

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

COTTONWOOD
COTTONWOOD
MOR2

DATE

04-Mar-97

SAMPLER
UNIT

DWG
YSI #1

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV	TDS g/l
03/04/97 10:22	30497	111805	9.77	0.746	92.3	10.45	0	8.08	235	0.344
03/04/97 10:23	30497	111906	9.52	0.74	91	10.36	0	8.08	235	0.339
03/04/97 10:24	30497	112004	9.46	0.728	90.4	10.31	0	8.08	234	0.333

Observations:

Flow	2 cfs
Sky	CLEAR
Wind	CALM
Direction	
Air Temp	15.00 C

Comments:

Site survey and inspection. Route 1 samples taken. Site generally undisturbed since lastt inspection on January 14, 1997.

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0
CPOM	0
Organics	0
Crypto-Giardia	0

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Troy Creek
TCC1

DATE

09-Apr-97

SAMPLER
UNIT

DWG
YSI #1

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV	TDS g/l
04/09/97 09:25	40997	101528	9.02	0.34	88.4	10.2	0	7.97	196	0.153
04/09/97 09:25	40997	101742	9.04	0.339	92.8	10.7	0	7.96	198	0.153
04/09/97 09:38	40997	103037	9.25	0.339	93	10.67	0	7.95	206	0.154
04/09/97 09:54	40997	104623	9.48	0.34	94.1	10.74	0	7.95	216	0.155
04/09/97 10:08	40997	110014	9.48	0.34	90.9	10.37	0	7.94	224	0.155
04/09/97 10:45	40997	113736	10.02	0.339	96.2	10.84	0	7.94	232	0.157

AVERAGE

9.38	0.34	92.57	10.59	0.00	7.95	212.00	0.15
------	------	-------	-------	------	------	--------	------

Observations:

Flow	0.5 cfs
Sky	O 100%
Wind	15-20
Direction	W
Air Temp	14.5 C

Comments:

Site inspection and sampling.
Illegal Immigrants Impact Project Sampling, upstream site. Assisted by new volunteer Elaine Lukey. Heavy traffic observed on upper west bank. A new trail beaten into bank with all tracks pointed north. Light trash in the area. Minimal activity by livestock in the area.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	6
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	1
Organics	0
Crypto-Giardia	0

FILE: s:\wqsl303dlist\city of san diego\cottonwood creek\tcc1_099

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Cottonwood
CWD6

DATE

04-Mar-97

SAMPLER
UNIT

DWG
YSI #1

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV	TDS g/l
03/04/97 11:00	30497	115550	14.25	0.706	100.6	10.29	0.1	8.27	232	0.365
03/04/97 11:02	30497	115745	14.33	0.703	100	10.21	0.1	8.26	235	0.364
03/04/97 11:03	30497	115918	14.4	0.702	99.9	10.18	0.1	8.25	238	0.364
03/04/97 11:04	30497	120002	14.42	0.702	99.9	10.18	0.1	8.25	239	0.364

Observations:

Flow	40.23 cfs
Sky	clear
Wind	5
Direction	e
Air Temp	17.5 C

Comments:

Site inspection and route 1 sampling. Observed strong flow over channel approx. 40ft wide. Meandering to straight channel tending towards braided. Evidence of cattle and foot traffic in area. Site otherwise undisturbed with minimal trash and no evidence of pollution.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0
CPOM	0
Organics	0
Crypto-Giardia	0

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Cottonwood
CWD6

DATE 31-Mar-97

SAMPLER
UNIT

DWG
YSI #1

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV	TDS g/l
03/31/97 13:23	33197	141614	19	0.709	98.3	9.1	0	8.21	214	0.408
03/31/97 13:24	33197	141718	19.09	0.706	98.2	9.07	0	8.21	215	0.407
03/31/97 13:41	33197	143406	19.28	0.641	97.7	8.99	0	8.2	227	0.371
03/31/97 13:41	33197	143443	19.33	0.64	97.8	8.99	0	8.2	228	0.371

AVERAGE

19.175	0.674	98	9.0375	0	8.205	221	0.38925
--------	-------	----	--------	---	-------	-----	---------

Observations:

Flow
Sky
Wind
Direction
Air Temp

cfs
PC60%
15
NNE
16.5 C

Comments:

Site inspection and sampling.
Roy Tamanaha from Spec. Projects on ride along collected crypto - giardia sample.
Flow lower than last sampling by 50%. Braided channel, meanandering flow.
Substrata all sand and gravel. Few benthics in samples.

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	1
Organics	0
Crypto-Giardia	1

WATERSHED WATER QUALITY REPORT SHEET

Watershed:	Cottonwood
Drainage:	Middle Cottonwood
Station:	CWD8d

Sampling Date: 20-Nov-97

SAMPLER:	DWG
UNIT:	YSI #2

YSI Data sonde Physicochemical Data

DATE	DATE	TIME	TEMP	SP COND	TDS	DO %	DO CONC	DEPTH	PH	ORP	
MM/DD/YY	TIME	MMDDYY	C	mS/cm	g/l	%	mg/l	m		mv	
11/20/97	13:05	112097	130129	13.87	0.629	316.0	94.50	9.74	0	8.35	117
11/20/97	13:05	112097	130159	13.74	0.629	316.0	95.20	9.84	0	8.34	114
11/20/97	13:06	112097	130227	13.68	0.63	316.0	92.50	9.58	0	8.34	113
11/20/97	13:06	112097	130248	13.65	0.631	316.0	92.20	9.55	0	8.34	113
11/20/97	13:14	112097	131008	13.58	0.632	316.0	90.30	9.37	0	8.33	116
11/20/97	13:16	112097	131252	13.58	0.632	316.0	90.10	9.35	0	8.33	119

AVERAGE	13.68	0.631	316.00	92.47	9.57	0.00	8.34	115.33	#DIV/0!
---------	-------	-------	--------	-------	------	------	------	--------	---------

Observations:	
Flow	0.00 cfs
Habitat Score	
Sky	
Wind	
Direction	
Air Temp	C

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	0
Organics	0
Crypto-Giardia	0

Comments:

Water Chemistry Profile

Constituents	HACH Method	Results
NH4-N (mg/l)	380	
NO2-N (mg/l)	371	
NO3-N (mg/l)	355	
PO4 P (mg/l)	490	
Turbidity (NTU)	2100P	
Mn (mg/l)	290	
Fe (Ferrous, mg/l)	255	
Cu (mg/l)	135	
Al (mg/l)	10	
Analysis Date:	10-Oct-97	
Analyst:	DWG	

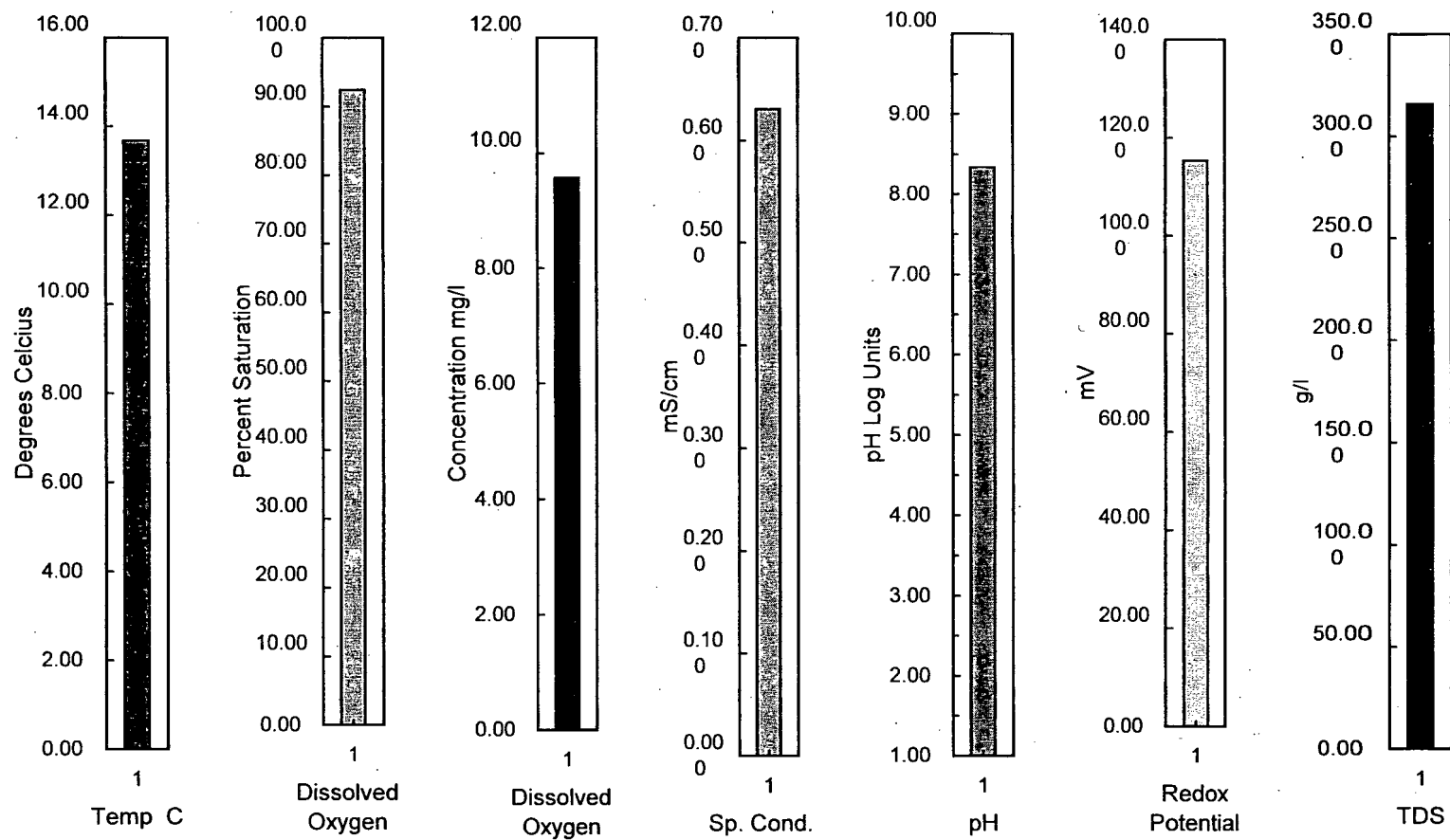
Rapid Bioassessment Protocol

Habitat Assessment				Benthic Macroinvertebrates				
Ref. Sta.	Score	% Comp.	Rating	Metric	Ref. Sta.	Study Site	% Comp.	Rating
CWD3a	143	0.00%	Good	MFBI				
LCC2	113	0.00%	Excellent	TR				
				PER CONT				
				EPT				
Ideal	155	0.00%	Good	% EPT				
				EPT/CHIR				
				SCFL				
				HBI				
				CLI				
Analysis Date:		10-Oct-97		Analysis Date:		10-Oct-97		
Analyst:		DWG		Analyst:		DWG		

