Appendix E

Baseline Aquatic Habitat Monitoring Survey

Pine Creek Baseline Aquatic Habitat Monitoring Survey

Final Report of 2012 Results



Submitted to:

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Aquatic Habitat Monitoring Survey

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INTRODUCTION

In the fall of 2012, ECORP was contracted by Glenn Lukos Associates, Inc. to conduct a baseline aquatic habitat survey using Surface Water Ambient Monitoring Program (SWAMP) sampling protocols and including a benthic macroinvertebrate (BMI) bioassessment assessment of Pine Creek above and below its confluence with Morgan Creek, in the vicinity of the Pine Creek Tungsten Mine near Bishop, Inyo County, California. Pine Creek Mine, LLC has filed an application to construct and operate a hydroelectric plant to generate electricity using spring water that accumulates. There is currently a concrete plug at the entrance to the mine shaft that allows water to accumulate. A pipe running through the concrete plug in the mine shaft allows water to exit the mine into Morgan Creek which drains immediately downstream into Pine Creek.

Location and Setting

Pine Creek is approximately 22.0 kilometers (km) (13.7 miles [mi]) in length and flows from its headwaters at Pine Creek Pass at an elevation of 11,120 feet (ft) through Upper Pine Lake, Pine Lake, and eventually drains into Lower Rock Creek just before its confluence with the Owens River within the Owens River Basin (Figure 1). Pine Creek Mine is located approximately 27.2 km (16.9 mi) to the west of Bishop, California. The mine is located just upstream from its confluence with Morgan Creek at an approximate elevation of 7,800 ft. Morgan Creek is an ephemeral creek that is approximately 4.3 km (2.7 mi) in length and flows from its headwaters at an elevation of 9,200 feet to its confluence with Pine Creek just downstream from Pine Creek Mine. Spring snowpack melt and naturally occurring artesian groundwater springs are the main contributors to stream flow.

METHODS

Physical habitat data collection and benthic macroinvertebrate sampling methods conformed to SWAMP's standard targeted riffle composite (TRC) method for documenting and describing benthic macroinvertebrate assemblages within sampling sites.

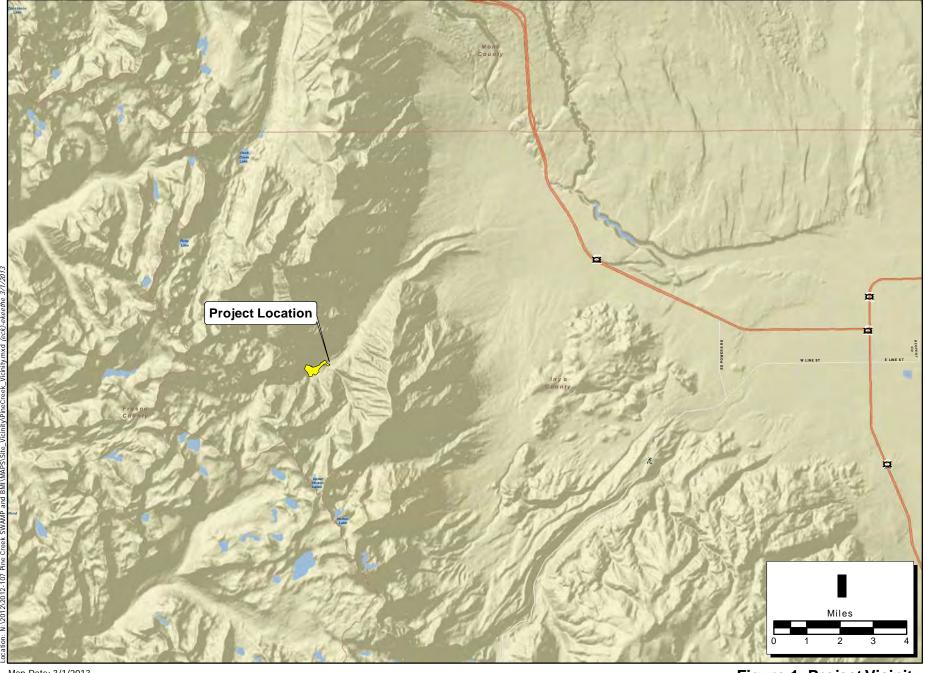




Figure 1. Project Vicinity

Physical Habitat Characterization

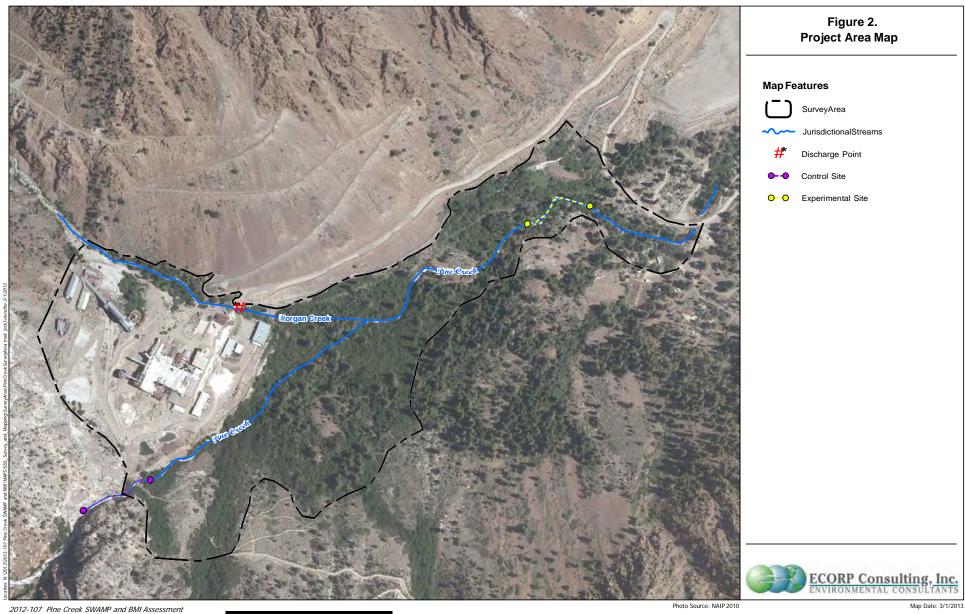
Two stream reaches (sites), each measuring 150 meters (m) in length, were selected during the Pine Creek Baseline Aquatic Habitat Monitoring Survey conducted on 10 and 11 September 2012 (Figure 2). One site was established in Pine Creek upstream from its confluence with Morgan Creek and served as the reference site (control site) for the study. The control site was located slightly outside the project area because streamflow in Pine Creek became subsurface within the project area. The control site was therefore located upstream and slightly outside of the project area because it was the only location in which a 150-m sampling reach could be located above the confluence with Morgan Creek.

A second site was established in Pine Creek downstream from the confluence with Morgan Creek and served as the potentially-affected site (experimental site) for the study. This site was selected based on its proximity to the confluence with Morgan Creek and the ability of surveyors to safely work within the stream channel.

In an effort to minimize any anomalous readings, water quality readings were collected prior to instream surveys. A multi-probe water quality meter (HORIBA Model U-52) was utilized to record water temperature, conductivity, salinity, dissolved oxygen (DO), total dissolved solids (TDS), pH, turbidity, and oxidation-reduction potential. The water quality meter was calibrated according to the manufacturer's instructions prior to the survey, and the data were tabulated according to site location and date of collection.

Physical habitat (PHAB) characteristics at each site location were evaluated, measured, and recorded using California's State Water Resources Control Board (SWRCB) SWAMP procedures (Ode 2007). According to SWAMP protocols, PHAB characteristics that are measured in streams less than 10 m wide should be based on a 150-m reach with sub-samples collected along 11 transects and 10 inter-transects.

At each transect, a tape measure was extended perpendicularly across the stream to measure the wetted width, bankfull width, and bankfull height dimensions. Along these transect lines, distance from left bank, depth, substrate size class, percent cobble embeddedness, presence of



coarse particulate organic matter (CPOM), microalgae thickness, presence of attached macroalgae, presence of unattached macroalgae, and presence of aquatic macrophytes were recorded at predetermined locations (left and right banks, center, and left and right centers). Canopy cover was measured by taking four readings (center left, center upstream, center right, and center downstream) using a densiometer. Visual estimates of riparian vegetation, instream habitat complexity, human influence, and bank stability were also recorded. The evaluation of riparian bank vegetation and instream habitat complexity was provided using the SWAMP Stream Habitat Characterization forms rating scale from 0 to 4. The rating scale is arranged as follows:

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0 = Absent	(0%)
1 = Sparse	(<10%)
2 = Moderate	(10-40%)
3 = Heavy	(41-75%)
4 = Very Heavy	(>75%)

At each inter-transect, a tape measure was extended perpendicularly across the stream to measure the wetted width. Along these transect lines, distance from left bank, depth, substrate size class, percent cobble embeddedness, presence of coarse particulate organic matter (CPOM), microalgae thickness, presence of attached macroalgae, presence of unattached macroalgae, and presence of aquatic macrophytes were recorded at predetermined locations (left and right banks, center, and left and right centers). Visual estimates of the percentage of flow habitats present were also recorded.

Streamflow discharge data were collected at the downstream extent of each site. Water discharge was measured using a Marsh-McBirney Flo-Mate 2000 electromagnetic flowmeter (FLO-MATE 2000). The flowmeter was calibrated according to the manufacturer's instructions prior to the survey, and the data were tabulated according to site location and date of collection. Surveyors also recorded evidence of any recent rainfall or fires in the area, in addition to the dominant surrounding land use.

The slope of the entire reach was measured using a hand-held inclinometer. Additional habitat characteristics including rankings of epifaunal substrate/cover, sediment deposition, and channel alteration were recorded using the following scale:

20-16	= Optimal	(>70%)
15-11	= Suboptimal	(41-70%)
10-6	= Marginal	(20-40%)
5-0	= Poor	(<20%)

BMI Collection

Within each site, a total of eight kick samples were collected within eight distinct riffle habitats using a 0.02-inch diameter mesh D-framed kicknet. Each of the eight subsamples covered one square foot of the stream bottom, and were used to form one composite sample for each site. Sub-samples were taken from a defined "core area" within each riffle, and surveyors were careful to avoid edges along channel margins as well as the upstream or downstream edges of the riffle. Samples were collected starting at the most downstream riffle unit and proceeding upstream to minimize instream disturbance.

All samples were preserved with 95-percent ethanol, and properly labeled with time, date, and site location. Samples were delivered to the EcoAnalysts laboratory, where each sample was then rinsed in a standard No. 35 sieve (0.5 mm) and transferred to a tray with four, square-inch grids for subsampling. In cases where BMI abundance exceeded 100 organisms per grid, half grids were delineated to assure that a minimum of three discreet areas within the tray of benthic material were subsampled. A total of at least 500 BMIs were subsampled from a minimum of five grids, or five half grids.

All organisms were removed from the subsample and identified to Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT) Level 2 protocol (Richards and Rogers 2006). Subsampled BMIs were identified by a taxonomist approved by the California Department of Fish and Wildlife (CDFW), (formerly California Department of Fish and Game), for U.S. Environmental Protection Agency (USEPA) evaluations using standard aquatic

macroinvertebrate identification keys. Following the data collection and sample processing, all data were subject to quality assurance/quality control (QA/QC) procedures including, but not limited to, spot-checks of data and review of electronic data for completeness. Standard biological metrics (as outlined in Ode et al. 2005) plus any additional relevant metrics (regional IBI), were calculated for each reach and presented in graphical or tabular form. Finally, the CDFW Aquatic Bioassessment Laboratory (ABL) was contracted to perform an external QC review of the sample identification. Twenty percent of the samples collected (or one sample, if five samples or less are collected) were randomly selected for QC by the taxonomist and sent to the CDFW ABL for taxonomic verification.

RESULTS

The following section provides an overview of the BMI results (all sampling reaches combined) obtained during the survey effort in fall 2012; general descriptions of sampling reaches including physical habitat conditions (based on fall surveys); and specific BMI results, by sampling reach, for the survey efforts.

During the fall 2012 surveys, an estimated 5,157 BMIs were collected from the two sampling sites, representing 51 distinct taxa and 11 orders. Of this total, 1,291 BMIs were identified during the sample processing effort.

Habitat and substrate characteristics for both sites are provided in Attachment A. Raw BMI data and summary metrics are presented in Attachment B. The SoCal B-IBI scores for each site are provided in Attachment C. Additionally, copies of field data sheets completed for the fall surveys are included in Attachment D. Attachment E includes representative site photos.

Control Site

The control sampling site is located on Pine Creek upstream from the Pine Creek Mine at UTM coordinates 11S 0349226 E, 4135902 N and an elevation of 7,961 ft. The downstream end of the 150-m sampling site is located approximately 520 m upstream from its confluence with Morgan Creek. The control site is within a high gradient mountain creek with a slope of

19.56%, with an average streamflow of 2.9 cubic feet per second (cfs). Water temperature was 14.35 degrees Celsius (°C), dissolved oxygen was 8.24 milligrams per liter (mg/L), and pH was 9.68 within the site (Table 1). Cascades/falls and riffles were the primary instream habitats with substrates dominated by cobble and both small and large boulders. Bankfull widths ranged from 3.8 to 9.2 m, with both stable and vulnerable banks. Stream depths ranged from near zero to 110 centimeters (cm). Canopy cover was intermediate with an average of 34.1% and consisted primarily of water birch riparian scrub with minimal deposits of coarse particulate organic matter (CPOM) in the stream channel. Riparian vegetation consisted of miner's dogwood (*Cornus* sp.), mountain dogwood (*Cornus* sp.), mountain alder (*Alnus* sp.), water birch (*Betula* sp.), California buckeye (*Aesculus* sp.), buckthorn (*Rhamnus* sp.), and slippery elm (*Ulmus* sp.). Emergent vegetation was absent throughout the reach. Human influence within and adjacent to the reach was evident by the trash and landfill present, along with a bridge that extends over the reach. The surrounding land use was forest and mining.

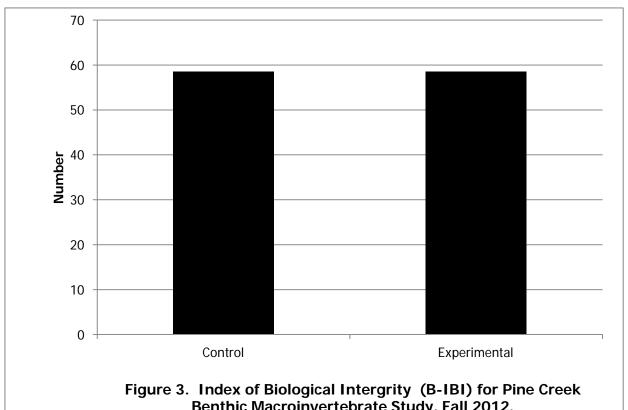
The three RBP scores for this reach were in the Optimal range. Epifaunal substrate cover scored a 17 (Optimal), sediment deposition consistently scored a 19 (Optimal), and the channel alteration parameter consistently scored 19 (Optimal) (see Attachment A). The SoCal B-IBI score for this reach was in the 'Fair' condition category (see Attachment B, Figure 3).

Community metrics indicated a balanced benthic community, as indicated by the Shannon Diversity Index (SDI) (see Attachment B, Figure 4). The stonefly, *Zapada cinctipes* dominated the benthic community, comprising 15% of the community (see Attachment B, Figure 5). The Tolerance Value (2.7) was lower than that observed for the experimental site (see Attachment B, Figure 6). Intolerant Organisms accounted for 56% of the community (see Attachment B, Figure 7). The high number of Intolerant Organisms directly affected the Tolerance Value.

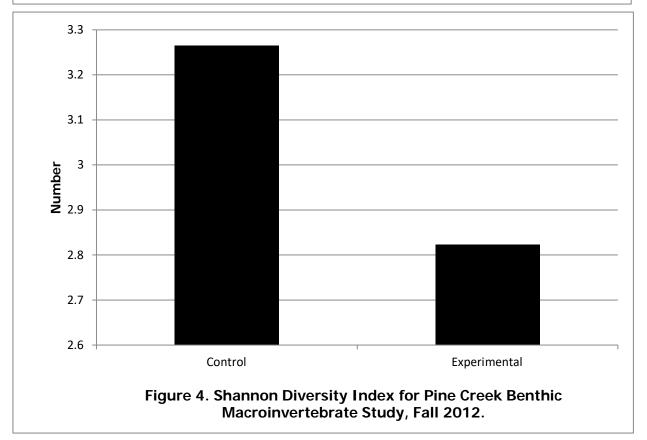
Correspondingly, Tolerant Organisms comprised 3.5% of the community. Additionally, EPT and Sensitive EPT indices exceeded 60% of the community (see Attachment B, Figure 8).

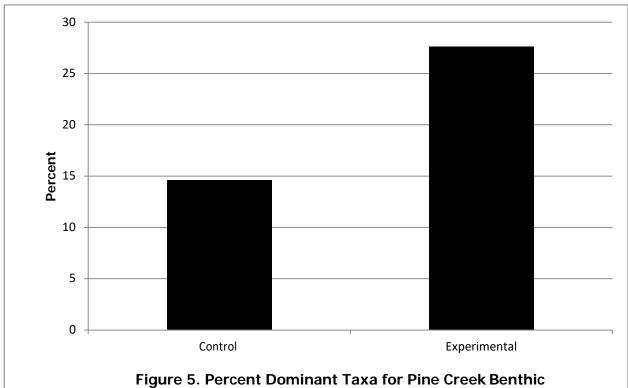
Table 1. General Physical Habitat Characteristics and Water Quality Measurements, Fall 2012

	Fall 2012		
	Pine Creek	Pine Creek	
Sampling Information	Control	Experimental	
Date Sampled	9/10/2012	9/11/2012	
Time Sampled	13:30	10:05	
Site Length (m)	150m	150m	
Specific Conductance (mS/cm)	0.03	0.07	
Dissolved Oxygen (mg/L)	8.24	9.17	
Water Temperature (°C)	14.35	10.64	
Turbidity (NTU)	0.00	0.00	
рН	9.68	9.44	
Salinity (ppt)	0.00	0.00	
ORP (mV)	183.00	134.00	
Total Dissolved Solids (g/L)	0.02	0.05	
Notable field conditions	Control	Experimental	
Recent Rainfall	N	N	
Evidence of Fires	N	N	
Dominant landuse/cover	FOREST/INDUSTRIAL	FOREST	

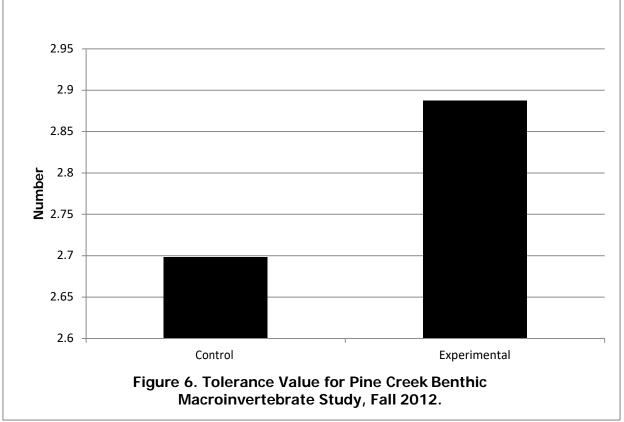


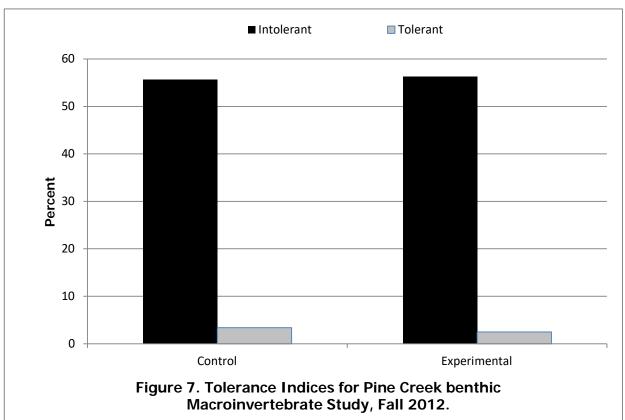
Benthic Macroinvertebrate Study, Fall 2012.

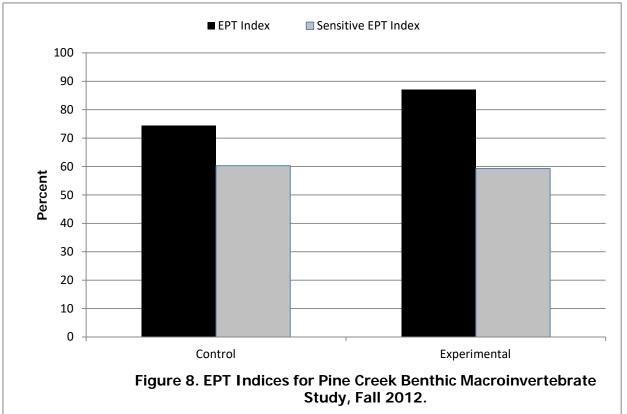




Macroinvertebrate study, Fall 2012.







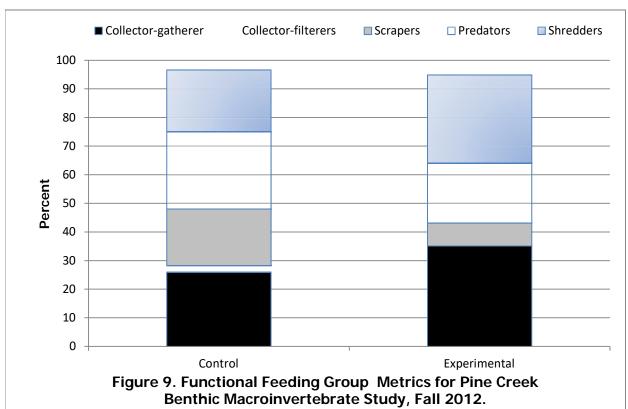
Functional Feeding Group metrics indicated that the community was co-dominated by three feeding groups; Predators, Collector-gatherers, and Shredders exceed 20% of the community (see Attachment B, Figure 9). Additionally, Scrapers comprised about 20% of the community.

Experimental Site

The experimental sampling site is located on Pine Creek downstream from the Pine Creek Mine at UTM coordinates 11S 0350045 E, 4136395 N and an elevation of 7,475 ft. The upstream end of the 150-m sampling site is located approximately 370 m downstream from its confluence with Morgan Creek. The experimental sampling site is within a high gradient mountain creek with a slope of 11.73% and an average streamflow of 17.7 cfs. Water temperature was 10.64 °C, dissolved oxygen was 9.17 mg/L, and pH was 9.44 within the site (Table 1). Rapids was the primary instream habitat type with substrates dominated by cobble and both small and large boulders (Attachment A). Bankfull widths ranged from 4.2 to 6.6 m, with both stable and vulnerable banks present. Stream depths ranged from near zero to 110 cm. Canopy cover was dense and averaged 75.3%. The riparian corridor consisted primarily of water birch riparian scrub, which included elderberry (*Sambucus* sp.), box elder (*Acer* sp.), mountain maple (*Acer* sp.), and ash (*Fraxinus* sp.), with minimal deposits of CPOM in the stream channel. Emergent vegetation was sparse throughout the reach. Human influence within and adjacent to the reach was evident by the trash present. The surrounding land use was forest.

The three Rapid Bioassessment Protocol (RBP) scores for this reach were in the Optimal range. Epifaunal substrate cover scored a 19 (Optimal), sediment deposition consistently scored a 19 (Optimal), and the channel alteration parameter consistently scored 19 (Optimal) (see Attachment A). The SoCal B-IBI score for this reach was in the 'Fair' condition category (see Attachment B, Figure 3).

Community metrics indicate that the benthic community was relatively balanced, as evidenced by the Shannon Diversity Index (SDI) (see Attachment B, Figure 4). The stonefly, *Zapada cinctipes* dominated the benthic community, comprising 28% of the community (see Attachment B, Figure 5). The mayfly, *Beatis* sp. comprised 17% of the community and was the second most abundant organism at this site. The Tolerance Value was slightly higher than was



observed at the reference site, however, both scored less than 3.0 (see Attachment B, Figure 6). Intolerant Organisms accounted for 56% of the community (see Attachment B, Figure 7). The high number of Intolerant organisms directly affected the Tolerance Value. Correspondingly, Tolerant Organisms comprised 2.5% of the community. Additionally, the EPT Index exceeded 85% and Sensitive EPT Index exceeded 59% of the community (see Attachment B, Figure 8).

Functional Feeding Group metrics indicated that the community was dominated by the three groups; Collector-gatherers, Shredders and Predators. The Collector-gatherers and Shredders each comprised greater than 30% of the community (see Attachment B, Figure 9). Scrapers comprised about 8% of the community.

The experimental site was randomly selected for external QC of taxa identification and counts by the CDFW ABL in Chico. The external QC found only minor discrepancies in the counts of six taxa. There was only one instance where the original ID was disputed by the ABL, and five instances where the original ID was placed at a different taxonomic level. The CDFW ABL external QC report is included in Attachment F.

