25 ord: 4 4 3 2 4 Absent 25 ord: 4 4 3 2 4 Absent 25 ord: 4 1 Absent No existing pools; only pool covers approximately the channel width; maximum depth is > 1m No existing pools; only pool covers approximately both reline and/or ris 0.5-1 meter Smail Absent No existing pools; only 25% of the channel width; shore and this maximum depth maximum depth is <0.5		type is graver or larger	iner sediments	gravel, but may still be in mix	Dedrock	
Number of Riffies Abundant Common Rare Absent No riffies Scriffies 5riffies 5riffies 2.4 riffies 1 riffie No riffies Scroer: 4 1 1 1 riffie No riffies Scroer: 4 2 4 3 2 1 Dimensions of Largest Pool Pool covers more than 50% of Pool covers approximately he channel width; maximum depth Scroer: 2 No existing pools; only shallow auxiliary pockets Score: 2 3 0.6.1 meter neter 0 0 Channel Flow Status High Water reaches the base of channel substrate is exposed Ustart is exposed Low No for W Water file 2.575% of the available channel width; maximum depth is dvD No for 0 Score: 3 3 0	Score: 4	4	3	2	1	
To be counted, riffles must extend >50% the width of the channel width channel and be at least along as the channel width state along as the channel width state along as the channel width the channel width; maximum depth is >0. 1 nffles 1 nffles Score: 4 4 3 2 1 Dimensions of Largest Pool Large Pool covers more than 50% of S% or slightly less than the channel width; maximum depth is <0.5	Number of Riffles	Abundant	Common	Rare	Absent	
extend >50% the width of the channel and be at least as long as the channel width depth is > 1m 4 3 2 1 Dimensions of Largest Pool Large Pool covers more than 50% of the channel width; maximum depth is 0.51 mater Small No Existing pools; only the channel width; maximum depth is 0.51 mater Absent Score: 2 3 2 1 Channel Flow Status High Water reaches the base of both the lower bhark; <5% of the channel width; maximum depth is 0.51 mater Low Water fills <75% of the valiable channel and mostly present is dro No Flow Water fills <75% of the valiable channel and mostly present is statile No Flow Water fills <75% of the valiable channel and mostly present is statile Score: 3 3 2 1 0 Bank Stability Stable Little evidence (<10%) of erosion bank failure; bank angles average <30''	To be counted, riffles must	≥5 riffles	2-4 riffles	1 riffle	No riffles	
channel and be at least as long as the channel width Score: 4 Dimensions of Largest Pool Score: 2 Score: 2 Scor	extend >50% the width of the					
as the channel width Dimensions of Largest Pool Pool covers more than 50% of Pool covers approximately the channel width; maximum depth is > 1 m Score: 2 Channel Flow Status Channel Flow Status Channel substrate is exposed Score: 3 Bank Stability Score: 1 Channel Sinuosity Extensive Score: 2 Channel Sinuosity Extensive Score: 2 Channel Sinuosity Score: 2 Channel Sinuosit	channel and be at least as long					
Score: 4 4 3 2 1 Dimensions of Largest Pool Large Moderate Small Absent Pool covers approximately the channel width; maximum depth is > 1m So% or slightly less than the channel width; maximum depth is < 0.5	as the channel width					
Dimensions of Largest Pool Large Moderate Smill Absent Pool covers more than 50% of Pool covers approximately the channel width; maximum depth is > 1m Pool covers approximately Pool covers approximately 25% of the channel width; maximum depth No existing pools; only shallow auxiliary pockets Score: 2 3 2 1 0 Channel Flow Status High Moderate No Flow Very little water in the channel substrate is exposed No Flow Score: 3 3 2 1 0 Score: 3 3 2 1 0 Bank Stability Stable Moderately Stable Moderately Stable Unstable Large and frequent evidence (10:29.9%) of erosion bank failure; bank angles average <30°	Score: 4	4	3	2	1	
Pool covers approximately the channel width; maximum depth is > 1m No existing pools; only soft = 0 covers approximately (be channel width; soft, soft person shallow auxiliary pockets No existing pools; only shallow auxiliary pockets Score: 2 3 0.51 meter 1 0 Channel Flow Status Moderate Low Vater fills <75% of the channel; or <25% of the channel and mostly present in standing pools; or stream exposed No Flow Very little water in the channel and mostly present in standing pools; or stream exposed Score: 3 3 2 1 0 Bank Stability Stable Some evidence (10-29 %) of erosion bank failure; bank angles average <30°	Dimensions of Largest Pool	Large	Moderate	Small	Absent	
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 Low No Flow Score: 3 3 2 1 0 Bank Stability Stable Moderate Low Variable channel and/or instance participation No Flow Score: 3 3 2 1 0 Bank Stability Stable Moderate/Stable Moderate/Stable Low No Flow Score: 1 3 2 1 0 Channel Sinuosity Stable Moderate/Stable Moderate/Stable Large and frequent erosion or bank failure; samil areas of reosion mostly head of erosion over; bank angles average 30- 39.9° Moderate None Score: 1 3 2 1 0 Channel Sinuosity High 22 well-defined bends with deep outside areas (cut banks) and shallow iniside areas (point bars) are present Moderate Low None Score: 3 3 2 1 0 Score: 3 3 2 1 0 Actinet is somostly head bends present The enderate/-defined bends OR only poorly- defined bends present None Score: 3 3 2 1 0 Act		Pool covers more than 50% of	Pool covers approximately	Pool covers approximately	No existing pools; only	
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Score: 23210Channel Flow StatusHigh Water reaches the base of both the lower banks; <5% of channel substrate is exposedModerate water fills 25.75% of channel substrate is exposedLow Water fills 25.75% of the available channel and mostly present is dry exposedNo Flow Very little water in the channel, or <25% of channel substrate is exposedNo Flow Very little water in the channel and mostly present is dry exposedScore: 33210Bank StabilityStable Little evidence (<10%) of erosion bank failure; bank angles average <30°		depth is > 1m	channel width; maximum depth	maximum depth is <0.5		