Stream Discharge WorkSheet

Station			
Width		Flow Q =	0.00
Width/7	0.00		
Depth 1		Velocity 1	
Depth 2		Velocity 2	
Depth 3		Velocity 3	
Mid Depth		Mid Vel.	
Depth 5		Velocity 5	
Depth 6		Velocity 6	
Depth 7		Velocity 7	

Middle Cottonwood Creek CWD8d November 20, 1997



Family Level Benthic Macroinvertebrates Worksheet

Data Entry

Ephemeroptera	C	Number	MFBI Value	Calc MFBI
Baetidae	1		4	0
Caenidae	1		7	0
Ephemerellidae			1	0
Heptageniidae			4	0
Tricorythidae			4	0
				0
Totals	2	0	20	0

Plecoptera	C	Number	MFBI Value	Calc MFBI
Capniidae	1		1	0
Chloroperlidae			1	0
Nemouridae			2	0
Perlidae			1	0
Perlodidae	1		2	0
Taeniopterygidae			2	0
Totals	2	0	9	0

Trichoptera	C	Number	MFBI Value	Calc MFBI
Brachycentridae			1	0
Glossosomatidae	1		0	0
Helicopsychidae			3	0
Hydropsychidae			4	0
Hydroptilidae	1		4	0
Lepidostomatidae			1	0
Leptoceridae			1	0
Limnephilidae			4	0
Philopotamidae	1		3	0
Polycentropodidae			6	0
Pyschomyiidae			2	0
Rhyacophilidae	1		0	0
Sericostomatidae			3	0
Totals	4	0	32	0

Odonata	C	Number	MFBI Value	Calc MFBI
Aeshnidae			3	0
Calopterygidae			5	0
Coenagrionidae			9	0
Cordulegastridae			3	0
Gomphidae			1	0
Libellulidae			9	0
Totals	0	0	30	0

Diptera	C	Number	MFBI Value	Calc MFBI
Athericidae			2	0
Blephariceridae			0	0
Ceratopogonidae			6	0
Chironomidae R	1		8	0
Chironomidae O	1		6	0
Dolichopodidae				0

Report

Total Specimens 0
 MFBI #DIV/0!
 TR 10
 EPT Index 8
 EPT/CHIR #DIV/0!

Empididae			6	0
Eyphyridae			6	0
Pyschodidae			10	0
Simuliidae			6	0
Muscidae			6	0
Syrphidae			10	0
Tabanidae			6	0
Tipulidae			3	0
Totals	2	0	79	0

Coleoptera	C	Number	MFBI Value	Calc MFBI
Dryopidae			5	0
Elmidae			4	0
Psephenidae			4	0
Totals	0	0	13	0

Megaloptera	C	Number	MFBI Value	Calc MFBI
Corydalidae			0	0
Sialidae			4	0
Totals	0	0	4	0

Lepidoptera	C	Number	MFBI Value	Calc MFBI
Pyralidae			5	0
Totals	0	0	5	0

Amphipoda	C	Number	MFBI Value	Calc MFBI
Gammaridae			4	0
Talitridae			8	0
Totals	0	0	12	0

Isopoda	C	Number	MFBI Value	Calc MFBI
Asellidae			8	0
Totals	0	0	8	0

WATERSHED WATER QUALITY REPORT SHEET

Watershed	Cottonwood
Drainage	Middle Cottonwood
Station	CWD8d

Sampling Date: 08-May-97

SAMPLER: DWG
UNIT: YSI #1

YSI Data sonde Physicochemical Data

DATE	DATE	TIME	TEMP	SP COND	DO %	DO CONC	DEPTH	PH	ORP	TDS	
MM/DD/YY	TIME	MMDDYY	C	ms/cm	%	mg/l	m		mV	g/l	
05/08/97	11:46	50897	123540	19.05	0.61	99.2	9.17	0	8.05	77	0.352
05/08/97	11:57	50897	124627	19.3	0.609	98.8	9.09	0	8.04	69	0.353
05/08/97	12:07	50897	125616	19.52	0.61	98.2	8.99	0	8.04	65	0.355
05/08/97	12:12	50897	130112	19.62	0.61	98.1	8.97	0	8.04	63	0.356
05/08/97	12:12	50897	130208	19.65	0.609	98	8.95	0	8.04	62	0.356

AVERAGE	19.43	0.610	98.46	9.03	0.00	8.04	67.20	0.35
---------	-------	-------	-------	------	------	------	-------	------

Observations:	
Flow	1.42 cfs
Habitat Score	116
Sky	Clear
Wind	5
Direction	W
Air Temp	87.2 F

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	2
CPOM	1
Organics	0
Crypto-Giardia	0

Comments:	
Watershed sampling and surveillance.	
Site survey and sampling with California State Fish and Game Biologist Alex Vejar.	
Site located approximately 1 mile upstream of CWD9. Significant signs of impact from both cattle and undocumented immigrant traffic. Stream reach sampled measured 120ft. A stream side transect on both sides yielded 26 old and new cattle fecal pats and two human fecal deposits (toilet paper or newspaper present).	
Site characterized by dense, mature riparian vegetation dominated by Live Oaks, Willows, Sycamores, and Cottonwoods with a dense understory of young willow and downed wood. The site is surrounded by heavily grazed Oak Savannah. The stream ranged in width from 4 to 20ft. Plunge pools below gradient drops were more than 2ft deep. Deep riffle/runs were also present between pools. The substrate was composed of cobbles and gravel underlain by clay and marl. Good bank and vegetative stability.	
Initial BMI sample sorting showed a relatively low diversity of invertebrates with Hydropsyche and Helicopsyche predominating.	

Water Chemistry Profile

Rapid Bioassessment Protocol

Constituents		HACH	Results		Habitat Assessment			Benthic Macroinvertebrates			
		Method	Ref. Sta.	Score	% Comp	Rating	Metric	Ref. Sta.	Study Site	% Comp	Rating
NH4-N (mg/l)		380	0.07	CWD3a	143	81.12%	Supporting	MFBI			
NO2-N (mg/l)		371	0.003	LCC2	113	102.65%	Comparable	TR			
NO3-N (mg/l)		351	0.68			#DIV/0!		PER CONT			
PO4 P (mg/l)		490	0.21			#DIV/0!		EPT			
Turbidity (NTU)		2100P	0.76	Ideal	155	74.84%	Supporting	% EPT			
Mn (mg/l)		290						EPT/CHIR			
Fe (Ferrous, mg/l)		255						SCFL			
Cu (mg/l)		135						HBI			
Al (mg/l)		10						CLI			
Analysis Date		06-May-97		Analysis Date		06-May-97		Analysis Date		01-Jan-97	
Analyst				Analyst				Analyst			

Habitat Assessment Scale

Metric Assessment Scale

			Metric	Excellent	Very Good	Good	Fair	Poor
> 90%	Comparable to reference	Excellent	MFBI					
75-88%	Supporting	Good	TR					
60-73%	Partially supporting	Fair	PER CONT					
<58%	Not supporting	Poor	EPT					
			% EPT					
			EPT/CHIR					
			SCFL					
			HBI					
			CLI					

WATERSHED WATER QUALITY REPORT SHEET

Watershed	Cottonwood
Drainage	Middle Cottonwood
Station	CWD8a

Sampling Date: 06-May-97

SAMPLER	DWG
UNIT	YSI #1

YSI Data on Physicochemical Data

DATE	DATE	TIME	TEMP	SP COND	DO %	DO CONC	DEPTH	PH	ORP	TDS	
MM/DD/YY	TIME	MM/DD/YY	C	ms/cm	%	mg/l	m		mV	g/l	
05/06/97	08:46	50697	93516	13.87	0.605	100.3	10.34	-0.2	8.63	61	0.309
05/06/97	08:46	50697	93613	13.88	0.604	100.3	10.34	-0.2	8.63	60	0.309
05/06/97	08:47	50697	93707	13.88	0.604	100.3	10.34	0	8.63	60	0.309
05/06/97	09:11	50697	100055	14.04	0.605	99.9	10.26	0	8.61	53	0.311
05/06/97	09:11	50697	100109	14.04	0.605	99.9	10.26	0	8.61	53	0.311
05/06/97	09:28	50697	101733	14.14	0.604	99.9	10.24	0	8.58	50	0.311
05/06/97	09:48	50697	103802	14.28	0.604	99.8	10.2	0	8.57	50	0.312

AVERAGE	14.02	0.604	100.06	10.28	-0.06	8.61	55.29	0.31
---------	-------	-------	--------	-------	-------	------	-------	------

Observations	
Flow	7.71 cfs
Habitat Score	116
Sky	Clear
Wind	Calm
Direction	Calm
Air Temp	85.4 F

Comments:

Watershed sampling and surveillance.