DISCUSSION

Results from the BMI bioassessment surveys indicated the sites were relatively similar, based upon IBI scores. However, streamflow at the experimental site was approximately six times the flow at the control site, due to a tributary entering Pine Creek between the two sites. Riparian canopy at the experimental site was also about twice that observed at the control site. However, the slope was much higher at the control site. Taxa Richness was higher at the control site as was the Shannon Diversity Index, indicating the control site had a more balanced community compared to the experimental site. Tolerance values were similar between sites, as were percent Intolerant and Tolerant organisms. The control site had a lower EPT Index, however the Sensitive EPT values were similar between sites, with a difference of only 1%. Mayfly and trichoptera taxa were more abundant at the control site, while the experimental site had more stonefly taxa. Abundance estimates were higher at the experimental site.

Substrate composition varied between the two sites; bedrock abundance at the control site was twice that observed at the experimental site. Larger substrates (boulder/bedrock) were more abundant (10%) at the control site and preferred BMI substrates (gravel/cobble) were more abundant (10%) at the experimental site. Habitat composition differed between the two reaches with cascades/falls comprising four times the habitat at the control site. Rapids comprised more than two times the habitat at the experimental site than that observed at the control site.

The following discussion provides an assessment and comparison of the BMI communities present at the control site relative to the communities at the experimental site.

Control Site

The SoCal B-IBI for the control site also scored in the 'Fair' range, indicating a degree of similarity between the two sites. However, the SDI at the control reach was higher than observed at the experimental site. This higher score indicates a relatively more balanced community than observed at the experimental site. Taxa richness also scored higher at this site. The EPT Indices exceeded 60% of the community at this site and many of these organisms were 'sensitive' to pollution. The benthic community was more evenly distributed as described by the Functional Feeding Groups. Four feeding group metrics were about 20% or more of the community, with only a minor percentage of Collector-filterers comprising the community. Predators, Collector-gatherers, Shredders, and then Scrapers were the four most abundant groups in the community, compared to three of these at the experimental site. The Tolerance Value was also lower at this site.

The control site also had a much higher percentage of large substrate types than observed at the experimental site. However, gravels and cobbles still comprised 40% of the substrate, which are favorable habitat for EPT taxa. Fines were a minor component of the substrate and probably had little effect on the benthic communities at this site. One of the biggest differences between the sites was the riparian canopy cover, which was half as abundant at this site compared to the experimental site.

Experimental Site

The SoCal B-IBI score for the experimental site was in the 'Fair' category. In addition to the reach location, substrates in the reach were dominated by cobble and small boulder with little fine substrates. Substrates of cobble, small boulder and coarse gravels are a stable base and preferred substrates for benthic macroinvertebrate communities, especially the orders Ephemeroptera, Plecoptera, and Trichoptera (EPT Taxa) (Hines 1970). The EPT Taxa are sensitive to most types of water pollution, and the number of individuals in these groups decline with decreasing water quality, as does Taxa Richness (Reice and Wohlenberg 2001). However, the EPT taxa were the most abundant organisms in this reach. The dominant taxa was Zapada cinctipes, an intolerant stonefly which is sensitive to pollution. The mayfly Baetis sp., was the second most dominant taxa, however Baetis sp. is not considered a sensitive organism. This reach also had more stonefly taxa than observed in the control reach, and many of the genera observed were also intolerant species. This reach was also dominated by three of the Functional Feeding Group metrics, Percent Collector-gatherers, Shredders and Predators with a few Scrapers. No Collector-filterers were collected in this reach. The SDI was lowest at this site, but indicated a fairly balanced community. Nonetheless, the two sites both appear to be in good condition as determined by the BMI metrics and B-IBI scores.

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ATTACHMENT A

Physical Habitat and Substrate Characteristics, Fall 2012

Attachment A. Physical Habitat and Substrate Characteristics, Fall 2012

Habitat Composition

	Cascade/							
	Falls	Rapid	Riffle	Run	Glide	Pool	Dry	Total
Control	28	16.5	27	12.5	12	3.5	0.5	100
Experimenta	7	42.5	22.5	18	6.5	3.5	0	100

Substrate Composition

				Gravel		Small	Large	Bedrock	Bedrock	
	Wood	Sand	Gravel Fine	Coarse	Cobble	Boulder	Boulder	Rough	Smooth	Total
Control	1.0	4.8	9.5	10.5	20.0	22.9	20.0	11.4	0.0	100.0
Experimenta	1.9	3.8	5.7	13.3	31.4	23.8	16.2	1.0	2.9	100.0

Embeddedness

	Control	Experimenta
Average	37.6	34.8

Canopy Cover

	Control	Experimenta
Average	34.1	75.3

Creek Flow

	Control	Experimenta
Average	2.9	17.7

Additional Habitat Characterization

	Control	Experimenta
Epifaunal		
Substrate		
/ Cover	17	19
Sediment		
Depositio	19	19
Channel		
Alteratio	19	19

ATTACHMENT B

Raw BMI Data and Summary Metrics

Pine Creek BMI Data 2012

CTV PHYLUM ARTHROPODA Class Insecta Coleoptera (Larvae) Elmidae 4	c	g	6275.1-1	6275.1-2
Class Insecta Coleoptera (Larvae) 4 Elmidae 4 Diptera Chironomidae 6 Tanytarsini 6 Microspecta sp. 7		g		
Coleoptera (Larvae) Elmidae 4 Diptera 6 Chironomidae 6 Tanytarsini 6 Microspecta sp. 7		g		
Elmidae 4 Diptera 6 Chironomidae 6 Tanytarsini 6 Microspecta sp. 7		g		
Chironomidae 6 Tanytarsini 6 Microspecta sp. 7		٠ I		1
Chironomidae 6 Tanytarsini 6 Microspecta sp. 7	C	- 1		
Tanytarsini 6 <i>Microspecta sp.</i> 7	C			
Microspecta sp. 7	C			
)		
	CÓ		4	5
Rheotanytarsus sp. 6	C		1	
Diamesinae 2	Cĺ	³		
<u>Diamesini</u> <i>Diamesa sp.</i> 5	C	, I	1	
Orthocladiinae 5	C	•	1	
Brillia sp. 5	sl		15	4
Chaetocladius sp. 6	C			2
Cricotopus sp. 7	C			2
Eukiefferiella devonica gr	or		4	4
Eukiefferiella gracei gr.	or	n	2	
Orthocladius sp. 6	C	,		1
Orthocladius (Symp.) lignicola			1	
Orthocladius complex			2	2
Paraphaenocladius 'n. sp.'			1	
Parorthocladius sp.			_	1
Rheocricotopus sp. 6	or		3	1
Tvetenia bavarica grp. 5	CÓ		15	3
Dixidae 2 Dixa sp. 2	Cĺ		1	
Dixa sp. 2 Empididae 6	C		3	2
Chelifera /Metachela sp. 6	p p		22	5
Clinocera sp. 6	p		1	3
Wiedemannia sp. 6	p		20	9
Simuliidae 6	C			
Simulium sp. 6	C	-	4	
Thaumaleidae	S	;	1	
Thaumalea sp.	S	;		
Tipulidae 3			1	
Dicranota sp. 3	p	4	2	
Megaloptera		4		
Corydalidae 0 Orohermes crepusculus 0	p		2	2
Orohermes crepusculus 0	p	4	3	2
<u>Ephemeroptera</u>		d		
Baetidae 4	C	,		
Baetis sp. 5	C		75	112
Baetis tricaudatus 6	C		8	51
Ephemerellidae 1	C			
Caudatella sp. 1	C		9	4
Caudatella hystrix 1	C		11	1
Drunella doddsi 0	C	,	20	26
Drunella spinifera 0	p		6	1
Heptageniidae 4	S	;	1	
Epeorus sp. 0	S		90	27
Ironodes sp. 3	S		34	21
Rhithrogena sp. 0	S		2	3
Leptophlebidae 2	CÓ	³ ¶	5	
Plecoptera Plecoptera				
Chloroperlidae 1	р	d	12	22
Nemouridae 2	sh		19	4
Malenka sp. 2	sh		17	1
Zapada cinctipes 2	sh		95	177
Zapada columbina 2	sl		7	2
Peltoperlidae 1	sl			1
Yoraperla sp. 1	sł			9
Perlidae 1	р		9	2
Calineuria californica 2	p	J	2	

I			ı	
			Pine Creel	k Pine Creek
	CTV	FFG	Control	Experimental
Doroneuria baumanni	1	р	4	3
Hesperoperla sp.	2	р		11
Hesperoperla hoguei	2	р	_	3
Perlodidae	2	р	1	1
Frisonia picticeps	2	р	9	26
Pteronarcyidae "	0	om		4
Pteronarcella sp.	0	om		1
<u>Trichoptera</u>				1
Hydropsychidae	4	cf		
Arctopsychinae			6	14
Arctopsyche sp.	1	р		5
Arctopsyche californica	1	p	1	4
Parapsyche sp.	0	p	9	6
Hydroptilidae	4	ph		
Nothotrichia shasta	4	ph	1	
Lepidostomatidae	1	sh		
Lepidostoma sp.	1	sh	4	
Philopotamidae	3	cf		
Dolophilodes sp.	2	cf	8	
Rhyacophilidae	0	р		
Rhyacophila sp.	0	р	5	5
Rhyacophila betteni gr	0	р	4	
Rhyacophila brunnea gr	0	р	24	10
Rhyacophila hyalinata gr	0	р		2
Rhyacophila vofixa gr.	0	р	1	
Uenoidae	0	SC	1	
Oligophlebodes sp.	0	cg		2
Subphylum Chelicerata				
Class Arachnoidea				
Acari				
Hygrobatidae	5	n		
Hygrobates sp.	8	p p	2	
Hydrovolziidae		Р	_	
Lebertiidae	5	р		
Lebertia sp.	8	p	2	2
Sperchontidae	5	p	1	1
Sperchon sp.	8	p	11	3
Sperchonopsis sp.	8	p	6	8
Torrenticolidae	5	p		
Testudacarus sp.	5	р	4	1
Torrenticola sp.	5	p	12	
		•		
Subphylum Crustacea				
Class Ostracoda				3
<u>Ostracoda</u>	8	С		3
Cyprididae	8	С		
PHYLUM MOLLUSCA				
Class Bivalvia				
<u>Pelecypoda</u>	8	cf		
Sphaeriidae	8	cf	1	
PHYLUM PLATYHELMINTHES				
Class Turbellaria			1	6
				45
Class Oligochaeta	5	cg	20	15

Pine Creek Summary Metrics, Fall 2012

	Control	Experimental
B-IBI	58.6	58.6
Abundance	2080	3077
Taxa Richness	62	55
Dominant Taxon	14.6	27.6
EPT Taxa	31	32
EPT Index	74.3	87.1
Sensitive EPT Index	60.3	59.3
Ephemeroptera Taxa	11	9
Plecoptera Taxa	9	14
Trichoptera Taxa	11	8
Dipteran Taxa	20	13
Percent Dipteran	16.0	6.4
Non-Insect Taxa	10	8
Percent Non-Insect	9.2	6.1
Percent Chironomidae	7.5	3.9
Percent Hydropsychidae	2.5	4.5
Percent Baetidae	12.8	25.4
Shannon Diversity	3.27	2.82
Tolerance Value	2.7	2.9
Intolerant	55.7	56.3
Tolerant	3.4	2.5
Collector-gatherer	26.0	35.1
Collector-filterers	2.2	0.0
Scrapers	19.8	8.0
Predators	27.1	20.9
Shredders	21.5	30.9
OTHER	1.5	0.9
Piercer herbivore	0.2	0.0
Macrophyte herbivore	0.0	0.0
Omnivore	1.4	0.9
Xylophage	0.0	0.0

ATTACHMENT C

SoCal B-IBI Scores

ECORP Pine Creek SWAMP Benthos 2012

Southern California B-IBI. EcoRegion = Southern CA Mountains

Data electronically subsampled to 550 count and certain taxa rolled-up for IBI calculations (Metrics shown on this page are calculated using CA specific attributes.)

S.tream	Pine	Creek	Pine	Creek		
Stie	Cor	ntrol	Experimental			
nme	13	:30	10	:05		
Sample Date	09-10	-2012	09-11	l-2012		
Percent Subsampfed	550	cnt	550	cnt		
EcoAnalysts Sample ID	6275	5.1-1	6275	5.1-2		
	Value	Score	Value	Score		
Coleoptera Taxa	0.0	0	0.0	0		
EPTTaxa	19.0	10	17.0	9		
Predator T.axa	17.0	10	13.0	10		
% Collector 1.1d: vidt.1a ls	28.8	0	35.0	0		
% Intolerant individuals	<i>5</i> 9.1	10	59.8	10		
% Non-Insect Taxa	24.3	6	25.0	6		
% Tolerant Taxa	20.6	5	19.2	6		
SoCalB-IB	58	3.6	58.6			

Score	Rating
0 -19	Very Poor
20-39	Poor
40 - 59	Fair
60 - 79	Good
80 - 100	Verv Good

ATTACHMENT D

Field Data Sheets

(carry over from transect

forms if needed to altain.
--larget count of 25;

measure in %)

14.

40

15

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:19

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ВO

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	Site Code:	ango ports Prima kata		iaracterizat			2012			generality galactic (1) y 1999	e e e e e e e e e e e e e e e e e e e		
	Andreas	SLOPE	and Be	aring Fo	км (tran	sect ba	sed = f	or Full	PHAB	only)		AUTOLEV CLINOME HANDLEV	TER X
	Starting	(rec	cord percen	MAIN S t of inter-trans optermental s	ect distance	in each seg used)	ment	(rec	ord percei	SUPPLEMEN nt of Inter-tran ipplemental	sect distan	MENT ::	
70	Transect		a rod ements	Slope (%) on Elevation Difference	Segment Length (m)	Bearing (0°-359°)	Percent of Total Length (%)		a rod ements	Slope of Elevation Difference Cm %	Segmen Length (m)	Bearing (0°-359°)	
	i k	(eye)	63		E Transfer	68							
			83	'&:'.>		660			[.,,',\'Q	- '2.C'i!,	(n) (n) (n) (n) (n)	45	
			1q	I ,q		(o'/'		 	:. t3	\ Sc		4-3	
>t:			4t·	Ilio		7d	<u>.</u>		55	.16%		45	
		3 , 4, 5,	3.i.	I 'oL		(oq')			-42	205		44	
			;" 150	113		1 .{	D C		I G,	147		50	
			t/3	1 "20 \ ")	1	12-		1	: 1	- \5,			
. ':			?, 1 7	1		70 90 90			q.5.	c:; g			
: - - 			;	1'31 <i>'1</i> '8		B5 B3			• I f 1	V2.% TOG		do	
	B		4.7	17\$ 1		88	<u> </u>	-	•	<u></u>		90	
1639	A additional		(-45	99		86			¦	- d		90	al slope
*	calculation area			→55→(=		ter en en en en en		133	and a decision of the second	High Gradi	and the same transfer than		
7979 Total Arsx 1: 2977	Par	ameter	April 18 Par	IAI HABITAT Optiin	ial	Şı	lboptim	al 🗐 🗀 🕒		Varginal :		Po	
- O		il Substr over	. fav	areater than 70% orable for epifaur and fish cover (5 gradient stream	al colonization C% for low-	40-70% m 50% for I	ix of stable h ow-gradient s ed for full colo	treams); 🚟	30% in id	ix of stable habit ow-gradient strea frequently distur	ms); (*) sed ar	Less than 20% 10% in low-grad Jack of habita	dent streams), t is obvious;
, i		core,		bmerged logs, tir cobble or other st 19 18		15 14	potential 13	12 11	(allog traces transferences)	removed 8 7	6 5	4 3	ble of lacking 2 1 0
	Sedimen	t Deposi	tion 💮 🤲	tie of no enlarger point bars and le e bottom affected position (<20% i	ss than 5% of by sediment	formation sand, or fi	new increase , mostly fron le sediment n affected (2	gravel, 5-30% of	sand, or fin 50% of the	ieposition of new e sediment on ba e bottom affected	grave ire: 30- i (50-a	increased bar on one than 50%	of fine material, and development; and for the bottom antly (>80% in
Total		core:	20	Estream		15 1/4	gradient strea 13	ims) 12 11	80% in i	ow gradient stream.	6 5	tow-gradien 4 3	(sireams) 2 1 0
= 19.85%	Channe	l Alterati		annelization or di r minimaj, stream patteri	with normal	(e.g., bridg	annel zation e abulmants) annelization s present but	; evidence (> 20yrs)	embankme present on	ation may be extents or shoring str both banks, 40.1	uctures re o 80%	ment, Over 80 ich channelize	vith gablan or % of the stream d and disrupted greatly altered :
· ·	in a sur Si	core:	20		17 16	15 14	lization not p	resent	10 9	am reach disrupt 8 7	eq.	or tewore	d entirely for the 2 1 0

						Transect Su	bstrates	e de la companya de La companya de la co		
Position	Dist frøm # LB (m)	Depth (cm)	mmv size class	% Cobble Embed,	СРОМ	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	Microalgae Thickness Godes 0 = No microalgae present
Len Bank	0	1	5B	—	P ⁄ 🖹	1	P 🖱 D	P 🙆 D	P 🔕 D	1 = Present but not visible.
Left Center	0,15	0	I	_	p <i>If</i>)	2.		p © D	P @ D	2 = Present and visible but <pre> <fmm; (ngers="" a)<="" on="" pre="" produces="" rubbing="" surface=""></fmm;></pre>
Genter	1.5	•	c.,c,		p ®		p (1)I D	р <i>а</i> , _D	p <i>ii!!</i> , D	brownish tint on them, scraping leaves visible
Right Center	2.25	1 q	;,<. 6		p Ifil,	l	p D	Pd, D	p .& D	
Right Bank	3.	2	5.B		Р 🔊	-	P A D	P & D	P Ø D	5 ≥ >20mm; UD ≠ Cannot deta mine if
	Note: Sub class cate	stratė size: gories liste	s can be d on the	recorded eill supplementa	ier as direc I page (dire	t measures of thi of measurement	e median axis of is preferred)	each particle of	one of the size	microalgae present, substrate too small or covered with sit (fornerly 2-zode) D = Dry_not assessed

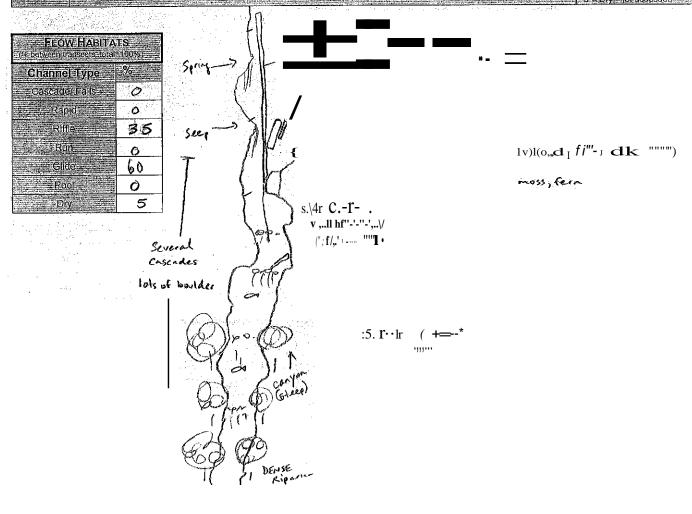
RIPARIAN VEGETATION (lacing downstream)	0 = Ab 1 ≃ Sp. 2 = Mo	arse (•	<10%)		:4 = '	Heav Very I	y (40 Jeav	-759 y (>7	o). (5%)		INSTREAM HABITAT COMPLEXITY	0 ∈ Abr 1 = Sp 2 = Mo 3 = He 4 = Ver	arse derate avy	(10-4) (40 ₂ 7	0%) 0%) 5%)		DENSIOMET READINGS (0 Countravered	1-17)
Vegetation Class	LE	ft Ba	ink			Rig	ht E	lani	C .		Filamentous Algae	(0) 1	2	3	4		Center	15
uppe	r Canop	y (>5	m hiç	ih)							Aquatic Macrophytes/ Emergent Vegetation	الما	2	3	4	İ	Leπ	
Trees and saplings >5 m high	0 1	②	3	4	0	1	(2)	3	4		Boulders				_4	•	Center ; Upstream	13
Lower 6	anopy (0.5 m	-5 m	nig	h)						Woody Debris >0.3 m				4		Center	1
All vegetation 0.5 m to 5 m	0 1	(2)	3	4	0	(1)	2	3,	4	Ī	Woody Debris < D.3 m	o (j)	2	3	4		Right _	_ []
Groun	l d Caver	(<0.5	m hi	gh			12.00				Undercut Banks	0	2	3	4		Center Downstream	1+1
Woody shrubs & saprings <0.5 m	o (1) 2	3 .	4	0		2	3	4		Overhang. Vegetation	$\overline{\circ} G$) 2	3	4		Optional	
Herbs/ grasses	G)	2	3 4	4	0	©	2	3	4		Live Tree Roots	0 0)	2	3	4		Left Bank	
Barren, bare soil/duff	0	2	3 :	4	,				4		Artificial Structures	0	2	3	4		Right Bank	

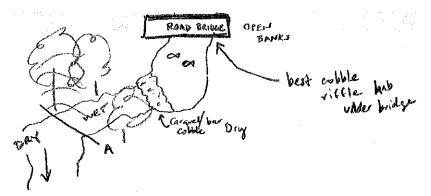
HUMAN INFLUENCE (circle only the closest to wetted channel)	B = 0 C = B P = ≥	lOm≠≤	∙ Ban 50m f	i & 10 ₀ rom Cha res or No					
		Left	Bank	Ċ	Channel		Righ	t Ban	k 🖃
-Walls/ Rip-rap/ Danis	Р	С	В	0	Y 🔯	9	В	С	Р
Baildings	Р	С	В	6)	Y 🕏	d	В	C	Р
Pavement/ Cleared Lot.	(P)	С	В				В	c	p
Road/Railirdad	p	c	В				В	c	p
Pipes (inlet/ Outlet)	p	c	В				В	С	p
Landfill/Trash	p	c	В				В	c	p
Park/Lawn	<u>p</u>	_c	В		-		В	c	p
Row Grop	р	c	В		_		В	c	p
Pasture/Range	<u>p</u>	С	В				В	c	p
Logging Operations	Р	С	В	6		d	В	С	p
Mining Activity	0	С	В	0	Y 🔞	d	В	c	p
Vegetation Management	Р	С	В	0		o	В	c	p
Bridges/ Abutments	Р	С	В	0	Y 😥	O	В	0	р
Orchards/Vineyards	Р	С	В	0		V	В	c	р

-B		
***************************************	4 Mary	

TAKE Hfff'OORM>ff (check box if taken & record hoto code Downstream (optiona!)
Upstream (required)

	Inter-7	Crans	ect: AB	}		Wetted Width (m): Z/8		
				ln	rec-Fransect	Substrates			
Position - Disi Rosition - from LB (in	Depth /cm1	size class	% Cobble Embed		Microalgae Ehicleness Gode	Macroalgae —Attached	Macroalgae Unaltached	Macrophytes	Microalgae Thickness Codes DENomicroalgae present Feelstrough, not slimy
Bank O	23	CB	60	Р 🕭		P 🙆 D	P Ø D	₽ ⊘ D	1 = Present but not visible Feels slimy. 2 = Present and visible but
Center 0.7	0	s.e.	•	P @	D	P (;))D	p €i,5D	P ® D	: Imm Rubbing fingers on sunface produces a
Center . 1.4	15	ei c.,		p ©	.Z)	p fil D	P®D	PaiD	brownish lint on them scraping leaves visible trail
Right 2,2	/ 15	@F		A	0	P@D	p ;)D</td <td>P 🚳 D</td> <td>3 = 1-5mm; -4, = 5-20mm; -5 = >20mm;</td>	P 🚳 D	3 = 1-5mm; -4, = 5-20mm; -5 = >20mm;
Right Z.8	8	GF		PA	0	P 🚳 D	P (A) D	P 🙆 D	UD = Cannot determine if microalgae present; substrate too small or
Note: S class o	iubstrate size ategories list	is can be ed on the	recorded eith supplements	ier as direc Il page (dire	f measures of the comment of the com	ne median axis of its preferred)	each particle or	one of the size	covered with silt = (formerly Z code) D = Dry, not assessed





SWAMP Stream Habitat Chara	cterization Form	F	ULL VERSION Rev	ision Date: January gth 2012
Site Code: Pine Creek Control	Site Name:. p_1	en	eek	Date: () (4) / 1 • / 2012
Wetted Width (m):	Bankfull V,ldth (m):	11-1	Bankfull Height (m):	Transact B

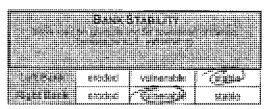
-71-01-05-6-						Transect Su	bstrates	Transit		
Position	Dist from LB (m)	Depth (cm)	mm/ size class	% Cobble Embed	C'POM	Microalgae Thickness 2 Code	Macroalgae Attached	Macroalgae -Unattached	Macrophytes	Microalgae Thickness Codes 9 = No microalgae present, Peels rough, not slimy;
u afi ∉ Bank,	Ü	i	ls!c,					P (}A D	PAD	Feels slimy
. Left Center	,7	16	Qit.		p ti)	$\mid o \mid$		р D	P t/fv D	2 = Present and Visible but <1mm, Rubbing fingers on surface produces a
Center	1.3	16	(',!?,	О	p ,0.	0	P √2iJ D	P '!I) D	p (!)) D	brownish tint on them; scraping leaves visible trail
Right Center	2.0	16	'S A		p fl)	D	р IJ D	р <i>G</i> D	p (#/ D	3 = 1-5mm; 4 = 5-20mm;
Right Bank	2.6	4	SB.	,	P Ø	10	P 49 D	P Ø D	POD	5 = ≥20mm; UD = Cannot determine if microalgae present.
						f measures of the ect measurement	e median axls of ts preferred)	each particle or	one of the size	substrate too small or covered with silt (formerly Z code). D.= Diy- not assessed.

