Standard Operating Procedure (SOP) 4.2.1.2

Physical/Habitat Quality Form

(CARCD 2001, Written by TAC Visual Assessments work group)

Physical habitat assessments are designed to give an overall rating to the condition of the stream habitat. Such assessments are semi-quantitative in that they are designed to produce a numeric product that is used to rate the stream. This rating system does not rely heavily on empirical measurements but instead relies on the observers' interpretation of the visual appearance of the environment and converting that observation into a numeric rating. This procedure therefore does allow a certain amount of subjectivity; hence, such physical habitat assessments are only semi-quantitative at best. Still they are useful in providing consistent comparisons between streams.

The enclosed California Department of Fish and Game (DFG) Physical/Habitat Quality Form (DFG Water Pollution Control Laboratory, California Stream Bioassessment Procedure, May 1999) is now used widely around the State on high gradient streams as an integral component of citizen bioassessment monitoring. This DFG form is actually based on the U.S. EPA protocol for high gradient version is for use on rocky bottom streams in mountainous regions (United States Environmental Protection Agency, Volunteer Stream Monitoring: A Methods Manual, EPA 841-B-97-003, 1997). The Physical/Habitat Quality Form is often completed at the same time as the macroinvertebrate sample collection procedure. It is also recommend that other citizen monitoring groups (those not currently performing bioassessment) also use this form as a supplement to the California Stream and Shore Walk Visual Assessment. Another version of this protocol, also in EPA's Volunteer Stream Monitoring: A Methods Manual, has been developed for use on low gradient, muddy bottom streams. This form, henceforth referred to as the Habitat Assessment Field Data Sheet for Muddy Bottom Streams, may be more appropriate for groups working in lowland areas. The habitat scoring criteria used in both the DFG Physical/Habitat Quality Form and the Habitat Assessment Field Data Sheet for Muddy Bottom Streams represents a standardized method used around the United States by citizen monitors and professional biologists alike.

INTENSIVE BIOSURVEY: HABITAT ASSESSMENT

County:	State:	
Investigators:		
Site (description):		
Latitude:	Longitude:	
Latitude:	Longitude:	

Weather in past 24 hours:

- □ Storm (heavy rain)
- □ Rain (steady rain)
- □ Showers (intermittent rain)
- Overcast
- Clear/Sunny

Weather now:

- □ Storm (heavy rain)
- Rain (steady rain)
- □ Showers (intermittent rain)
- Overcast
- Clear/Sunny

Sketch of site

On your sketch, note features that affect stream habitat, such as: riffles, runs, pools, ditches, wetlands, dams, riprap, outfalls, tributaries, landscape features, logging paths, vegetation, and roads.

GENERAL CHARACTERISTICS

1.	Water	appearance:			Page 92	5.
	$egin{array}{c} \Theta \\ \Theta \\ \Theta \end{array}$	Clear Milky Foamy	θ Turbid θ Dark brown θ Oily sheen	θOrange θGreenish θOther		
		,	,			
2.	Water	odor:	0 F isher		Page 92	
	θ	Chlorine	θ Rotten eggs	θOther		
3.	Water	temperature:			Page 92	
			°C <i>or</i>	°F		
4.	Appro	ximate width of	f stream channel:		Page 93	
			feet θ Measu	ured θ Estimate	ed	
l						

LOCAL LAND USE

(with	in ab	oout 1/4 mile of the site; adjacent and	l upstream)
Land (have a "2" if c	u ses i an im learly	in the local watershed can potentially pact on a stream. Check "1" if present, having an impact on the stream.	Page 93
1	2	Residential	
θ	θ	Single-family housing	
θ	θ	Multifamily housing	
θ	θ	Lawns	
θ	θ	Commercial/institutional	
1	2	Roads, etc.	
θ	θ	Paved roads or bridges	
θ	θ	Unpaved roads	
1	2	Construction underway on:	
θ	θ	Housing development	
θ	θ	Commercial development	
θ	θ	Road bridge construction/repair	
1	2	Agricultural	
θ	θ	Grazing land	
θ	θ	Feeding lots or animal holding areas	
θ	θ	Cropland	
θ	θ	Inactive agricultural land/fields	
1	2	Recreation	
θ	θ	Power boating	
θ	θ	Golfing	
θ	θ	Camping	
θ	θ	Swimming/fishing/canoeing	
θ	θ	Hiking/paths	
1	2	Other	
θ	θ	Mining or gravel pits	
θ	θ	Logging	
θ	θ	Industry	
θ	θ	Oil and gas drilling	
θ	θ	I rash dump	
θ	θ	Landills	

HABITAT ASSESSMENT FIELD DATA SHEET

ROCKY BOTTOM SAMPLING

Habitet		Cate	agory	
Parameter	Optimal	Suboptime	Marginal	Poor
1. Attachment Sites for Macro- invertebrates Page 93	Well developed riffle and run; riffle is as wide as stream and length extends 2 (imax the width of stream; orbible predominate; Uophies and gravel common 20 19 18 17 16	Riffle is as wide as stream but length is leas than 2 times width: cobble tess abundant; boulders and gravel common.	Run area may be lacking; rittle not as will as stream and its length is less than 2 times the stream width: gravel or large boulders work bedrock prevalent; some crabble present. 10. 9 8 7 6	Riffles or run virtually nonexistent; large boulders and bedrock provalent; cobble lacking.
2. Embaddedness Page 93	Fine sediment surrounds and fills in 0-25% of the fiving spaces around and in between the gravel, nobble, and boulders.	Fine sediment surrounds and filts in 25-50% of the living speces around and in between the gravel, cobble, end boulders.	Fine sediment surrounds and fills in 50.75% of the living spaces around and in between the gravel, cobble, and boulders.	Five sediment surrounds and fills in more then 75% of the bying spaces around and in between the gravet, cobble, and boulders. 5 4 3 · 2, 1 0
3. Shelter for Fish Page 93	Snegs, submorgod logs, undercut banks, cobble and large rocks, or other stable habitet ere found in over 50% of the site.	Snags, submerged logs, undercut banks, cobble and lerge rocks, or other stable habitat are found in over 30- 50% of the site.	Shaga, submorged logs, undercut banks, cobble and large rocks, or other stable habitat are found in over 10 30% of the site.	Snags, submerge() logs, undercut banks, cobble and large rocks, or other stable habitat are found in less than 10% of the site.
SCORF	20 19 1B 17 16	15 14 19 12 31	,10 ⁺ 9,18,718	5 4 3 2:1 0°
4. Channel Alteration Page 93	Stream straightening, dredging, artificial ambankments, dams or bridge abutments absent or minimal; stream with meandering pattern	Some stream straightening, dredging, artificial embankments or dams present, usually in areas of bridga abutments; no evidence of recent chennel alteration activity.	Artificial embankments present to some extent on both banks; and 40 to 80% of stream site etreightened, drodgod, or otherwise altered.	Banke shored with gabion or cement; over 60% of the stream site straightened and disrupted.
SCORE	20 19 18 17 16	1 5 14 13 1 2 11	-10 ∯ ⊕ <u>7</u> 115.	543210
5. Sectionent Deposition Page 94	Little or no enlargement of islands or point hars and less than 5% of the buttom affected by sediment deposition	Some new increase in bar tomation, mostly from coarse gravel; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, coarse sand on old and new bars; 30-60% of the borrom affected; sediment deposits at stream obstructions and bends; moderate deposition in pools.	Heavy deposits of fina material, increased bar development; more then 50% of the bottom affected: pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 46	19, 14 mm3, 12, 11	10 0 <u>8</u> ,7·6;;	1 5° 4 3 2. 1 0