Illegal immigrant impact project sampling. Collected six bacti samples at fifteen minute intervals.

CWD9 station sampled by JP and EL as downstream station.

Observed a rainbow trout leaping after insects in the bedrock pool just above the confluence of Middle Cottonwood and Hauser Canyon Creek.

Stream discharge estimated from the flume wier.

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	6
Solids	0
Plankton	0
TOC	0
BMI	2
CPOM	1
Organics	0
Crypto-Giardia	0

Border Patrol agents making frequent inspections of the area. Two officers interviewed us during sampling.

Water Chemistry Profile

Rapid Bioassessment Protocol

Constituents	HACH Method	Results	Habitat Assessment				Benthic Macroinvertebrates				
			Ref. Sta.	Score	% Comp	Rating	Metric	Ref. Sta.	Study Site	% Comp	Rating
NH4-N (mg/l)	380	0.07	CWD3a	143	81.12%	Supporting	MFBI				
NO2-N (mg/l)	371	0.003	LCC2	113	102.65%	Comparable	TR				
NO3-N (mg/l)	351	0.68			#DIV/0!		PER CONT				
PO4 P (mg/l)	490	0.21			#DIV/0!		EPT				
Turbidity (NTU)	2100P	0.76	Ideal	155	74.84%	Supporting	% EPT				
Mn (mg/l)	290						EPT/CHIR				
Fe (Ferrous, mg/l)	255						SCFL				
Cu (mg/l)	135						HBI				
Al (mg/l)	10						CLI				
Analysis Date:	06-May-97		Analysis Date:	06-May-97			Analysis Date:	01-Jan-97			
Analyst:			Analyst:				Analyst:				

Habitat Assessment Scale

Metric Assessment Scale

> 90%	Comparable to reference	Excellent	Metric	Excellent	Very Good	Good	Fair	Poor
75-88%	Supporting	Good	MFBI					
60-73%	Partially supporting	Fair	TR					
<58%	Not supporting	Poor	PER CONT					
			EPT					
			% EPT					
			EPT/CHIR					
			SCFL					
			HBI					
			CLI					

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Cottonwood
CWD8

DATE 21-Apr-97

SAMPLER
UNIT

DWG
YSI #1

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV	TDS g/l
04/21/97 08:55	42197	94550	13.89	0.602	100.2	10.33	0.1	8.57	130	0.308
04/21/97 09:03	42197	95443	13.93	0.602	100.4	10.34	0	8.55	138	0.309
04/21/97 09:24	42197	101516	14.04	0.602	99.2	10.19	0	8.52	150	0.309
04/21/97 09:41	42197	103210	14.04	0.602	98.8	10.15	0.1	8.55	152	0.309
04/21/97 09:42	42197	103312	14.05	0.602	98.8	10.15	0	8.55	152	0.309
04/21/97 09:54	42197	104534	14.14	0.602	98.8	10.13	0	8.54	154	0.31
04/21/97 09:54	42197	104547	14.14	0.602	98.8	10.13	0	8.54	155	0.31
04/21/97 09:57	42197	104823	14.14	0.602	98.7	10.12	0	8.55	155	0.31

AVERAGE	14.05	0.602	99.21	10.19	0.03	8.55	148.25	0.31
---------	-------	-------	-------	-------	------	------	--------	------

Observations:

Flow 7.62 cfs
Sky Clear
Wind 5
Direction W
Air Temp 77 F

Comments:

Site inspection and sampling.
Illegal Immigrants Impact Project sampling with volunteer Elaine Lukey. Observed large piles of white suds in plunge pools. Little human impact on site. Camp site not heavily used and very little trash or waste in the area. No fish observed in the pools or runs. Large stands of poison oak in oak woodlands and riparian corridor. Nasturtium in runs downstream.

Samples Taken	Number
Nutrients	2
TON/Turbidity	2
Metals	2
Bacti	6
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	0
Organics	0
Crypto-Giardia	0

FILE: s:\wqsl\303dlist\city of san diego\cottonwood creek\c wd8a111

WATERSHED WATER QUALITY REPORT SHEET

Watershed	Cottonwood
Drainage	Middle Cottonwood
Station	CWD8

Sampling Date: 02-Oct-97

SAMPLER	DWG
UNIT	YSI #1

YSI Data on Physicochemical Data

DATE MM/DD/YY	TIME	DATE MM/DD/YY	TIME	TEMP C	SP COND ms/cm	DO %	DO CONC mg/l	DEPTH m	PH	ORP mV	TDS g/l
10/02/97	09:13	100297	94724	17.55	0.611	98.3	9.37	0	8.5	44	0.341
10/02/97	09:14	100297	94921	17.55	0.611	98.7	9.41	0	8.5	43	0.341
10/02/97	09:16	100297	95036	17.55	0.611	98.5	9.39	0	8.5	42	0.341
10/02/97	09:16	100297	95052	17.57	0.611	98.5	9.39	0	8.5	42	0.341
10/02/97	09:16	100297	95109	17.57	0.611	98.6	9.4	0	8.5	42	0.341

AVERAGE	17.56	0.611	98.52	9.39	0.00	8.50	42.60	0.34
---------	-------	-------	-------	------	------	------	-------	------

Observations:	
Flow	6.10 cfs
Habitat Score	
Sky	clear
Wind	calm
Direction	na
Air Temp	25.2 C

Comments:	
Watershed sampling and surveillance.	
Site sampled 093097 for Illegal Immigrant Impact Project by JP. Flow data collected by JP.	
Site revisited for photodocumentation and habitat assessment. No benthic samples taken.	
Nutrients sampled on 093097.	

Samples Taken:	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	6
Solids	0
Plankton	0
TOC	0
BMI	0
CPOM	0
Organics	0
Crypto-Giardia	0
Photo Documentation	12

Water Chemistry Profile

Rapid Bioassessment Protocol

Constituents	HACH	Results	Ref. Sta.	Score	% Comp	Rating	Metric	Ref. Sta.	Study Site	% Comp	Rating
NH4-N (mg/l)	380		CWD3a	143	0.00%		MFBI				
NO2-N (mg/l)	371		LCC2	113	0.00%		TR				
NO3-N (mg/l)	351				#DIV/0!		PER CONT				
PO4 P (mg/l)	490				#DIV/0!		EPT				
Turbidity (NTU)	2100P		Ideal	155	0.00%		% EPT				
Mn (mg/l)	290						EPT/CHIR				
Fe (Ferrous, mg/l)	255						SCFL				
Cu (mg/l)	135						HBI				
Al (mg/l)	10						CLI				
Analysis Date:	01-Oct-97		Analysis Date:	02-Oct-97			Analysis Date:	01-Jan-97			
Analyst:			Analyst:				Analyst:				

Habitat Assessment Scale

Metric Assessment Scale

> 90%	Comparable to reference	Excellent	Metric	Excellent	Very Good	Good	Fair	Poor
75-88%	Supporting	Good	MFBI					
60-73%	Partially supporting	Fair	TR					
<58%	Not supporting	Poor	PER CONT					
			EPT					
			% EPT					
			EPT/CHIR					
			SCFL					
			HBI					
			CLI					

Stream Discharge WorkSheet

Station	CWD8		
Width	8.00	Flow Q =	6.10
Width/7	1.14		
Depth 1	0.22	Velocity 1	1.72
Depth 2	0.22	Velocity 2	2.04
Depth 3	0.24	Velocity 3	2.17
Mid Depth	0.42	Mid Vel.	2.70
Depth 5	0.38	Velocity 5	3.45
Depth 6	0.28	Velocity 6	2.89
Depth 7	0.35	Velocity 7	2.09

WATERSHED WATER QUALITY REPORT SHEET

Watershed	Cottonwood
Drainage	Cottonwood
Station	CWD8

Sampling Date: 25-Jun-97

SAMPLER	DWG
UNIT	YSI #1

YSI Datasonde Physicochemical Data

DATE	DATE	TIME	TEMP	SP COND	DO %	DO CONC	DEPTH	PH	ORP	TDS	
MM/DD/YY	TIME	MM/DD/YY	C	mS/cm	%	mg/l	m		mV	g/l	
06/25/97	09:11	62597	95545	15.57	0.594	102.2	10.16	0	8.39	68	0.317
06/25/97	09:18	62597	100234	15.53	0.595	100.2	9.97	0	8.37	68	0.317
06/25/97	09:31	62597	101535	15.6	0.595	99.5	9.88	0	8.38	65	0.317
06/25/97	09:45	62597	103009	15.71	0.594	99.2	9.83	0	8.4	62	0.318
06/25/97	09:59	62597	104337	15.79	0.595	98.9	9.78	0	8.41	60	0.319
06/25/97	10:32	62597	111644	16.03	0.595	98.6	9.71	0	8.43	55	0.32

AVERAGE	15.71	0.595	99.77	9.89	0.00	8.40	63.00	0.32
---------	-------	-------	-------	------	------	------	-------	------

Observations:	
Flow	7.46 cfs
Habitat Score	
Sky	
Wind	
Direction	
Air Temp	F

Samples Taken	Number
Nutrients	
TON/Turbidity	
Metals	
Bacti	
Solids	
Plankton	
TOC	
BMI	
CPOM	
Organics	
Crypto-Giardia	

Comments:		
Watershed sampling and surveillance.		
Open Channel flow estimate		
V	D	W=7.92
2.62	0.26	Q=7.46
2.47	0.30	
2.9	0.36	
3.21	0.58	
3.06	0.28	
2.76	0.32	
1.64	0.28	