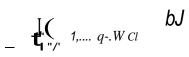
The same of the sa										
Plean an Vesenation	@	Spa	ent (C rs @ (= lerate	197	a)(3 = 1 4⊕ V				
Vegetation Class	0	Fé	ft Ba	ınk	1	(8)	Rig	h€B	añl	- 4
' Barren, bare soil/ dulf Upper	O Can	ору	(≥5	n h	igh)	0		2	3	
Trees and saplings >5 m high	0	1	2	3	4	0	0	2	3	4
Lower C	anop	y (0	.5 m	·5 n	hig	a)			(0.00 0.000)	
All vegetation 0.5 m to 5 m	0	1	2	3	4	0	@	2	3	4
The Ground	t Cov	er (<0.			'				
					•		(C)			

INSTREAM Aquality Mayor Mayor Emergen Velyamon Boulders	1 2 3	= Abse = Spar = Mod = Heav = Very	se eraje N	(*1 (10.4 (46 ² 7	0%)" 0%)
PVleorderRebrisAt@alem	O	0	2	3	44
Woody Debris <0.3 m	0	0	2	3	4
Undercut Banks	0		2	3	4
Overhang, Vegetation	0	(!)	2	3	4
live Tree Roots	0	G)	2	3	4
Artificial Structures	0			3	4

	DENSIÓME READINGS (count coverse	0-17)
	Center	0
	Center Upstream	D
	Center Right	_
	Center Downstream	<u>Z</u>
Ī	 Optional 	
	Left Bank	······································
	Bight Bank	

	HUMAN INFLUENCE (circle only the closest to wetted channel)	0 = Not Present, 8 = On Bank, C = Between Bank & 10'm from Channel, P >>10m <50m from Channel; Channel (record Yas or No.)											
			Left	Bank		Cha	nnel -		Right	Ban	k 💮		
	Walls/ Rip-rep/ Dams	Р	С	M	6 2	Υ	Ø	(6)	X	С	Р		
	Buildings	P	С	В	0	Y	Ø	19	В	С	Р		
	Pavement/Cleared Lot	(P)	С	В	0			(0)	В	С	р		
Ø	Road/Raliroad	P	С	В	6)	Υ	(8)°	0)	В	c	р		
	Pipes (Inlet/ Outlet)	p	c	В					В	c	р		
	Landfill Trash	р	c	В					В	c	р		
	Park/ Lawn	р	c	В					В	c	р		
	Row Crop	p	c	В			_		В	c	_ р		
	Pasture/Range	p	c	В					В	c	р		
	Logging Operations	р	c	В			_		В	С	р		
	Mining Activity	p	c	В					В	c	р		
1	Vegetallon Management	Р	С	В	0)			(0)	В	c	р		
叫	Bridges/Abulments	Р	С	(B)	Q	Υ	Ø	. 0	<u> </u>	С	р		
	Orchards/ Vineyards	Р	С	В	0		Parities of	1	В	c	р		





SWAMP	Stream Habitat	Charar;terization	Form	FULL VERSION	- RevIsionDate: Janua	9',2012
				经的数据 电路径 医乳头虫 医皮肤病 医多克氏管	The forest figure is the more than the first of the contract o	经帐款帐 法允许的 使说完的

	\mathbf{I}	nter-T	Frans	ect: BC		2-	Wetted Width (n	n): 4,4		
					li lii	ter-Transec	Substrates			
	Dist from HB (m)	≓Depth: ⊯(cm)	mm/ Sizo elass	€obble Embed	GPOM.	-Microalgae - Unickness - Code	≓Macroalgae — Attached	Macroalgae = EUnatrached	Macrophytes	Microalgae Thickness Codes 0 No microalgae present Feels rough, not slimy
v Left. Bank	O	30	SB	\$	(P/ 0)	0	P 🚳 D	P 🐠 D	P 🚳 D	4 = Present but not visible Feels allmy 2 = Present and visible but
Lens Ecenter	1.1	6		2.[)	p (!;)	сJ	P A)D	P (A)D	P 🙋 D	Zimm, Rubbing fingers on surface produces a
enter.	2.2	5	1!:1 F	·-&	P @	C)	P @ D	p liS) D	P 🙆 D	brownish tint on them scraping leaves visible trail
Right Genter	3,3	11	6f'		1	0	p I<'- D	P 6 D	P Ø D	3 = 1-5mm, 4 = 5-20mm
Right Bank	4.4	8	6F		P (A)	0	P (5) D	P 20 D	P (b) D	UD = Cannot determine if = criticroalgae present = substrate too small or
							nts preferred)	feach particle or	une or de size	covered with sitt (formerly Z.code) D = Dry, not assessed

一个的专家的基本是基本的基础的特别。	60 St. 10 St.
FLOW HABITA (% between transacts total	
Channel Type	·%
Cascade/-Falls	0
Rapid	O
Rifle	60
1 Run Joseph	O
Glide	40
基型 I Pool	0
Dry	ر

Site Code: [] ,µ (!(- C,	, Site Name: >,,,,,	Date: 0 9 / 10 / 2012
Wetted Width (m):	Bankfull Width (m): '3, 0 Bankfull Heigb.J (m):	Transect C

									14.	
Lett Bank	o		GF		Р 🔗	0	P 🙆 D	P 🙆 D	р D	1 ≤ Present out not visible, Feels slimy;
Left Center	0.7	12	XB		p &		P 🕭 D	P (3) D	p <i>t.!i</i> D	2 = Present and Visible but *Imm; Rubbing fingers on surface produces a
Center :	1.4	1	X6		p JD	1)	P @. D	P · D	p iA. D	brownish tint on them, scraping leaves visible
Right Center	2.1	87	ce	10	Р 🙆	١	P (!!) D	р <i>W</i> . D	P ell. D	frell. 3 = 1-5mm; 4 = 5-20mm;
Right Bank	2.8	26	СВ	30	P 6	#	P Ø D	P Q D	P 🙆 D	5 = >20mm; UD = Cannot determine if
	Note: Sub	strate size	s can be i	recorded eit	her as direct al page (direc	measures of t measureme	the median axis of ents proferred)	each particle or	one of the size	microalgae present, substrate too small or covered with slit
										(formerly Z code). D = Dry, not assessed

FerriorVetamics						Bush (m. 2006) (m. 1000) (
		44				Filmsunkau Alpon 1 1 1 1 1 Suntar	l g
Soft Uppe						Aquatic Macrophytes/	[©]
Trees and saplings >5 m high	Ø 1 2	3 4	0 (1)	2 3	4	Emergent Ve-getation 2 3 4 1 Center Boulders 0 1 2 4 Upstream	4
Lower C	апору (0.5 m-5	m high). 12 111 111		King and the	Woody Debris >0.3 m ((15 1 2 3 4 Center	
All vegetation 0.5 m to 5 m	0 1 🔞	(3) 4	o (1)	2 3	4	Woody Debris <0.3 m 0 6) 2 3 4 Right	1
Groun	d Cover (<0.5 i	n high)				Undercut Banks 0 2 3 4 Center Downstre am	0
Woody shrubs & saplings <0.5 m	0 (j) 2	3				Overhang. Vegetation_ 0 2 3 4	
Herbs/ grasses	0 $tJ>2$	3				live Tree Roots 0 {!) 2 3 4	
Barren, bare soil/ duff	0) 2					Artificial Structures 0 2 3 4 Right Bank	

HUMAN INFLUENCE (circle only the closest to wetted channel)	B = 0 C ≥ B P = 5	6 = Not Present. B : Op Bank. C = Between Bank & for from Channel. P =>10 m+-sion from Channel. Channel (record Yes of No).										
		Left	Bank		Char	inel		Right	Ban	k =		
Walls/ Rip-rap/ Dams	Р	С	В	Q ₁	Υ	N	di.	В	С	Р		
Buildings '	<u>p</u>	c	В		_	1 ,.	 	В	С	Р		
Pavement/ Cleared Lot	p	c	В			_		В	С	p		
Road/Rallroad	p	С	В					В	c	p		
Pipes (Inlet/Outlet)	p	С	В					В	С	p		
Landrill/ frash	р	С	В						С	р		
Park/Lawn	<u>p</u>	С	В			_			С	p		
Row Grop	<u>p</u>	С	В		_	_			c	p		
Pasture/ Range	<u>p</u>	С	В		_	_			c	p		
Legging Operations	<u>p</u>	С	В		_	_			c	p		
Mining Activity	p	c	В		_				c	p		
Vegetation Management	<u>p</u>	c	В		_	_		В		p		
-Bridges/ Abulments	p	c	В		_	_		В	c	p		
Örchards/ Vineyards	р	c	В					В	c	p		

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4			
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22-44-44-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-	*****	4	
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	nental	vadracaide vadracaide	
	nental	vadracaide vadracaide	

	Ι	nter-T	rans	ect: CD			Wetted Width (n	1: 4.6	ing Signal Signal Signal Signal Signal	
					- In	ter=l*r/msect	Substrates			
Position=	Dist = from LB (m)	Depth (cm)	nim/ size class	% Cobble= = Bmb-d	CPOME	=Mi c roalgae. =Fhickness± - Code	Macroalgae	Macroalgae Unatfached	E VIACIOUEVICE	Microalgae Thickness = Codes = 0 = No microalgae present =
Тоб ванк	Ś		GC		P (5)	-مـ	PA D	P 🗥 D	P 🔕 D	Feels fough, not slimy 1 = Present but not visible.
Loft S	1.1	0)(e,	_	р I).	>		<i>P {fj</i> D	P @ D	tmm, Rubbing fingers on surface produces a
Conten	2.3	32	\$		p ()J	0	p ,il D	p . €) D	P \$,. D	brownish lint on them, scraping leaves visible trail.
Right Center	3,4	0	\4		p @	b	р li) D 		P i D	3 = 1-5mm; 4 = 5-20mm; 5 = >20mm; 5 = 5 = 20mm;
Right Bank	4,6	3	C/B	80	P (b)	O t measures of th	P Ø D ie median axis o	P (A) D	P 🕡 D	■UD = Cannot determine if () === microalgae present; == substrate too small or
						ect measuremen		A STATE OF THE STA		covered with sijt (formerly Z code), D = Dry, not assessed

		17 (42 (42)
	FLOW HABITA	
Į	Earner Harrick Hord	production and the state of the
	Channel Type ::	%
	Cascade/ Falls # #	5
	Rapid	25
	Riffle	45
	2 17 Run	Ø
	Glide	15
	Pool	10
	Dry 12	Ò

Site Name: Pine Creek

Pankfull Width (m): . , | Bankfull Height (m): 0.65 Site Code: Pine Creek Control Date: 0 9 1 10 1 2012 Wetted Width (m): 3.4 Transect D

	TV:-t					Transect Su							Missagua Tuldasa
Position :	from LB (m)	Depth (cm)	size	Cobble Embed	CPOM	Microalgae Thickness Code	:Macr Atte	oalgae iched		roalgae itached	Macro	phytes	Microalgae Thickness Codes 0 ≠ No microalgae present, Feels rough, not slight
Lett Bänk	0	2	хв	_	Р / А	О	р	D	р	D	р	D:	1.≒ Present but not visible. Feels silmy,
Left Center	, 8	15	86			0	p	D	p	A D	рΑ	D,	2 = Present and visible but \$1mm; Rubbing Ingers on surface produces a
Center	1.7	24	c.,	-		0	р	D	p	D	р	D _	strownish tint on them, Castraping leaves visible trail.
Right Center	2.5	52.	@v ·			0			ļ	1./	р	D	3 = 1-5mm; 4 = 5-20mm;
Right Bank	3.4	5	CB	10	P A	0	Р	D	P	V D	P	Б	5 ≅>20mm; UD = Cannot determine if microalgae present
						measures of the			each p	article or	one of the	size	substrate too small or covered with sill
			of age and to the second of th	American Committee (Springer Springer S									(formerly Z code), D = Dry, not assessed

RIPARIAN VEGETATION (facing downstream)	11 =	Spar	se (*	=10%	a)	3≒) 4≐V }==	ery l	i (40- leavy	75% (>7) 5%)		INSTREAM HABITAT COMPLEXITY	. 2 n 3 ≤	Spa Mod Hea	se orate VV	(0% (<1) (10-4) (40,7) (<7	0%) 0%) 5%)
Vegetation Class		Lef	t Ba	ink			Rig	ht B	ank		e:	Filamentous Algae	0	1	1	3	4
i Uppe	r Can	ору	(>5	m h	igh)		,					Aquatic Macrophytes/ Emergent Vegetation				3	4
Trees and saplings >5 m high	0	O	2	3	4	0	1	2	3	.4		Boulders			2	CI)	4
Lower	anop	ıy (0.	5 m	-5 n	i hig	h)						Woody Debris >0.3 m			2	3	4
All vegetation 0.5 m to 5 m	σ	1	2	9	4	0	1	②	3	4		Woody Debris <0.3 m			a,	3	4
Groun	d Co	ver (<0.5	m l	iigh)							Undercut Banks	0	CI)	2	3	4
Woody shrubs & saplings <0.5 m	0	11/	Ø	3	4	0	0	2	3	4		Overhang. Vegetation	0	1	(3)	3	4
Herbs/ grasses	0	©	2	3	4	(9		2	3	4		Live Tree Roots	0	ID	2	3	4
Barren, bare soil/ duff	0			3	4	0		2		4		Artificial Structures	0 ·	1	2	3	4

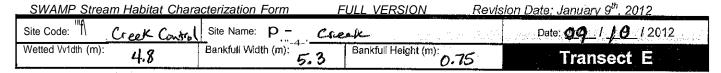
(0% (\$10 10 40 40 76 7 (\$70	%) = (4) = (5) =	DENSIOME READINGS (count covered	0-17)
3	4	Center	11-
3	4	Center	
CI)	4	Upstream	<i>I</i>
3	4	Center Right	1-:/-
3	4	Genter	14.
3	4	Downstrea	. <i>It;,.</i>
3	4	Optional	
3	4	Left Bank	
3	4	Bight Bank	

HUMAN INFLUENCE (circle only the closest to wetted channel)	B = 0 C = B P = 3	0 = Not Presen; B = Ch Bank; C = Between Bank & 10m from Channel; P = > 10m + 50m from Channel; Channel (record Yes or No) Left Bank Channel Right Bank									
-Wajis/Rip-rap/ Dams -+	Р	С	В	6)	Y	Δħ	18	В	С	Р	
Buildings	р		B	6	Y	\ J	10	B	Ċ	P	
Pavement/ Cleared Lot	р	С	В					В	c	р	
Road/ Railroad	р	С	В					В	c	р	
Pipes (Infel/ Outlet)	р	c	В					В	c	р	
Landfill/Trash	р	c	В			İ		В	c	р	
Park/Lewn	<u>p</u>	c	В					В	c	р	
Row Crop	<u>р</u>	c	В		_			В	c	р	
Pasture/ Range	<u>p</u>	c		_				В	c	р	
Logging Operations	<u>р</u>	c	В		-			В	c	р	
Mining Activity	<u>p</u>	c	В					В	c	р	
Vegetation Management	р	c	В	Ш				В	c	р	
Bridges/ Abulments	р	c	В	Ц.				В	c	р	
Orchards/Vineyards	<u>p</u>	c	В	Ш				В	c	р	

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	22-2 88-42-11-42	W-001-2-100140-4-200-	
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	enadod I		
	endel		
	enadod I		

		Inter-T	Trans	ect: DE	<u>C</u>		Vetted Width (n	n): 4.6	Agi sandheime san	Bir Biring
					ln	ter-Fransect	Substrates			
osition .	= Dist = froin - LB (m)		= innu/= = stzic= = class=	- ⁄o ≥Cobble= - Linbed=	CPOM≡	Microalgae Thickness Code	A COMPANY OF THE PARTY OF THE P	Macroalgae Unartached	≡Maerophytes	Microalgae Thickne Codes 0 No microalgae presc
Leit Bank z	် ()	3	GF		P 💋	0	P 👸 D	P & D	P & D	Fééls rough not slimy 1 = Present but riot visib Féels slimy 2 = Present and visible b
Lenter.	1.1	18	iВ		• p t»·.	o	p di! D	p /) D	р <i>б)</i> D	Strom: Rubbing finger on surface produces:
entei	2.3	I z,	ˈiΒ		p 6,l	0	Р Gi D	::P ·. <i>ti/</i> . D	p 'ill D	Drownish tipt on them scraping leaves visible trail
Right Senter	3.4	S'!	s.e.	,	p ta	<u> </u>	p D	р D	₽ % D	3 = 1-5mm, / 1/6 4 = 5-20mm, 5 = ≥20mm
Right Bank	4.6		CB	25	P (6)	0	P 🝪 D	P 😝 D	P (3) D	UD = Cannot determine milicroalgae present
						t measures of th ect measuremen		teach particle or	one of the size	substrate foo small of covered with silt (formerly Z code)

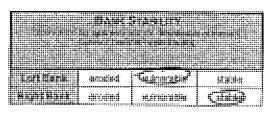
		:
FLOW HABITA ///petween-transects-total		- :
Channel Type	%	4
Cascade/, Falls	60	
Rapid * *	2.0	
R/file Service	0	
Glide	70	
Pool	0	
Dry Dry	٥	



						Transect Su	bstrat	es 💮					
Position	Dist from LB (m)	Depth (cm)	nun/ size class	% Cobble Embed,		Microalgae Thickness Code	Macr Atta	oalgae sched	Macı Unat	oalgae tached	Macro	phytes	Microalgae Thickness Godes 0 = No microalgae present
Left: Bank	O	5	S I!J		A	O	۲	עי	Р	D	· P	D	Feels rough, not allmy Teels slimy Feels slimy
Left Center	1.2	15	\$11>	1	p \$,()	p ,	,	р	D	р	D	2 = Present and visible but 11mm, Rubbing fingers on surface produces a
Center	2.4	0	&t c,	_	p <i>J0</i>	6	р	D	р	D	р	D _	brownish tint on them. Scraping leaves visible
Right Center	3.6	0	& '>		p <u>!</u> !>	t>	р	D	р	D	p	D,	trail. 3 = 1-5mm; r 4 = 5-20mm;
Right Bank	48	3.	SB	أسبع	P 60	6	Р	D	P	D	Р	D	5 = >20mm; UD ≃ Gannol dete mine if microalgae present.
	Note: Sub-	strate size gories fiste	dan be	recorded eith supplementa	er as direc I page (dire	measures of the	media s prefer	n axis of red)	each þa	irticle or	one of th	ė size	substrate too small or covered with sit
													(formerly Z code), D = Dry, not assessed

RIPARIAN VEGETATION (facing downstream)	0 = Ab 1 = Sp 2 = Mo	arse (<10%	6)	4 = V	ery H	eavy	į (>/t			INSTREAM HABITAT COMPLEXITY	1 = 5 2 = M	jarse oderate iavv	(0%) (4%) (10:4 (40:7 (40:7	0%)*** 0%) 5%)		DENSIONE READINGS (Count count	j-17)
Vegetation Class	Le	eft Ba	ink			Rigi	ηt B	ank			Filamentous Algae	0 () 2	3	4	i	Center	Ι.,
Uppe	г Сапор	y (>5	m h	igh)						ſ	Aquatic Macrophytes/							1b
Trees and saplings >5 m high	0 1	ි ර) з	4	ത	1	2	3	4	ŀ	Emergent Vegetation Boulders						Center Upstream	ILf
Lower C	апору (0.5 m	-5 m	i higi	າ)				Church Church	ŀ	Woody Debris >0.3 m					ŀ	Center	$\frac{1}{2}$
All vegetation 0.5 m to 5 m >	0 @) 2	3	4	0	(D					Woody Debris <0.3 m		2	3	4		Right Center	0
	<u></u>							477 9		Ī	Undercut Banks	0_	2	3_	4		Downstream	15
Woody shrubs & saplings <0.5 m	₀ G	i) 2	3	4	0	6)					Overhang. Vegetation	0 1	CD	3	4	l		
Herbs/ grasses	o (j) 2	3	4	(§)						Live Tree Roots	o (j	2	3	4		Left Bank	
Barren, bare soil/duff	0	2		4	0						Artificial Structures	0 1	2	3	4		Right Bank	<u> </u>

HUMAN INFLUENCE circle only the closest to wetted channely.	B ≤ 0 C = B P = >	iom+<	r Bank 50ar fre	& 10m om Cha es of No					
		Left	Bank		Channel		Right	Banl	k : :
Walls/ Rip-rap/ Dams	Р	С	В	ρ	Y	A	В	С	Р
Buildings	Р	С	В	0	Y	19	В	С	Р
Pavement/Cleared Lot	Р	С	В	p]		Id	В	c	_ p
Road/Rallroad	Р	С	В	but	YW	0	В	c	р
CPipes (inlei/ Outlet)	Р	С	B	0	Øи		В	c	p
Landfill/ Trash	Р	_C	В	D	Ø N	0	В	c	p
Park/Lawn	р	c		Ľ	27 C - 1 C -		В	С	_p
Row Crop	р	<u>c</u>	В				В	c	p
Pasture/ Range	р.	c	В				<u>B</u>	c	р
Logging Operations	_ p_	c	В	<u> </u>	ı		В	c	p
Mining Activity	р	c	В				В	c	р
Vegetation Management	р	c	В				В	c	p
Bridgest Abutments:	р	c	В		_		В	c	p
Orchards/ Vineyards	р	c	В				В	c	р



1;,,J..L,J *w;*,,*e*.*1*

 $f(M-') = -1-At.k/w, j_1, j_2$ '; \0 f''f''' ''' l & J 1...

Page of 26 Page 1i of 26

| Position Digiti Size Clobble CPOM Microalege Macroalege Code ≡Microalgae Thickr
Godes |
|--|---|
| Bank o 31 ce 15 PR O POD POD POD | =0 = No misrcalgae pre
Feels rough, not slin |
| Edit 6.7 49 56 - P. CI. Pii?D P. D P. D | Feels Slimy |
| | s1mm Rubbing fing
Consultace produce |
| enter 1.5 37 KB — PA C) (.)) A D PAD PAD | prownish tint on the
scraping leaves vis
trail. |
| Right 2.2 8 56 — PO O DAD POD POD | 3 = 1/5mm; 4 = 5-20mm 5 = >20mm; |
| Right 3.1 15 CB 80 PO O POD POD POD | UD = Cannot determin |

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Committee Committee and the committee of	
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	111111111111111111111111111111111111111

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10-1-10-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	:::
**************************************	***

Site Code:j,I,J- & c,...d; Site Name: f, f, f Code f, fDate: **0 9 / 10 /** 2012 Bankfull Height (m): Bankfull Width (m): 4.0 Wetted Width (m): Transect F

						Transect Su	bstrates		7	
Position	Dist from LB (m)	Depth (cm)	mm/ size class	% Cobble Embed	CPOM	Microalgae Thickness / Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	Microalgae Thickness Codes 0 = No microalgae present
Bank	D	48	CB	to	P (A)	6	P (A) D	P 🕡 D	Р₩Д	Feels rough not slimy 1 - Present but not visible, Feels slimy
Left Center	(!> p		s-e.	.,		0	P ft) D	D	P 🔞 D	2 = Present and visible but \$1mm Rubbing fingers on surface produces a
Center	1.2		'i,		Ρi		b D	P Q·n	P 💋 🗗	brownish tint on them, scraping leaves visible
Right, Center	_1. ; B		e,		p		p Q,D	p (& D	P 🕢 D	frail. 3. = 1-5mm; 4 = 5-20mm;
Right Bank	2,4	30	XB	~	P A	1	PQD	P. (4) D	P (A) D	5 = >20mm; UD = Canhot determine if microalgae present.
	Note: Sub class cate	strate size gorles liste	s can be d on the	recorded eill supplements	ier as direc Il page (dire	t measures of the	e median axis of is preferred)	each particle or	one of the size	substrate too small or covered with silt
										(formerly Z code) _D = Dry = not assessed =

RIPARIAN VEGETATION (racing downstream)] ‡	Spar	se ()%) k10%) k10-40°	.::4 ≐.	Very	Heav	y (≥7		INSTREAM HABITAT COMPLEXITY	0 ≡ Abse 1 = Spår 2 ≡ Mode 3 = Hedy 4 = Våry	se orate V	(40-759	0 0	DENSIOME READINGS (I count covered	0-17)
Vegetation Class		Lef	t Ba	ink		Riç	jht E	3ank	Ç	Filamentous Algae	00	2	3	4	Center	
Uppe	r Can	ору	(>5	m high)	ija kr					Aquatic Macrophytes/ Emergent Vegetation		2	3	4	Leπ	
Trees and saplings >5 m high	0	1	2	3 4	Ø) 1	2	3	4	Boulders	0	2	_3		Center Upstream	b
Lower C	anop	y (0.	5 m	-5 m hig	ih) –					Woody Debris >0.3 m	0	2	3		Center	
All vegetation 0.5 m to 5 m	0	1	2	3 4	0	1	6	3	4	Woody Debris <0.3 m	0 (i)	2	3	4	Right Center	2','
Groun	d Co	ver (<0.5	m high		V. 2007. 1107				Undercut Banks	0	2	3	4	Downstream	
Woody shrubs & saplings <0.5 m	0	6)	2	3	0		2	3	4	Overhang. Vegetation	<u>o (J)</u>	2	3	4	Optiocal	
Herbs/ grasses	0	0	2	3	0	(j)	2	3	4	live TreeRoots	o (j)	2	3	4	Left Bank	
Barren, bare soil/ duff	0		2	3	0		2	(G)	4	Artificial Structures	(§) t	2	3	4	Right Bank	

HUMAN INFLUENCE (circle only the closest to wetted channel)	B = 0 C = B P = 2	10m#≤	Bank 50m f	& 10 m om Cha les or No	inel;	annel,				
		Left	Bank	• 5 =	Cha	nnel		Righ	Ban	k
Walls/ Rip-rap/ Dams	Р	С	В	/\dag{\partial}	Υ	N	6	В	С	Р
Bulldings.	p	С	В	0	Υ	M		В	С	Р
Pavement/ Cleared Lot	р	С	В					В	С	р
, Road/Rallroad	р	С	В			П		В	С	
Pipes (inlet/ Outlet)	р	С	В			T		В	c	<u>p</u>
Landfill Trash	p	С	В			Т		В	c	p
Park/Lawn	<u>p</u>	c	В		- -			В	c	р
Row Crop	<u>p</u>	c	В		_			В	С	p
Pasture/Range	р	c	В		_			В	c	p
Logging Operations	<u>p</u>	c	В		_			В	c	p
Mining Activity	<u>p</u>	c	В		_			В	c	p
Vegetation Management	p	c	В		_			В	c	р
Bridgest Abutments	р	c	В					В	c	p
Örchards/ Vineyards	p	С	В			_		В	c	p

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Principal March Land Committee Commi	**** *********		1 1 +2-2-142 4-1441 1
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	44.4**********	i con statementer. Maria.	