RUCKY BOTTOM SAMPLING

Hobitat		Cat	ogery	
Parameter	Optimal	Suboptimel	Marginal	Poot
6. Stream Velocity and Depth Combinations Page 94	Slow (< 1 tt/s)/deep (> 1.5 tt); slow/shallow; fast/deep; tast/shallow combinations all present.	3 of the 4 velocity/depth combinations are present; fast current areas generally dominate.	Only 2 of the 4 velocity/depth combinations present. Score lower if fast current creas missing.	Dominated by 3 velocity/depth category (usually slow/shallow areas).
SCORE	20: 19: 08: 07: 08	15. 14 13 12 11	10 9 8 7 5	5 4 3 2 1 0
7. Channel Flow Status Page 94	Water reaches base of both lower banks and minimal emount of channel substrate is exposed.	Water fills >75% of the available channel; <25% of channel substrate is exposed.	Weter tille 25-75% of the available channel and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 .13 12 11	10.9 8 7 6	·5·4 9 2 1·0
8. Bank Vegetative Protection (score each bank) Page 95 Nate: determine left or right aide by facing downstream	More than 90% of the streambank surfaces covered by natural vegetation, including trees, shrubs, or other plants; vegetative disruption, through grazing or mowing, minimal or not evident; almost all plants allowed to grow naturally.	70 90% of the streambank surfaces covered by antural vegetation, but one cless of plants is not well-represented; some vegetative disruption evident; more than one-hall of the potential plant stubble height remaining.	50-70% of the etreembenk surfaces covered by vegetation; patches of bare soil (n closely cropped vegetation common); less than one half of the potential plant stubble beight remaining.	Leas than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 2 inches or less in everage stubble height.
SCORE (LB) SCORE (RB)	Tett Bank, 10 .9 Right Bánk, 10 .9	8.7.6 8.7.6	िंडों 4⊡. 3 5 %1 3.	2 1 0 ·
9, Condition of Banks (score each bank) Page 95	Banke stable; no evidence of erosion or bank faiture; lime potential for future problems.	Moderately stable; infrequent, small erans of crosion mostly healed over.	Moderately unstable; up to 60% of banks in site have areas of erosion; high crosion potential during floods.	Unstable; many eroded areas: "rew" ereas frequent along straight sections and bends; obvious bank collapse or failure; 60- 100% of bank hes erosional scars.
SCORE (1.B) SCORE (RB)	Left Bank - 10 - 9 Right Bank (10) - 9	8 7 6 9 7 5	54.3 54.3	Z 1 0 2 1 D
10. Riparian Vegetative Zone Width (score each bank riparian zone) Page 95 SCORE (I R)	Width of riporian zone >50 feet: no evidence of human activities (i.e., parking kas, roadbeds, clear cuts, mowed arees, or crops) within the riparian zone. Left Bank, 10 9.	Width of riparian zone 35-40 feet.	Width of riparion zone 20-35 feet.	Width of riparian zone < 20 teet. 2 . 1 . 0
SCORE (NU)	Bight Bank 10 9	8 7 8	5 4 3	5 1 0

HABITAT ASSESSMENT FIELD DATA SHEET

MUDDY BOTTOM SAMPLING

Habitat		Categ	jory	
Parameter	Optimal	Suboptimal	Marginel	Poor
1, Simher for Fish and Meuro- Invertebrates Page 99	Shags, submerged logs, undercot banks, rubble or other stelle habitat found over 50% of the site, logs/snags are old fell.	Snags, submerged loge, undercut banks, rubble or other stalile habitiat tound over 30-50% of the site; some old fall, but prependerance of new fall.	Snags, submerged loge, melereut banks, rubble or other stable habitiat found over 10- 30% of the site; appears (metable; some new fall 10: 3: 8: 20.6	Sinegs, submerged logs, undercut benks, tubble or other stable habilier found over less than 10% of the site; no old or new fall
	20, 10, 10, 10	- 19, 17, 12, 12, 14, 11		
2. Pool Substrate Clustecterization Page 100	Pools have mature of substrate materials, with grevel and firm sand prevalent; root mats and submerged vegetation common.	Profis have mixture of soft sand, mud, or elay substrate; mud may be dominant; some rout mate and submerged vegetation present.	Pools have all mud or clay or send substrete, little or no root mat; no submerged vogetation.	Poole have hard pan elay or bedrock substrate; no roof mat or vegetation.
\$CORE	120 19 18 17 10 1	15 14 13 12 JT	10 9 8 7 6	5 4 3 2 1 0
3. Pool Variability Page 100	Even mix of large- shellow, large deep, small-shellow, small- deep pools.	Majority of pools large deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shollow or pools absent.
SCORE	20 19 18 17 JE	-16 14.33 JZ:31	10 9 8 5 7 6	6.4327.03
4. Channel Alteration Page 100	Stream straightening, dradging, artificial embankments, dams or bridge abutments absent or ininimit, stream with meandering pattern.	Some stream arraightening, artificial embankments or dams present, usually in areas of bridge abutments; no evidence of recent channe! alteration activity.	Artificial embnokments present to some extent on both banks; and 40 to 90% of stream site straightened, dredged, or otherwise altered.	Banks shored with gabon or coment; over 80% of the stream site streaghtened and disrupted.
5COBL	120-19-18 17116 -	16-14-13-12-11	10 9 8 7 6.	E 4 3 2 1 0
5. Sediment Deposition Page 100	Less than 20% of stream bottom affected by extensive sediment deposition; minor accumulation of fine and coarse material at snags and submerged vegetation; lipte or no enlargement of islands or point bars.	20-50% of stream bottom affected by extensive sediment deposition; moderate accumulation; substantiel sediment movement only during major storm event; some new ancrease in bar formation.	50-80% of stream bottom attected by extensive sediment deposition; pools shallow, heavily silted: embaokments may be present on both banks; frequent end substantial sediment movement during storm events.	Greater than 80% of stream bottom attented by extensive sediment deposits; mud, silt, and/or send in braided or nonbraided channels; pools almost sbsent due to deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 B 7 B	5 4 3 2 1. 0
6. Chennel Sinuosity Page 100	The bends in the stream would increase the stream length 3 to 4 times longer than it it was in a straight line.	The bends in the stream would increase the stream length 2 to 0 times longer than if it was to a straight line.	The bends in the stream wook! journees the stream length 2 to 1 times longer then it it was an a straight line.	Channel straight; waterway has been channelized.
SCORE	20 19 18 17 16	15 14 13 12 11	יא <u>א פ</u> יטר פיטר	S 4 3 2 1 0

