Krenn, Sally

From: Heidi Fish [Heidi.Fish@noaa.gov]
Sent: Wednesday, July 31, 2002 3:33 PM
To: Krenn, Sally
Cc: Jon Goin
Subject: PG&G trip and Hollister Ranch access

Hello Sally,

Thank you so much for being so accomodating to our survey last week. John and Morgan have told me how beautiful the property is and what a nice time they had with you. Morgan is so excited that she is invited back to go diving. I am beside myself with envy that I missed out on that trip!!! Perhaps we (me) can come back to those creeks that were dry this year but have salmonid-potential in wetter year. I am feeling much better. Antibiotics fixed whatever was wrong with me, but the cause is still unresolved.

Here is a quick summary of what we found on the PG&E property 25 July 2002 by survey crew members Jon Goin and Morgan Kilgour:

Coon Creek-Two YOY steelhead were observed while snorkeling a 6 meter pool below the culvert barrier. Water temp 15 C at 1140 hrs.
Crowbar Canyon - Dry
Diablo Canyon - one Y+ steelhead was observed in a 1.4 meter pool below the culvert near the mouth. Water temp 16.5 C at 1630 hrs.
Little Irish Canyon - Dry
***Irish Canyon** - Dry...but perhaps revisit in a wetter year.
***Pecho Creek** - Barrier near mouth. Dry.
Rattlesnake Canyon - Snorkel survey not completed. Water temps 16.5 and 18 C in the two pools that were snorkeled. Revisit in a wetter year.
Wild Cherry Canyon - Barrier near mouth.

* It is mentioned on the datasheet that Irish and Pecho hold promise for restoration and that you know the family to contact regarding this. Perhaps you know the Fish and Game Fish-Habitat-Special for the SLO area, Dave Highland (phone # (805)466-0341 and e-mail dhighland@dfg.ca.gov). He would be interested to know about this....

Jon mentioned to me that your husband is the biologist for Hollister Ranch and that he may be able to help us get access to creeks on that property. That sure would be a wonderful thing! May I ask you to forward this request and following stream list to him? (see attached for stream list) I put this stream list together for a trip I am planning for Santa Barbara County. I am coordinating with the Conception Coast Project in Santa Barbara to try and get access to streams of interest south of Gaviota, but would love some help for Hollister Ranch.

Hollister Ranch streams (realizing that some of these may be dry):
Aqua Caliente
Alegria
Cuarta
Sacate

Santa Anita
Aqua
Arroyo El Bulito
(Arroyo San Augustin--It's my understanding that this one is blocked to anadromy by a barrier)
Llegus
Barranca Honda
(Cojo--It's my understanding that this one is blocked to anadromy by a barrier)
Wood - not sure if this is on Hollister Ranch
Black - not sure if this is on Hollister Ranch

We'd also like to survey Jalama Creek on Bixby Ranch /Vandenberg Air Force Base and Canada Honda (VAFB) if we can get access. I am in contact with Vandenberg Air Force Base, so maybe we can access these two creeks from that property.

I sure appreciate your help. I hope to hear back soon about possibly getting permission to survey on Hollister Ranch!

Thank you,

Heidi

--
National Marine Fisheries Service
110 Shaffer Road
Santa Cruz, California 95060

(831)420-3913

Barrier Analysis for Santa Barbara Streams. CCC data, selecting barriers with severity rating of 0.9-1.0 as presumed upper limit to anadromy

"Steelhead" noted only if found below the barriers listed *and* found to be currently present (years 2000-2002).