TAKE —PH6re6ftAPH5— (check box if taken & record hoto code Downstream (required)
Upstream (required)

	I	nter-T	Crans	ect: FG		į.	Wetted Width (n	n) 2,4	. The second second second second	gradistation (1997) Bernard George (1998) (1997) (1997) Bernard George (1998) (1997) (1997)
					- In	ter#I ransect	Substrates			
Position	*Dist from I-B (m)		mim/ size class	Cobble - Embed		Microalpae Threkness Code	=Macroalgae	Maoroaloge "Unattached	Macrophyres	Microalgae Thickness Codes Service of the control
elt Bank	0	2	GF		P 🔌	o	P (0 /D	P Q D	P 🗱 D	Feels rough not slimy I = Present but not visible Feels slimy
J.eff Genter	0.6	12.	****			0	p (!) D	P 🛕 D	P A D	2 = Present and visible but <from lingers="<br" rubbing="">on surfaces roduces a:</from>
Genter	1.2	11?	')< <i>e</i> ,		P il))	О	(!) A D	New York	p D_	brownish tint on them, scraping leaves visible.
Right Genter	1.8	<u>'</u> 'lo			P ®	0	P III D	p @ D	p ,/) D	3 = 1.5mm = 4 = 5-26mm = 5 = .20mm
Right Bank	2.4	5	RR	7-7-	P 🙆	(O	P Ø D	P 🗱 D	Ρ Λλ D	aUD.≡ Cannot determine ∏ (a. ≝≝ migroalgae present
						t measures of th of measuremen		feachmarticle or	one of the size	substrate too small or covered with slit ((ormorly Z code)
										⊒D ≡ Dry⊒not assessed

FLOW HABITA			
Channel Type Cascade/ Palis	%		
Rapid ATELE	15	13	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
Riffle	10	ığ	
Rur (1975) Glide	25 5	2 \$ 5	es la la companya de la companya de la companya de la companya de la companya de la companya de la companya de
Pool ware	5	5	
Dry 🔭	Ò	,	

 Site Code: P, \tau- Cr
 (!., J, | Site Name: fi ::, _ Cr. αL
 Date: 0 9 1 10 12012

 Wetted Width (m): 3.5
 Bankfull Width (m): 5.6
 Bankfull Height (m): 0.6
 Transect G

				19 19 19 19 19 19 19 19 19 19 19 19 19 1		Transect Su	bstrates			
Position .	Dist from LB (m)	Depth (cm)	mm/ size class	% Cobble Embed.	СРОМ г	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	Microalgae Thickness Codes 6 % No microalgae present Feels rough; not slimy;
iefi Bank	0	_22	İ					р ^ D	P.(ALD	Feels slimy
Left Center	0.8	(p		_	p ///		P @ D	p D	P If D	2 = Present and visible but <1 mm, Rubbing fingers bn, surface produces a
Genter .	1.7	_2'?,	Sf>		p (lil	0	@ A D	p @- D	p /t). D	brownish fint or them, scraping leaves visible trail
Right Center	2.5	12-)(e,		p (£)	()	<i>d)</i> A D	p (! D	р <i>б)</i> D	3 = 1.5mm; 4 = 5-20mm;
Right Bank	3.5	2	RR		P 🙆	0	P 🙆 D	P 🙆 D	P 🙆 D	5 = >20mm; UD = Cannot determine (f microalgae present,
	Note: Sub class cate	strate size gories liste	s can be d on the	recorded eith supplementa	ier as direc I page (dire	measures of the of measurement	e mediair axis of is preferred)	each particle or	one of the size	substrate too small or covered with \$1. (formerly Z code). D = Dry_not assessed

RIPARIAN VEGETATION Macing downstream)	1.3	• Spa	use (0%) <10%) • (10-40		4 # Ve	ery Ĥ	eavy			INSTREAM HABITAT COMPLEXITY	EE ⊕ Abse 1 ≜ Spar 2⊫ Mod 3 ≘ Fleat 24 ≗ Very	se erato i	40-7	%) %) 1%)		DENSIOME READINGS (I count covered	0-17)
Vegetation Class		Le	ft B	ink -		COLUMN TO	Rigi	it B	ank		Filamentous Algae	00	2	3	4	Ī	Center	41
Uppe	r Cai	пору	/ (>5	m higl	1)						Aquatic Macrophytes/ Emergent Vegetation	l	2	3	4	-	Left Center	
Trees and saplings >5 m high	0	1	2	3 4		(0)	1	2	3	4	Boulders		2	3	a>		Upstream	2-
Lower C	ano	py (C).5 m	-5 m h	igh)					W	Woody Debris >0.3 m		2	3	4	_	Center	
All vegetation 0.5 m to 5 m	0	0	2	3 4		0	0	2	3	4	Woody Debris <0.3 m		2	3	4		Right Center	
Groun	d Cc	ver	(<0.5	m hīg	h)	Santar va					Undercut Banks		2	3	4		Downstream	0
Woody shrubs & saplings <0.5 M	0	<i>(j)</i>	2	3			(j)	2	3	4	Overhang. Vegetation		2	3	4	A721	Optional	
Herbs/ grasses	0	&	2	3			G)	2	3	4	Live Tree Roots		2	3	4	+	Left Bank	
Barren, bare soil/ duff	0		2	3				2	3		Artificial Structures		2	3	4	- 	Right Bank	

HUMAN INFLUENCE (circle only the closest to wetted channel):	0.5 Not Present B = On Bank; C = Between Bank & 10m from Channet; P = >10m+-50m from Channet; Channet (record Yes or Not)													
		Left	Bank		Channel		Righ	t Ban	k 📑					
Walls/Rip-rap/ Dams	Р	С	В	[8]	ΥM	d	В	С	Р					
Buildings	Р	C	В	0	Y	d	В	С	Р					
Pavement Cleared Lot	Р	С	В	0		q	В		р					
Road/Rallroad	Р	С	В	0	YA	q	В	С	р					
Pipes (Inlet/ Outlet)	Р	С	В	q	Y M	d	В	С	р					
Landfill/ Trash	Р	С	В	Q	Ø N	0	В		<u>c</u>					
Park/ Lawn	Р	С	В	q		0	р	В	c					
Row Crop	Р	С	В	Ç		0	р	В	c					
Pasture/Range	Р	С	В	q		0	р	В	c					
Logging Operations	Р	С	В	d		0	р	0	n					
Mining Activity	_						В	Č	_ p					
Vegetation Management	<u>р</u>	<u>-E</u>	B				₿	<u>-8</u>	_B					
Bridges/Abutments	<u>р</u>	c	В	_			В	С	p					
Orchards/ Vineyards	р	c	В				В	c	р					

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		iiialeii	TUIIS	ect: GE			Wetted Width (m): 5.2.		
		10010615				The state of the s	t Substrates			West Control of the C
sitions	Dist Lion EB (m)	Depthi (cn)		Cobble Embed	CPOM	■Micrealeae ■Eliickitess ■Code	Macroalgae	Macroalgae E nattached	Macrophyles	Microalgae Thickn Codes O-No microalgae pre
Feft Bank	O	Ž.	i,,6.	- है कि देखा के है करते. जन्म के लेखा के के कि			r & D	1 0 D	r 🕿 D	Feels rough, hat slim Feels slimy Feels slimy 2 Fresent and visible
l eti enter	1.3	0	' '/ e,		. p: ,il	/)	p <illd< td=""><td></td><td>p 'It/ D</td><td>on surface produces</td></illd<>		p 'It/ D	on surface produces
enter-	2.6	1 q			p (!))		p D.	p /:) D	P la) D	scraping leaves visi trail: 3 - 1 Smm
Right Jenter	3.9	7	<u> </u>	7 5'	P @	0	(g) A D	p (;;\? D	P e'g D	4 = 5-20mm (1 5 = >20mm (4
Right Bank	5.2	3	RR		P 🔕	0	P 🐼 D	P 🐼 D	P 🚳 D,	:UD = Cannot determin == microsigae present ==substrate loo small
						t measures of of measureme		each particle or	one of the size	covered with sift

na ali firmë en jimi uzështetji	
FLOW HABITA	CONTRACTOR OF THE PARTY OF THE
Channel Type	%
Cascade/ Falls	55
Rapid	<u> </u>
Rifle -	S
Rûn Bûn	_ 10
Cara Glide	O
Talk Pool Parks	_ 5
Dry 3.	0

Site Code: fr'tte.. Ct',, dt {;,,/, | Site Name: Pine Creak | Date: 09 | 0 | 2012 |

Wetted Width (m): 3.2 | Bankfull Width (m): 5.4 | Bankfull Height (m): 0.75 | Transect H

						Transect Su	bstrat	es					
Position	Dist from LB (m)	Depth (cm)	mm/ size class	Cobble Embed.	СРОМ	Microalgae Thickness Code		oalgae iched			Macr	ophytes	Microalgae Thickness Codes 0 = No microalgae present
ran Bark	O	3.	CB	'30		0	P.	\ D	P	A D	P	A D	Feels rough not slimy. 1 - Freesen but not visiting. Feels slimy.
Left Center	0.8	14	C,f,	i+0	p fy	o	p	D	р	_D	p	b	2 = Present and visible but s1mm; Rubbing ingers on surface produces a
Conter	1.6	20	se		p <i>t</i> 9	0	p	D	p	D	p	D	brownish tint on them.
Right Center	2.4	t_\7	5e,		b ©	, Ci	p	D	p	. D	p	D	trail 3 = 1-5mm; 4 = 5-20mm;
Right Bank	3.2	5	SA	-	P A	0	P	A D	P Z	D.	P	D	5 = ≥20mm; - UD = Cannot determine if microalgae present
						measures of the ct measurement			each pa	ifticle or	one of t	ne size	substrate too small or covered with sill (farmerly Z coce), D = Dry Hot assessed

RIPARIAN VEGETATION (facing downstream)	0 = 1.≅ 2.≅	Absi Spai Mod	ent (C 'se (: erate)%) :10% :(10	6) 40%	-3 = 4 ∈ V)	leav 'ery l	/ (40 leav	75% / (>75	(%)		Instream Habitat Complexity	1= 2= 3=	Spars Mode Heav	id rafe ((0%) -(<10 (10=40 (40=75 y (>75	(%) (%) (%)		DENSIONE READINGS (6 count covered	0-17) =
Vegetation Class		Lef	tΒε	ink			Rig	ht B	ank			Filamentous Algae	0	0	2	3	4		Center	
, Uppe	Can	ору	(>5	m h	igh)							Aquatic Macrophytes/ Emergent Vegetation	-					•		O
Trees and saplings >5 m high	0	1	2	3	4	0	1	2	3	4		Boulders							Center Upstream	0
. Eower C	anoj	ıy (0	.5 m	-5 m	hig	1)						Woody Debris >0.3 m							Center	
All vegetation 0.5 m to 5 m	0	-				1	44				 	Woody Debris <0.3 m			2	3	4	-	Right Center	
					-gh)							Undercut Banks			2	3	4		Downstream	O
Woody shrubs & saplings <0.5 M	R		2	3	4	0	(f)	2				Overhang. Vegetation			2	3	4		. Optional	
Herbs/ grasses	0	'ID	2	3	4	0	©	2	3			Live Tree Roots			2	3	4		Left Bank	
Barren, bare soil/duff	0		2	3		0		2	3			Artificial Structures	0		2	3	4		Right Bank	

HUMAN INFLUENCE (circle only the closest to wetted channel)	B = 0 C = B P = >	lóm+s něl (ré		m Cha	ngel;	hannet, annel	ľ	Rìdh	t Ban	k
Walls/ Rip-rap/ Dams	Р	С	В	B	Υ	Κ'n		n B	C	Р
Buildings	P	<u></u>	B	16	Y	7	+-1	ON B	- C	P
Payement/ Cleared Lot	Р	Ċ	В	Ó) B	c	p
Road/Raliroad	P	С	B	d	Υ	W		ј в	С	p
Pipes (inlet/ Outlet)	р	С						В	c	_ p
Ländfill/Trash	p	_c	В					В	c	p
Park/ Lawn	p		c	В	3	-		В	_c	p
Row Clop	<u>р</u>		c	В	<u> </u>			В	c	p
Pasture/Rångë	<u>р</u>	c	В		_			В	c	_ p
Logging Operations	p	c	В		_			В	c	p
Mining Activity	<u>р</u>		c	Е	<u> </u>			В	С	р
Vegetation Management	<u>р</u>	c	В		_			В	c	p
Bridges/ Abutments	р	c	В			_		В	c	_ p
Orchards/ Vineyards	<u>p</u>	c	В					В	c	p

Inter-	Fransect: H]		Wetted Width (n	1): 5,2	त्री । देश । स्वयुक्त रिक्ष राज्यसम्बद्धाः स्वर्णे स्थापनीतः	
		ln .	ter-Transec	Substrates			
Position From Depth (cm)	mm/ % size : Cobble : elass : Embed	CPOM-	Microalgae L'Thickness Code	Macmalgae Attached		-Macrophytes	Microalgae Thickness Codes 0 - No microalgae present
Banka O ULE	rr -	Р 🔗	. · O	P A D	P (% D	P 🔏 D	Feels rough, not slimy 1. Fresent but not visible, Feels slimy 2. Present and visible but
Gener 1.3 q2.:.	x6		-0	P 🌓 D	P 🐼 D	P (D	stmm, Rubbling fingers
Center 2.4 q l	,	р <i>(fJ</i>	О	PAD	P 60 D	P D	prownish lint on them. scraping leaves visible trail
Right 4.0 3(,	1.10		0_	PAD	P Ø D	P 🍂 D	3. 4 5mm; 4 5-20mm
Right 5,2	DF- □		10	P ∮ D	P A D	PD	UD = Cannot determine if = microalgae present,
	s can be recorded eit of on the supplement				feach particle or	one of the size	substrate too small or covered with slit (formerly 7 code), D= Dry, not assessed
FLOW HABITATS (% between transcost total 100%) Channel Type %							

FLOW HABITATS	
-(% between transecis-total=100%)	
Channel Type%_	
Cascade/ Falls	¥. '\$0
t Rapid Little	2D
'35	<u>i</u> '
)
Glide 0	
Pool State	5
Dry 0	

Site Code: p, ..., i $c, r, t_j \in W$, V. (Site Name: V, V. ..., V. ... Date: 99110 / 2012 Bankfull Width (m): Bankfull Height (m): , 55 Wetted Width (m): Transect I

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		2.			Pø	D	P o b	røe røe	r y n	
::::::::::::::::::::::::::::::::::::::	······································	***************************************		***************************************		D	P {v D	р ЈО 🗅	р ,Q. <i>b</i>	Kimm, Rubbing fingers on surface produces a
Center	2.7	<u>:</u> 1-=r	se,_		P Ø	0	(f) A D	? f:? D	p ˈ/ill D	brownish that on them, see scraping leaves visible
Right Center	4.0	18	G:iC		P 🙆	Ø	P 🙆 D	P ® D	POD	frall. 3 = 1-5 mm; 4 = 5-20 mm;
Right Bank	5.4	5	SA		P 🙆	O	P 🏈 D	P 🙆 D	P 🙆 D	5 ≠ ≥20mm, UD ≅ Cannot determine if a- - ← microalgae present,
	Note: Sub class cate	sträte size gories liste	s can be ed on the	recorded eith supplements	ner as direc il page (dire	i measures of the comment of the com	ne median axis of its preferred)	each particle or	one of the size	substrate too small or covered with sit (formerly Z code). D = Dry, not assessed

RIPARIAN VEGETATION (facing downstream)	T =	Spa		<10%	6)	4 ≂ ∜	Heavy /ery H				100	INSTREAM HABITAT COMPLEXITY	1 ≠ S) 2 = M 3 = H	oderate	(10 ² (40-7	0%) 0%) 5%)	100000000000000000000000000000000000000	DENSIOME READINGS (Count covered)-17)
 Vegetation Class 	,	Le	t Ba	ink			Rigi	ηf B	ank			Filamentous Algae	0 () 2	3	4		Center	,
Uppe	Car	юру	(>5	m h	igh)						1	Aquatic Macrophytes/ Emergent Vegetation	തര	J 2	3	4	l L	Left Center	<u>'</u>
Trees and saplings >5 m high	0	1	2	3	4	0	1	2	3	4	Ï	Boulders	0 1				_	Upstream	
Lower C	anor	y (0	.5 m	-5 m	hig	h)						Woody Debris >0.3 m	0				_	Center	e
All vegetation 0.5 m to 5 m	0	Ε)	2	3	4	0	0	2	. 3	4		Woody Debris <: J.3m	0<) 2	3	4		Right Center	<u>6</u>
					,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		7. n. i		emple of the last	- arraydar b		Undercut Banks		2	3	_4	- =	Downstream	<u> </u>
Woody shrubs & saplings <0.5 M	0	€)	2	3	4	0	(j)	2	3	4		Overhang. Vegetation		2	3	4	200	Optional	<u> </u>
Herbs/grasses	0	O	2	3	4	0	©	2	3	4		Live Tree Roots		2	3	4		Left Bank	
Darren, bare soil/duff	0		2	3	Ð	0_	_1_	2	3_	4_		Artificial Structu,-es		2	3	4		Right Bank	

HUMAN INFLUENCE (circle only the closest to wetted channel)	0.4 Not Present B = On Bank; C = Between Bank & 10th from Channel; P = >10m² <50m from Channel; Channel (secord Yes or No)												
		Left	Bank		Cha	nnel		Right	Banl	Ç.			
Walls/ Rip-rap/ Dams	Р	С	В	0	Υ	Ø	0	В	С	Р			
Buildings	Р	С	3	9	Y	Ø	0	В	С	Р			
Pavement/ Cleared Lot	р	c	В							р			
Road/Railroad .	р	c	В						c	p			
Pipes (inlet/ Outlet)	р	c	В		1				c	р			
Eandfill Trash	р	c	В						c	p			
Park/Lawn	р	c	В		1	-			c	p			
Row Grap	р	c	В	╄				В	c	p			
Pasture/Range	р	c	В'			_		В	c	p			
Logging Operations	p	c	В	$oldsymbol{\perp}$				В	c	p			
Mining Activity	p p	_c	В	4_				В	c	p			
Vegetation Management	р	c	В					В	c	р			
Bridges/Abulments	р	c	В	┸				В	c	р			
Orchards/ Vineyards	р	c	В					В	c	р			

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Left Black arcine		

' , ' · · ·	· ·	Inter-	Frans	sect: IJ		7	Vetted Width (m): 5.6	gagaran ya kata da kata da kata da kata da kata da kata da kata da kata da kata da kata da kata da kata da kat Kata da kata d	santania e e e e e e e e e e e e e e e e e e e
					. In	ter=Fransect	Substrates			
Position	=Dist =from -LB-(m)=	Depth (on)	nim/ size aclass	Cabble : Dinbed:	.€P⊝M=	=Microalgae = Thickness == Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	Microalgae Thicknes Codes O No microalgae prese
l ett Bank ==	Ø	16	GF		РФ	<.b_	P 💋 D	P 💋 D	P (2) D	Feels rough, not slimy, 1 ≭ Present but not visible Feels:slimy
Left Center	1,4	_0			p 13>)>	P @ D	P@D	p ®_D	2 = Present and visible b = \$1mm, Rubbing fingers on surface produces a
Genter	2.8	2-	<i>cR</i> .,	"10	р '9	(!)	P @ D	Pu)) D	P1!i1 D	brownish int on them scraping leaves visible strail
Right	4.2	3.2	Gf'?	i o	р @	'6	p 41 D	p (l;)) D	p ti) D	3 = 1-5mm 4 = 5-20mm 5 = 20mm
Right Bank	5.6	31	RR	~	PA	2	P 🚱 D	РБО	, P () D.,	UD = Cannot determine , microalgae present
						t measures of in of measuremen		each particle or	one of the size	supstrate too small or covered with slit. (formerly Z code)

FLOW HABITAT	S	
	100%)	
Channel Type	%	
Cascade//Falls	25	250
Rapid (* 1	30 -	35
Eliffle Elife	35	
e g = ⊘Rún⊈se e e	5	
- Glide	0] .
Pooles	Ø	
Dry Dry	0	

		and the same of the same of the	el el retriète el translation			7	and the second		To Proceed to the season	
			SECONO CONTRACT			Transect Su	bstrates			TOWN COLUMN TO A STREET
	, Dist	Depth	inni/-	%		Microalgae	Macroalgae	Macroalgae		Microalgae Thickness
Position	from	(cm)	size	Cobble	CPOM.	Thickness	Attached	Unatfached	Macrophytes	Codes : 0 = No microalgae present
	LB (m)		class	Embed,		Code			1 1 2 3 6 7 7 7 1 7 7 7 7 7 7	Feels rough incts/lmy;
Bank	O	2	SA		P 🚳	0	P 🔕 D	P 🔕 D	P 🔕 D	1 = Present but not visible Feels slimy,
Left	0.0			20	p / D	6	p .f& D	n 4/1 D	n D	2 ≅ Present and visible but ≪timm: Rubbing fingers
Center	2.0	_	e6	<i>30</i> ,.	1 11	•	p ./ w D	P 1,11 D	Р Б_	on surface produces a
Genter .	3.9	2,\$			P @		p D /	D.	p I:1 D	brownish fint on them, screpling leaves visible
Right Center	5,9)	R.R.	******	Р@		^p e0 D	D.	D,	
Right Bank	7.8	ľ	RR		P 🔊	'0	Ø A D'	P (A) D	$_{P}$ Q $_{D}$	5 ≅ >20mm UD = Cannot determine if
						reservation (Fig.	1		2011	microalgae present substrate foo small or
							e median axis of to professed	each particle or	une or me size	covered with sit
	viass cale	กิดเเอราเรเต	u ornale	anhhigiticitie	ii haac fanc	ect measuremen	io hidicifed)			(formerly Z code).
					Control of the second s		Marie Control of the			D ≘Dry not assessed