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 Low No Flow Score: 3 3 02 1 0 Score: 3 3 02 1 0 Bank Stability Stable Little evidence (<10%) of erosion bank failure; bank angles average <30°			is 0.5-1 meter	meter		
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Score: 332Moderately data bandsValue functional bandsValue func	Channel Flow Status	Mater reaches the base of	Moderate $\sqrt{75\%}$ of the	LOW	Nor little water in the	
Score: 33210Bank StabilityStable Liftie evidence (<10%) of erosion bank failure; bank angles average <30°		both the lower banks: <5% of	shapped: or <25% of shapped	water fills 25-75% of the	shapped and mostly propert	
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Score: 1 angles average <30° areas of erosion mostly healed over; bank angles average 30° high potential of erosion during flooding; bank angles average >60° Score: 1 3 2 1 0 Channel Sinuosity 2 light 0 None Score: 2 3 2 1 0 Score: 3 3 2 1 0 Aesthetics of Reach Width of natural buffer is >20 Width of natural buffer is >20 Moderate Natural Area Common Setting 0 Natural Area Common Setting Offensive Score: 2 3 2 1 0 Score: 3 3 2 1 0 Aesthetics of Reach Wilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptional Score an urban park; dwellings); water clarity may be sightly turbid Score area is darcolor native vegetation of discolored Offensive Score: 2 3 2 1 0		erosion bank failure: bank	erosion or bank failure: small	failure is common (30-50%):	evidence (>50%) of erosion	
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: 2 3 2 1 0 Riparian Buffer Vegetation Riparian Buffer Vegetation Extensive Width of natural buffer is >20 meters Wide Width of natural buffer is 10.1- 20 meters Moderate 1 0 Narrow Width of natural buffer is 5- 10 meters Narrow Width of natural buffer is <5 meters Score: 3 1 0 Aesthetics of Reach Wilderness Outstanding natural beautry exceptional Natural Area rea; water clarity is usually exceptional Natural Area rea (avet clarity is usually exceptional Common Setting rea and/or native vegetation common; some development evident (from fields, pastures, dwellings); 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 Score: 2 3 2 1 0		angles average <30°	areas of erosion mostly healed	high potential of erosion	or bank failure: raw areas	
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Score: 3meters20 meters10 metersmetersScore: 33210Aesthetics of ReachWilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptionalNatural Area Tee and/or native vegetation common; some development evident (from fields, pastures, slightly turbidCommon Setting Not offensive; area is developed, but uncluttered such as in an urban park; cluttered; highly developed; water clarity may be discoloredOffensive Stream does not enhance the aesthetics of the area; water clarity is usually discoloredScore: 23210Total Score: 25HIGH		Width of natural buffer is >20	Width of natural buffer is 10.1-	Width of natural buffer is 5-	Width of natural buffer is <5	
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; discolored Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; water clarity is usually water clarity is usually turbid Score: 2 3 2 1 0 Total Score: 25 HIGH		meters	20 meters	10 meters	meters	
Aesthetics of Reach Wilderness Natural Area Common Setting Offensive Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptional Natural Area Common Setting Offensive Wilderness 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; dwater clarity may be turbid or discolored Stream does not enhance the aesthetics of the area; cluttered; highly developed; water clarity is usually turbid or discolored Score: 2 3 2 1 0 Total Score: 25 HIGH Hight Hight Hight	Score: 3	3	2	1	0	
Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptionalTree and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity may be slightly turbidNot offensive; area is developed, but uncluttered such as in an urban park; water clarity may be turbid or discoloredStream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbidScore: 23210Total Score: 25HIGH	Aesthetics of Reach	Wilderness	Natural Area	Common Setting	Offensive	
usually wooded or unpastured area; water clarity is usually exceptionalcommon; some development evident (from fields, pastures, dwellings); water clarity may be slightly turbiddeveloped, but uncluttered such as in an urban park; water clarity may be turbid or discoloredthe aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually to r discoloredScore: 23210Total Score: 25HIGH		Outstanding natural beauty;	Tree and/or native vegetation	Not offensive; area is	Stream does not enhance	
area; water clarity is usually exceptional evident (from fields, pastures, dwellings); water clarity may be water clarity may be urbid or discolored such as in an urban park; water clarity may be urbid or discolored cluttered; highly developed; may be a dumping area; water clarity is usually turbid Score: 2 3 2 1 0 Total Score: 25 HIGH 1 0		usually wooded or unpastured	common; some development	developed, but uncluttered	the aesthetics of the area;	
exceptional dwellings); water clarity may be water clarity may be discolored may be a dumping area; water clarity is usually turbid or discolored Score: 2 3 2 1 0 Total Score: 25 HIGH 1 0		area; water clarity is usually	evident (from fields, pastures,	such as in an urban park;	cluttered; highly developed;	
slightly turbid discolored water clarity is usually turbid or discolored Score: 2 3 2 1 0 Total Score: 25 HIGH 1 0		exceptional	dwellings); water clarity may be	water clarity may be turbid or	may be a dumping area;	
Score: 2 3 2 1 0 Total Score: 25 HIGH			slightly turbid	discolored	water clarity is usually turbid	
Score: 2 3 2 1 0 Total Score: 25 HIGH					or discolored	
Total Score: 25 HIGH	Saara: 2			A		
	Total Score: 25	ہ م HIGH	4	1	U	