Water Chemistry Profile

Rapid Bioassessment Protocol

Constituents	HACH	Results	Ref. Sta	Score	% Comp	Rating	Metric	Ref. Sta	Study Site	% Comp	Rating
NH4-N (mg/l)	380		CWD3a	143	0.00%		MFBI				
NO2-N (mg/l)	371		LCC2	113	0.00%		TR				
NO3-N (mg/l)	351				#DIV/0!		PER CONT				
PO4 P (mg/l)	490				#DIV/0!		EPT				
Turbidity (NTU)	2100P		Ideal	155	0.00%		% EPT				
Mn (mg/l)	290						EPT/CHIR				
Fe (Ferrous, mg/l)	255						SCFL				
Cu (mg/l)	135						HBI				
Al (mg/l)	10						CLI				
Analysis Date	01-Jan-97		Analysis Date	01-Jan-97			Analysis Date	01-Jan-97			
Analyst			Analyst				Analyst				

Habitat Assessment Scale

Metric Assessment Scale

> 90%	Comparable to reference	Excellent	Metric	Excellent	Very Good	Good	Fair	Poor
75-88%	Supporting	Good	MFBI					
60-73%	Partially supporting	Fair	TR					
<58%	Not supporting	Poor	PER CONT					
			EPT					
			% EPT					
			EPT/CHIR					
			SCFL					
			HBI					
			CLI					

**Reservoir and Watershed Monitoring Team
Stream Discharge WorkSheet**

Station: **CWD8** Date: **01-Jan-97**

Width	8.00	Flow Q =	0:00
(Width / 7)	1.14		
Depth 1		Velocity 1	
Depth 2		Velocity 2	
Depth 3		Velocity 3	
Mid Depth		Mid Vel.	
Depth 5		Velocity 5	
Depth 6		Velocity 6	
Depth 7		Velocity 7	

Estimated Flow

Stations	PVC1	PVC2	PVC3
Dates			

Estimated Flow

Stations Dates	NPC1	NPC2	NPC3A	NPC3B	NPC3C	NPC3D
-------------------	------	------	-------	-------	-------	-------

Estimated Flow

Stations	SPC1	SPC2
Dates		

Estimated Flow

Stations	NOB1	NOB2
Dates		

Estimated Flow

Stations	SCC1	SCC2	SCC3	SCC4
Dates				

Estimated Flow

Stations	WLC1	WLC2
Dates		

Estimated Flow

Stations	CWD8	CWD9
Dates		

Cottonwood Watershed
Middle Cottonwood Creek Baseline Flow
Middle Cottonwood Flow Estimates 1997

Station
CWD8

Sample Dates	21-April-97		06-May-97		25 June-97		29-July-97		26-Aug-97		02-Oct-97					
	Width =	4.80	Width =	8.00	Width =	8.00	Width =	8.00	Width =	8.30	Width =	8.00	Width =		Width =	
	(width/7)	0.69	(width/7)	1.14	(width/7)	1.14	(width/7)	1.14	(width/7)	1.19	(width/7)	1.14	(width/7)	0.00	(width/7)	0.00
Parameters	depth	velocity	depth	velocity	depth	velocity	depth	velocity	depth	velocity	depth	velocity	depth	velocity	depth	velocity
	1.30	1.15	0.22	2.04	0.20	1.91	0.20	1.33	0.21	0.79	0.22	1.72				
	1.31	2.16	0.23	2.31	0.22	2.01	0.20	2.45	0.22	1.08	0.22	2.04				
	1.35	1.18	0.34	3.39	0.32	3.30	0.28	2.93	0.25	1.58	0.24	2.17				
	1.10	1.20	0.56	3.85	0.55	3.67	0.54	4.02	0.40	2.92	0.42	2.70				
	0.95	1.19	0.32	3.66	0.34	3.54	0.33	3.22	0.35	2.90	0.38	3.45				
	1.10	1.44	0.30	2.78	0.30	2.67	0.29	3.00	0.26	1.91	0.28	2.89				
	1.00	1.16	0.21	2.16	0.20	1.83	0.22	1.76	0.35	1.50	0.35	2.09				

Q=	7.62		Q=	7.71		Q=	7.16		Q=	6.93		Q=	4.75		Q=	6.10		Q=	0.00		Q=	0.00	
----	------	--	----	------	--	----	------	--	----	------	--	----	------	--	----	------	--	----	------	--	----	------	--

Station
CWD9

Sample Dates	8-May-97		26-Aug-97 Transect #1		26-Aug-97 Transect #2		26-Aug-97 Transect #3		30-Sep-97 Transect 1		30-Sep-97 Transect 2					
	Width =	7.50	Width =	10.80	Width =	5.10	Width =	9.20	Width =	10.20	Width =	9.90	Width =	9.90	Width =	9.90
	(width/7)	1.07	(width/7)	1.54	(width/7)	0.73	(width/7)	1.31	(width/7)	1.46	(width/7)	1.41	(width/7)	1.41	(width/7)	1.41
Parameters	depth	velocity	depth	velocity	depth	velocity	depth	velocity	depth	velocity	depth	velocity	depth	velocity	depth	velocity
	0.32	0.21	0.40	0.43	0.72	0.76	0.38	0.33	0.40	0.48	0.46	0.34				
	0.35	0.17	0.54	0.38	1.02	0.78	0.52	0.81	0.64	0.73	0.50	0.71				
	0.65	0.53	0.52	0.38	1.28	0.81	0.72	0.69	0.80	0.95	0.72	0.72				
	1.10	0.43	0.42	0.50	0.80	0.77	0.80	0.66	0.82	0.95	0.80	1.08				
	0.45	0.76	0.48	0.43	1.10	0.81	0.84	0.98	1.06	0.88	0.90	0.76				
	0.40	0.05	0.50	0.91	1.34	0.79	0.86	0.75	1.10	0.81	1.40	0.67				
	0.25	0.08	0.30	0.49	0.92	0.56	0.64	0.72	0.66	0.57	0.84	0.49				

Q=	1.42		Q=	2.46		Q=	3.98		Q=	4.60		Q=	6.41		Q=	5.55		Q=			Q=		
----	------	--	----	------	--	----	------	--	----	------	--	----	------	--	----	------	--	----	--	--	----	--	--

WATERSHED WATER QUALITY REPORT SHEET

Watershed:	Cottonwood
Drainage:	Middle Cottonwood
Station:	CWD9

Sampling Date: 26-Aug-97

SAMPLER: DWG
UNIT: YSI #1

YSI Datasonde Physicochemical Data

DATE	DATE	TIME	TEMP	SP COND	DO %	DO CONC	DEPTH	PH	ORP	TDS	
MM/DD/YY	TIME	MMDDYY	C	ms/cm	%	mg/l	m		mV	g/l	
08/26/97	09:09	82697	94736	18.04	591.7	31.2	2.94	0	7.88	34	0.333
08/26/97	09:22	82697	100010	18.12	591.8	35.9	3.38	0	7.92	13	0.334
08/26/97	09:40	82697	101833	18.28	592	43.9	4.12	0	7.92	6	0.335
08/26/97	09:48	82697	102618	18.36	590.9	46.7	4.38	0	7.92	6	0.335
08/26/97	10:19	82697	105800	18.72	592	55.3	5.14	0	7.95	1	0.339

AVERAGE	18.30	591.680	42.60	3.99	0.00	7.92	12.00	0.34
---------	-------	---------	-------	------	------	------	-------	------

Observations:	
Flow	1-2 cfs
Habitat Score	
Sky	
Wind	
Direction	
Air Temp	F

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	0
Bact	6
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	0
Organics	0
Crypto-Giardia	0

Comments:
Watershed sampling and surveillance.
Site sampled for Illegal Immigrant Impact Project. Six samples taken at 15 min intervals.
Also collected nutrients, CPOM/BMI and metals for general watershed monitoring.
Performed habitat assessment and noted general conditions.
Evidence of illegal immigrant traffic noted in abandoned toiletries and spanish language wrappers and trash.

Water Chemistry Profile

Rapid Bioassessment Protocol

Constituents	HACH Method	Results	Habitat Assessment				Benthic Macroinvertebrates				
			Ref. Sta.	Score	% Comp.	Rating	Metric	Ref. Sta.	Study Site	% Comp.	Rating
NH4-N (mg/l)	380		CWD3a	143	0.00%		MFBI				
NO2-N (mg/l)	371		LCC2	113	0.00%		TR				
NO3-N (mg/l)	351				#DIV/0!		PER CONT				
PO4 P (mg/l)	490				#DIV/0!		EPT				
Turbidity (NTU)	2100P		Ideal	155	0.00%		% EPT				
Mn (mg/l)	290						EPT/CHIR				
Fe (Ferrous, mg/l)	255						SCFL				
Cu (mg/l)	135						HBI				
Al (mg/l)	10						CLI				
Analysis Date:	26-Aug-97		Analysis Date:	26-Aug-97			Analysis Date:	01-Jan-97			
Analyst:			Analyst:				Analyst:				

Habitat Assessment Scale			Metric Assessment Scale					
> 90%	Comparable to reference	Excellent	Metric	Excellent	Very Good	Good	Fair	Poor
75-88%	Supporting	Good	MFBI					
60-73%	Partially supporting	Fair	TR					
<58%	Not supporting	Poor	PER CONT					
			EPT					
			% EPT					
			EPT/CHIR					
			SCFL					
			HBI					
			CLI					

WATERSHED WATER QUALITY REPORT SHEET

Watershed:	Cottonwood
Drainage:	Middle Cottonwood
Station:	CWD9

Sampling Date: 30-Sep-97

SAMPLER: DWG
UNIT: YSI #1

YSI Datasonde Physicochemical Data

DATE	DATE	TIME	TEMP	SP COND	DO %	DO CONC	DEPTH	PH	ORP	TDS	
MM/DD/YY	TIME	MMDDYY	C	mS/cm	%	mg/l	m		mV	µl	
09/30/97	10:42	93097	111652	19.34	0.619	88.2	8.11	0	7.81	46	0.359
09/30/97	10:42	93097	111714	19.34	0.618	88	8.09	0	7.81	46	0.358
09/30/97	10:53	93097	112808	19.45	0.619	86.8	7.96	0	7.82	45	0.359
09/30/97	11:09	93097	114337	19.62	0.619	88.3	8.07	0	7.82	46	0.361
09/30/97	11:23	93097	115756	19.8	0.618	89	8.11	0	7.83	47	0.362
09/30/97	11:39	93097	121336	19.99	0.619	89.5	8.12	0	7.83	49	0.364
09/30/97	11:57	93097	123200	20.2	0.619	89.6	8.09	0	7.83	50	0.365

AVERAGE	19.68	0.619	88.49	8.08	0.00	7.82	47.00	0.36
---------	-------	-------	-------	------	------	------	-------	------

Observations:	
Flow	
Habitat Score	
Sky	
Wind	
Direction	
Air Temp	

Comments:	
Watershed sampling and surveillance.	