RIPARIAN VEGETATION (facing downstream)	0 ≅ A 1 = S 2 = W	pars	se (<	10%)	4 ≕∖	Heav Very H	r (40 feav	75% 7 (27) 5%)	States of the states of the states	INSTREAM HABITAT COMPLEXITY	1 = 2 = 3 =	Modei Heavy	e rate ((0%) (≈10%) (0-40%) (0-75%) (≈75%)	3	DENSIOMET READINGS (0 count covered)-17)
Vegetation Class	1	eft	Ва	nk			Rig	ht B	ank			Filamentous Algae	0	(1)	2	3 4		Center	
Upper	Cano	рγ	>5 i	n hi	gh)							Aquatic Macrophytes/ Emergent Vege: ation							<u> U</u>
Trees and saplings >5 m high	Ø	4	2	2	4	്ക	1 4	2	2	1	1	Boulders					_	Center Upstream	3
Lower C		i (n	- 	5 5m	y Bini	W		<u>د</u>		- -		Woody Debris >0.3 m					┪	Center	
		_					~ ~ ~ · ·	The Control of	A A STANSON OF THE		51	,					1	Right	
All vegetation 0.5 m to 5 m	.0	O_	2	3	4	्०	6)	2	3	4		Woody Debris <0.3 m				3 4		center	
STORING CONTRACTOR OF CONTRACT	3 COVE	31 E.	·U.J	HEE	TOI 13	, and where it		_			•	Undercut Banks	0	1	2	3 4		Downstream	U
Woody shrubs & saplings <0.5 m	0	IQ)	2	3		0	6)	2	3			Overhang. Vegetation	@		2	3 4		Left Bank	
Herbs/ grasses	0 t	D	2	3		0	©	2	3			Live Tree Roots			2	3 4			1
Barren, bare eolll duff	0		2	3		0		2	3			Artificial Structures			2	3 4	丄	Right Bank	

HUMAN INFLUENCE (Gircle only the closest to wetted channel)	B = 0 C = B P = ≥	Not Present. On Bank, Between Bank & 10m from Channek, 10m+-50m from Channek, annel (record Yas of No). Left Bank Channel Right Ban									
		Left	Bank		Channel	À	Right	Ban	k'		
Walls/ Rip-rap/ Dams	Р	С	В	A	YQ	Ta	В	С	Р		
Buildings	Р	С	В	0	YW	19	В	С	Р		
Pavement/ Cleared Lot	Р	С	В	С		10	В	С	Р		
Road/Railroad	Р	С	В	C	YQ	Ja	В	c	P		
Pipes (Inlet/Quilet)	Р	С	В	q	YK	0	В	С	р		
Landfill/ Trash	Р	С	В	0	♠ N	0	В	С	р		
Park/Lawn	Р	С	В	0		0	В	c	р		
Row Crap	р	c	В	4			В	С	р		
Pasture/Range	p	С	В		[В	c	p		
Logging Operations	р	_c	В				В	c	p		
Mining Activity	р	c	В				В	c	p		
Vegetation Management	р	С	В		[В	c	p		
Bridges/ Abutments	p	С	В		Ī		В	c	p		
Orchaids/ Vineyards	p	С	В				В	С	p		

1 H. H. H. P. L. H. H. H. H. L. L. L. L. L. L. L. L. L. L. L. L. L.	

.!?1-,...**>** s+vvdv,,"'-, / --LleJ (rt..,-1.,)

	1	nter-	Frans	sect: JK	(A	Vetťed Width (m). 5.5	And the second second	Ny ivonana ny inanana ny isana
	17016				i. h	iter-Fransect	Substrates			
Position :	Dist from LB (m)	Depth (cm)	size class	% == Cobble= Enbed=	CPOM	Microalgae Unicknes Code	Maeroalgae Attached		Macrophytes	Microalgae Thickness Codes O No microalgae present
Lott, Bank =	0	8	6F		√P 6 9	O	P 🐧 D	P Ø D	Р Ø Д	Feels rough, not slimy 1 = Present but not visible Feels slimy.
Evit. Eenten	1.4	45	C i!,	'10	p 6>	() <u> </u>	P A D	P \delta D	P 6 D	Imm. Rubbing-lingers ** on surface produces a
Center	2.7	10	c.h	·e£ ·	p /?	<i>C</i>)	p <i>I D</i>	р {J D	₽ & D	brownishtlijt on thom, scraping leaves visible
Right == Center ==	4,1	0	Y.,f;,	<u> </u>	p f9	D	p jil D	D	₿₽D	3 1.5mm, 4 5.20mm
Bank a	5.5	H	RR		P 🚱	0	P ∌ D	PAD	P Ø D	5 = >0mm VD = Cannot determine if microalgae present.
	≓Nøte Sub class cate	strate size gories listo	s can be id on the	recordedseith supplementa	ier asidire Epage (dir	it measures of the ect measuremen	e median axis of is preferred)	each particle or	one of the size	substrate too small of covered with sill (formerly 7 code) D = Dry not assessed

FLOW HA		1%)- "-		
Channel Ty		40-	15	W. i
Rapid F		10		
Riffle -	CONTROL CONTROL	30 25		
Glide**		O LPT.	5	10
Diy		Ó		•

Revision Date: Janu gth 2012

Site Name: Pine Creek fr.*ult*- t,,Jri, Date: {}"/.._ / ___/ 2012 Site Code: $oldsymbol{l}$ Bankfull Width (m):4.5 Bankfull Height (m): Wetted Vv1dth (m): Transect K

	4	le mant de la par				ar a co	Y			
Position	Dist from LB (m)	Depth (om)	mm/ size class	% Cobble Embed,	СРОМ	Transect Su Microalgae Thickness Code	Macroalage	Macroalgae Unattached	Macrophytes	Microalgae Thickness Codes D = No microalgae present
Left Bank	0	5	RR		Ý 💋	F	P 💋 D	P 🔗 D	P 🔕 D	1 ≜ Present but not visible. Peels aliny:
Left Čehter	1.0	8	XB	-	ą,	&-	p <i>If</i> > D	D	p {P} D	2 = Present and visible but :: <1mm, Rubbing fingers on surface produces a
Center	2.1	9	XB		F	<i>e</i> -	® A D	D	pf,» D	brownish tinf on them. scraping leaves visible
Right Center	3.1	10	60	_'''	p _	-	р D	<u></u>	p D	trall, 3 = 1-5mm; 4 = 5-20mm;
Right Bank	4.2	4	RR		Р 🎾	: Per	P AD D	P Q D	P 🍪 D	5 = >20mm; U = Cannot determine if microalgae present.
						t measures of the of measuremen	e median axis of ts preferred)	each particle or	one of the size	substrate too small or covered with silf (formerty Z code). D = Dry, not assessed

RIPARIAN VEGETATION (facing downstream)	- 1 :	≓ Abs = Spa = Moc	rse (<10%	o) :	8=1 4=V	leav 'ery l	y (40- Heav)	75% (>7) 5%)	INSTREAM HABITAT COMPLEXITY	0 ≑ Abse 1 ≓ Spar 2 = Mdd 9 ≑ Hea 4 = Very	rse i crato vy	(10 40 (40-7)	7%) 7%) 7%)	DENSIOME READINGS (count covered	0-17) -
Vegetation Class		Le	tB.	ank			Rig	ht B	ank		Filamentous Algae	0 D	2	3	4	Center	
Uppe	r Ca	пору	(>5	m h	igh)						Aquatic Macrophytes/ Emergent Vegetation		-] 0
Trees and saplings >5 m high	(6) 4	2	2	4	[<i>i</i> 6)	1	7	2	1	Boulders	0 1	2	3	—	Center Upstream	'2
Trees and sapings >5 in right			- <u>/.</u> - 5 m	S Section	i hi ni		ı		, 	+	Woody Debris >D.3 m	0 CD	1 2	3		Center	┥╻┇╽
All vegetation 0.5 m to 5 m	0	0	2	3	4	0	1	(2)	3	4	Woody Debris <0.3 m	0 (D	2	3	4	Right	
- Groun	d Co	over	<0.5	i m l	righ)						Undercut Banks		2	3	4	Center Downstream	0
Woody shrubs & saplings <0.5 m	0	fl)	2	3		0	(j)	2	3	4	Overhang. Vegetation		2	3	4	::::::::::::::::::::::::::::::::::::::	<u>;</u>
Herbs/ grasses	0	<5	2	3		0			3	4	Live Tree Roots		2	3	4	Left Bank	
Barren, bare soil/ duff	0		2	3		0		2	3	4	Artificial Structures		2	3	4	Right Bank	

Human Influence (direle only the closest to wotted channel)	B = 0 G = B P = >	l0m+< nel (re	Bank 50m fr ord Y	& 10m f om Char es or No	nel;					
	ME .	Left	Bank	A	_ Una	nnel	A .	dgri	Ban	
- Walls/Rip-rap/ Dams	Р	С	В	10	Υ	N)	16 I	В	С	Р
Buildings	Р	C	В	0	Υ	M	ा	В	С	Ρ
Pavement/ Cleared Lot	р	•	В	7 1		,,, u	1-2-8-	В	С	р
Road/Ralfroad	р	С	В					В	c	_ p
Pipes (injet/ Outlet):	р	С	В					В	c	p
Landfill/Trash	p	С	В					В	c	р
-Park/Lawn	p	c	В		_			В	c	
Row Grop	<u>p</u>	С	В		_			р	3 _	<u>c</u>
Pasture/ Range	p	_c						В	c	
Logging Operations	P	C	·B	0			0	В	c	
Mining Activity	• •P •	C	В	0 /	Υ	0	\0	р		
Vegetation Management	Р	С	В	þ			0_	В	c	
Bridges/ Abutments	р	С	В					В	c	р
Orchards/ Vineyards	<u>p</u>	c	В	_				_B	<u>c_</u>	p

**************************************	40.4044.00.00		Maria di Contratti di Calendari

D	Bd+d++10-+4484 E		
	***********	******************	*************

Downstream (required)	
,	凶
Upstream (optional)	

SWAMP Stream Hab	oitat Characterization Fo	o <u>rm F</u>	-ULL VEF	RSION	Revi	ision Date: Ja	anuary 9 th , 2012	V-V
Site Code;	ceek Contal		9110			Analyte	Control of the Contro	
	BENTHIC INVERTEB	BRATE SAME	PLES			Light	Cal date: /	/
ea	llection Method					Wat	Calidate: /	/,
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RWB (standard)	RWB (MCM)	(TRC)	1.01			oxygen	Cal date:	1
R,WB (standard)	RWB (MCM)	TRC	2			oxygen	A Company	
()	(,	''``	 			sat sat	Cal date:	/ January
RWB (standard)	RWB (MCM)	TRC				specific cond	Cal date:	
RWB (standard)	RWB (MGM)	TDC	-			SCANDA BROKENSKA	Cal date.	
,	, ,	TRC				Salinity	, Cal date:	1
Field Notes/ Con						Altrolipity		7 4. V
	rrow e* ' co11f>,v,ve,o,	15: t1., je	- bird	h,p	ines	Alkalinity	Cal date:	- 31.50
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0-A- \UU	'-\-l s:4"-S ,					Turbidity	Cal date:	1
			17 17			Silica		
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						29-10-10-10-10-10-10-10-10-10-10-10-10-10-	Cal date: /	1. 13-45
						Velocity		5000 P. 10276
ning sampatinwasi da	ser op og av forste herforet og tremste og	ere er proved programme fil				VC COA.	Cal date:	$F_{\gamma_{k}, \gamma_{k}, \gamma_{k}}$
	ALGAE SA	MPLES				Mate	r and Sedime	4
Collection			VAMP S	WAMP	SWAMP :			
(circle one or write new n	and the second s			EMAP _	EMAP	GIRG	mistry Sample	Š
Collection				Rep.	Rep.		/ATER chemistry	1.
sum # of transect	(4) (-1), 40-13, (4)-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	1	2			gra_b sarnple	Wa_s collected	D
Rubber Delimiter (area	· · · · · · · · · · · · · · · · · · ·		-			(nutrients, S		
PVC Delimiter (area=1	2.6cm')					1	UPLICATE WATER	
Syringe Scrubber (area	:a=5.3cm')					chemJstry gr collected	ab- sample wa.s	D
Other area=							EDIMENT chemistry	ח
Nul)lberof.transects s	amplc:J.(O, 11 İ					sample .asc		D
Cpmposite Volurne {m	nL)				†	Check) ! aDl	UPLICATE SEO	
	,				 	.chemistry sa	ample was collected	D
Assel]lblag ID volume ((diatoms) (50 mltube)					Sed Coll· Device : S	SCOOP CORE	GRAB
Assemblage ID volume	50 ml tube						Stainless Steel Polyeth	
Check if Qualitative Alga	ae sample was		-			Sediment Coll	ection	
collected with soft algae/ re uiredeven if macroal ac	/diatom.sample enotvisible	D I	D	D	D	Depth (cm):	2 or	5
Check if a water chem. in				1;			ction records for each ch"e	
was;collect§id (chi, AFD	DM)	D 1	D	di	D.		ed ari.d Qrab water chertlistry	
OhlQ[bphylla volume	. use GF/F filter				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			5.44.7
Ash Jree Dry Mass	use GFIF filter						A CHEST CONTRACT	
	ml (preferred vol)							
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Description	Photo Cod	e e e e			in-		== Phóto Cade	
With the Control of the Control			<u> </u>	<u> </u>		12 144 25		
and the second s	I			4, 1, 2, 2		1		

	SW	AMP Stream I	Habitat Cha	racteriz	ation Fo	rm	FUL	L VERSI	<u>'ON</u>	Re	vision D	ate: Jar	ıuary 9 ^t	th , 2012	
	F	REACH DOCK	IMENTATIC)N:		Standard Alte	Réach L mate Re	angth (wett ach Lengtr	ed width i (wetted	≤ 10 m) #	150 m	Distance	between	transects	≅ 15 m
	Proje	ect Name: ρ_{1}	e Creek	SWAMI	BIGA	SP Fasan	enT		EPT /		/ 2012	Sampl			
	Strea	m Name: '.\'	• ('.,.<.0			De amore	jame -	Site Nar	ne/ Des	cription:					
•	Site	$r_1 \stackrel{1}{=}$ Code: \cdot ;	:- C<.,.,l	Lc,U	Į.			Crew Me		— <i>™&</i> Z- ı A s		i) S 6	• Ca	lve.AU	/1'1.ar. "'
•	Latitu	ıde (actual – de	cimal degre	es): ºN	37.30	,217		datum:	1	<u>L- 176</u>					
		itude (actual –					4	NAD83 other:		Device:	ARMIN	r5x61	· · · ·		:
;		MBIENT WATER				≓ 2.≛Tα	irbidity: si	lica, oxyge	a satural	on and a	dr fernover			Pank I	ength (m
4		Temp (Deg C)	βH		MR AND COMPANY OF THE PARK AND ADDRESS.	ly (0)/L)	The second second	<i>calibration</i> furbidity (n	Statement & Sections & Section 19		ngge 24 n-Sat-(%)		(see req		guidelines
00736	1	0.64	9,4	14	0,0			Ö						150	
(), 	Disso	ived O² (mg/L)	Specific Conduct (4)	S/cm)	Salini	ty (ppf)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Silica (mg/	4)	Air Ten	ip (Deg C)	Salar Salar	Explanat	tion:	
		7.17	0.074	F.	0			134			6.0			· 	
·	1 St ir	Discharce I			downsh	eam\		ē	heck if	discha	rge mea	surem	ents n	ot poss	ible —
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,	7	Distance from Left Bank (cm)		Veloci (ft/sec			ce from ink (cm)	Depth (em)A	Ve	ocity		2000		Float 2	
Salar S		40	1.7	-04	A Company of			/ . i:i	1	sec) 📜 .88	oi!:ita:n_c in <;	\; <u></u>			
Carl of Mick	2	70	1.6	0.1	1 /12	1:	3 <i>o</i>			.Is	fl <ii; _ir<="" th=""><th></th><th></th><th></th><th></th></ii;>				
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Construct	4	150	3.2	-0,2	6 14	1	10	[.3		+2-		c : Uppe c-:-¦Csectio		∕/IIdl <i ectioh:::: :};</i 	
	5	180	3.2	0	15	l ·	90	0.4	2.	<i>†7</i> -	Width	est I			P
, }	6	210	2.9		16	Z .	10	υ ,'+	2,	-#	Depth 1				
ا المسيدية المارا	7.	is majarap di disempan ministra di penerinja. Kamaminina menoning panggan danggan di sebagai penerinjang di se A kamamining manasan majarah sa panggan dan ministra penggan danggan danggan danggan dan menggan dan sebagai p	Andrews of the State of the Sta	MANAGEMENT HER THE LAND	17						Depth 2	i i i i i i i i i i i i i i i i i i i			
Re- Survice	8	40	0.4	0.3	18					_	Depth 3				
Als of	9	70	0.7	3.13	19						Depth 4	YX YX HI			
150 parl	-10	90	0.9	3.63	. 20					. 1 . 2	Depth 5				
		ner en en en en en en en en en en en en en		Not	ABLE F	EED C	ONDITIO	NS (che	ck one l	ex per f	opic)			turi e e e	
	Ε	vidence of rec	ent rainfall					-	N		1500	ninimal		>10% f	
	Ţ	Evidence of fir	es in réach	or imme	diately i	pstrean	ı (<500 i	n) 🔭	NO.)	Χ.	1 year		≮5.yea	I'S
		Dominant la	nduse/ land	coverin	area sür	roundin	g reach	a a de la compansión de la compansión de la compansión de la compansión de la compansión de la compansión de l La compansión de la compansión de la compansión de la compansión de la compansión de la compansión de la compa	Agricu	Sandardon Santa Charles	This congress	Forest	X	Rangeia	and .
									Urba Eindus		Sub	urb/Towr		Other	Same of the
		TIONAL COBBL BEDDEDNESS		1 2 2 3 7	1.3	15 (A 5-3	<u> </u>	696	477	***8	9	#10°	211	The second second second	=13
		MEASURES	20	5	5	0	10	40	60	15	35	10	10	5	2.5
	forms	If needed to attai	il a	15	16	1.7	:18	19			22	23	24	25	
Exercises and the second secon	tai (iet count of 25; = leasure in %)	80	60	30	5	30	10	5	15	25	25	15	30	

Site Code:	eck Ex	a la la	Date: 🧖 🤊	1.11	/ 2012						
	SEOPE and BE	ARING FOR	м (tran	sect k	ased =	forFull	PHAB	only)		AUTOLEVE CLINOMETE HANDLEVE	R = ×
		Main Se	GMENT	la plant				SUPPLEMENT at of interstrans			
Starting Transect		pplemental se Slope (%) or			Percent		if su	ipplemental se Slope or Elevation		e used)	Percent
	Stadia rod measurements	Elevation Difference Cm 2 %	Length (m)	Bearing (0°-359°)		Stadi measur		Difference Cm M %	Length (m)	Bearing (0°-359°)	of Total Length (%)
,K	66	17				46		= 119-			
J	58	105	4.25 2.45 2.45			-:1°	{	173		\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
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	71	92									
B	17	146	<i>i.</i>								
Aadditional	H2 15	[121] 59 ÷ 15,0	(10.5)	<i>(</i>) -							
calculation area						0 ()	. I	ligh Gradie	nt ☑ 🌲	Low Gr	adient ⊢i∗
² 4% Para	meter last	NAL HABITAT Optim	al·		on Suboptin	nal	A PARTIE	Wardinal		gai Poo	
		Greater than 70% or vorable for epifauna and fish gover (50 agradient stream	al colonization : % for low-	50% 6	nix of stable or low-gradien uited for full co	streams),	30% in id	ix of stable habitat bw-gradient stream frequently disturbe	s) (10 d.or l	ss than 20% s % in low-grade ack of habitat (ent streams); s obvious;
	5	ubmerged logs, und cobble or other sta 0 (19) 18		15	potential 14 18	12 11	10 9	removed 7	6 5	bstrate unstab	
Sediment	Deposition	ittle or no enlargen ir point bars and les he bottom affected	s than 5% of by sediment	forma sand, c	ne new increa tion, mostly to ir fine sedimen trom affected	nn gravel, t: 5-30% of	sand or fin 50% of th	eposition of new g e sectiment on bar e bottom affected (avel. 130. 10 50 - 5 25	nvy deposits of creased bar de life than 50% o anging frequen	velopment; f the bottom
i i i i i i i i i i i i i i i i i i i	ore 20	teposition (<20% in streams 0 (19) 18		15	w-gradientstr 14 13	aams)	10 9	·	6 5	ilow-gradient : 4 ; 3	atreams) 1 0
Channel	Alteration	hannel zation or dro or minimal, stream pattern	with normal	(e.g., bo of pas	channelizatio idge abulment t channelizatio y be present b	s), evidence n (> 20yrs)	embankme present on	ation may be exten hts or shoring struc both banks, 40 to	sive cerr etures reac 80% ns	anks shored wi ent; Over 80% hichannelized tream habitat g	of the stream ! and disrupted
° Sc	ore: 20		17 16		nnelization not		of stre	am reach dis <i>l</i> upte 8 7		or removed	

SWAMP Stream Habitat Characterization Form

FULL VERSION Revision Date: January 9th, 2012

Site Code: f,,,..._ C,ai,;. Site Name: 7, Crack

Wetted Width (m): Bankfull Width (m): 7,1

Bankfull Height (m): 4

Transect A

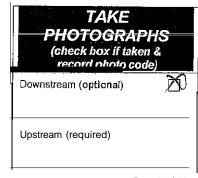
5/1.70

in the second second second second						H				Mark Andrews
						Transect Su	bstrates			
Position.	Dist from LB (m)	Depth (em)	mm/ size class	Cobble Embed,	СРОМ	Microalgae : Thickness := Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	Microalgae Thickness Godes 0 = No microalgae present,
Len :: Bank ::	0	10	GC	==	P 🙆	σ	P 💋 D	P Ø D	P Q D	1 Present but not visible.
Left Center	1,4	41	SB		р fJ	t;,	p < D	p ft) D	(!') A D	2 = Fresent and visible but , <1mm, Rubbing Ingers on surface produces a
Center	2.8	35	WD	i 	p ti)	0	p ,£ } D	pl)D	p (ill D	brownish tint on them, scraping leaves visible trail
Right; Center		12	CB	30	pi <i>l)</i>	р	Р (j,, D	r 6 □	p 6) D	uran 3 = 1-5mm; 4 = 5-20mm;
Right Bark	5.6	10	CB	50	(P) A	ø	P 🔕 D	P 🚳 D	P 🐼 D	5 = 20mm, UD = Cannot defermine if microaloae present.
	Note: Sub class cate	strate slže gories liste	s can be od on the	recorded eith supplementa	ier as dîréci I page (dire	t measures of the	e median axis of s preferred)	each particle or	one of the size	substrate too small or covered with silt (formerly Z code)
And the second second second								regions from the control of the control		D = Dry, not assessed

RIPARIAN VEGETATION T. (acing downstream)	0 = Abs 1 = Spa 2 = Mod	ırse (<	10%	T.	4 = 1					Section of the second	INSTREAM : HABITAT COMPLEXITY	1 2 3	≓Spa =Mod =Hea	rse Idrate Vy	(0% (410 (10-40 (40-75 % (376	96) 96) 96)	DENSIOME READINGS Count covere	(0-17)
Vegetation Class	Le	ft Ba	ńk			Rigi	ht B	ank		2240	Filamentous Algae	0	1	2	3	4	Center	0
У Пррег	Canopy	(>5)	n hi	gh)						200	Aquatic Macrophytes/ Emergent Vegetation	4 4	* ****	2	3	4	Left	8
Trees and saplings >5 m high	0 1	0	3	4	0	1	2	<u>Ø</u>	4	ž.	Boulders		1	2	3 _		Center Upstream	1:\$
Lower C	anopy (().5 m-	5 m	hig	h) 🚆						Woody Debris >0.3 m	0	Ci)	2	3	4	Center	
All vegetation 0.5 m to 5 m	0 (1)	2	3	4	0	0	2	3	4		Woody Debris <0.3 m	0	(j)	2	3	4	Right Center	14
Groun	d Cover	(<0.5	m h	igh)				ingle in the control of the control			Undercut Banks	0		2	3	4 .	Downstream	10
Woody shrubs & saplings <0.5 M	o (D	2	3	4	0	G)	2	3	4		Overhang. Vegetation	0	('i)	2	3	4	— Optional	
Herbs/ grasses	0		3	4	0	GI	2	3	4		Live Tree Roots	0	CD	2	3	4	Left Bank	
Barren, bare soil/duff	0		'3	4	0		2		4		Artificial Structures	_		2.	3	4	Bight Bank	

	HUMAN INFLUENCE (circle only the closest to wetted channel)	B = 0 C = B P = 9	10m+<	r Mank 50m: fr	& 10m f om Offar es of No	nnel	innel;				
i	EFFSTATION		Left	Bank		Chai	nel		Right	Ban	(
	Walls/ Rip-rap/ Dams	Р	С	В	þ	Υ	0	1	ρВ	С	Р
	Buildings	p	c	В		,			В	С	Р
4	Pavement/Cleared Lot :	p	c	В					В	С	p
`	Road/Rallroad	р	c	В					В	c	_
	Pipes (Inlet/ Outlet)	p	С	В					В	c	p
	Landfill Trash	р	_ <u>c</u>	В				_	В	С	р
	Park/:Lawn	p	c	В					В	c	p
	Row Grop	<u>p</u>	_ <u>c</u>	В					В	c	p
- Carrier	Pasture/Range	<u>р</u>	_c	В				\neg	В	С	_
2020	Logging Operations	-		2					В	c	p
12av2m25	Mining Activity	p	c	В					В	c	_
100	Vegetation Management	p	С	В					p		p
1501.632	Bridges/ Abutments	p	С	В			T	Ī	В	С	p
S HEDRON	Orchards/ Vineyards		c	В					В	c	p
				S	heet	med	al	t	ck,_	, \overline{L}	

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Page 3 off 26

Inter-Transect	t: AB	V	Vetted Width (m): 4.5		
	ln(er-Transect	Substrates			
bistion Depth Size C		Microalgae Threkness Gode	Macroalgae Attached	Macroalgae Umitached	Macrophytes	Microalgae Thickne Codes Denomicroalgae prese
Feb. 0 4 58	- P Ø	1	P (5) D	P A D	PAD.	1 = Present but not visit Feel's slimy 2 = Vissent and visite
enter 2?, ()>		·- O	p D	p D	P A D	is frum Rubbing finge can stirtage produces crownish that on them
enier : f_, t ')(. e,	р ј	0	(!)A , b	p D	P A D	scraping leaves visib trail
Grider 3.3 31 58	PR.	<u> </u>		p D	P A D	= 3 = 1-5mm; = 4 = 5-20mm; = 5 = >20mm;
Rent 4.5 3 AS	P Ø	U	P (AD	P A D	P A D	 UD = Carinot determine microalgae present. «substrate too small o
a Note: Substrate sizes can be reconciled and the sup	plemental page (dire	ct measures of the	ts preferred)	eacrepanicie or	ene or ne size	" covered with slit. " (formerly Z code) D = Dry thot assessed

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FLOW HABITA	
Channel Type	:% <u>-</u>
t:Cascade/Æalis	<u>L</u> 'S
# // Papide	55'
Riffle - 2	<u>15</u>
Programme and the second	
Glide - Glide	!,
Pool 4.75	0
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SWAMP Stream Habitat Chara	acterization Form	FULL VERSION Revis	sion Date: Januar 👊 2012
Site Code},,,:;, <i>tr.u)c.,</i> Ex	Site Name_: P .		Date: <u>0</u> 9 / 1 / 2012
Wetted Width (m): ,1 2,	Bankfull Width (m): 5, 1	Bankfull Height (m): .42	Transect B

						Transect Su	bstrates					
Position	Dist from LB (m)	Depth (em)	size Glass	% Cobble Embed	СРОМ	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	Microalgae Thickness Codés 0 = No microalgae present.		
Leit Bank	0	19	CB	40	Р 👸	0	P 💋 D	P 💋 D	P 🙆 D	1 = Present but not visible. Feels \$limy;		
Left Center	1.0	2			р .	0	_ D	p ® D	:) A D</td <td>2 = Present and visible but 31mm, Rubbing fingers on surface produces a</td>	2 = Present and visible but 31mm, Rubbing fingers on surface produces a		
Center:	2.1	0	'× I,		p (J.	O	p O	b @ D	P @ D	brownish tint on them; scraping leaves visible		
Right Genter	3.1	'8 ' /	56		p '®	0	p le) D	p li!! D	p (b D	trail. 3 = 1-5mm; 4 = 5-20mm		
Right Bank	4,2	30	XB		P 🔕	1	P 👌 D	P 6 D	P (3 D	5 = >20mm UD = Cannot determine (f		
	Note; Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size categories listed on the supplemental page (direct measurements preferred) covered with silt. To a Dry not assessed.											