MUDDY BOTTOM SAMPLING

Habitat		Cate	101Y	
Paremeter	Optimal	Subaptimal	Marginal	Рини
7. Channel Flow Status Page 100 SCORE	Weter reaches base of both lower banks and minimal amount of channel abbetrate is exposed. 20 19 18 18 17 17 3	Water fills >75% of the available channel; <25% of channel substrate is exposed.	Water fills 25-75% of the available channel end/or riffle substrates are mostly exposed. 10- 9 -8 -7 -6	Very little water in channel and mostly present as standing pools 5 4 3 2 1 0
S. Bank Vegetative Protection Page 100 Note: determine left or right side by taking downstream	More than 90% of the streambank sturfaces covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes: vegetative disruption through grazing ru- mowing, minimal or not evident: simost all plants allowed to grow osturally.	20.90% of the streambank surfaces covered by getive vegetation, but one class of plents is not well represented; some vegetative disruption cylight; more then une- half of the potential plant stubble beight remaining.	50-70% of the streambank surfaces covered by vegatetrinit; petches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stybble (reight remaining,	Less than 50% of the streambank surfaces covered by vegetation; disruption of stream- bank vegetation is very high; vegetation has been removed to 2 inches or less in average stubble height.
SCORE(LB) SCORE(RB)	Left Sánk. 10.19. Ríght Bank 10.19	.8 7 6 .8 7	.4	2 1 0
9. Condition of Banks Page 100	Banks stable; no evidence of erosion or bank failure; little potential for future problems.	Moderately stable; infrequent, small areas of crosion mostly healed over.	Moderately unstable: up to 60% of banks in aite have areas of erosion; high crosion potentia! ditring floods.	Unstable; many eroded araas, "reve" areas frequent along straight sections and benufs; obvious bank collapse or failure, 60-100% of bank has crosional scare.
SCORE(LB) SCORE(AB)	Left Bank: 10-9 Right Bank: 1.10-9	9.7.6. 8.7.6	5 4 3 5 4 3	.2: 1 0 2 1 T. 0
10. Riperian Vegetativo Zona Width (score each bank riparian zone) Page 100	Width of riparian zone > 50 (eet; human activities (i.e. perking lots, roadbeds, clear cuts, lawns, or crops) have not affected riparian zone.	Width of riperian zone 35-40 feet.	Width of riparian zone (20 35 feet.	Width of reparian zone < 20 feet.
SCORE (RB)	Right Bank 10 9	8 (7 E)		2 1 0

Total Score ____

HABITAT ASSESSMENT GUIDE

Percent Similarity to Reference Score	Habitat Quality Category	General Attributes
> 90%	Excellent	Comparable to the best situation to be expected within an ecoregion. Excellent overall habitat structure conducive to supporting healthy biological community.
75-88%	Good	Habitat structure slightly impaired. Diverse instream habitat generally well-developed. Some degradation of riparian zone and banks. A small amount of channel alteration may be present.
60-73%	Fair	Loss of habitat compared to reference. Habitat is a major limiting factor to supporting a healthy biological community.
< 58%	Poor	Severe habitat alteration at all levels.

NOTE: If your score falls between ranges consider the site's habitat assessment results and chemical data, if available, in making your decision.

Overall Assessment:

Page 106

- Excellent
- Good
- Fair
- D Poor

COMMENTS:

STREAM HABITAT WALK

Stream Name:		
County:	State:	
Investigators:		
Site (description):		
Latitude:	Longitude:	
Site or Man Number		

Weather in past 24 hours:

- □ Storm (heavy rain)
- □ Rain (steady rain)
- □ Showers (intermittent rain)
- Overcast
- Clear/Sunny

Weather now:

- □ Storm (heavy rain)
- Rain (steady rain)
- □ Showers (intermittent rain)
- Overcast
- Clear/Sunny

Sketch of site

On your sketch, note features that affect stream habitat, such as: riffles, runs, pools, ditches, wetlands, dams, riprap, outfalls, tributaries, landscape features, logging paths, vegetation, and roads.

PHYSICAL CHARACTERIZATION

In-Stream Characteristics

	(You can check more i	than 1 habitat)			
	·		/ .		
1	Pool(s)	θ Riffle(s)	θ Run(s)	
2.	Nature of particles	in the strear	n bottom at si	te	Page 48
			None/Little	Some	Most
	Silt/Clay/Mud				
	Sand (up to 0.1" in	diam.)			
	Gravel (0.1 - 2" in di	am.)			
	Cobbles (2 - 10" in c	liam.)			
	Boulders (over 10" in	n diam.)			
	Bedrock (solid)				
3.	Pick the category t which gravel, cobb bottom are embed	hat best des les, and bou led (sunk) in	cribes the ext Iders on the s I silt. sand. or	ent to tream mud.	Page 49
	A Somewhat/not	embedded (()-25%) A Mos	tlv embedde	d (75%)
	A Halfway embedd	lod (50%)			addad (100%
	0 Hallway embedd	ieu (3078)	0 0011		
4.	Presence of logs o	r large wood	ly debris in st	ream:	Page 49
	θ None	θ Occasi	onal θ	Plentiful	
5.	Presence of natura (i.e., leaves and twi	illy-occurring igs, etc.) in s	g organic mate stream:	erial	Page 49
	θ None	θ Occasi	onal θ	Plentiful	
6.	Water appearance:				Page 49
	θ Clear	0 Light b	rown θ	Orange	
	θ Milky	θ Dark bi	rown θ	Greenish	
	θ Foamy θ Turbid	θ Oilysh	een θ	Other	
7	Water odor:				Page 50
· ·		0 Fieby	0	Nono	Tage 50
	θ Sewage θ Chlorine	θ Rotten	eaas θ	Other	
	•••••••••••••••••••••••••••••••••••••••	0.10000	-99-	0	
8.	water temperature				Page 50
		°C	r	°F	