Samples Taken	Number
Nutrients	
TON/Turbidity	
Metals	
Bacti	
Solids	
Plankton	
TOC	
BMI	
CPOM	
Organics	
Crypto-Giardia	

Water Chemistry Profile

Rapid Bioassessment Protocol

Constituents	HACH Method	Results	Ref. Sta.	Score	% Comp.	Rating	Metric	Ref. Sta.	Study Site	% Comp.	Rating
NH4-N (mg/l)	380		CWD3a	143	0.00%		MFBI				
NO2-N (mg/l)	371		LCC2	113	0.00%		TR				
NO3-N (mg/l)	351				#DIV/0!		PER CONT				
PO4 P (mg/l)	490				#DIV/0!		EPT				
Turbidity (NTU)	2100P		Ideal	155	0.00%		% EPT				
Mn (mg/l)	290						EPT/CHIR				
Fe (Ferrous, mg/l)	255						SCFL				
Cu (mg/l)	135						HBI				
Al (mg/l)	10						CLI				
Analysis Date:	01-Jan-97		Analysis Date:	01-Jan-97			Analysis Date:	01-Jan-97			
Analyst:			Analyst:				Analyst:				

Habitat Assessment Scale

Metric Assessment Scale

> 90%	Comparable to reference	Excellent	Metric	Excellent	Very Good	Good	Fair	Poor
75-88%	Supporting	Good	MFBI					
60-73%	Partially supporting	Fair	TR					
<58%	Not supporting	Poor	PER CONT					
			EPT					
			% EPT					
			EPT/CHIR					
			SCFL					
			HBI					
			CLI					

WATERSHED WATER QUALITY REPORT SHEET

Watershed	Cottonwood
Drainage	Cottonwood
Station	CWD3A

Sampling Date: 28-Jan-98

SAMPLER	DWG
UNIT	207002

YSI Datasonde Physicochemical Data

DATE	DATE	TIME	TEMP	SP COND	TDS	DO	DO CONC	Depth ^a	pH	ORP	Salinity
MM/DD/YY	TIME	MMDDYY	C	mS/cm	g/l	% sat	mg/l	m	log units	mV	ppt
01/28/98	09:39	12898	92914	5.61	644	259.0	80.50	10.1	-1	8.36	142
01/28/98	09:40	12898	93019	5.62	644	259.0	80.20	10.06	0	8.36	141
01/28/98	09:44	12898	93423	5.67	645	260.0	79.20	9.92	0	8.36	140
01/28/98	09:48	12898	93805	5.72	644	260.0	78.50	9.82	0	8.36	140

AVERAGE

5.66	644	259.5	79.60	9.98	0	8.36	141	#DIV/0!
------	-----	-------	-------	------	---	------	-----	---------

Observations:	
Flow	0.58 cfs
Habitat Score	112
Sky	clear
Wind	calm
Direction	
Air Temp	72.7F C

Comments:	
Perennial flow this year.	
Some yellow/white suds observed in plunge pools. Flow moderately low; approaching baseline from seasonal low.	
Riffle # 3 from top sampled. Three replicates taken at bottom, middle and top of riffle. Riffle approximately one sample net wide.	
Some mining activity evident. Tailings or fresh diggings from the tunnel are being brought down.	
A well worn foot path now to the tunnel.	

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	0
Organics	0
Crypto-Giardia	0

Water Chemistry Profile

Rapid Bioassessment Protocol

Constituents			HACH	Results	Habitat Assessment				Benthic Macroinvertebrates				
		Method			Ref. Sta.	Score	% Comp	Rating	Metric	Ref. Sta.	Study Site	% Comp	Rating
NH4-N (mg/l)	380				CWD3a	143	78.32%	Good	MFBI				
NO2-N (mg/l)	371				LCC2	113	99.12%	Excellent	TR				
NO3-N (mg/l)	355								PER CONT				
PO4 P (mg/l)	490								EPT				
Turbidity (NTU)	2100P				Ideal	155	72.26%	Good	% EPT				
Mn (mg/l)	290								EPT/CHIR				
Fe (Ferrous, mg/l)	255								SCFL				
Cu (mg/l)	135								HBI				
Al (mg/l)	10								CLI				
Analysis Date:	01-Jan-98		Analysis Date:	01-Jan-98		Analysis Date:	01-Jan-98		Analysis Date:	01-Jan-98			
Analyst:	DWG		Analyst:	DWG		Analyst:	DWG		Analyst:	DWG			

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

COTTONWOOD
COTTONWOOD
CWD3A

DATE

04-Mar-97

SAMPLER
UNIT

DWG
YSI # 1

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV	TDS g/l
03/04/97 08:55	30497	94945	6.71	0.541	89.4	10.91	0	8.37	215	0.229
03/04/97 08:55	30497	95133	6.7	0.541	95.1	11.61	0	8.37	211	0.229
03/04/97 08:56	30497	95216	6.7	0.541	90.2	11.01	-0.1	8.36	211	0.229

Observations:

Flow	10.91	cfs
Sky	clear	
Wind	calm	
Direction		
Air Temp	12	C

Comments:

Site sampled for Illegal Immigrant Impact Project. Six samples taken at 15 min intervals. Also collected nutrients, CPOM/BMI and metals for general watershed monitoring. Performed habitat assessment and noted general conditions. Evidence of illegal immigrant traffic noted in abandoned toiletries and spanish language wrappers and trash.

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	6
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	1
Organics	0
Crypto-Giardia	0

WATERSHED WATER QUALITY REPORT SHEET

Watershed	Cottonwood
Drainage	Cottonwood
Station	CWD3A

Sampling Date: 18-Jun-97

SAMPLER	DWG
UNIT	YSI #1

YSI Datasonde Physicochemical Data

DATE	DATE	TIME	TEMP	SP/COND	DO %	DO/CONC	DEPTH	PH	ORP	TDS	
MM/DD/YY	TIME	MMDDYY	C	ms/cm	%	mg/l	m		mV	g/l	
06/18/97	08:16	61897	90132	16.47	0.72	78.3	7.63	0	7.87	69	0.392
06/18/97	08:17	61897	90211	16.47	0.72	78.3	7.63	0	7.87	68	0.392
06/18/97	08:18	61897	90351	16.49	0.721	78.2	7.62	0	7.87	65	0.393
06/18/97	08:25	61897	91012	16.55	0.721	78.1	7.6	0	7.89	59	0.393
06/18/97	08:28	61897	91333	16.6	0.721	78.2	7.6	0	7.89	57	0.393

AVERAGE	16.52	0.721	78.22	7.62	0.00	7.88	63.60	0.39
---------	-------	-------	-------	------	------	------	-------	------

Observations:	
Flow	
Habitat Score	
Sky	
Wind	
Direction	
Air Temp	

Comments:	
Watershed sampling and surveillance.	

Samples Taken	Number
Nutrients	
TON/Turbidity	
Metals	
Bacti	
Solids	
Plankton	
TOC	
BMI	
CPOM	
Organics	
Crypto-Giardia	

Water Chemistry Profile

Rapid Bioassessment Protocol

Constituents		HACH	Results		Habitat/Assessment				Benthic Macroinvertebrates			
	Method		Ref. Sta.	Score	% Comp	Rating	Metric	Ref. Sta.	Study Site	% Comp	Rating	
NH4-N (mg/l)		380	CWD3a	143	0.00%		MFBI					
NO2-N (mg/l)		371	LCC2	113	0.00%		TR					
NO3-N (mg/l)		351			#DIV/0!		PER CONT					
PO4 P (mg/l)		490			#DIV/0!		EPT					
Turbidity (NTU)	2100P		ideal	155	0.00%		% EPT					
Mn (mg/l)	290						EPT/CHIR					
Fe (Ferrous, mg/l)	255						SCFL					
Cu (mg/l)	135						HBI					
Al (mg/l)	10						CLI					
Analysis Date	01-Jan-97		Analysis Date	01-Jan-97			Analysis Date	01-Jan-97				
Analyst			Analyst				Analyst					

Habitat Assessment Scale

Metric Assessment Scale

> 90%	Comparable to reference	Excellent	Metric	Excellent	Very Good	Good	Fair	Poor
75-88%	Supporting	Good	MFBI					
60-73%	Partially supporting	Fair	TR					
<58%	Not supporting	Poor	PER CONT					
			EPT					
			% EPT					
			EPT/CHIR					
			SCFL					
			HBI					
			CLI					

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Cottonwood
CWD3a

DATE

01-Apr-97

SAMPLER
UNIT

DWG
YSI #1

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV	TDS g/l
04/01/97 09:47	40197	103946	10.59	0.611	90.7	10.07	0	8.37	176	0.288
04/01/97 09:47	40197	104016	10.59	0.611	90.7	10.07	0	8.37	176	0.288
04/01/97 09:50	40197	104309	10.62	0.612	90.6	10.06	0	8.37	175	0.289
04/01/97 09:54	40197	104659	10.61	0.611	90.6	10.06	0	8.37	174	0.288

AVERAGE

10.6025	0.61125	90.65	10.065	0	8.37	175.25	0.28825
---------	---------	-------	--------	---	------	--------	---------

Observations:

Flow		cfs
Sky	PC 60%	
Wind	10-15	
Direction	NNE	
Air Temp	13.5	C

Comments:

Site inspection and sampling.
Illegal Immigrant Impact Project sampling. Performed full protocol on site. Substantial evidence of illegal immigrant traffic on site - trash, beaten paths, clothing.
Evidence of activity in abandoned mine above site.