RIPARIAN VEGETATION (facing downstream)	0 = At 1 = St 2 = M	arse (<109	6)	4′=1	Heav /ery l	y (4) leav)-75% NJ (>1) 5%)		INSTREAM HABITAT COMPLEXITY	0 = Abs 1 = Spa 2 = Mod 3 = Hea 4 = Very	se erate (vy ((<10 (10-40 (40-7)	%) :%)	DENSIOMET READINGS (Countrovered)-17)
Vegetation Class	##£	eft B	ank			Rig	ht E	3ank		Ī	Filamentous Algae	00	2	3	4	Center	1,,
Uppe	r Canop	y (>5	m h	igh)					ji.		Aquatic Macrophytes/ Emergent Vegetation	1	2	3	4	Left	14
Trees and saplings >5 m high	0 -	<i>(</i> 2)	3	4	0	1	(2)	3	4		Boulders	0	2		4	Center Upstream	111
Lower C	anopy	(0.5 m	-5 n	n hìg	ነ)						Woody Debris >0.3 m	00	2	3	4	Center	1 444
All vegetation 0.5 m to 5 m	0	2	@	4			_			ľ	Woody Debris <: 0.3 m	₀ (iJ	2	3	4	Right	17
Groun									140-16	L	Undercut Banks	0	2	3	4	Downstream	9
Woody shrubs & saplings <0.5 m	0 (J) 2	3	4	0	(.	2	3	4		Overhang, Vegetation	0 - ©	2	3	4		
Herbs/ grasses	0	(y	3	4	0	CD	2	3	4		Live Tree Roots	0 Ci)	2	3	4	Left Bank	attacher and a second
Barren. bare soil/ duff	0	R	3	4	0		2	G>	4		Artificial Structures		2	3	4	Bight Bank	

HUMAN INFLUENCE (circle only the closest to wetted channel)	B = 0 C = B P = ≥	0 ÷ Not Present; B ≈ On Bank; C ⇒ Between Bank & 10m from Channe; P ≈ >10m <50m from Channe; Channet (record Yes or No)												
		Left	Bank		Righ	Ban	k							
Walls/ Rip-rap/ Dams	Р	C	В	(0	Υ	Ñ	6	В	С	Р				
Buildings.	Р	c	В	0	Y	N	•	В	С	Р				
Pavenient/ Cleared Let	p	c	В					В		p				
Road/ Railroad	p	С	В			1		В	С	p				
Pipes (Inlet/ Outlet)	p	С	В					В	С	p				
Landfill Trash	p	С	В			•		В	С	p				
Park/Lawn 1	<u>p</u>	c	В					В	С	p				
Row Crop	p	c	В					В	С	p				
Pasture/Range	<u>p</u>	c	В					В	С	р				
Logging Operations	p	c	В					В	С	р				
Minling Activity	р	c	В					В	С	p				
Vegetation Management	p	С	В					В	c	p				
Bridges/Abutments	p	С	В					В	С	p				
Orchards/ Vineyards	p	c	В					В	c	p				

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onter 0.8 — 5e	p f))	D	p@D P 🗜	D D B D	finm; Rubbing lingers ton surface produces a
enter 1.7 3)'6	P @	0	р !!, D р @)' D : p @ D	prownish tink on them; scraping leaves visible trail
Right 2.5 65 5e,		O ,	P D	' P@ D	3 = 1.5mm, 3 = 4 = 5.20mm, 4 = 5.20mm, 4 = 5.20mm, 5 = 5.30mm, 5 =
Right 3.4 39 GC -	- P 🚳	0.5	P Ø D P Ø	D P D	5 ∈ >20mm; UD =(Cannot determine) imigroalgae present, substrate too small of

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Site Code: P, '
Wetted Width (m):

Bankfull Width(m): 7 /

Bankfull Height (m):

0.'35

Date: <u>Ø 🧐 / / 1</u> 1 / 2012

Transect C

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Bank	O		. .	<u> </u>		0_	P	A D	Ρį	l D	Р	D	r = rresent out not visible, Feals slimy
Left Center	<i>"</i> %	1 2			p	0	p	A D	P A	D	.P	D	2 Present and Visible but <1mm; Rubbing finders on surface procuces a
Center	1 ,7-	_10	c£,	1 O	p <i>t</i> >	-0	р	A D	P A	D	P	D	brownish tint on them.—— scraping leaves visible
Right Center	2.5	<i>10</i>	ge,		p &	0	Р	A D	P A	D	P	D	frail 3 = 1-6rmm; 4 = 5-20mm;
Right Bank	3.5	5	GF	-	Р (А)	0	P	A D	P A	Ð	P	D	5 = >20mm; UD = Cannot determine if
	Note: Sub	strate size:	can be	recorded eith	ier as direc	t measures of th ct measuremen	e media	in axis of	each pa	rticle or	one of th	e size	inicroalgae present, substrate (oo smal) or covered with sil:
		,		out piction is	n poga (dije	C. Hoadu ellen	is hiere	ngu)			***		(formerly 2 code) D = Dry hot assessed

RIPARIAN VEGETATION (facing downstream)	0 = Ab 1 = Sp 2 = Mo	arse	(<10°	%)	4=\	ery l	deav,	r (>7) 5%)		INSTREAM HABITAT COMPLEXITY	- 0 = Abso -1 = Spar -2 = Mod -3 = Hear -4 = Very	se erate Vy	(510 (10-40 (40-7)	1%) 1%) 1%)		DENSIOMET READINGS (C count covered	0-17)
Vegetation Class	<u> </u>	eft E	ank			Rig	ht B	ank		ė	Filamentous Algae	0 (D)	2	3	4	, 	Center	Ī
Uppe	r Canop	y (>!	mh	iigh)							Aquatic Macrophytes/ Emergent Vegetation	-ما		3	4	ļ	Lett	1,1
Trees and saplings >5 m high	o O) 2	3	4	0	1	0	3	4		Boulders	0 1	2	- 0	4		Center Upstream	16
Lower C	апору (0.5 r	n-5 n	n hig	h)						Woody Debris >0.3	0	2	3	4		Center	
All vegetation 0.5 m to 5 m	0 1	2	3	4	0	1	(2)	3	4		Woody Debris <0.3 m	0 (D	2	3	4		Right	11
	d Cóvei	(<0.	5 m	hĩah)							Undercut Banks	0	_ 2	3	4		Center Downstream	1 .
Woody shrubs & saplings	0 (_	3	4	0		(;)	3	4	i 	Overhang. Vegetation.	0 (J	2	3	4		7 Optional	
Herbs/ grasses	0)8	316)	3	4	0	0>	2	3	4		Live Tree Roots	0 6)	2	3	4		Left Bank	Name of the last o
Ba rren. bare soil/ duff	0		3	4	0		(z)	3	4		Artificial Structures		2	3	4		Right Bank	

HUMAN INFLUENCE (circle only the classes to wetted channel)	B=0 G=B P=3	10m+s nel (re	k 1 Bank 50m fr cord Y	8 10m.) op:Cha es o:No	inel;					
		Left	Bank	Apparent of the	Cha	nnel		Righ	Ban	<
Walls/ Rip-rap/ Dams	P	С	В	þ	Υ	Ŋ	O	В	С	P
Buildings	р	c	В	Ь	Y	N	0	В	С	Р
-Pavement/ Cleared Lot	р	С	В					В	c	р
Road/Railroad	р	С	В			Ш		B	c	р
Pipes (Infel/ Outlet)	р	С	В			Ti		В	c	р
Landfill/Trash	p	С	В			1		В	С	р
Park/Lawn	р	С	В		-		<u>'</u>	В	c	р
Row Grop 4	<u>р</u>	c	В		_	_		В	c	р
Pasture/ Range	р	c	В					В	c	р
Logging Operations	р	c	В					В	c	р
Mining Activity	р	c	В					В	c	р
Vegetation Management	р	c	В					В.	c	р
Bridges/Abutments	р	c	В					В	c	р
Orchards/-Vineyards	р	c	В		_			В	С	р

7. × 3 10 × 4	I	nter-T	rans	ect: CI			and the second of the second o						
					i Ji kn	ter-Transect	Subst	rates -				(1)	
≅-Position=	⇒ Dist =ftom=2 =I-B-(m)=	Depth (em)	s size =	% Cobble Embed	CROM	Mitioalgae Thickness Code	and the state of the last of the	oalgae iehed	Macro Unatt			rophytes	Microalgae Thickness Codes O No microalgae present
Banke	.0						8 1.38 Q.19	D	r n	υ	ľ	ğμ	Feels rough, not silmy Brack how not sill like Feels slimy. 2 = Present and visible but
Eeft. Center	∀ ,X	25	e,		p <i>t!z</i>		р	D	p	D	p	(). D	Immy Rubbing fingers to an surface produces a kind to brownish that an them.
Center	,{,(,,	O	'/\$		p (el	l>	p	D	p	D	R	A D	
Right Center	<u>2't</u>	0	')(e,		р (f1 I	b	р 	D I	р 1 1	D	p	6)D.	5 = \$20mm (4) 5 = \$20mm
Right Bank	3.2	<u> </u>	CB	10	P Ø	0	P	d D	P	D	P	∌ D	UD = Cannot determine if 'A' microalgee present, 's substrate too small or
	Note: Sub class cate	strate size gories list	s can be ed on the	recorded eit supplement	al page (dir	t measures of the ect measuremen	its prefe	rred) .	each pa	rhele or	one of	the size	covered with silt (formerly Z code) D = Dry _not assessed

1.8 3.3 5 3.4 5 3.4 5 5.4	
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					1000		Transect Si	ibstra	te	S	ST 2					
Position :	Dist from LB (m)	Depth (cm)	mm/ size člass	% Cobble Embed	CP	ON 2	Microalgae Thickness Code	Lyrac		algae hed		oalgae tached	Macro	ophytes	Microalgae Thickness Codes 0 = No microalgae present,	
Left Bank	0	19	es	55	Р	A	0	Р	A	D	P	D	P	D	Feels rough, not slimy, 1 = Present but not visible, Feels slimy,	
Center	0.9	32	88		· P	Α	D	P	A	D	p	D	р	D	<1mm; Rubbing fingers en surface produces a	
Center	1.8	0	XB		P	Α	0	P	A	D	p	·_ D	p	D	brownish tint on them; scraping leaves visible trail.	
Right Center	2.7	12	СВ	50	Р	Α	0	P	Α	D	р	_D	p	D	.3 ≠ 1-5mm, 4 ≒ 5-20mm	
Right Bank	3.6	2_	SA		P	Ø	0	P	M	D	P	$\mathbf{\Phi}_{j}$	Р	ΚĎ	5 = ≥20mm; UD = Cannot determine]f microalgae present;	
	Note: Sub class cate	štrate size: gories liste	can be d on the	recorded eiti supplementa	ier as Il pag	dire e (d	ct measures of the rect measuremen	ie medi its prefe	an erre	axis of d)	each pa	irtiçle ör	one of th	ė sizė	substrate too small or covered with still (formerly Z code). D = Dry_rot assessed	

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RIPARIAN VEGETATION (Bicing downstream)	1 ∈	Spa	se (<10%		4 = V	ery ř	eavy	(>7	5%)
Woody shrubs & saplings	-27	MIGG	erate	10.	40%	,	(7			
Vegetation Class		Let	tB	ank	4		Ħigl	nt B	ank	4
Herbs/ grasses Uppe	Can	ору	0	mßhi	gh)	0	- 1	J	3	4 .
Tre-Seamon shortmggik 5lwffhigh	60	0	2	3	4	00	1	(2)	3	41
LowerC	anop	у (0	.5 m	-5 m	hig	h) :				
All vegetation 0.5 m to 5 m	0	1	2	3	4	0				'
Groun	d Co	ver (<0.5	mh	igh)					1

INSTREAM HABITAT COMPLEXITY	1# 2# 3 =	Spar Mou Heav	nt se erata y Heav	. (*) (10-4) 40-7	0%) 0%) 5%)
Filamentous Algae	0	1	2	3	4
Aquatic Macrophytes/ Emergent Vegetation			2	3	4
_Boulders	0		2		4
Woody Debris >C.3 m	0	1	2	3	4
Woody Debris <0.3 m	0 (CD	2	3	4
Undercut Banks	0		2	3	4
Overhang. Vegetation	0 (C)	2	3	4
Live Tree Roots	0		2	3	4
Artificial Structures	0 ·	1	2	3	4

HUMAN INFLUENCE (circle only the closest to wetted channel)	B = 0 C = B P = >	o⊧Prese n Bank eiwaen Jon+< nel (rec Left I		Right Bank							
-Walls/Rip-rap/Dams -	Р	С	В	ρ	Υ	N		b	В	С	Р
Buildings	р	c	3	b	Υ	M	\perp	þ	В	С	Р
Pavement/ Cleared Lot	р	c	В			_				c	p
Road/Rallibad	р	c	В						В	c	р
Pipes (Inlet/ Outlet)	р	c	В						В	С	р
Landfill/ Trash	<u>p</u>	c	В						В	c	р
Park/ Lawn	_ p_	c	В		_				В	c	p
Row Crap	<u>p</u>	c	В		_				В	c	р
Pasture/Range	<u>p</u>	c	В		_				В	С	_ p
Logging Operations	<u>p</u>	c	В		1				В	<u></u>	р
Mining Activity	р	c	В						В	c	р
Vegetation Management	р	c	В						В	c	_
Bridges/Abutments	р	c	В						р		
Orchards/ Vineyards	р	c	В			_			В	c	_ p

		
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DENSIOMETER
READINGS (0-17)
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Center

Center

Upstream Center Right

Center

Downstream

Left Bank

Right Bank

Optional 1

SWAMP.Stream HabitEJt Characterizi'ltion Form <u>FULL VERSION</u> Revision Date: January 9th, 2012

Electrical Section 1	Inter	Trans	ect: DI	}	Wetted	Widih (m) 4.2		Manufacture of the second		
				- In	ESubst	rates :	distribution of				
	Dist Dept from Jem LB-(m)	SIZC	Gobble Embed	CPOM	Microalgae FIBiekness Code	- Iviaci		Macroalgae Unattached	Magre	phytes	Microalgae Thickness Codes O No microalgae present.
lacif Bank -	0 3	\$8	1 19 11 (11))	Р 🐧	0	P	D	P Å D	P	D	Feels rough, not slimy 1 = Present but not visible Peels slimy 2 = Present and visible but
Centers	1.0 44	<u>e.o</u>	<u>L</u> /S	• · · · · · · · · · · · · · · · · · · ·	i	р	D	D	p	D	on stiriace produces a brownish tint on them.
Center	2,1 48	0:: C		р		p	D	D,)'	D	scraping leaves visible := trail
Right Center	3,1 2	,<. e,	-	p 		p	D	D	p	D	3 = 1-5mm; 4 = 5-20mm; 5 = 20mm;
Bank	4,2 7 Note Substrates	GF	recorded áil	D A heras direc	f measures of t	P he media	D D	P∖A D each barricle or	P i	AD ie size	HD ≓ Cannot determine it ** microalgae present * substrate too small or **
	class categories I										covered with sill (formerly Z code). Die Dny, not assessed
	The state of the s				, d = 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	M. Actu		利克尔公司	19 9490		

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		44076					Transect Su	bstrai	eš			10 10 10 10 10 10 10 10 10 10 10 10 10 1		
Position	Dist from LB (m)	Depth (em)	mm/ size class	% Cobble Embed,	CPC	M	Microalgae Thickness Code		oalgae iched			Macr	ophytes	Microalgae Thickness Codes 0 = No microalgae present,
Bank	0	4	GF		р			р	D	ΡÀ	D	Р ,	D	1 = Present but hat visible Feels slipty
Left Center	Į	27	СВ	5	р			p	D	p	D	р	- D	2 = Present and visible but strimm: Rubbing fingers on surface produces a
Center	2	50	SB		p		0	p	D	p	D	p	D .	brownish tint on them, scraping leaves visible
Right Center	3	56	SB		p		0	p	D	p	D	p	D	frail 3 = 1-5mm; 4 = 5-20mm;
Right Bank	40	13	ac		Ρ.	Ā	0	P	A D	? A	Ď	Р	A D	5 = ≥20mm; UD = Cannot determine if microalgae present.
							t measures of the ct measuremen			each pa	ticle or	one of t	nė size .	substrate too small or covered with still (formerly Z code). D = Dry not assessed

Riparian Vegetation (lacing downstream)	1.1 🕏	0 ± Absent (0%). 3 = Heavy (40-75%). 1 = Sparse (<10%) 4 = Very Heavy (>76%). 2 = Moderate (10-40%)										INSTREAM HABITAT COMPLEXITY	0 = Ab 1 = Sp 2 = Mo 3 = He 4 = Ve)	irse Jerete Ivy	(+10 (10-4) (40-7)	1%) 1%) i%)	DENSIOME READINGS (count, covered	0-17)
Vegetation Class	1.00	Le	ft B	ank			Rig	ht E	sank			Filamentous Algae	XX (1)	2	3	4	Center	3
Uppe	r Car	юру	(>5	m h	igh)							Aquatic Macrophytes/ Emergent Vegetation	1	2	3	4	Left Center	_
Trees and saplings >5 m high	0) 1	2	3	4	0	0	2	3	4		Boulders		2	3	4	Upstream	4
Lower	anoj	эў (С	.5 m	-5 n	i hig	η) 🔃						Woody Debris >0.3 m		2	3	4	Center	15
All vegetation 0.5 m to 5 m	0	1	2	<u> </u>	4	.0	1	2	(3)	4		Woody Debris <0.3 m		2	3	4	Right Center	<u>/5</u>
Grour	d Co	ver	(<0.5	i m f	iigh)	ienen.	e ka bibi				L	Undercut Banks	0 1	2	3	4	Downstream	6
Woody shrubs & saplings <0.5 m	0	G)) 2	3	4	0	(1)	2	3	4		Overhang. Vegetation	o (I)	2	3	4	Optioral	
Herbs/ grasses	0	(9	2	3	4	0		2	@	4		Live Tree Roots	R	2	3	A	Left Bank	
Barren, bare soil/ duff	0		2	@	4	0	(i)	2	3	4		Artificial Structures	0	2	3	4	Right Bank	

HUMAN INFLUENCE (circle only the closest to wetted channel)	B = 0 C = B P = >	Not Present: •On Bank; Between Bank & 10n (form Channel). •10n+ •50n from Channel; annel (rector Yes of No)										
		Left	Bank		Char	inel	E	Right	Ban	k		
-Walls/ Rip-rap/ Dams	Р	С	В	P	Y	M	•	В	С	Р		
Buildings	<u>p</u>	С	В	•				В	С	_ P		
Pavement/ Cleared Lot	р	С	В		1	n I		В	c	р		
Road/Railroad	р	c	В					В	c	р		
Pipes (Inlet/ Outlet)	р	С	В			Ιi		В	c	р		
Landfill/Trash	р	С	В					В	c	р		
Park/ Lawn	p	c	В		1			В	c	р		
- Row Crop	р	c	В			_		В	c	р		
Pasture/ Range	р	c	В					В	c	р		
- Logging Operations	р	c	В					В	c	p		
Mining Activity	<u>p</u>	c	В		_	· <u>-</u>		В	(c		
Vegetation-Management	р	c	В					р				
Bridges/ Abutments	р	c	В					В	c	p		
Orchards/Vineyards	p	c	В		:	_		В	c	_p		

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	I	nter-	Trans	ect: El	F	Wetfed Width (m): 6,2								
	fire to				- J	nter-Leansect	Subst	rates					III de come de la companya de la companya de la companya de la companya de la companya de la companya de la co	
Position-	Dist == from== LB (m)=	Depth (ční)		% = Clobble =Emb e d		#Microalpac #Elitekness # Code	ENTACE	oalgae ehed			=Macr	ophytes	Microalgae Thickness Godes De No microalgae present	
Left Bank	0	10	ce,	20	- P 🐧	0	P	l D	P	D	P	A D	1 = Present but not visible. Feels slimy	
Left Center	1.5	4g	se.		distance distribution	0	р	D	p	D	P	A D	2 Present and visible but Imm. Rubbing fingers on surface produces a	
Center,	3.1	5	:,.;		p	0	p	D	р	D	(A D	brownish tigt on them scraping leaves visible trail	
Right — Center	4.6	13	CJ/,	to_	р Т	ı v	p	D	P	D	, P	ΛD	3 = k5mm = 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
Right Bank	6.2	16	GC		P A	0	P	D	P.	D	P	Å D	UD = Cannot determine it. microalgae present.	
						ct measures of the			each pa	rticle or	one of t	ne size	substrate too small or a covered with silt of the covered with silt of	
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			T.				Transect Su	bstrat	ės					
Position	Dist from LB (m)	Depth (cm)	nun/ size class	Cobble Embed,	CPO	M.	Microalgae Thickness Code		oalgae iched			Macrophytes		Microalgae Thickness Codes 0 4 No microalgae present,
Lefta Bank	. 0	_	B</td <td>15</td> <td></td> <td></td> <td>0</td> <td>P A</td> <td>ע</td> <td>P</td> <td>X D</td> <td>Р</td> <td>ďΩ</td> <td>Feels rough, not slimy; Feels slimy</td>	15			0	P A	ע	P	X D	Р	ďΩ	Feels rough, not slimy; Feels slimy
Left Center	0' 1	2	se.		p		P	p	D	p	D	(P)	A. D	2 = Present and Visible but *frim, Rübbing fingers on surface produces a
Center	, , "I	_3"	C6	70	р		0	p	D	p	D	р	D.	brownish first on them, scraping leaves visible
Right Cenfer	2.7	3	xe.	,,,,,	р		CJ	p	D	р	D	p	D	74 . 3 = 1.5mm; 4 = 5-20mm
Right! Bank	3.8	6	SA	,	P A		0	P A	, D	Р	L D	Р	A D	5 = >20mm; UD = Cannot determine if
	Note: Sub class cate	istrate size gories liste	s can be d on the	recorded eith supplements	ier as d Il page	lirec (dire	measures of the	e media is prefer	n axis of red)	each ö	article or	one of tr	e size	microalgae present, substrate too sinal or covered with silt
					77				ia de 11					(formerly Z code). =D # Dry, not-assessed

RIPARIAN VEGETATION (facing downstream)	0 = Absent (0%). 3 = He 1 = Sparse (<10%). 4 = Ve 2 = Moderate (10.40%).		INSTREAM HABITAT COMPLEXITY	0 = Absent (0%) 1 = Sparse (410%) 2 = Moderata (10.40%) 3 = Heavy (40.75%) 4 = Yery Heavy (2.75%)	DENSIONETER READINGS (0-17) count covered dots
Vegetation Class	Eeft Bank F	Right Bank	Filamentous Algae	0 6 2 3 4	Center
Uppe	r Canopy (>5 m high)		Aquatic Macrophytesi Emergent Vegetation	0 2 3 4	l'f
Trees and saplings >5 m high	0 <i>G</i> P	1 ② 3 4	Boulders	0 1 2 4	Center Upstream 1'7
Lower C	anopy (0.5 m-5 m high)		Woody Debris >0.3 m	0 1 /J} 3 4	Center
All vegetation 0.5 m to 5 m	_	3 4	Woody Debris <0.3 M	0 <fl< b=""> 2 <u>3 4</u></fl<>	Right III
<u> </u>	d Cover (<0.5 m high)		Undercut Banks	2 3 4	Downstream O
Woody shrubs & saplings <0.5 m	0 (i) 2 3 4 0	3 4	Overhang. Vegetation	0 6) 2 3 4	Optional
Herbs/grasses	0 2 6) 4 0	(j) 3 4	live Tree Roots	0 G) 2 3 4	Left Bank
Barren, bare soil/ duff	0 (D 2 3 4 0	3 4	Artificial Structures	0 1 2 3 4	Right Bank

HUMAN INFLUENCE (circle only the closest to wetted channel)	B = 0 C = B P = 3	10m+< nel (rei	Bank 50m fro	om Cha es or No))	amel. nnel		Right Bank					
Walls/ Rip-rap/ Dams	P	С	В	В	Υ	A) В	C.	Р			
Buildings	р	c	В	Ь	Υ	N		В	C	P			
Pavement/ Cleared Lot	p	С	В		ĺ			В	c	p			
Road/Rallroad	р	c	В			1		В	c	p			
Pipes (inlet/ Outlet)	p	С	В					В	С	_ p			
Landfil/Trash	p	c	В					В	С	p			
Park/Lawn	p	c	В	,				В	c	p			
Row Crop	<u>p</u>	c	В					В	c	p			
Pasture/ Range	<u>p</u>	c	В		_			В	c	p			
Logging Operations	<u>p</u>	_ <u>c</u>	В					В	c	p			
Mining Activity	<u>р</u>	c	В					В	c	p			
Vegetation Management	<u>p</u>	c	В					В	c	p			
Bridges/ Abulments	<u>p</u>	c	В		_			_ B _	c	p			
Orchards/ Vineyards	р	c	В	-	A complete complete control of the c	ern auer a e		В	c	p			

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TAKE —PH9 (check box if taken record photo code) Downstream (required)	
Upstream (required)	,gi.