Streambank and Channel Characteristics

9.	(a) Approxi			(f4	Page 50
		< 11	0 1-21	() > 2	it.	
				(f4	
	0	< 111	0 1-2 II	t t	J > Z	it.	
10.	Approxima	te widtl	h of stream chan	nel:			Page 50
		feet	θ measured θ	estima	ted		
11.	Stream velo	ocity:	ft/sec				Page 50
12.	Looking up best fits the	estream shape	i (100 yds.), pick e of the stream b	the desc ank and	riptio the cl	n that nannel.	Page 50
	(a) Stream	bank:					
	Left				Right		
	θ	V	ertical/undercut		θ		
	θ	S	steeply sloping (> 3	30°)	θ		
	θ	G	Gradual/no slope («	< 30°)	θ		
	(b) Extent o	of artific	cial bank modific	ations:			
	Left				Right		
	θ	В	ank 0-25% cover	ed	θ		
	θ	B	ank 25-50% cove	red	θ		
	θ	В	ank 50-75% cove	red	θ		
	A	В	ank 75-100% cov	erea	θ		
	(c) Shape c	of the cl	hannel:				
	θ	Narrow	, deep 6	Wide,	deep		
	θ	Narrow	r, shallow 6	Wide,	shallo	N	
13.	Looking up	stream	(100 yds.), desc	ribe the			Page 51
	streamside	cover.	Check "1" if pre	sent, "2 '	' if co	mmon	
	(a) Along w	vater's e	edge and stream	bank on	ly:		
	L	eft			Rig	jht	
	1	2			1	2	
	θ	θ	Trees		θ	θ	
	θ	θ	Bushes, shrubs	;	θ	θ	
	θ	θ	Tall grasses, fe	rns, etc.	θ	θ	
	θ	θ	Lawn		θ	θ	
	θ	θ	Boulders/rocks		θ	θ	
	θ	θ	Gravel/sand		θ	θ	
	θ	θ	Bare soil		θ	θ	
	θ	θ	Pavement, stru	ctures	θ	θ	

(b) From the top of the streambank out to 25 yards.

			Le	ft	Right		
			1	2	1 2		
			θ	θ	Trees $\theta = \theta$		
			θ	θ	Bushes, shrubs $\theta = \theta$		
			θ	θ	Tall grasses, ferns, etc. $\theta = \theta$		
			θ	θ	Lawn θ θ		
			θ	θ	Boulders/rocks θ θ		
			θ	θ	Gravel/sand θ θ		
			θ	θ	Bare soil $\theta = \theta$		
			θ	θ	Pavement, structures $\theta = \theta$		
I.	Pick whic	the h ve	catego getati	ory that on sha	at best describes the extent to ades the stream at your site.	Pa	age
	θΟ	%	θ	25%	θ 50% θ 75% θ 100%		
j.	Lool	king	upstre	eam, n	note general conditions. Check	P	age
	"1" i	f pre	sent,	"2" if	severe problem is clearly		
	L	eft				R	ight
	L 1	eft 2	Stre	eam B	anks	Ri 1	ight 2
	Ц 1 Ө	eft 2 θ	Stre Nati	eam Ba	anks reamside plant cover degraded	Ri 1 0	ight 2 θ
	ι 1 θ θ	eft 2 θ θ	Stre Nati	eam B ural sti iks coll	anks reamside plant cover degraded lapsed/eroded	R i 1 θ θ	ight 2 θ θ
	μ 1 θ θ θ	eft 2 θ θ	Stre Nati Ban Gar	eam B aural sti ural sti iks coll bage/j	anks reamside plant cover degraded lapsed/eroded unk adjacent to the stream	R i 1 θ θ	ight 2 θ θ θ
	L 1 0 0 0 0	eft 2 θ θ θ θ	Stre Nati Ban Gar Foa	eam B aural str liks coll bage/j lm or s	anks reamside plant cover degraded lapsed/eroded unk adjacent to the stream sheen on bank	R i 1 θ θ θ θ	ight 2 θ θ θ
	L 1 0 0 0 0 1	eft 2 θ θ θ θ	Stre Nati Ban Gar Foa	eam B ural sti ks coll bage/j m or s eam C	anks reamside plant cover degraded lapsed/eroded unk adjacent to the stream sheen on bank hannel	R i θ θ θ	ight 2 θ θ θ θ 2
	L 1 0 0 0 0 0 1 0	eft 2 θ θ θ θ 2 θ	Stre Natu Ban Gar Foa Stre Muc	eam B ural str iks coll bage/j im or s eam C d, silt, d	anks reamside plant cover degraded lapsed/eroded unk adjacent to the stream sheen on bank hannel or sand in or entering the stream	R i θ θ θ 1 θ	ight 2 θ θ θ θ 2 θ
	L 9 9 9 1 9	eft 2 θ θ θ θ 2 θ θ	Stre Nati Ban Gar Foa Stre Muc Gar	eam B ural sti iks coll bage/j im or s eam C d, silt, o bage/j	anks reamside plant cover degraded lapsed/eroded unk adjacent to the stream sheen on bank hannel or sand in or entering the stream unk in the stream	R i θ θ θ θ θ θ	ight 2 θ θ θ 0 2 θ θ
	L 1 0 0 0 0 1 0 0 1	eft 2 θ θ θ θ 2 θ θ θ	Stre Natu Ban Gar Foa Stre Muc Gar	eam B ural struks coll bage/j im or s eam C d, silt, o bage/j er	anks reamside plant cover degraded lapsed/eroded unk adjacent to the stream sheen on bank hannel or sand in or entering the stream unk in the stream	Ri 9 9 9 1 9	ight 2 θ θ θ 2 θ θ 2
	L 1 0 0 0 1 0 0 1 0 0	eft 2 θ θ θ 2 θ 2 θ 2 θ	Stree Natu Ban Gar Foa Stree Muc Gar Oth Yare	eam B ural stri bage/j m or s eam C d, silt, d bage/j er d wast	anks reamside plant cover degraded lapsed/eroded unk adjacent to the stream sheen on bank hannel or sand in or entering the stream unk in the stream	R i θ θ θ 1 θ θ	ight 2 θ θ θ θ 2 θ θ 2 θ
	L 1 0 0 0 0 1 0 0 1 0 0 0	eft 2 θ θ θ 2 θ θ 2 θ θ θ	Stre Natu Ban Gar Foa Stre Gar Oth Yard	eam B ural stri bage/j m or s eam C d, silt, o bage/j er d wast estock	anks reamside plant cover degraded lapsed/eroded unk adjacent to the stream theen on bank hannel or sand in or entering the stream unk in the stream te on bank (grass, clippings, etc.) in or with unrestricted access to stream	Ri θ	ight 2 θ θ θ 2 θ θ 0 2 θ θ 0
	L 1 0 0 0 0 1 0 0 0 0 0 0 0 0	eft 2 θ θ θ θ θ θ θ θ θ θ θ θ θ θ θ θ θ θ	Stree Natu Ban Gar Foa Stree Muc Gar Oth Yaro Live Acti	eam B ural stri ks coll bage/j m or s eam C d, silt, d bage/j er d wast estock vely di	anks reamside plant cover degraded lapsed/eroded unk adjacent to the stream sheen on bank hannel or sand in or entering the stream unk in the stream e on bank (grass, clippings, etc.) in or with unrestricted access to stream ischarging pipe(s)	Ri θ	ight 2 0 0 0 0 2 0 0 0 0 0 0 0 0 0
	L 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0	eft 2 θ θ θ θ θ θ θ θ θ θ θ θ θ	Stree Natu Ban Gar Foa Stree Muc Gar Oth Yaro Live Acti Oth	eam B ural stri ks coll bage/j m or s eam C d, silt, o bage/j er d wast estock vely di er pipe	anks reamside plant cover degraded lapsed/eroded unk adjacent to the stream sheen on bank hannel or sand in or entering the stream unk in the stream ere on bank (grass, clippings, etc.) in or with unrestricted access to stream ischarging pipe(s) e(s) entering the stream	Ri 1 θ	ight 2 θ θ θ θ 2 θ θ θ θ θ θ θ θ θ θ θ