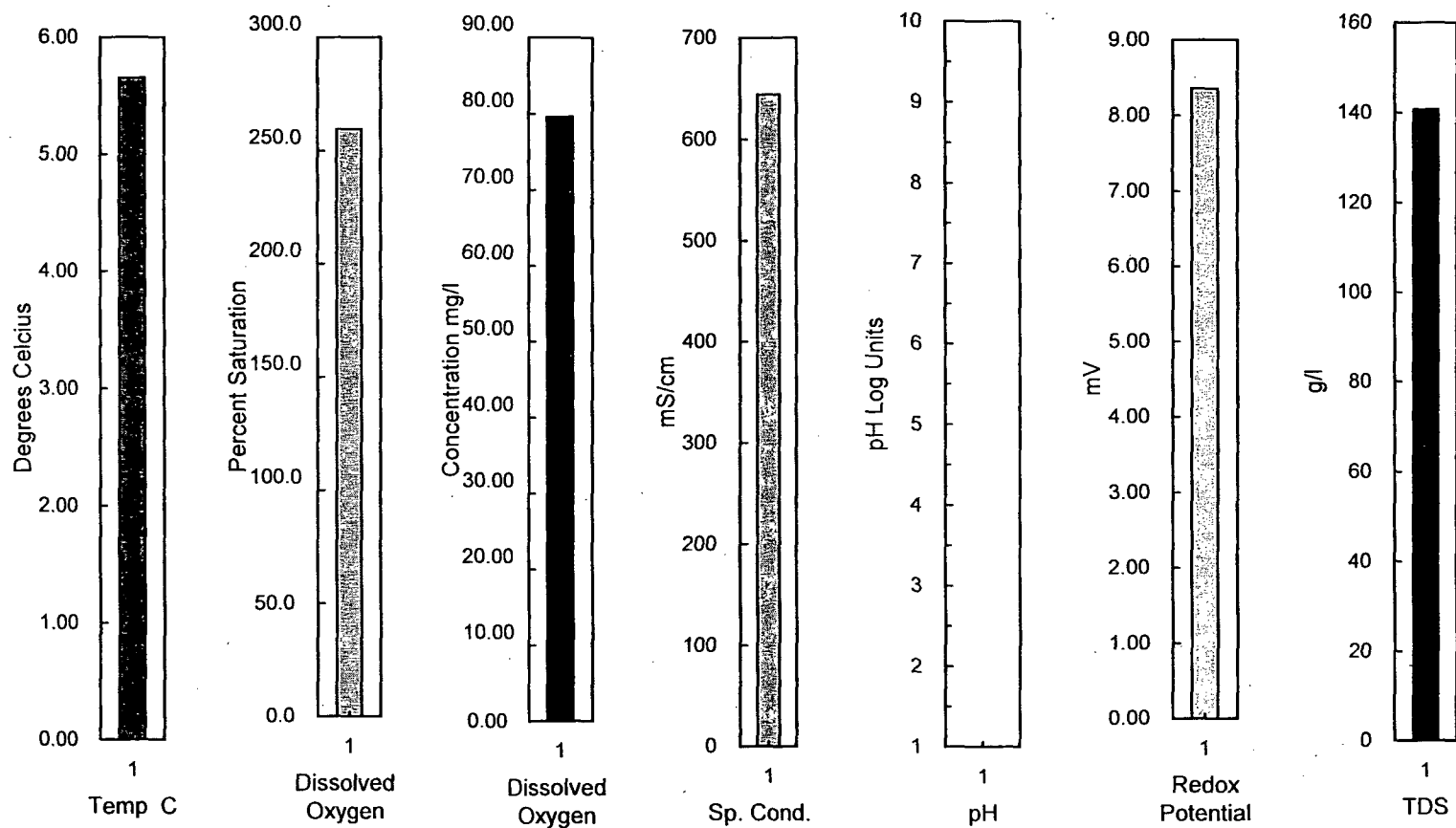
Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	6
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	1
Organics	0
Crypto-Giardia	0

FILE:s:\wqs\city of san diego\cottonwood creek\cwp3a091

Stream Discharge WorkSheet

Station	CWD3A		
Width	2.36	Flow Q =	0.58
Width/7	0.34		
Depth 1	0.42	Velocity 1	0.20
Depth 2	1.08	Velocity 2	0.22
Depth 3	1.32	Velocity 3	0.32
Mid Depth	1.32	Mid Vel.	0.27
Depth 5	1.36	Velocity 5	0.24
Depth 6	1.16	Velocity 6	0.23
Depth 7	0.12	Velocity 7	0.28

Lower San Diego River Watershed SDR10 October 10, 1997



Species Level Benthic Macroinvertebrates Worksheet

Data Entry

Notes:

Report

Total Specimens
MFB
TR
EPT Index
EPT/CHIR

Ephemeroptera	C	No. Family	No. species	MFB Value	HBI Value	Calc MFB	Calc HBI
Baetidae	1	0		4		0	
Baetis sp. A							0
Baetis sp. B							0
Baetis bicaudatus							0
Baetis intercalaris							0
Baetis parvus							0
Baetis tricaudatus							0
Callibaetis sp.							0
Enallagma sp.							0
Totals	0		0		0	0	0

Caenidae	1	0		7		0	
Caenis sp.							0
Caenis tardata							0
Totals	0		0		0	0	0

Ephemerellidae	0	0		1		0	
Drunella sp.							0
Ephemerella sp.							0
Seratella sp.							0
Totals	0		0		0	0	0

Heptageniidae	1	0		4		0	
Epeorus sp.							0
Ironodes sp.							0
Ironodes californicus							0
Rhithrogena sp.							0
Totals	0		0		0	0	0

Tricorythidae	1	0		4		0	
Tricorythodes sp.							0
Tricorythodes fallax							0
Totals	0		0		0	0	0

Plecoptera		No. Family	No. species	MFB Value	HBI Value	Calc MFB	Calc HBI
Capniidae		0		1		0	
Capnia sp.							0
Totals	0		0		0	0	0

Chloroperlidae		0		1		0	
Sweltsa sp.							0
Sweltsa continua							0
Sweltsa pacifica							0
Sweltsa townesi							0
Haploperla chilnualna							0
Plumiperla diversa							0
Plumiperla spinosa							0
Totals	0		0		0	0	0

syn A. spatulata

Can occur in slow lowland coas

Nemouridae		0		2		0	
Malenka sp.							0
Malenka biloba							0
Malenka californica							0
Malenka depressa							0
Malenka marionae							0
Nemoura spiniloba							0
Prtostola besametsa							0

FILE:s:\wgs\303dist\city of san diego\cottonwood creek\Cwd3a028

<i>Soyedina nevadensis</i>						
<i>Soyedina producta</i>						
<i>Visoka cataractae</i>						
<i>Zapada</i> sp.						0
<i>Zapada cinctipes</i>						0
<i>Zapada columbiana</i>						0
<i>Zapada cordillera</i>						0
<i>Zapada frigida</i>						0
<i>Zapada haysi</i>						0
<i>Zapada oregonensis</i>						0
						0
Totals	0		0		0	0

Perlidae				1		
<i>Calineuria californica</i>						
<i>Claassenia sabulosa</i>						
<i>Doroneuria baumanni</i>						
<i>Hesperoperla hoguei</i>						
<i>Hesperoperla pacifica</i>						
Totals	0					

Perlodidae				2		
<i>Baumannella alameda</i>						
<i>Calliperla luctosa</i>						
<i>Cascadoperla trictura</i>						
<i>Chernokrilus erratus</i>						
<i>Chernokrilus misnomus</i>						
<i>Chernokrilus venustus</i>						
<i>Cosumnoperla hypocrena</i>						
<i>Cultus pilatus</i>						
<i>Cultus tostonus</i>						
<i>Frisonia picticeps</i>						
<i>Isogenoides colubrinus</i>						
<i>Isoperla acula</i>						
<i>Isoperla adunca</i>						
<i>Isoperla baumanni</i>						
<i>Isoperla bifurcata</i>						
<i>Isoperla denningi</i>						
<i>Isoperla fulva</i>						
<i>Isoperla marmorata</i>						
<i>Isoperla mormona</i>						
<i>Isoperla pinta</i>						
<i>Isoperla quinquepunctata</i>						
<i>Isoperla roguensis</i>						
<i>Isoperla sobria</i>						
<i>Isoperla sordida</i>						
<i>Kogutius nonus</i>						
<i>Megarcys subtruncata</i>						
<i>Megarcys yosemite</i>						
<i>Oroperla barbara</i>						
<i>Osobenus yakimae</i>						
<i>Perlinodes aureus</i>						
<i>Rickera sorpta</i>						
<i>Salmoperla sylvanica</i>						
<i>Skwala curvata</i>						
Totals						

Taeniopterygidae				2		

Trichoptera						
Brachycentridae				1		
<i>Amiocentrus aspilus</i>						
<i>Brachycentrus</i> sp.						
<i>Micrasema</i> sp.						
<i>Micrasema onisca</i>						