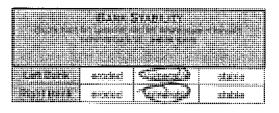
	I	nter-T	[rans	ect: FG	1		V	Wetted Width (m): 3, 4							
						ln	ter-I-ransect	Sübst	rates						
Position	Dist Home LB (m)	Depth:	Microalgae Thickness Code		oaigae ched		Macro	ophytes	Microalgae Thickness Godes						
Left Bank	0	1	GF		P A	1	0	P	D	P) D	P	D	1 = Aresent but not visible; Beels slimy, #	
Len Center	0.8	37	СВ	60	р	İ	0	р	D	р	D	р	D	2 = Present and visible but. <1mm; Rulibing fingers #3 on surface produces a	
Conter	1.7	1	XΒ		р		1	р	D	p	D	р	D	Scraping leaves visible. trail	
Right Center.	2.5	32	СВ	20	р		0	P	A D	р	D	p	D	3 = (1-5mm) = 4 = 4 = 4 = 4 = 6 = 20mm, = 4 = 20mm	
Right Bank	3.4	3	CB	75	P			P	D	P	. D	P	A D	UD = Cannot determine if := :::::::::::::::::::::::::::::::::::	
							measures of the oct measuremen			each pa	rticle.or	one of II	ie size	substrate foo small or covered with silt (formerly Z code)	
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		100	To the	ASS SECTION			Transect Su	bstrat	es ,	7.				
and the same	. Dist.	Depth	mm/	%			Microalgae	Mane	nalmae	Man	o almon		pak di	Microalgae Thickness
Position	from,	(cm)	"Sizo»	Cobble	CPC	M	Lihickness							Codes 0 ≠ No microalgae present.
T #	LB (n.)		_class_	Embed		4	Code	La complete a record	•					Feels rough, not slimy;
Bank =	0	- S	(,iF		' r .	 	Ø	1 1 4	ע	P	Y D	Р:	A D	Feels slimy
Left	1.7.		0-		р		(1	р	D	р	D	р		2 = Present and visible but < 1mm, Rubbing lingers
Center	11 4	_\0	Ge		т		(3	Г		Р	Ь	Р		on surface produces a
Center	2.5	,,	$(\?,$	'20	p		\	p	D	p	D	p	D	brownish tint on them, scraping leaves visible
Right Center	3,7	32	CB	40	p		19	p	D		D	p	D	fralk 3 = 1.5mm; 4 = 5.20mm;
Right Bank	5.0	44	CB	89	Р .	1	Ь	P 4	D	P	A D	Р,	D	5 = >20mm; UD = Carnot determine if
Service Control of th	Note: Sub	strate size	s can be	recorded ell	i Ter as c	lfrað	measures of th	e media	návic Áf	each n	diele or	one of th	r ia elta	microalgae present substrate too small or
	class cate	gories liste	d on the	supplementa	it page	(dire	ct measuremen	ts prefer	red)	caur p	article of	one of it	ic size	covered with sill
												Toronto de de la companya de la comp		(formerly Z code). D = Dry, not assessed.

RIPARIAN VEGETATION (facing downstream)	1 = 5	bsent (i parse (loderate	410%		4 = V	ery H	edvy	7 (57		INSTREAM HABITAT COMPLEXITY	1 = 2 = 3 =	Abser Spars Mode Heav Very	of rate ((*10 10.40 40-75	1%) 1%) 1%)	DENSIOM READINGS court cover	(0-17)
Vegetation Class	i i i l	Left Ba	ank :	Ĕ.		Righ	it B	ank		Filamentous Algae	0	0	2	3	4	Center	1 40-
Uppe	r Cano	ру (>5	m hi	gh)						Aquatic Macrop1ytes/ Emergent Vege:atlon	1	-			4	Left Center	15
Trees and saplings >5 m high	0	1 2	③	4	0	1	0	3	4	Boulders			_		4	Upstrearr	14
	di inh	31 W 11	V 101	ue.	·/-				E STATE OF STATE OF	Woody Debris >0.3 m					4	_ Center	
All vegetation 0.5 m to 5 m	0 6	6) ₂								Woody Debris <0.3 m			2	3	4	Right Center	12
 	 	 :0.5	m hi	gh)					2000	Undercut Banks			2	3	4	_ Downstrea,11	13
Woody shrubs & saplings <0.5 m	0									Overhang. Vegetation	0		2	3	4		1 Marketine
Herbs/ grasses	0	(y	3	4	0	<d< td=""><td>) 2</td><td>3</td><td>4</td><td>Live Tree Roots</td><td>0</td><td></td><td>2</td><td>3</td><td>4</td><td>Left Bank</td><td>ESECT LECUL</td></d<>) 2	3	4	Live Tree Roots	0		2	3	4	Left Bank	ESECT LECUL
Barren, bare soil/duff	0	2	3	4	0		2		4	Artfficlal Structures	0		2	3	4	Right Bank	

HUMAN INFLUENCE (circle only the closest to welted channel)	C P	10m# ine (re	K	1	annel; nnel	E Rig		P R
Walls/Rip-rap/ Dams Buildings Pavement/ Cleared Let. Road/ Rall/oad Pipes (Inlet/ Outlet) Landfill/ Trash Park/ Lawn Row Crop Pasture/ Range Logging Operations Mining Activity Vegetation Management		c c c c c	B B B B	Y Y		B B B		- p - p - p
Bridges/ Abutments Orchards/ Vineyards	p	c	В		-	В	<u>c</u>	_



1887 J	4.4-94					In	fer≘l ransect	Subst	rates		e de la companya de la companya de la companya de la companya de la companya de la companya de la companya de	All British	
osition .	Dist from LB(m)	Depth (cm)	SIZC	% Cobble Embed	CPC	M	Microalgae Thickness = Code =	NACTO (LEGE STA				Macrophyrcs	Microalgae Thickne Codes 0 = No microalgae pres
Left. Bank	0	3	WD		P	Å	0	P. 4	D	P	A D	O A D	Feels rough, not slimy 1⇒ Rresent but not visit Feels slimy
Letts enter	lit	26	CB	10	P	A	0	р	D	р	D	PfP	2 = Present and visible ≤Imm; Rubbing finge on surface produces
enter	2,3	26	CB	35	P	A	0	p	D	Р	D	Р If р	brownish lint on them scraping leaves visib trail
Right enier	3,4	31	XB	Medicine	P	A	1)	p	D	Р	D	A D	: 3 = (1-5mm)
Right Bank	4.6	24	GC	Tenthib	P	<u> </u>	0	P	D	Р.	A D	P A D	UD = Cannot determine migroalgae present,
	Note Sub	istrate size	s can be	recorded eit	her as	direc	f measures of the ect measuremen	e media Is orefei	n axis of	each p	article or	one of the size	substrate too small o covered with slit (formerly Z code).

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ELOW HABITA	
Channel Type	%
a Cascade/ Falls : - (O
a trans Rapido and	5
Riffle.	45
Run 1 1 3 3	30
Glide	5
Pool 4	15_
Dry	O

					u de la		Transect Su	bštrat	es					
Position :	Dist from LB (m)	Depth (cm)	mm/. size class	% Cobble Embed	CPOI	M.	Microalgae Thickness Code	Macı Att	oalgae iched	Mac Una	roalgae tached	Macr	ophytes	Microalgae Thickness Codes 9 = No microalgae present Feels rough, not slimy;
Left. Bank	O	51	XB		P A		0	P	A D	P	D	(P)	A D	1 Present but not visible.
Left Center	1.1	106	CB	5	p			p	D	p	D	Р.	Ä. D	2 = Present and visible but = <1 mm, Rubbing fingers on surface produces a
Center	2.2	110	XB		p		0	p	D	p	D	,P	A D	prownish fint on them, scraping leaves visible
Right - Center	3.3	103	50	Palipadition.	P A		O	p	D	p	, D	P.	A ,D	ral 3 = 1-5mm; 4 = 5-20mm;
Right Bank :	4.4	95	SB		P Ą		0	P	A D	P	A D	P	A D	5 ≅ >20mm; UD = Campt determine (f microalgae present
							measures of the ct measuremen			each p	article or	one of t	ie siże	substrate too small or covered with sill (formerly Z code), D = Dry, not assessed

RIPARIAN VEGETATION (facing downstream)	1 =	Spa	ent (C 190 (* Jerate	109	6)	4 = \	ery i	leav	<i>į</i> (>7) 5%)		INSTREAM HABITAT COMPLEXITY	0 = AE 1 ° SE 2 = Mo 3 ≠ Fe 4.= VE	iárse Sderati Iavy	(41 6 (1044 (40-7	0%) 0%) 5%)	THE RELIGIONS OF THE	DENSIOME READINGS (I count covered	(17)
Vegetation Class		Le	ft Ba	ink			Rig	ht E	ank			Filamentous Algae	0 (1) 2	3	4		Center	1
- Uppe	Cai	1op)	/ (>5	m h	igh)							Aquatic Macrophytes/ Emergent Vegetation	1		3	4	_	Left Center	1 /
Trees and saplings >5 m high	0	1	2	0	4	ō	1	(2)	3	4	1	Boulders	0	2		4		Upstream	15
Eower C	ano	ру (().5 m	5 n	i hig	h)	71 .	, Mari				Woody Debris >D.3 m	0	2	3	4		Center	T
All vegetation 0.5 m to 5 m	0	1	2	3	4	0	1	(2)	3	4		Woody Debris <0.3 m	o (V	7 2	3	4	_	Right Center	
Groun	d Cc	ver	(<0.5	m l	righ)					30015	1	Undercut Banks	@ 1	2	3	4			<i> h</i>
Woody shrubs & saplings <0.5 M	0		@	3	4	0	@	2	3	4		Overhang. Vegetation	@ 1	2	3	4	Se	Optional	Carland Carland
Herbs/ grasses	0	CD	2	3	4	0		(b	3	4		Live Tree Roots	(I)	2	3	4		Left Bank	
Borrcn, bare soil/ duff	0			3	4	0		2	(;i)	4		Artificial StructLres	0	2	3	4		Right Bank	

HUMAN INFLUENCE (circle only the closest to- wetted channel)	B=(C=(P=)	I = Not Present 3 = On Benk 2 = Between Bank & 10m from Channel 1 = 15 10m × 50m from Channel Channel (record Yes or No)											
		Left	Bank		Cha	nnel	2.	Right	Ban	k 🚉			
- Walls/ Rigirap/ Dams	Р	С	В	Ø	Y	M	þ	В	С	Р			
Bulldings	p	С	В	•		-		В	С	P			
Pavement/ Cleared Lot	p	c	В		I			В	c	Р			
- Road/Railroad	p	С	В		Ī			В	С	p			
Pipes (Infet/ Outlet)	p	С	В					В	С	p			
Ländfill/Trash .	p	С	В					В	c	p			
Park/ Lawn	<u>p</u>	С	В		 -			В	С	p			
Row Crop	<u>p</u>	c	В		_	_		В	С	p			
Pasture/ Range	<u>p</u>	c	В		_	_		13	С	р			
Logging Operations	р	c	В					В	С	p			
Mining Activity	<u>p</u>	c	В	a	_			В	С	p			
Vegetation Management	р	c	В	a	ı			В	С	p			
Bridges/ Abutments	p	c	В					В	С	p			
Orchards/ Vineyards	р	c	В					В	c	p			

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	Inter-Transect: HI							n). જેમાર	50	San Maria	nyezhoù e e e e e e e	and toppe a faith conserve of the conserver of
				- In	ter=l ransect	Subst	rates					
= Position	Dist Depth from (cirr):	op - Promise Comments	Cobble Embed	CPOM:	Microalgae Thickness Code	- Macro			oalgaé Jached	Macr	ophytes	Microalgae Thickness Codes Substitution Substitution Facisional not slimy
Left Banke	0 6	GF		P A	Ø	Р 2	D	P	A D	P	ΔD	freesent out not visible. Freesent out not visible. Freesent and visible out
Center	1.2 2-7.;	1 % 1	8 97 F. I	F - 10 1 € -	· o_	PA	D	P	A. D	P	A D	zimm: Rubbing fingers y
= Center = 2	2.5 '13			p	D	P	\ D	P	A.D	P	d D	brownish lint on them; scraping leaves visible trail
Right == Center	3.7	XB		р	< <i>D</i>	P A	D	' P ·	A D	р	D	3 = 1-5mm; = = = = = = = = = = = = = = = = = =
Right Bank	5.0 10	RR	-	(P) A	0	P	D	P	A_D	P	A D	5 = >20mm; UD = Cannot determiné it : 'militroalgae present.''.
	Note Substrate siz class categories lis							feach p	article or	one of t	io size	substrate too small on covered with silf.
					opart fil							D = Dry not assessed

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			orthography (gradie). Article orthography				
FLOW-HABITATS (% between transacts-total=100%).							
-Channel Type - %							
Cascade/Falls 5							
Riffle 5						Selver Se	
Ruja (V. 2.0	30						
Glide -5	10	e de la companya de la companya de la companya de la companya de la companya de la companya de la companya de La companya de la companya de la companya de la companya de la companya de la companya de la companya de la co					
Dry., O							2.75

SWAMP Stream Habitat Chara	cterization Form	FULL VERSION Re	vision Oat : Janua · 9 ^{1,,} 2012
Site Code: 'y the Creek Exp	Site Name: ()_	Creek	Date: <u>3 9 / 1 (</u> / 2012
Wetted Width (m): 나,5	Bankfull Width (m):	Bankfull Height (m): 45	Transect I

			is is				Transect Su	bstra	te:				-		
Position -	Dist from LB (m)	Depth (cm)	min/ size class	% Cobble Embed.	ÇPÇ	M	Microalgae Thickness Code	Mae Att			Macr Unat	balgaë lached	Macro	ophytes	Microalgae Thickness Codes 0 = No microalgae present,
Lett Barik	0	33	ÇB	65	р		0_	P.	Ā	D	P	A D	P 2	D	C - Present but not visible, Feels slimy
Left Center	1.1	34	36	unclassed for Main	p		0	Р	A	D	P A	i D	p	D	2 Thom: Rubbing lingers on surface produces a
Center	2.2	36	св	60	p		fI	. P	Α	D	. Р	D.	р	D	brownish tint on them, scraping leaves visible
Right Center	3.3	28	XB		р		0	P	4	D	P	1 D.	p	D	trail 3 ¥ 1-5mm; 4 = 5-20mm;
Right. Bank	4.5	5	CB	90	PΔ	1	6	P.		D	Р	X D	P	D	5 = -20mm; UD = Cannot determine if Microaloae present.
							measures of the of measurement				each pa	irticle ör	one of th	ie siże	substrate too small or covered with sit (formerly Z code). D ≅ Dry, hot assessed

Riparian Vegetation (facing downstream)	1 =	Spai		10%	۵)	4 = Y	Heav /ery /			
Vegetation Class		Let	t Ba	nk			Rig	nt E	ank	
Uppe Woody shrubs & sablinos	Can	ору	(>5	m h	igh)		08			
Trees and samptimgs >5 m high	8	1	7	3	4	B	UB	² 2_	33	4
Lower 0	anop	y (0	.5 m	5 n	ı hig	1)	ďΝ			
Herbs/ grasses All vegetation 0.5 m to 5 m Barren, bare soil/ duff	0	1	<u> </u>	3	4	0	CD	2	3 3	4
Groun	d Cov	rër (<0.5	m t	righ)		A CONTRACTOR OF THE	Ú	<u> </u>	- 1

INSTREAM HABITAT COMPLEXITY	1 2 3	= Abse Spar = Mod = Hear = Very	se erate (y	(4) (10-4 (40-7	0%) 0%) 5%)
Filamentous Algae	(0)	1.	2	3	4
Aquatic Macrophytes/ Emergent Vegetation			2	3	4
Boulders	0	1	2		4
Woody Debris >0.3 m	0	,(I)	2	<u>3</u>	4
Woody Debris <13 m	0	'1j)	2	3	4
Undercut Banks			2	3	4
Overhang. Vegetation		1_	2	3	4
Live Tree Roots	0	(D	2	3	4
Artificial Structu1·es			2	3	4

 DENSIONE READINGS (I count dovered)-17)
Center	\ ,
Center Upstream	\'2
Center Right	<u>l'2.</u>
Center	It._
Left Bank	THE STREET
Right Bank	

HUMAN INFLUENCE (circle only the closest to wetted channel)	B = 0 0 = B P = 5	l0m+<	Bank 30m fro jord Ye	m Cha	x)=-;::	anhel, nnel		Right	Ban	k
Walls/ Rip-rap/ Dams	Р	С	В	Ю	Υ	KI)	þ	В	С	Р
Buildings	<u>p</u>	С	В	lo	Υ	V	b	В	С	Р
Pavement/ Cleared Lot	<u>p</u>	c	В					В	c	Р
Road/Railroad	<u>p</u>	<u>_c</u>	В					В	c	р
Pipes (Inlet/ Outlet)	р	c	В					В	c	p
Landfill/Trash	р	c	В				0	В	c	р
Park/Lawn	<u>p</u>	c	В		_		0	В	c	р
Row Crop	р	c	В				0	В	c	р
Pasture/Range	<u>р</u>	c	B'		_	_		В	c	p
Logging Operations	<u>р</u>	c	В		ı			В	С	р
Mining Activity	р		В					В	С	р
Vegetation Management	р	c	В					В	c	р
Bridges/ Abulments	р	c	В			-		<u>B</u>	c	р
Orchards/Vineyards	р	c	В					В	c	p

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			111111111111111111111111111111111111111
******		L. CLASS COM MANAGEMENT	

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Page 18 of 26 Page 19 of 26

		Inter-	Tran	sect: IJ			Ŋ	Vetted \	∕Vidth (m): 3,	1-	<u>)</u>	Section 1	
						In	ter-Transect	Subst	rates =	(14.04°, H)				
Position	Dist from IB (m)	Depth (om)	nnn/ SIZC Slasc	Cobbie Embed	cro	M	Microalgae Thlokness Code		oalgae: che(l;+,			Macr	ophytes	Microalgae Thickness Codes Godes Godes Godes Godes Godes Godes
l eft Bank	o i	43	ХB		* P (*)		0	P Z	D	P 4) D	P	A, D	The Present but not visible but Present and visible but Present and visible but
LCII.	0,7	70	SB		р.		O	P	D .	P	D	р	D	thmm: Rubbing finders';
Genter.	/,5	84	SB		p			р	D	. p	D	p	D	brownish (int on them, scraping leaves visible: trail
Right Center	2.2	9	XB		р		f'	P	D	P	. D	Р	A D	3 = 1-5mm; 4 = 5,20mm; 5 = > 20mm
Right Bank	3,1	G/C	3		Р			P A	d D	P	D	Р	A D	UD⇒ Cannordetermine it imjorodigae present, is
							t measures of the ect measuremen			each pa	nticle or	oneloft	he şize	substrate too small or covered with silt (formerly Z code) D = Dry not assessed

The Period State of Heating and Heat A Timber 1997 (see	1 1 to 1 to
	mains.
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						Transect Su	bstrai	tes				
Position	Dist from LB (m)	Depth (cm)	-inm/ size class	Cobble Bmbed	СРОМ	Mi¢roalgae Thickness, Code		roalgae achied		oalgae tached	Macrophytes	Microalgae Thickness Godes U=No microalgae present
Leit : Jänk :	Ö	5	RS	ARTHUM:	P 🙆	0	Р	A D	р	D	(A) A D	1 = Present but not visible
Left Center	1.4	2.	ac	Name of the last o	P A	0	р	D	р	D	P 🐧 D .	2 = Present and visible but Strain, Rubbing lingers on surface produces a
Center	2.8	35	CB	70	Р (А)	0	p	D	p	D	D Q q	brownish thit on them; scraping leaves visible
Right Center	4.2	30	SB	_	P Ø	1	p	D	р	, D	Р (frail. 3 = 1-5mm; 4 = 5-20mm;
Right Bank	5.6	2	RS	_	P (Ā)	0	P	D	P	A D	OAD	5 =>20mm; UD = Cannot determine if microalgae present.
	Note: Sub class cate	strate size gories liste	s can be ed on the	recorded eitr supplementa	er as direct I page (dire	measures of the ct measurement	e media Is prefe	ir⊧axis of fred)	each p	rticle or	one of the size	substrate for small or covered with site (formerly Z code). D = Dry not assessed

RIPARIAN VEGETATION (facing downstream)	0 = A 1 = S 2 = M	parse (<10%)	4 = ∨	ery H	eavy	(>7)			INSTREAM HABITAT COMPLEXITY	0 = Abse 1 = Spar 2 = Moo 3 = Head 4 = Very	se eraterf	(<10%) 10-40%) 40-75%		DENSIONE READINGS (count covered	0-17)
Vegetation Class	L L	eff B	ank			Rigi	it B	ank			Filamentous Algae	0 (1)	2	3 4		Center	
Uppe	r Cano	ру (>5	m hì	gh)							Aquatic Macrophytes/ Emergent Vegetation			3 4	'		12-
Trees and saplings >5 m high	0	1 2	O	4	0	1	Ø	3	4		Boulders			4	_	Center Upstream	7
Lower C	anopy	(0.5 m	-5 m	hig	b)						Woody Debris >0.3 m	0		4		Center	
All vegetation 0.5 m to 5 m	0	-			1	~					Woody Debris <0.3 m	o '.	2	3 4		Right Center	10
				_							Undercut Banks	0	2	3 4		Downstream	10
Woody shrubs & saplings <0.5 m	0	ti)	3	4	0	(@	3	4] `	Overhang. Vege;ation	0 O	2	3 4		<u>i</u>	AND THE PARTY OF T
Herbs/ grasses	0	О	3	4	0	<))</td <td>3</td> <td>4</td> <td></td> <td>Live Tree Roots</td> <td>o <d< td=""><td>2</td><td>3 4</td><td> -</td><td>Left Bank</td><td>AT PRE-</td></d<></td>	3	4		Live Tree Roots	o <d< td=""><td>2</td><td>3 4</td><td> -</td><td>Left Bank</td><td>AT PRE-</td></d<>	2	3 4	-	Left Bank	AT PRE-
Barren, bare soll/duff	0	2	3	4	0	(@	3	4		Artificial Structures	0_1	2	3 4		Bignt Bank	