Local Watershed Characteristics											
	(within about 1/4 mile of the site; adjacent and upstream)										
16.	Land an imp clearly	uses pact o y hav	in the local watershed can potentially have on a stream. Check "1" if present, "2" if ing an impact on the stream.	Page 53							
	1	2	Residential								
	θ	θ	Single-family housing								
	θ	θ	Multifamily housing								
	θ	θ	Lawns								
	θ	θ	Commercial/institutional								
	1	2	Roads, etc.								
	θ	θ	Paved roads or bridges								
	θ	θ	Unpaved roads								
	1	2	Construction underway on:								
	θ	θ	Housing development								
	θ	θ	Commercial development								
	θ	θ	Road bridge construction/repair								
	1	2	Agricultural								
	θ	θ	Grazing land								
	θ	θ	Feeding lots or animal holding areas								
	θ	θ	Cropland								
	θ	θ	Inactive agricultural land/fields								
	1	2	Recreation								
	θ	θ	Power boating								
	θ	θ	Golfing								
	θ	θ	Camping								
	θ	θ	Swimming/fishing/canoeing								
	θ	θ	Hiking/paths								
	1	2	Other								
	θ	θ	Mining or gravel pits								
	θ	θ	Logging								
	θ	θ	Industry								
	θ	θ	Oil and gas drilling								
	θ	е Н	i rash dump								
	9	Ð	Lanumis								

BIOLOGICAL CHARACTERIZATION

V

ISU.								21. If macroinvertebrates were collected from the stream Page 53						Page 53
17. W	ild	life in or aroun	d t	he stream? (Mark	all	that apply)	age 53	θ Rock-rubbing method: From cobbles and large stones selecte					elected	
	θ	Amphibians	θ	Waterfowl 0 F	kep	itiles θ Mamn	mals	f the first first for the firs			from riffles.	from riffles.		
18. Fi	sh θ	in the stream? No	(Л Ө	<i>lark all that apply)</i> Yes, but rare	θ	Yes, abundant	age 53	θ	Stick-picking method:		From woody ob silty bottoms.	ject	s in streams w	ith sandy,
	θ	Small (1-2 in.)	θ	Medium (3-6 in.)	θ	Large (7 in. and abo	ove)	θ	Leaf-pack sorting meth	nod	: From submerge either a rocky o	ed l r sa	eaves in strea ndy, silty botto	ms with om.
A	re	there any barrier	's t	o fish movement?				22 L	Are macroinvertebrate	s n	resent?			Dama 54
	θ	Beaver dams	θ	Waterfalls > 1'	θ	None		,		o p				Page 54
	θ	Dams	θ	Road barriers	θ	Other			θ Νο	θ	Yes, but rare	θ	Yes, abundai	nt
19. A	9. Aquatic plants in the stream. (Mark all that apply)							23. li	f present, describe the	e ty	pes of macroinve	rte	orates	Page 54
	θ	None	θ	Occasional	θ	Plentiful		f	ound.					
	θ	Attached	θ	Free-floating				(1	Mark all that apply)					
	θ	Stream margin	θ	Pools	θ	Near riffle			Wormlike	θ	Occasional	θ	Plentiful	
20. E	0. Extent of algae in the stream. (Mark all that apply)					age 53		Snails/clamlike	θ	Occasional	θ	Plentiful		
(a)	Ar st	e the submerge ream coated with	d s h a	tones, twigs, or oth layer of algal "slime	er e"?	material in the	<u> </u>		Insects Cravfish	θ θ	Occasional Occasional	θ θ	Plentiful Plentiful	
	θ	None	θ	Occasional	θ	Plentiful			Craynon	Ŭ	Coccontra	Ŭ		
	θ	Light coating	θ	Heavy coating			F							
	θ	Brownish	θ	Greenish	θ	Other		С	OMMENTS: (Note)	cha	nges or potential i	orot	lems such as	spills.
(b)	Ar	e there any filan	ner	ntous (string-like) al	ga	e?		ne	ew construction, type of	dis	charging pipes)			-1 -,
	θ	None	θ	Occasional	θ	Plentiful								
	θ	Brownish	θ	Greenish	θ	Other								
(c)	Ar Wa	e any detached ater's surface?	"cl	umps" or "mats" of a	alg	ae floating on the								
	θ	None	θ	Occasional	θ	Plentiful								
	θ	Brownish	θ	Greenish	θ	Other								

MACROINVERTEBRATE SURVEY (Optional)

STREAMSIDE BIOSURVEY: HABITAT WALK

County:	State:	
Investigators:		
Site (description):		
Latitude:	Longitude:	
Site (description):	Longitude:	

Weather in past 24 hours:

- □ Storm (heavy rain)
- □ Rain (steady rain)
- □ Showers (intermittent rain)
- Overcast
- Clear/Sunny

Weather now:

- □ Storm (heavy rain)
- Rain (steady rain)
- □ Showers (intermittent rain)
- Overcast
- Clear/Sunny

Sketch of site

On your sketch, note features that affect stream habitat, such as: riffles, runs, pools, ditches, wetlands, dams, riprap, outfalls, tributaries, landscape features, logging paths, vegetation, and roads.