Glossosomatidae				0		
Helicopyschidae				3		
Hydropsychidae				4		
Hydroptilidae				4		
Lepidostomatidae				1		
Leptoceridae				1		
Limnephilidae				4		
Philopotamidae				3		
Polycentropodidae				6		
Pyschomyiidae				2		
Rhyacophilidae				0		
Sericostomatidae				3		

Odonata

Aeshnidae	3
Calopterygidae	5
Coenagrionidae	9
Cordulegastridae	3
Gomphidae	1
Libellulidae	9

Diptera

Athericidae	2
Blephariceridae	0
Ceratopogonidae	6
Chironomidae R	8
Chironomidae O	6
Dolichopodidae	4
Empididae	6
Ephydriidae	6
Pyschodidae	10
Simuliidae	6
Muscidae	6
Syrphidae	10
Tabanidae	6
Tipulidae	3

Coleoptera

Dryopidae	5
Elmidae	4
Psephenidae	4

Megaloptera

Corydalidae

0

Sialidae

4

Lepidoptera

Pyrilidae

5

Amphipoda

Gammaridae

4

Talitridae

8

Isopoda

Asellidae

8

tal plain rivers

Family Level Benthic Macroinvertebrates Worksheet

Data Entry

Ephemeroptera	C	Number	MFBI Value	Calc MFBI
Baetidae	1	12	4	48
Caenidae	1	23	7	161
Ephemerellidae			1	0
Heptageniidae			4	0
Tricorythidae			4	0
				0
Totals	2	35	20	209

Plecoptera	C	Number	MFBI Value	Calc MFBI
Capniidae	1	1	1	1
Chloroperlidae			1	0
Nemouridae			2	0
Perlidae			1	0
Perlodidae	1	3	2	6
Taeniopterygidae			2	0
Totals	2	4	9	7

Trichoptera	C	Number	MFBI Value	Calc MFBI
Brachycentridae			1	0
Glossosomatidae	1	35	0	0
Helicopsychidae			3	0
Hydropsychidae			4	0
Hydroptilidae	1	31	4	124
Lepidostomatidae			1	0
Leptoceridae			1	0
Limnephilidae			4	0
Philopotamidae	1	7	3	21
Polycentropodidae			6	0
Psychomyiidae			2	0
Rhyacophilidae	1	9	0	0
Sericostomatidae			3	0
Totals	4	82	32	145

Odonata	C	Number	MFBI Value	Calc MFBI
Aeshnidae			3	0
Calopterygidae			5	0
Coenagrionidae			9	0
Cordulegastridae			3	0
Gomphidae			1	0
Libellulidae			9	0
Totals	0	0	30	0

Diptera	C	Number	MFBI Value	Calc MFBI
Athericidae			2	0
Blephariceridae			0	0
Ceratopogonidae			6	0
Chironomidae R	1	1	8	8
Chironomidae O	1	12	6	72
Dolichopodidae			4	0
Empididae			6	0
Ephydriidae			6	0
Psychodidae			10	0
Simuliidae			6	0
Muscidae			6	0
Syrphidae			10	0
Tabanidae			6	0
Tipulidae			3	0
Totals	2	13	79	80

Coleoptera	C	Number	MFBI Value	Calc MFBI
Dryopidae			5	0
Elmidae			4	0
Psephenidae			4	0

Report

Total Specimens	134
MFBI	3.29
TR	10
EPT Index	8
EPT/CHIR	9.31

Totals	0	0	13	0

Megaloptera	C	Number	MFB Value	Calc MFB
Corydalidae			0	0
Stalidae			4	0
Totals	0	0	4	0

Lepidoptera	C	Number	MFB Value	Calc MFB
Pyrallidae			5	0
Totals	0	0	5	0

Amphipoda	C	Number	MFB Value	Calc MFB
Gammaridae			4	0
Talitridae			8	0
Totals	0	0	12	0

Isopoda	C	Number	MFB Value	Calc MFB
Asellidae			8	0
Totals	0	0	8	0

WATERSHED WATER QUALITY REPORT SHEET

Watershed	Cottonwood
Drainage	Cottonwood
Station	CWD4A

Sampling Date: 28-Jan-98

SAMPLER	DWG
UNIT	207002

YSI Datasonde Physicochemical Data

DATE	DATE	TIME	TEMP	SP COND	TDS	DO	DO CONC	Depth	pH	ORP	Salinity
MM/DD/YY	TIME	MMDDYY	C	mS/cm	g/l	% sat	mg/l	m	log units	mV	ppt
01/28/98	10:15	12898	100528	8.27	737	321.0	79.20	9.29	0	7.51	64
01/28/98	10:17	12898	100737	8.31	719	313.0	77.30	9.06	0	7.51	63
01/28/98	10:22	12898	101214	8.37	678	296.0	77.90	9.12	0	7.5	61
01/28/98	10:30	12898	102045	8.48	747	327.0	77.50	9.04	0	7.54	60
01/28/98	10:36	12898	102557	8.58	683	300.0	77.80	9.06	0	7.5	59

AVERAGE	8.40	713	311.4	77.94	9.11	0	7.51	61	#DIV/0!
---------	------	-----	-------	-------	------	---	------	----	---------

Observations:	
Flow	1.11 cfs
Habitat Score	104
Sky	Clear
Wind	calm
Direction	
Air Temp	59.6F

Comments:	
Orange precipitate observed on rocks and algae. Extensive algae growth through slow areas. Fast flow areas without algae and with less precipitate. Evidence of mining activity. Truck tire marks from road to the stream bank. Extensive modification of streambed substrate. No evidence, however, of high banking. They apparently dug out some bedrock crevices and under rocks. Suction dredging? New trash dumped at the site upstream; mostly construction waste (wood, tar paper, etc).	

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bact	0
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	0
Organics	0
Crypto-Giardia	0

Water Chemistry Profile

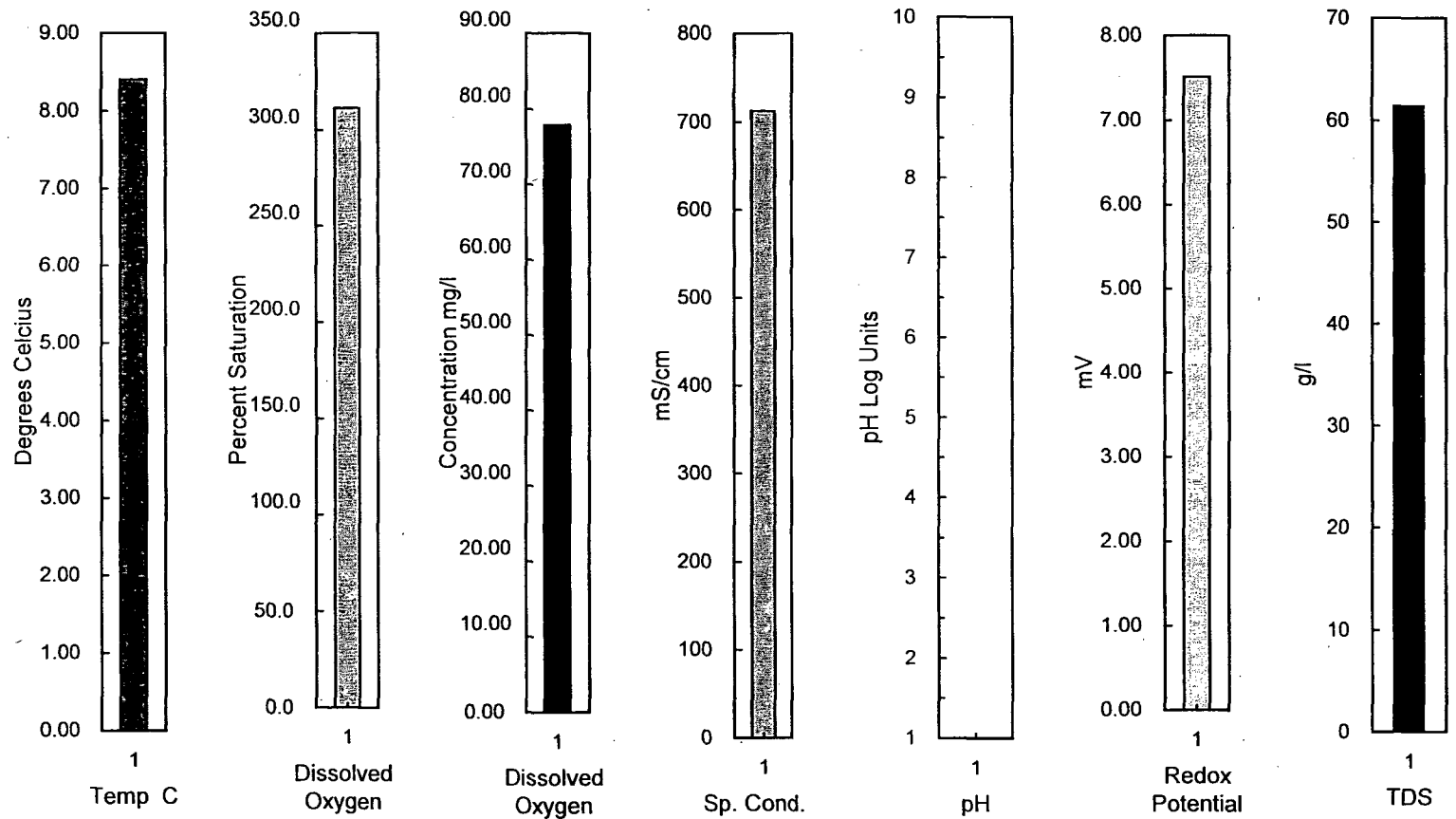
Rapid Bioassessment Protocol

Constituents		HACH	Results	Habitat Assessment				Benthic Macroinvertebrates				
		Method		Ref. Sta.	Score	% Comp.	Rating	Metric	Ref. Sta.	Study Site	% Comp.	Rating
NH4-N (mg/l)	380			CWD3a	143	72.73%	Good	MFBI				
NO2-N (mg/l)	371			LCC2	113	92.04%	Excellent	TR				
NO3-N (mg/l)	355							PER CONT				
PO4 P (mg/l)	490							EPT				
Turbidity (NTU)	2100P			Ideal	155	67.10%	Good	% EPT				
Mn (mg/l)	290							EPT/CHIR				
Fe (Ferrous, mg/l)	255							SCFL				
Cu (mg/l)	135							HBI				
Al (mg/l)	10							CLI				
Analysis Date:		01-Jan-98		Analysis Date:		01-Jan-98		Analysis Date:		01-Jan-98		
Analyst:		DWG		Analyst:		DWG		Analyst:		DWG		