HUMAN INFLUENCE (circle only the closest to wetted channel)	B = 0 0 = B P = >	iom+< nel (re	r Bank 50m fro	in Cha is or No			Righ	Ban	
	Р	С	В	74	y A	J	В	С	Р
Buildings	P.	c		1	Y	 	В	-c -	- <u>-</u> -
Pavement/Cleared Lot	P	C	 B	1		16	В		p
Road/ Railroad	р		В	- 8-5		- B	В	С	р
Pipes (Inlet/ Outlet)	р	С	В				В	С	р
Landfill/Trash	р	С	В				В	С	<u>p</u>
Park/Lawn	<u>p</u>	c	В		! = _	1	В	С	р
Row Crop	р	c	В				В	c	p
Pasture/Range	p	С	В		· -		В	С	_p
Logging Operations	<u>p</u>	_c	В				В	_c	р
Mining Activity	<u>p</u>	c	В		=		В	c	_p
Vegetation Management	p	c	В		_		В	_c	р
Bridges/ Abutments	_p	c	В				В	_c	р
Orchards/ Vineyards	р	<u>c</u>	В			i.u	В	_c	p

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-E	
1	
******* Bt - Bt B - B - B - B - B - B - B - B - B - B	

/2,"%**W** S""lv•f ,,_,4'

		nter-'	Frans	sect: JK		.47.44	years independent description	Width (m	1): 5	4			g v Greene i generalistico.
osition_	Dist	Depth (cm)	cmun/ size	∉Cobble=		ter - Franseel - Microalgae - Thickness - Code	Macr	rates oalgae iched	Contract Con	reference was seen to a still be	Macn	phytes	Microalgae Thickri , Codes ou≕No microalgae pre
Leit Rank	o	5	SA	·	P 🔕	Ø	P	A D	Р	D	Р	A D	Feels, rough, not slin = Present but not vis Feels, slimy,
Feft enter	1.3	3	<2\C,	1 10	@ A	0	P	A D	P .	D	P	D	2 Prosent and visible 31mm Rubbing find on surface produces
enter	2.6	S 3	7	5	l	0	P	À D	P A	D	P.	A D	brewnish tint on the scraping leaves visit trail.
aelil enfer	3,9	<i>(.,</i> I	se.		P 🔕	0	p.	D	p A	.,D	P	D'	3 = 1-5mm(4 = 5-20mm;
Right Bank	5.4	26	СВ	85	P (A)	0	P	D	P A	D	. Р	D	5 = >20mm; UD = Gannot defemin microalgae present

	elikariya Kapatan	. (14) 1. (14)	
FLOW HABITA (% between transects total		- 1. -1. * 1.45	36
Channel Type	%		ì
Cascade/ Falls	[0	100	۶
Rapid####	10	v dry	\$
Riffle	5	-	
Run See	65	3	5
Glide : Clide	10	<u>-</u> ا	5
Pool 2	0		
Dry 📜 📜	0		

Revision Date: Janua gkh 2012

Site Code: P. ... Crack Exp
Wetted Width (m): 117

Site Name: ()

e Creek

Bankfull Height (m):

0.4

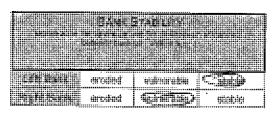
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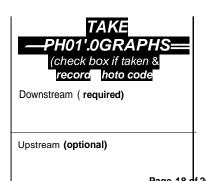
Transect K

Position	Dist	Depth	mm/ size	% Cobble	-CPO	M.	Transect Su Microalgae Thickness	Macr	oalgae		roalgae	Mag	rophytes	Microalgae Thickness Godes
Left	LB (m)	(em)	class	Embed	_	i i	Code	Atta	chéd I		ttached : r			0 ≅ No microalgae presen Feels rough, not slimy
Bark		6	SA	- Andrews	P A	_	· O	PA	D	P	A D	P	A D	1 = Present but not visible - Feels slimy:
«Center»	1.6	19	CB	50	р		0	P A	D	P	A D	Р	A D	Strim, Rubbing fingers on surface produces a
Center	2.3	34	58	<u></u>	p		0	p /	D	P	A D	P	A D	brownish tint on them, scraping leaves visible
Right Center	3,5	45	CB	00	р		0	р А	D	Р	Å D	P	A D	frall: 57 3 = 1-5min; 4 = 5-20mm; 4 = 5-20mm; 4 = 5-20mm; 5 = 5-20
Right Bank	4.7	6	ac	erestrante	P A		6	Р	D	P	D	P	A D	5 = >20mm U = Cannot determine if
	Note: Sub	strate size	s can be i	ecorded eith	eras d Loage i	rect	measures of the	mediar	axis of	each p	article or	one of t	he size	microalgae present substrate too smalt or covered with sit.
					2007		down is a second							(formerly Z code). D = Dry_not assessed

RIPARIAN VEGETATION (taking downstream)	1.	Spa	ent (0 rse (s lerate	10%	·)	4 ± \						INSTREAM HABITAT COMPLEXITY	0 = Absi 1 = Spa 2 = Mod 3 = Hea 4 = Very	se erate i	(<10%) (10-40%) 40-75%		DENSIOME READINGS (C count covered	0-17)
Vegetation Class			t Ba				Rig	ht E	Bank			Filamentous Algae	(6) 1	2	3 4	\exists	Center	16
To Uppe	Cai	юру	(>5)	n h	gh):							Aquatic Macrophytes/ Emergent Vegetation		2	3 4	•	Left	16
Trees and saplings >5 m high	0	1		0	4	0	1	(2)	3	4]	Boulders	0		4		Center Upstream	16
Lower C	ano) y (0	.5 m-	5 m	hig	ı)						Woody Oeris >C.3 m	0		4		Center	10
All vegetation 0.5 m to 5 m	. 0	1	2	3	4	0	1	2	(3	·4		Woody Debris <0.3 m	0 (1)	2	3 .4	1	Right Center	_/0
Groun	d Co	ver (<0,5	m h	igh)	de Tout				e post		Undercut Banks	0	2	_3 .4	4	Downstream	
Woody shrubs & saplings <0.5 m	0	Cv	2	3	4	0	<i>(1)</i>	2	3	4	L	Overhang. Vegetation	0 ti)	2	3 4			⊥ <u>⊥</u> ∐∣
Herbs/ grasses	0		(j	3	4	0	(I)	2	3	4		Live Tree Roots	o d)	2	3 4			<u> </u>
Barren, bare soil/ duff	0		2		4	0		2	Q)	4	1	Artificial Structures	0 1	2	3 4		Right Bank	

HUMAN INFLUENCE : (sircia only the closest to wetted channel)	B = 0 C = E	10m+<	k i Baril 60ni f	t & 10n roin Ch es or N		annet				
		Left	Bank	m	Cha	nnel		Righ	t Ban	ĸ' .
Walls/ Rip-rap/ Dams	Р	С	В	0	Y	M	7 d	В	С	Р
Buildings	p		В	0	Y	N	q	В	С	P
Pavement/ Cleared Lot	. p	С	В						C	p
Road/Rallroad	p	С	В					В	c	p
Pipes (Inlet/ Outlet):	p	c	В					В	c	p
Landfill/Trash	<u>p</u>	С	В	-	_			В	<u>c</u>	р
Park/Lawit	p	c	В					В	c	p
Row Grop	p	c	В					В	c	p
Pasture/Range	p	c	В					$\cdot s$	c	р
Logging Operations	p	C	В					В	c	р
Mining Activity	p	c	В					В	c	р
Vegetation Management	p	c			_			В	c	<u>р</u>
Bridges/Abutments	Р	С	В	0	Υ	Ø	0	В	c	р
Orchards/Vineyards	Р	С	В	Q.			Ъ	-	c	р





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SWAWE Stream made	itat Characterization F	orm <u>I</u>	F <u>ULL VE</u>	<u>RSION</u>	Revis	ion Date: Ja	nuary 9"', 2012 🖖	(ted
Site Code; A C	o.k Fxp	Date: 💋			7.4	Analyte	Equipment & Calibra Date	ation
The second secon	BENTHIC INVERTER			7 - 13 - 19 - 1	A Law Me store of the Law	ol la Se	The second secon	
							Cal date: www./	, , segige
	lection Method		Rep	olicate	# Jars	Wat	Cal date: /	
. To compression and the second and the second	ard or margin-center-n					dissolved	Cal date: /	
RWB (standard)	RWB (MCM)	(TRC)		1		exygen	Cal date: / /	'
RIJVB (standard!)	RWB (MCM)	TRC		2		oxygen=		,
, ,	. ,		<u></u> 9		<u> </u>	sat specific	Cal date: / /	
RWB (staridard)	RWB (MCM)	TRC		,		cond	Cal date: /	4.00
RWB (standard)	RWB (MGM)	TRC	N. J.			Salinity		
` '		*****	1494		The second second		Cal date: / /	
Field Notes/ Com	ım¢nts:	* *		į		Alkalinity	Cal date: / /	
					7.7.7		Caluato.	
				orania Programa		Turbidity	Cal date: / /	
			e of the area of t			Silica		417\A
		41	an e gaingte San e gainge				Cal date: 🍻 / 💛 1	28 A 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
						An temp	Cal date: // /	
		<u> </u>		Billion was Van Nivas			Cardate(Asset) Asset	tudo da Cuntrada
		i de la companya de l		alaming .		Velocity	Cal date: / /	a saya Kabata
patiente de la company	ALGAE SA		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	rizio di Tali e Migrati L	jaran Sarip kecapatan ke			
		SWAMP S	WAMP :	SWAMP	1 0444115		er and Sedimen	
				SAVAMIL	SWAME			
Collection	MERION		EMAP	EMAP	SWAMP ;	Che	mistry Samples	
	netrou nethod if applicable) Device	EMAP I		100,176,000,000,000,000	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	check if a W	VATER chemistry e was collecte-d	D
Gollection	method (Fapplicable) Device its per device)	EMAP E	EMAP Rep.	EMAP	EMAP	check if a W grab sample (nutrients, S	VATER chemistry e was collecte-d SC, etc.)	2007
dicicle one of write new received the control of t	method if applicable) Device Its per device) a=12.6cm')	EMAP E	EMAP Rep.	EMAP	EMAP	check if a W grab sample (nutrients, S Check if a D	VATER chemistry e was collecte-d SC, etc.) DUPLICATE WATER	D
Gorde one or write new r Gollection (sum # of transection that the control of transection that	method if applicable) Device Its per device) a=12.6cm') 2.6cm')	EMAP E	EMAP Rep.	EMAP	EMAP	check if a W grab sample (nutrients, S Check if a D	VATER chemistry e was collecte-d SC, etc.)	2007
Gollection Gollection (sum # of transec Rubber Delimiter (area PVC Delimiter (area=1)	method if applicable) Device Its per device) a=12.6cm') 2.6cm')	EMAP E	EMAP Rep.	EMAP	EMAP	check if a W grab sample (nutrients, S Check if a D cheinistry- ·g collected	VATER chemistry e was collecte-d SC, etc.) DUPLICATE WATER irab sample was	D D
Collection Collection	method (Lapplicable) Device Is per device) a=12.6cm') 2.6cm') a=5.3cm')	EMAP E	EMAP Rep.	EMAP	EMAP	check if a W grab sample (nutrients, S Check if a D cheinistry- ·g collected	VATER chemistry e was collecte-d SC, etc.) DUPLICATE WATER irab sample was	D
Collection Collection (sum # of transect Rubber Delimiter (area PVC Delimiter (area=1: Syringe Scrubber (area Other area:.	method it applicable) Device Its per device) a=12.6cm') 2.6cm') a=5.3cm') sa(Tiple>d (0°11).	EMAP E	EMAP Rep.	EMAP	EMAP	check if a W grab sample (nutrients, S Check if a D cheinistry- · g collected Checok if a S sample I'/as Check if a p	VATER chemistry e was collecte-d SC, etc.) DUPLICATE WATER irab sample was	D D
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Collection (sum # of transect Rubber Delimiter (area PVC Delimiter (area=1: Syringe Scrubber (area Other area:. Nu_mber oftranse.cts s Composite VoJuni (!1 Assemblage ID volume	method if applicable) Device Its per device) a=12.6cm') 2.6cm') a=5.3cm') TIL) (diatom) (50 ml tube) (soft algae) 50 ml tube	EMAP E	EMAP Rep.	EMAP	EMAP	check if a W grab sample (nutrients, S Check if a D cheinistry- g collected Checok if a S sample I'/as Check if a p ch_em\sJry sa	VATER chemistry e was collecte-d SC, etc.) DUPLICATE WATER rab sample was SEDIMENT chemistry scollected qIPLICATE 9E;P amplewas_c_ollected scoo_p	D D D GRAB
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ATTACHMENT E

Representative Site Photos



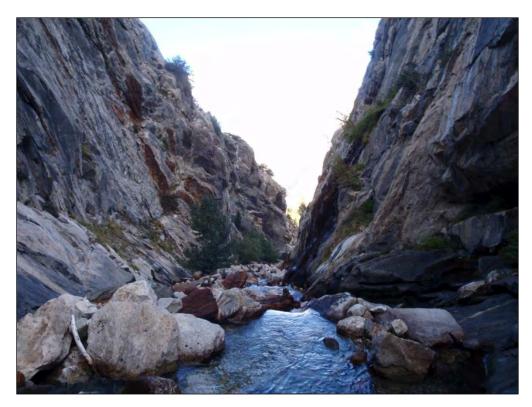
A) Pine Creek Mine adjacent to the control site.



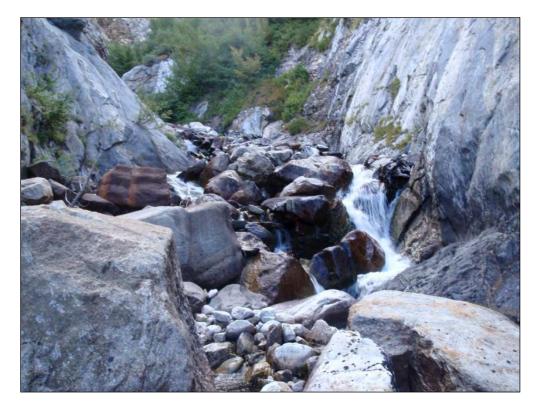
B) The downstream transect of the control site facing downstream.



C) The downstream transect of the control site facing upstream.



D) The upstream transect of the control site facing downstream.



E) The upstream transect of the control site facing upstream.



F) The downstream transect of the experimental site facing downstream.



G) The downstream transect of the experimental site facing upstream.



H) The upstream transect of the experimental site facing downstream.



I) The upstream transect of the experimental site facing upstream.



J) Dry stream channel downstream from the control site adjacent to the mine.



K) A BMI sample collected within the control site.



L) A bridge crossing over the lower section of the control site.



M) Old mining debris left in the stream channel within the control site.



N) An ECORP biologist taking water quality readings in the control site.

ATTACHMENT F

CDFW ABL External QC Report



DEPARTMENT OF FISH AND GAME AQUATIC BIOASSESSMENT LABORATORY-CHICO CALIFORNIA STATE UNIVERSITY, CHICO CHICO, CA 95929-0555 530-898-4792

27 February 2013

Adam Schroeder ECORP Consulting, Inc. 1801 Park Court Place, B-103 Santa Ana, CA 92701

Dear Adam,

Attached are the results of my QC analysis of 1 sample submitted from the Pine Creek project. The results are presented in five summary tables. This QC analysis was performed in accordance to the Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT)'s Standard Taxonomic Effort Document (STE) 1 March 2011 version (Richards and Rogers, 2011).

There were two instances of "tagalong" organisms. These are defined as specimens accidentally included in a vial of organisms of another taxon and are marked as "Probable sorting error" in the attached Listing of Taxonomic Discrepancies file.

Specimens originally identified as *Drunella spinifera* were earlier instars. The advice we've been given (for example, the mayfly workshop manual, Jacobus and Randolph, 2005; materials from the workshop given at Long Beach earlier this year) has been to identify only the later instars to species and leave the earlier ones at *Drunella grandis/spinifera*.

A damaged early instar *Calineuria californica* (Banks) nymph was misidentified as Perlodidae. Leaving this specimen at family level would be perfectly understandable given the condition, but the presence of filamentous gills on the thorax send the specimen to Perlidae instead of Perlodidae (Stewart and Stark, 2002).

The specimens originally identified as *Hesperoperla hoguei* do not appear to be either *H. pacifica* (mushroom-shaped light area anterior to compound eyes, few intercalary spinules on abdominal segments) or *H. hoguei* (inverted W-shaped light area and many intercalary spinules) but intermediate between the two (Baumann and Stark, 1980). John Sandberg of the ABL has been monitoring a site in the North Fork of the Feather River drainage in which both *Hesperoperla* species are present, based on adult collections. Nymphs from the site exhibit the same intermediate characters state as your specimens, perhaps as a result of hybridization. For these reasons, I suggest leaving these *Hesperoperla* specimens at genus.

Two specimens originally identified as *Orohermes crepusculus* included one mature and one immature specimen. Since head color patterns develop in later instars and generally several corydalid genera can co-occur in a given stream, I would personally leave the earlier instar specimen at Corydalidae.

I welcome any questions or comments you may have concerning this report.

Sincerely,

Austin Brady Richards

Aquatic Bioassessment Laboratory-Chico

California State University, Chico

austra Brudy Richards

Chico, CA 95929-0555

arichards@csuchico.edu

(530) 898-4792

Literature Cited

- Baumann, R. W. and B. P. Stark. 1980. *Hesperoperla hoguei,* a new species of stonefly from California (Plecoptera: Perlidae). Great Basin Naturalist 40:63-67.
- Richards, A. B., and D. C. Rogers. 2011. Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT) List of Freshwater Macroinvertebrate Taxa from California and Adjacent States including Standard Taxonomic Effort Levels. Version: 1 March 2011. SAFIT. Retrieved 1 September 2011 from: http://safit.org/ste.html
- Stewart, K. W. and B. P. Stark. 2002. Nymphs of North American stonefly genera (Plecoptera). Columbus, Ohio, The Caddis Press.

Comparative Taxonomic Listing of all Submitted Samples

Samples submitted by ECORP Consulting, Inc. for Project: Pine Creek Report prepared by Brady Richards, CDFG ABL-Chico, 2/22/2013

Taxonomist	Sample no.	Vial no.	Original ID	Original	Stage	ABL	ABL ID
				Count		Count	
B. LaVoie	6275.1-2						

1	Baetis	112	L	1	Zapada cinctipes
1	Baetis	112	L	112	Baetis
2	Baetis tricaudatus	51	L	51	Baetis tricaudatus
2	Baetis tricaudatus	51	L	1	Nemouridae
3	Caudatella hystrix	1	L	1	Caudatella hystrix
4	Caudatella	4	L	4	Caudatella
5	Drunella doddsii	26	L	26	Drunella doddsii
6	Drunella spinifera	1	L	1	Drunella grandis/spinifera
7	Epeorus	27	L	27	Epeorus
8	Ironodes	21	L	18	Ironodes
9	Rhithrogena	3	L	3	Rhithrogena
10	Chloroperlidae	22	L	22	Chloroperlidae
11	Doroneuria baumanni	3	L	3	Doroneuria baumanni
12	Frisonia picticeps	26	L	25	Frisonia picticeps
13	Hesperoperla hoguei	3	L	3	Hesperoperla
14	Hesperoperla	11	L	11	Hesperoperla
15	Malenka	1	L	1	Malenka
16	Nemouridae	4	L	4	Nemouridae
17	Peltoperlidae	1	L	1	Peltoperlidae
18	Perlidae	2	L	2	Perlidae
19	Perlodidae	1	L	1	Calineuria californica
20	Pteronarcella	1	L	1	Pteronarcella
21	Yoraperla	9	L	9	Yoraperla
22	Zapada cinctipes	177	L	175	Zapada cinctipes
23	Zapada columbiana	2	L	2	Zapada columbiana
24	Elmidae	1	A	1	Elmidae

Page 1 of 3

Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
B. LaVoie	6275.1-2						
		25	Orohermes crepusculus	2	L	1	Orohermes crepusculus
		25	Orohermes crepusculus	2	L	1	Corydalidae
		26	Brillia	4	L	4	Brillia
		27	Chaetocladius	2	L	2	Chaetocladius
		28	Cricotopus	2	L	2	Cricotopus
		29	Eukiefferiella devonica group	4	L	4	Eukiefferiella devonica group
		30	Micropsectra	5	L	5	Micropsectra
		31	Orthocladius complex	2	L	2	Orthocladius complex
		32	Orthocladius	1	L	1	Orthocladius
		33	Parorthocladius	1	L	1	Parorthocladius
		34	Rheocricotopus	1	L	1	Rheocricotopus
		35	Tvetenia bavaric	a 3	L	3	Tvetenia bavarica group
		36	Chelifera/Metacha	nel 5	L	5	Chelifera/Metachela
		37	Empididae	2	P	2	Empididae
		38	Wiedemannia	9	L	9	Wiedemannia
		39	Arctopsyche californica	4	L	4	Arctopsyche californica
		40	Arctopsyche	5	L	5	Arctopsyche
		41	Arctopsychinae	14	L	14	Arctopsychinae
		42	Oligophlebodes	2	L	2	Oligophlebodes
		43	Parapsyche	6	L	6	Parapsyche
		44	Rhyacophila brunnea group	10	L	10	Rhyacophila brunnea group
		45	Rhyacophila hyalinata group	2	L	2	Rhyacophila hyalinata group
		46	Rhyacophila	5	L	5	Rhyacophila
		47	Trichoptera	1	P	1	Trichoptera
		48	Oligochaeta	15	X	15	Oligochaeta
		49	Lebertia	2	X	2	Lebertia
		50	Sperchon	3	X	3	Sperchon

Page 2 of 3

Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
B. LaVoie	6275.1-2						
		51	Sperchonopsis	8	X	8	Sperchonopsis
		52	Sperchontidae	1	X	1	Sperchontidae
		53	Testudacarus	1	X	1	Testudacarus
		54	Ostracoda	3	X	3	Ostracoda
		55	Turbellaria	6	X	5	Turbellaria

Listing of Enumeration Discrepancies

Samples submitted by ECORP Consulting, Inc. for Project: Pine Creek

Report prepared by Brady Richards, CDFG ABL-Chico, 2/22/2013

				# Counted		Difference	
	Sample #	Vial#	Original ID	Original	\mathbf{QC}	(Original - QC)	
Minor Counting Discrepancies							
	6275.1-2	1	Baetis	112	113	-1	
		2	Baetis tricaudatus	51	52	-1	
		8	Ironodes	21	18	3	
		12	Frisonia picticeps	26	25	1	
		22	Zapada cinctipes	177	175	2	
		55	Turbellaria	6	5	1	

Listing of Taxonomic Discrepancies

Samples submitted by ECORP Consulting, Inc. for Project: Pine Creek Report prepared by Brady Richards, CDFG ABL-Chico, 2/22/2013

Final ID	Taxonomic level		nic level	# Organisms		
Sample #	Vial #	Original ID	QC Final ID	of dispute		Comments
6275.1-2 Disputed ID						
Disputed ID	19	Perlodidae	Calineuria californi	ca Family	1	This disputed ID also represents a difference in taxonomic precision.
QC ID not in Master Taxa List						
Probable sorting error	6	Drunella spinifera	Drunella		1	
	1	Baetis	Zapada cinctipes	Order	1	This disputed ID also represents a difference in taxonomic precision.
	2	Baetis tricaudatus	Nemouridae	Order	1	This disputed ID also represents a difference in taxonomic precision.
Original ID more precise						
-	13	Hesperoperla hogue	ei Hesperoperla		3	
	25	Orohermes crepusculus	Corydalidae		1	

Summary of Taxonomic and Enumeration Discrepancies

Samples submitted by ECORP Consulting, Inc. for Project: Pine Creek

Report prepared by Brady Richards, CDFG ABL-Chico, 2/22/2013

		Taxonomic Discrepancies			Counting I	Discrepancies
				<u>c Precision</u> e to QC		
Sample	Total Taxa	Disputed ID	More precise	Less Precise	<u>Major</u>	Minor
		f^* n^{**}	f n	f n	$f d^{**}$	* f d
6275.1-2	55	1 1	2 4			6 9

^{* =} the frequency of occurence of the discrepancy, in number of samples

^{** =} the number of organisms affected (by QC Lab counts) n

^{*** =} the sum total of (absolute value of) differences in counts d

QC Report - Disputed IDs only

Samples submitted by ECORP Consulting, Inc. for Project: Pine Creek Report prepared by Brady Richards, CDFG ABL-Chico, 2/22/2013

Sample #	Vial #.	Original ID	QC ID	comments
6275.1-2	19	Perlodidae	Calineuria californica	This disputed ID also
				represents a difference in
				taxonomic precision.