	In-Stre	eam Characteri	istics		Streambank and Channel Characteristics						
1. Check (You ca θ	which stream an check more th Pool(s)	h abitats are prese an 1 habitat) θ Riffle(s) θ F	nt: Run(s)	Page 73	10.	(a) Appro	ximat ∂ < 1 1	e depth of run ft θ 1	(s): -2 ft	$\theta > 2 \text{ ft}$	Page 7
2. Nature	e of particles in	n the stream bottom	n at site	Page 73		(b) Appro) < 11 € < 11	ft θ 1	DI(S): -2 ft	$\theta > 2 \text{ ft}$	
		P	ercent		11.	Approxin	nate w	vidth of stream	channel:		Page 7
Si	ilt/Clay/Mud						feet	θ measure	d θ estin	nated	
Sa	and (up to 0.1"	in diam.)			12.	Stream v	elocity	y:	ft/sec.		Page
C	obbles (2 - 10" oulders (over 10	in diam.)			13.	Looking best fits	upstre the sha	eam (100 yds.), ape of the stre	pick the de am bank an	scription that d the channel	Page
Be	edrock (solid)	, _				(a) Streai	m banl	k:			
3. Pick ti	he category th	TOTAL at best describes th	100% ne extent to	Page 74		L. (eft)	Vertical/unde	rcut	Right θ	
which bottor	gravel, cobble m are embedde	es, and boulders on ed (sunk) in silt, sar	the stream id, or mud.	Tuge / 4		(Ð	Gradual/no s	lope (< 30°)	θ	
θ \$	Somewhat/not e	embedded (0-25%) θ	Mostly embedded	1(75%)		(b) Exten	t of an	tificial bank m	odifications	:	
θH	alfwayembedde	ed (50%) 0	Completely embe	dded (100%)		L	eft			Right	
1 Stroop	nhad sinks han	ooth your foot in:				(Ð	Bank 0-25%	covered	θ	
θ. Stream	No spots	θ A few spots	θ Many spots	Page 74		(+ + -	Bank 25-50% Bank 50-75%	covered	θ θ	
5. Prese	nce of logs or	large woody debris	in stream:	Page 74		t	7	Darik 75-100	% covered	θ	
θ	None	θ Occasional	θPlentiful			(c) Shape	e of the	e channel:			
6. Prese	nce of natural	ly-occurring organic	c material	Page 74		(NarıNarı	row, deep row, shallow	θ Wide θ Wide	e, deep e, shallow	
(т.е., к Ө	None	θ Occasional	θPlentiful		14.	Looking streamsi	upstre de cov	eam (100 yds.), /er	describe th	e	Page
7. Water	appearance:			Page 74		(a) Along	water	r's edge and st	ream bank o	only:	
θ	Clear	θTurbid	θOrange			Left	(Perce	ent)	F	Right (Percent)	1
θ	Milky	θ Dark brown	θGreenish			-		Trees			
θ	гоату	e Oliy sheen	aOrner			-		_ Bushes, s	shrubs		
3. Water	odor:			Page 74		-		_ Tall grass	ses, ferns, etc	D	
θ	Sewage	θFishy	θNone			-		_ Lawn	rooko		
θ	Chlorine	θ Rotten eggs	θOther			-		_ Boulders/	TUCKS		
9. Water	temperature:			Page 74		-		Bare soil	inu		
		°C <i>or</i>	°F			-		Pavemen	t. structures		
					Тот	ALS	100%		.,	100%	

(b) Fron	n the	top of the s	treambank (out to 25 ya	rds.		
		Lef	t (Percent)			Right (Percen	t)	
				Trees			-	
				Bushes, shru	ubs			
				Tall grasses,	ferns, etc.			
				Lawn				
				Boulders/roc	ks			
				Gravel/sand				
				Bare soil				
		-		Pavement, s	tructures			
T	OTAL	S	100%			100%		
15.	Pick vege	the c tatio	ategory than shades th	t best descr e stream at ;	ibes the ext your site.		F	Page 77
	0 07	/0	0 23%	0 30%	0 75%	0 100%		
16.	Look Chec	cing ι ck "1"	i pstream, n if present, "2	o te general (2" if severe pi	conditions.	arly evident.	F	Page 77
	L	eft					Ri	ght
	1	2	Stream Ba	nks			1	2
	θ	θ	Natural str	eamside plar	nt cover degra	aded	θ	θ
	θ	θ	Banks colla	apsed/erodec			θ	θ
	θ	θ	Garbage/ju	Ink adjacent	to the stream	1	θ	θ
	θ	θ	Foam or si	neen on bank	K		θ	θ
	1	2	Stream Ch	annel			1	2
	θ	θ	Mud, silt, c	r sand in or e	entering the s	stream	θ	θ
	θ	θ	Garbage/ju	ink in the stre	eam		θ	θ
	1	2	Other				1	2
	θ	θ	Yard waste	e on bank (gr	ass, clipping	s, etc.)	θ	θ
	θ	θ	Livestock i	n or with unre	estricted acce	ess to stream	θ	θ
	θ	θ	Actively dis	scharging pip	e(s)		θ	θ
	θ	θ	Other pipe	(s) entering t	he stream		θ	θ
	θ	θ	Ditches en	tering the str	eam		θ	θ