Habitat Parameter	Scoring Category		Location: 13006	Date: 9/3/02
Available Instream Cover	Abundant	Common	Rare	Absent
	>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
	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	desirable; substrate	unstable or lacking
	cover types such as snags,	the number of different habitat	frequently disturbed or	Ũ
	cobble, undercut banks.	types	removed	
	macrophytes			
Sooro: 4		2	2	1
Bottom Substrate Stability	4 Stable	S Moderately Stable	Z Moderately Unstable	l Linstable
Bottom Substrate Stability	>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 some	substrate, dominant	uniform sand silt clay or
	type is gravel or larger	finer sediments	gravel, but may still be in mix	bedrock
	type is graver of larger		of sizes	bearbox
Score: 4	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: 3	4	3	2	1
Dimensions of Largest Pool	Large	Moderate	Small	Absent
	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 depth	maximum depth is <0.5	
Score: 3	2	is 0.5-1 meter 2	meter 1	0
Channel Flow Status	High	Z Moderate	l ow	No Flow
Chamier I low Clauds	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
			exposed	is dry
Score: 3	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
	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 healed	high potential of erosion	or bank failure; raw areas
		over; bank angles average 30-	during flooding; bank angles	frequent along steep banks;
		39.9°	average 40-60°	bank angles average >60°
C			4	
Score: U	J	2 Madarata	1	V
	No. well defined hands with	1 well defined hand OR >2	<2 moderately defined	None Straight channel: may be
	22 weil-defined bends with	moderately defined bands	S moderately-defined	shappolized
	banks) and shallow inside	procent	defined bands present	channelized
	proce (point bare) are present	present	defined bends present	
	areas (point bars) are present			
Score: 2	3	2	1	0
Riparian Buffer Vegetation	Extensive	Wide	Moderate	Narrow
	Width of natural buffer is >20	Width of natural buffer is 10.1-	Width of natural buffer is 5-	Width of natural buffer is <5
	meters	20 meters	10 meters	meters
Score: 3	3	2	1	0
Aesthetics of Reach	Wilderness	Natural Area	Common Setting	Offensive
	Outstanding natural beauty;	I ree and/or native vegetation	Not offensive; area is	Stream does not enhance
	usually wooded or unpastured	common; some development	developed, but uncluttered	the 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 be	water clarity may be turbid or	may be a dumping area;
		slightly turbid	discolored	water clarity is usually turbid
				or discolored
Score: 2	3	2	1	0
Total Score: 24	HIGH	-		