Stream Discharge WorkSheet

Station	CWD4A		
Width	2.32	Flow Q =	1.11
Width/7	0.33		
Depth 1	0.18	Velocity 1	2.00
Depth 2	0.20	Velocity 2	2.56
Depth 3	0.22	Velocity 3	2.64
Mid Depth	0.26	Mid Vel.	2.41
Depth 5	0.24	Velocity 5	2.32
Depth 6	0.20	Velocity 6	2.12
Depth 7	0.16	Velocity 7	1.80

Lower San Diego River Watershed SDR10 October 10, 1997



Species Level Benthic Macroinvertebrates Worksheet

Data Entry

Notes:

Report

Total Specimens

MFBI

TR

EPT Index

EPT/CHIR

Ephemeroptera	C	No. Family	No. species	MFBI Value	HBI Value	Calc MFBI	Calc HBI
Baetidae	1	0		4		0	
Baetis sp. A							0
Baetis sp. B							0
Baetis bicaudatus							0
Baetis intercalaris							0
Baetis parvus							0
Baetis tricaudatus							0
Callibaetis sp.							0
Enallagma sp.							0
Totals	0		0		0	0	0

Caenidae	1	0		7		0	
Caenis sp.							0
Caenis tardata							0
Totals	0		0		0	0	0

Ephemerellidae	0	0		1		0	
Drunella sp.							0
Ephemerella sp.							0
Seratella sp.							0
Totals	0		0		0	0	0

Heptageniidae	1	0		4		0	
Epeorus sp.							0
Ironodes sp.							0
Ironodes californicus							0
Rhithrogena sp.							0
Totals	0		0		0	0	0

Tricorythidae	1	0		4		0	
Tricorythodes sp.							0
Tricorythodes fallax							0
Totals	0		0		0	0	0

Plecoptera		No. Family	No. species	MFBI Value	HBI Value	Calc MFBI	Calc HBI
Capniidae		0		1		0	
Capnia sp.							0
Totals	0		0		0	0	0

Chloroperlidae		0		1		0	
Sweltsa sp.							0
Sweltsa continua							0
Sweltsa pacifica							0
Sweltsa townesi							0
Haploperla chilnualna							0
Plumiperla diversa							0
Plumiperla spinosa							0
Totals	0		0		0	0	0

syn A. spatulata

Can occur in slow lowland coast

Nemouridae		0		2		0	
Malenka sp.							0
Malenka biloba							0
Malenka californica							0
Malenka depressa							0
Malenka marionae							0
Nemoura spiniloba							0
Prtostioia besametsa							0
Soyedina nevadensis							0
Soyedina producta							0
Visoka cataractae							0
Zapada sp.							0

File: s:\wqst303\dist\city of san diego\cottonwood creek\Cwd4_028

<i>Zapada cinctipes</i>						0
<i>Zapada columbiana</i>						0
<i>Zapada cordillera</i>						0
<i>Zapada frigida</i>						0
<i>Zapada haysi</i>						0
<i>Zapada oregonensis</i>						0
Totals	0		0		0	0

Perlidae						
<i>Calineuria californica</i>						
<i>Claassenia sabulosa</i>						
<i>Doroneuria baumanni</i>						
<i>Hesperoperla hoguei</i>						
<i>Hesperoperla pacifica</i>						
Totals	0					

Perlodidae				2		
<i>Baumannella alameda</i>						
<i>Calliperla luctosa</i>						
<i>Cascadoperla trictura</i>						
<i>Chemokrilus erratus</i>						
<i>Chemokrilus misnomus</i>						
<i>Chemokrilus venustus</i>						
<i>Cosumnoperla hypocrena</i>						
<i>Cultus pilatus</i>						
<i>Cultus tostonus</i>						
<i>Frissonia picticeps</i>						
<i>Isogenoides colubrinus</i>						
<i>Isoperla acula</i>						
<i>Isoperla adunca</i>						
<i>Isoperla baumanni</i>						
<i>Isoperla bifurcata</i>						
<i>Isoperla denningi</i>						
<i>Isoperla fulva</i>						
<i>Isoperla marmorata</i>						
<i>Isoperla mormona</i>						
<i>Isoperla pinta</i>						
<i>Isoperla quinquepunctata</i>						
<i>Isoperla roguensis</i>						
<i>Isoperla sobria</i>						
<i>Isoperla sordida</i>						
<i>Kogutius nonus</i>						
<i>Megarcys subtruncata</i>						
<i>Megarcys yosemite</i>						
<i>Oroperla barbara</i>						
<i>Osobenus yakimae</i>						
<i>Perlinodes aureus</i>						
<i>Rickera sorpta</i>						
<i>Salmoperla sylvanica</i>						
<i>Skwala curvata</i>						
Totals						

Taeniopterygidae				2		

Trichoptera

Brachycentridae				1		
<i>Amiocentrus aspilus</i>						
<i>Brachycentrus</i> sp.						
<i>Micrasema</i> sp.						
<i>Micrasema onisca</i>						

Glossosomatidae				0		
------------------------	--	--	--	---	--	--

Helicopsychidae				3		
------------------------	--	--	--	---	--	--

Hydropsychidae				4		
Hydroptilidae				4		
Lepidostomatidae				1		
Leptoceridae				1		
Limnephilidae				4		
Philopotamidae				3		
Polycentropodidae				6		
Pyschomyiidae				2		
Rhyacophilidae				0		
Sericostrimatidae				3		

Odonata

Aeshnidae	3
Calopterygidae	5
Coenagrionidae	9
Cordulegastridae	3
Gomphidae	1
Libellulidae	9

Diptera

Athericidae	2
Blephariceridae	0
Ceratopogonidae	6
Chironomidae R	8
Chironomidae O	6
Dolichopodidae	4
Empididae	6
Ephydridae	6
Pyschodidae	10
Simuliidae	6
Muscidae	6
Syrphidae	10
Tabanidae	6
Tipulidae	3

Coleoptera

Dryopidae	5
Elmidae	4
Psephenidae	4

Megaloptera

Corydalidae	0
Sialidae	4

Lepidoptera

Pyrilidae	5
-----------	---

Amphipoda

Gammaridae	4
Talitridae	8

Isopoda

Asellidae	8
-----------	---

tal plain rivers

Family Level Benthic Macroinvertebrates Worksheet

Data Entry

Ephemeroptera	C	Number	MFB Value	Calc MFB
Baetidae	1	12	4	48
Caenidae	1	23	7	161
Ephemerellidae			1	0
Heptageniidae			4	0
Tricorythidae			4	0
				0
Totals	2	35	20	209

Plecoptera	C	Number	MFB Value	Calc MFB
Capniidae	1	1	1	1
Chloroperlidae			1	0
Nemouridae			2	0
Perlidae			1	0
Perlodidae	1	3	2	6
Taeniopterygidae			2	0
Totals	2	4	9	7

Trichoptera	C	Number	MFB Value	Calc MFB
Brachycentridae			1	0
Glossosomatidae	1	35	0	0
Helicopsychidae			3	0
Hydropsychidae			4	0
Hydroptilidae	1	31	4	124
Lepidostomatidae			1	0
Leptoceridae			1	0
Limnephilidae			4	0
Philopotamidae	1	7	3	21
Polycentropodidae			6	0
Psychomyiidae			2	0
Rhyacophilidae	1	9	0	0
Sericostomatidae			3	0
Totals	4	82	32	145

Odonata	C	Number	MFB Value	Calc MFB
Aeshnidae			3	0
Calopterygidae			5	0
Coenagrionidae			9	0
Cordulegastridae			3	0
Gomphidae			1	0
Libellulidae			9	0
Totals	0	0	30	0

Diptera	C	Number	MFB Value	Calc MFB
Athericidae			2	0
Blephariceridae			0	0
Ceratopogonidae			6	0
Chironomidae R	1	1	8	8
Chironomidae O	1	12	6	72
Dolichopodidae			4	0
Empididae			6	0
Ephydriidae			6	0
Psychodidae			10	0
Simuliidae			6	0
Muscidae			6	0
Syrphidae			10	0
Tabanidae			6	0
Tipulidae			3	0
Totals	2	13	79	80

Coleoptera	C	Number	MFB Value	Calc MFB
Dryopidae			5	0
Elmidae			4	0
Psephenidae			4	0

Report

Total Specimens	134
MFB	3.29
TR	10
EPT Index	8
EPT/CHIR	9.31

Totals	0	0	13	0

Megaloptera	C	Number	MFB Value	Calc MFB
Corydalidae			0	0
Slalidae			4	0
Totals	0	0	4	0

Lepidoptera	C	Number	MFB Value	Calc MFB
Pyrallidae			5	0
Totals	0	0	5	0

Amphipoda	C	Number	MFB Value	Calc MFB
Gammaridae			4	0
Talitridae			8	0
Totals	0	0	12	0

Isopoda	C	Number	MFB Value	Calc MFB
Asellidae			8	0
Totals	0	0	8	0