(within about 1/4 mile of the site; adjacent and upstream) 1 Land uses in the local watershed can potentially have an impact on a stream. Check "1" if present, "2" if clearly having an impact on the stream. 1 2 Residential 0 0 Single-family housing 0 0 Multifamily housing 0 0 Lawns 0 0 Commercial/institutional 1 2 Roads, etc. 0 0 Commercial development 0 0 Unpaved roads 1 2 Construction underway on: 0 0 Commercial development 0 0 Grazing land 0 0 Grazing land 0 0 Inactive agricultural land/fields 1 2 Recreation 0 0 Inactive agricultural land/fields 1 2 Other 0 0 Swimming/fishing/canoeing 0 0 Swimming/fishing/canoeing 0 0 Hausing a drilling 0 0 Swimming/fishing/canoeing	Local Watershed Characteristics										
 17. Land uses in the local watershed can potentially have an impact on a stream. Check "1" if present, "2" if clearly having an impact on the stream. 1 2 Residential 0 0 Single-family housing 0 0 Lawns 0 0 1 2 Roads, etc. 0 0 Paved roads or bridges 0 0 Unpaved roads 1 2 Construction underway on: 0 0 Housing development 0 0 Commercial development 0 0 Road bridge construction/repair 1 2 Agricultural 0 0 Grazing land 0 0 Inactive agricultural land/fields 1 2 Recreation 0 0 Camping 0 Cater 0 0 Cother 0 <l< th=""><th colspan="11">(within about 1/4 mile of the site; adjacent and upstream)</th></l<>	(within about 1/4 mile of the site; adjacent and upstream)										
1 2 Residential 0 Single-family housing 0 Multifamily housing 0 Lawns 0 Commercial/institutional 1 2 Roads, etc. 0 Paved roads or bridges 0 Unpaved roads 1 2 Construction underway on: 0 Housing development 0 Commercial development 0 Road bridge construction/repair 1 2 Agricultural 0 Grazing land 0 Feeding lots or animal holding areas 0 Cropland 0 Inactive agricultural land/fields 1 2 Recreation 0 Qoffing 0 Camping 0 Swimming/fishing/canoeing 1 2 Other 0 Mining or gravel pits 0 Hiking/paths 1 2 Other 0 Industry 0 Industry 0 Industry	17.	17. Land uses in the local watershed can potentially have an impact on a stream. Check "1" if present, "2" if clearly having an impact on the stream.									
θ Single-family housing θ Multifamily housing θ Lawns θ Commercial/institutional 1 2 Roads, etc. θ Paved roads or bridges θ Unpaved roads 1 2 Construction underway on: θ 0 Unpaved roads 1 2 Construction underway on: θ 0 Housing development θ 0 Commercial development θ 0 Commercial development θ 0 Commercial development θ 0 Commercial development θ 0 Grazing land θ Grazing land Pereding lots or animal holding areas θ Cropland Inactive agricultural land/fields 1 2 Recreation θ Power boating Swimming/fishing/canoeing θ Osofing Swimming/fishing/canoeing θ Swimming/fishing/canoeing Power boating θ Other Cogging θ L		1	2	Residential							
θ Multifamily housing θ Lawns θ Commercial/institutional 1 2 Roads, etc. θ Paved roads or bridges θ Unpaved roads 1 2 Construction underway on: θ Housing development θ Housing development θ Road bridge construction/repair 1 2 Agricultural θ Grazing land θ Feeding lots or animal holding areas θ Cropland θ Inactive agricultural land/fields 1 2 Recreation θ Golfing θ Comming/fishing/canoeing θ Hiking/paths 1 2 Other θ Logging θ Industry θ Oil and gas drilling θ Trash dump θ Logfills		θ	θ	Single-family housing							
θ Lawns θ Commercial/institutional 1 2 Roads, etc. θ θ Paved roads or bridges θ θ Unpaved roads 1 2 Construction underway on: θ θ Housing development θ θ Housing development θ Road bridge construction/repair 1 2 Agricultural θ Grazing land θ Feeding lots or animal holding areas θ Cropland θ Inactive agricultural land/fields 1 2 Recreation θ Golfing θ Camping θ Swimming/fishing/canoeing θ Hiking/paths 1 2 0 Logging θ Industry θ Oil and gas drilling θ Trash dump θ Landfills		θ	θ	Multifamily housing							
θ Commercial/institutional 1 2 Roads, etc. θ Paved roads or bridges θ 0 Unpaved roads 1 2 Construction underway on: θ 0 Unpaved roads 1 2 Construction underway on: θ 0 Housing development θ 0 Commercial development θ 0 Road bridge construction/repair 1 2 Agricultural θ 0 Grazing land θ 0 Grazing land θ 0 Feeding lots or animal holding areas θ 0 Inactive agricultural land/fields 1 2 Recreation θ 0 Inactive agricultural land/fields 1 2 Recreation θ 0 Camping θ 0 Swimming/fishing/canoeing θ 0 Swimming/fishing/canoeing θ 0 Mining or gravel pits θ 0 Logging θ		θ	θ	Lawns							
1 2 Roads, etc. 0 Paved roads or bridges 0 Unpaved roads 1 2 Construction underway on: 0 0 Housing development 0 0 Commercial development 0 0 Commercial development 0 0 Road bridge construction/repair 1 2 Agricultural 0 0 Grazing land 0 0 Inactive agricultural land/fields 1 2 Recreating 0		θ	θ	Commercial/institutional							
θ Paved roads or bridges θ Unpaved roads 1 2 Construction underway on: θ Housing development θ Power commercial development θ Road bridge construction/repair 1 2 Agricultural θ Recreation θ Grazing land θ Feeding lots or animal holding areas θ 0 0 Feeding lots or animal holding areas θ 0 1 2 Recreation θ Power boating θ Power boating θ Golfing θ Swimming/fishing/canoeing θ Hiking/paths 1 2 0 Mining or gravel pits θ Logging θ Oil and gas drilling θ Oil and gas drilling θ Undustry θ Undustry θ Undustry θ Undustry θ Undills		1	2	Roads, etc.							
θ Unpaved roads 1 2 Construction underway on: θ Housing development θ Q 0 Road bridge construction/repair 1 2 Agricultural 0 0 Grazing land 0 0 Grazing land 0 0 Feeding lots or animal holding areas 0 0 Feeding lots or animal holding areas 0 0 Cropland 0 0 Inactive agricultural land/fields 1 2 Recreation 0 0 Camping 0 0 Golfing 0 0 Swimming/fishing/canoeing 0 0 Swimming/fishing/canoeing 0 0 Hiking/paths 1 2 Other 0 0 Logging 0 0 Industry 0 0 Industry 0 0 Industry 0 0 Landfills		θ	θ	Paved roads or bridges							
1 2 Construction underway on: 0 0 Housing development 0 0 Commercial development 0 0 Road bridge construction/repair 1 2 Agricultural 0 0 Grazing land 0 0 Feeding lots or animal holding areas 0 0 Feeding lots or animal holding areas 0 0 Inactive agricultural land/fields 1 2 Recreation 0 0 Inactive agricultural land/fields 1 2 Recreation 0 0 Golfing 0 0 Camping 0 0 Swimming/fishing/canoeing 0 0 Hiking/paths 1 2 Other 0 0 Industry 0 0 Industry 0 0 Ind gas drilling 0 0 Industry 0 0 Landfills		θ	θ	Unpaved roads							
 θ θ Housing development θ Commercial development θ Road bridge construction/repair 1 2 Agricultural θ Grazing land θ Feeding lots or animal holding areas θ Cropland θ Inactive agricultural land/fields 1 2 Recreation θ Golfing θ Golfing θ Camping θ Swimming/fishing/canoeing θ Hiking/paths 1 2 Other θ Mining or gravel pits θ Olil and gas drilling θ Trash dump θ Landfills 		1	2	Construction underway on:							
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θ Road bridge construction/repair 1 2 Agricultural θ 9 Grazing land θ 9 Feeding lots or animal holding areas θ 9 Feeding lots or animal holding areas θ 9 Cropland θ 9 Cropland θ 9 Inactive agricultural land/fields 1 2 Recreation θ 9 Power boating θ 9 Power boating θ 9 Camping θ 9 Camping θ 9 Swimming/fishing/canoeing θ 9 Swimming/fishing/canoeing θ 9 Hiking/paths 1 2 Other θ 9 Logging θ 0 Industry θ 0 I and gas drilling θ 9 0 I and fills		θ	θ	Commercial development							
12AgriculturalθθGrazing landθθFeeding lots or animal holding areasθθCroplandθθInactive agricultural land/fields12RecreationθθPower boatingθθGolfingθθCampingθθSwimming/fishing/canoeingθθHiking/paths12OtherθθLoggingθθIndustryθΘOil and gas drillingθθTrash dumpθθLandfills		θ	θ	Road bridge construction/repair							
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θ Feeding lots or animal holding areas θ Cropland θ Inactive agricultural land/fields 1 2 Recreation θ θ Power boating θ θ Camping θ θ Camping θ θ Swimming/fishing/canoeing θ θ Hiking/paths 1 2 Other θ θ Logging θ θ Industry θ 0il and gas drilling θ θ Trash dump θ θ Landfills		θ	θ	Grazing land							
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$ \begin{array}{cccc} \theta & \theta & \text{Power boating} \\ \theta & \theta & \text{Golfing} \\ \theta & \theta & \text{Camping} \\ \theta & \theta & \text{Swimming/fishing/canoeing} \\ \theta & \theta & \text{Swimming/fishing/canoeing} \\ \end{array} $		1	2	Recreation							
$ \begin{array}{cccc} \theta & \theta & \text{Golfing} \\ \theta & \theta & \text{Camping} \\ \theta & \theta & \text{Swimming/fishing/canoeing} \\ \theta & \theta & \text{Hiking/paths} \\ \end{array} $		θ	θ	Power boating							
$ \begin{array}{cccc} \theta & \theta & \text{Camping} \\ \theta & \theta & \text{Swimming/fishing/canoeing} \\ \theta & \theta & \text{Hiking/paths} \\ \end{array} $		θ	θ	Golfing							
$ \begin{array}{ccc} \theta & \theta & Swimming/fishing/canoeing \\ \theta & \theta & Hiking/paths \\ \end{array} \\ \begin{array}{ccc} 1 & 2 & \mathbf{Other} \\ \theta & \theta & Mining \ or \ gravel \ pits \\ \theta & \theta & Logging \\ \theta & \theta & Industry \\ \theta & \theta & Oil \ and \ gas \ drilling \\ \theta & \theta & Trash \ dump \\ \theta & \theta & Landfills \\ \end{array} $		θ	θ	Camping							
θ θ Hiking/paths 12Other θ θ Mining or gravel pits θ θ Logging θ θ Industry θ θ Oil and gas drilling θ θ Trash dump θ θ Landfills		θ	θ	Swimming/fishing/canoeing							
12Other θ θ Mining or gravel pits θ θ Logging θ θ Industry θ θ Oil and gas drilling θ θ Trash dump θ θ Landfills		θ	θ	Hiking/paths							
$\begin{array}{cccc} \theta & \theta & \text{Mining or gravel pits} \\ \theta & \theta & \text{Logging} \\ \theta & \theta & \text{Industry} \\ \theta & \theta & \text{Oil and gas drilling} \\ \theta & \theta & \text{Trash dump} \\ \theta & \theta & \text{Landfills} \end{array}$		1	2	Other							
$\begin{array}{llllllllllllllllllllllllllllllllllll$		θ	θ	Mining or gravel pits							
$\begin{array}{llllllllllllllllllllllllllllllllllll$		θ	θ	Logging							
θ θ Oil and gas drilling θ θ Trash dump θ θ Landfills		θ	θ	Industry							
$\theta = \theta$ Trash dump $\theta = \theta$ Landfills		θ	θ	Oil and gas drilling							
		Б Ю	Ð	Landfills							
		0	U	Lanumo							