Habitat Parameter	Scoring Category		Location: 17802	Date: 8/5/03
Available Instream Cover		Common	Baro	Absort
	>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	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 fail or transient) cover types such as snags, cobble, undercut banks, macrophytes	maintenance of populations; may be limited in the number of different habitat types	desirable; substrate frequently disturbed or removed	unstable or lacking
Score: 2	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: 4	4	3	2	1
Dimensions of Largest Pool	Large 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	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°	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 Channel Sinuccity	3 High	Z Modorato	1	U
	≥2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) are present	1 well-defined bend OR ≥3 moderately-defined bends present	<3 moderately-defined bends OR only poorly- defined bends present	Straight channel; may be channelized
Score: 3	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: 3	3 Wildomooo	2 Natural Area	1 Common Sotting	0 Offensive
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	Uttensive 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: 24	HIGH			

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Habitat Darameter	Sooring Catagory		Location: 12007	Data: 8/6/02
Habitat Parameter	Scoring Category	0	Location: 13007	Date: 8/6/03
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, magraphytop	30-50% of substrate supports a stable habitat; adequate habitat for maintenance of populations; may be limited in the number of different habitat types	Rare 10-29.9% of substrate 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
	macrophytes			
Score: 2	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 Abaant
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: 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 Stable	2 Madarataly Stable	1 Mederataki Unatakia	0 Unatabla
Bank Stability	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°	Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60°	Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60°
Score: 2	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 Butter 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: 3	3 Müldemees	2	1 Common Softime	0 Offensive
Resthetics of Reach	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: 2	3	2	1	0
Total Score: 22	HIGH	-	-	-

Habitat Parameter	Scoring Category		Location: 13006	Date: 8/6/03
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	Common 30-50% of substrate supports a stable habitat; adequate habitat for maintenance of populations; may be limited in the number of different habitat types	Rare 10-29.9% of substrate 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
	macrophytes			
Score: 3	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: 3	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: 2	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: 3	3	2	1	0
Aesinetics of Reach	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: 2	3	2	1	0
Total Score: 23	HIGH			

Habitat Parameter	Scoring Category		Location: 17802	Date: 10/8/03
Available Instream Cover		Common	Baro	Absort
	>50% of substrate favorable for colonization and fish cover; good mix of several stable (not new fall or transient)	30-50% of substrate supports a stable habitat; adequate habitat for	10-29.9% of substrate supports stable habitat; habitat availability less than desirable; substrate	<10% of substrate supports stable habitat; lack of habitat is obvious; substrate
	cover types such as snags, cobble, undercut banks, macrophytes	populations; may be limited in the number of different habitat types	frequently disturbed or removed	
Score: 2	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: 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°	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: 2	3	2 Madarata	1	U
	≥2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) are present	1 well-defined bend OR ≥3 moderately-defined bends present	<3 moderately-defined bends OR only poorly- defined bends present	Straight channel; may be channelized
Score: 3	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: 3	3	2	1 Common Sotting	0 Offensive
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	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: 2	3	2	1	0
Total Score: 24	HIGH			

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Habitat Darameter	Secring Catagory		Location: 12007	Data: 10/0/02
	Scoring Category	Common	Location: 13007	Date: 10/9/03
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,	common 30-50% of substrate supports a stable habitat; adequate habitat for maintenance of populations; may be limited in the number of different habitat types	Rare 10-29.9% of substrate 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
	macrophytes			
Score: 2	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: 2	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 Stable	2 Madarataly Stable	1 Mederataki Unatakia	0 Unatabla
Bank Stability	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°	Moderately Unstable Evidence of erosion bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60°	Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60°
Score: 2	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: 3	3 Wildernee -	2	1 Common 0-#!	0 Offensive
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	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: 2	3	2	1	0
Total Score: 21	HIGH		•	

Habitat Parameter	Scoring Category		Location: 13006	Date: 10/9/03
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	Common 30-50% of substrate supports a stable habitat; adequate habitat for maintenance of populations; may be limited in the number of different habitat types	Rare 10-29.9% of substrate 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: 2	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 Abaant
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	2-4 riffles	kare 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°	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: 3	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: 3	3 Wildomoss	2 Natural Area	1 Common Sotting	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: 2	3	2	1	0
Total Score: 23	HIGH			