2000 MACRO-INV. FUNCTIONAL ...

FILE: WILZBACH

MEMORANDUM

To: Bob Barnum **Date:** November 1, 2000

From: Steve Horner

Re: HSU Fisheries Class at Redwood Creek

Bob,

Last week I accompanied an HSU fisheries class taught by Dr. Peggy Wilzbach to Redwood Creek to sample stream macroinvertebrates at the rotary screw trap site. The students gathered and identified bugs from the rocks and decaying plant matter of the stream.

Also in attendance were Dr. Kenneth Cummins and Dr. Walt Duffy, both of the DFG Fisheries Cooperative at HSU.

Attached is a summary of the students work. The consensus at the site and conclusions of the students report reflect a stream with an abundant macroinvertebrate population representative of a stream with large and stable substrate, open to sunlight, abundant streamside alder canopy and lower conifer canopy.

Macroinvertebrate Functional Feeding Group Analysis - Upper Redwood Creek: 10/26/2000
by Fish 580 Class

Substratum: Cobble

	Team 1	Team 2	Team 3	Team 4
Shredders	2	0	-	2
Collectors:	(4)	(30)	-	(23)
Gathering	1	4	-	2
Filtering	3	26	-	21
Scrapers	8	2	-	24
Predators	4	0	-	11
Total	18	32	-	60
Scrapers/Shredders + Collectors (~P/R)	1.3	0.07	-	0.92
Scrapers+ Filterers/Shredders + Gatherers (~Substrate Stability)	3.7	0.93	-	1.8

Substratum: Litter

	Team 1	Team 2	Team 3	Team 4
Shredders	25	3	0	-
Collectors:	(13)	(5)	(15)	-
Gathering	13	5	13	-
Filtering	0	0	2	-
Scrapers	12	4	1	-
Predators	3	0	5	-
Total	53	12	21	-
Shredders/Collectors (~CPOM/FPOM)	1.9	0.6		-

Team 1=Blank; Team 2 = Scrapers; Team 3 = Drunken Sumo Wrestlers; Team 4 = Friends of Crawlers

TOTALS:

	All Cobble Samples (n=3)	All Litter Samples (n=3)	Fines Sample (n=1)	Total All Samples
Shredders	4	28	6	38
Collectors:	(57)	(33)	(3)	(93)
Gathering	8	31	3	42
Filtering	51	2	0	53
Scrapers:	34	17	6	57
Predators:	15	8	0	23
Total:	110	86	15	211

Ecosystem Attributes inferred from Functional Group Ratios:

P/R: Scrapers/Shredders + Collectors = 57/131 = 0.44 ; for cobbles alone, P/R = 0.56 (Autotrophy is indicated when ratio > 0.75)

Substrate Stability: Scrapers + Filtering Collectors / Shredders + Gathering Collectors = 110/80 = 1.37 (Substrate Stability an issue when ratio > 0.5; substrate stability not limiting)

FPOM Loading: Filtering Collectors/Gathering Collectors = 53/42 = 1.26 (FPOM Loading is significant when ratio >0.5; loading is occurring)

CPOM/FPOM: Shredders/Total Collectors = 38/93 = 0.41 (community contains normal complement of fall shredder populations when ratio > 0.05; shredder fall component is below prediction); for litter collection alone, ratio = 0.84 – suggesting normal fall shredder component present

Percent Predators = Predators/all others = 23/211 = 10.9% (normal range is 10-15%)

Conclusions: Despite open canopy and wide stream, P/R invertebrate surrogate ratio indicates the stream is heterotrophic (scrapers/shredders + collectors < 0.75). Considering cobble samples alone (ratio of 0.56) still does not put the invertebrate community in the P/R>1 surrogate range. Explanation? Heavy growth of short filamentous algae on all large cobble is primarily entering heterotrophic pathways rather than autotrophic (i.e. for surrogates, filamentous algae is limiting scraper populations). Taking the litter samples alone, the stream would be evaluated as having a normal fall shredder component present (shredders/collectors > 0.5). For all habitats, shredder component is slightly below normal (ratio = 0.41). Stable substrates are in good supply (Large proportion of scrapers and filtering collectors, which require stable substrate, relative to shredders and gathering collectors). FPOM loading is indicated (filtering collectors/gathering collectors > 0.05 [1.26]), probably from the dead and sloughing FPOM generated by the filamentous algae. The predator component, which suggests the potential for providing top down control , is in the normal range (10-15% of total) for most undisturbed stream systems.