BIOLOGICAL CHARACTERIZATION

VISUAL BIOLOGICAL SURVEY

18. Fish in the stream? (Mark all that apply)										
	θ	No	θ	Yes, but rare	θ	Yes, abundant				
	θ	Small (1-2 in.)	θ	Medium (3-6 in.)	θ	Large (7 in. and	above)			
19. Are there any barriers to fish movement?										
	θ	Beaver dams	θ	Waterfalls (>1')	θ	None				
	θ	Dams	θ	Road barriers	θ	Other				
20. Ac	20. Aquatic plants in the stream. (Mark all that apply)									
	θ	None	θ	Occasional	θ	Plentiful				
	θ	Attached	θ	Free-floating						
	θ	Stream margin	θ	Pools	θ	Near riffle				
21. Extent of algae in the stream. (Mark all that apply)										
(a)	A st	re the submerge ream coated wi	ed th	stones, twigs, or a layer of algal "s	oth lim	ner material in th ne"?	e			
	θ	None	θ	Occasional	θ	Plentiful				
	θ	Light coating	θ	Heavy coating						
	θ	Brownish	θ	Greenish	θ	Other				
(b)	A	re there any fila	me	entous (string-like	e) a	lgae?				
	θ	None	θ	Occasional	θ	Plentiful				
	θ	Brownish	θ	Greenish	θ	Other				
(c) Are any detached "clumps" or "mats" of algae floating on the water's surface?										
	θ	None	θ	Occasional	θ	Plentiful				
	θ	Brownish	θ	Greenish	θ	Other				

COMMENTS: (Note changes or potential problems such as spills, new construction, type of discharging pipes)