Stream Name	Barrier ID	Type	Rating	Location	stream miles to ocean	SH Present (Yr)
Rincon	BR_RN_1	culvert and apron barries	1	Hwy 101 crossing	0.16	
Carpenteria	BR_CA_2	private road crossing	0.9	Driveway at 6217 and 6199 Casitas Pass Rd.	2.11	2000 juv & adult
Franklin						
Santa Monica						
Arroyo Paredon	BR_AP_1	bridge and concrete-lined bottom	0.9	Hwy 192 crossing	0.91	2000 juv
Toro Creek						
Romero Creek						2001 juv (in lagoon)
San Ysidro	BR_SY_9	pipe crossing grade control struct.	0.9	100' d/s Debris Basin Dam	2.28	2002 juv
Oak Creek						
Montecito	BR_MO_14	concrete channelization	0.9	Elev. 150'. By Casa Dorina retirement commun.	1.03	2001 juv
Sycamore						
Mission	BR_MN_2	concrete channelization	0.9	Castillo Bridge to u/s of Arrellaga Bridge	1.11	2000 adult
Arroyo Burro	BR_AB_2	grade control stucture	0.9	Elev. 20'.	0.63	
*Atascadero	BR_AO_5	concrete channelization	1	d/s end is d/s of Hospital Creek confluence	3.12	
Maria Ygnacio	BR_AO_MY_13	bridge and apron	0.9	Old San Marcos Road Bridge crossing	4.55	2001 juv, 2000 adult
San Antonio	BR_AO_MY_SA_4	culvert stream crossing	0.9	San Antonio County Park	4.45	
*San Jose	BR_AO_SJ_1	concrete channelization	1	Along Hwy 271 to 30' u/s Hollister Ave	0.97	
San Pedro	BR_AO_SJ_SP_1	grade control stucture	0.9	Downstream from UPRR crossing	1.95	
Las Vegas	BR_AO_SJ_SP_LV_7	Sustained slope exceeding 10%	1	Elevation 360'	4.29	
*Tecolotito						
Glen Annie	BR_AO_TO_GA_5	double box culvert	1	50' d/s of UPRR crossing	3.05	
Carneros	BR_AO_TO_CS_5	waterfall	1	Elevation 300'	6.25	
Bell						
Tecolote	BR_TE_1	culvert stone apron	0.9	UPRR, Hwy 101, SB County Road Crossing	0.26	
Eagle Creek						
Dos Pueblos	BR_DP_1	concrete channelization	0.9	From beach u/s to 0.2 mile.	0-0.2	
Las Vargas						
Gato	BR_GO_2	stream crossing(s)	1	0.2 mile u/s of UPRR culvert	0.42	
Las Llagas						
El Capitan	BR_EC_2	culvert stream crossing	1	Hwy 101/SB County Road crossing	0.35	
Corral	BR_CL_1	culvert stream crossing	1	UPRR/Hwy 101 crossing	0.05	
Venadito						
Refugio	BR_RE_4	culvert stream crossing	0.9	#2 Refugio Road crossing	0.64	
Tajiguas	BR_TS_1	culvert stream crossing	1	UPRR/Hwy 101 crossing	0.02	
Arroyo Quemado	BR_AQ_2	culvert stream crossing	1	UPRR/Hwy 101 crossing	0.11	
Arroyo Hondo	BR_AH_2	boulder cascade	0.9	Elevation 280'	1.33	2001 juv & adult
Molino	BR_ML_1	culvert stream crossing	1	UPRR/Hwy 101 crossing	0.1	
San Onofre	BR_SO_2	culvert stream crossing	1	UPRR/Hwy 101 crossing	0.11	
Gaviota	BR_GA_20	box culvert	1	Hwy 101 crossing	4.44	2001 juv & adult
Aqua Caliente	BR_AC_1	dam w/stream crossing	1	Rancho Real Road crossing	0.18	
Alegria	BR_AA_1	dam w/stream crossing	1	Rancho Real Road crossing	0.2	
Cuarta						
Sacate	BR_SE_5	Sustained slope exceeding 10%	1	Elevation 440'	2.07	
Santa Anita	BR_SA_3	dam	0.9	Elevation 45'	0.65	
Aqua						
Arroyo El Bulito	BR_AE_4	bedrock waterfall	1	Elevation 220'	1.48	
Arroyo San Augustin	BR_AS_2	dam	1	100' u/s UPRR culvert	0.08	
Llegus						
Barranca Honda						
Cojo	BR_CO_2	culvert stream crossing	0.9	100' u/s of UPRR culvert	0.09	
Wood						
Black						
Jalama	BR_JA_6	Sustained slope exceeding 10%	1	Elevation 840'	9.81	
Canada Honda						
possible NMFS investigations						
current work being done						
barrriers preclude SH anadromy						

Report Issued: OCT 06 1986

Report 420-86.423

PACIFIC GAS AND ELECTRIC COMPANY
DEPARTMENT OF ENGINEERING RESEARCH
3400 Crow Canyon Road
San Ramon, California 94583

FIELD TEST REPORT

SUBJECT: DIABLO CREEK AQUATIC SURVEY

INTRODUCTION

Two aquatic surveys were conducted on Diablo Creek on April 15 and May 28, 1986. The purpose of these surveys was to determine the aquatic species composition and distribution of Diablo Creek relative to six identified discharge points from the Diablo Canyon Power Plant (DCPP). These six locations originate from within the power plant boundary and either due to accident or during heavy rains, may direct the discharge of toxic substances into the creek.

STUDY AREA

Diablo Creek originates approximately 5.5 miles north-east of DCPP in the Irish Hills near Saddle Peak (elev. 1819 feet), San Luis Obispo County, California. Due to its coastal foothill origin, streamflows are dependent upon rainfall, groundwater discharge, and springs. Groundwater discharge and springs are the streams only source of water in the late summer and early fall months when there is little or no rainfall in this area. Streamflow and water temperature were similar during each survey, averaging two to three cubic feet per second and 55-60 ^{o}F, respectively, throughout the study area.

DATE Oct 17, 1986
TESTED BY J.K. Fleming
APPROVED [illegible]
FILE NO.

1144a/BAVC

Approximately one mile of the lower portion of Diablo Creek from Diablo Cove to approximately 300 feet above the diversion dam and weir were surveyed in this study (Figure 1). Diablo Creek generally has a low to moderate gradient (5.5 %) in this area, rising to an elevation of 340 feet at the upper portion of the creek surveyed. The creek flows through four distinct habitat types in addition to an approximate 2700 foot section which flows through a large (10 feet dia.) culvert under the 230 KV switchyard, settling basin, and 500 KV switchyard. Additional description of the flora and fauna of Diablo Creek beyond that provided below is presented in Warrick and Colson (1971).

The lowermost habitat type, from Diablo Cove to road crossing 1, is approximately 300 feet in length and is the most distinct of the four sections. The creek rises an estimated 30 feet, resulting in a gradient of 10%, almost double that of the upper three sections. This steep gradient is typified by a series of short runs, steep riffles, and a few small pools. This is in contrast to the long, shallow runs typical of the upper sections. The creek banks of this section are very eroded and in some areas are five to six feet above the live streambed. Streambed substrate is predominately sand (1/8"<), gravel (1/8-3"), rubble (3-12"), and a few boulders (>12"); little silt was noted. Riparian vegetation is limited to grasses, coastal scrub, coyote brush (Baccharis sp.), and an occasional willow (Salix sp.) which provides little or no overstory above the creek.

The second habitat type extends approximately 600 feet from road crossing 1 to approximately 100 feet beyond road crossing 2. This section, as-well-as the next two, tends to have a much lower gradient (5-6%) and with the exception of an occasional short riffle area, is mostly long, shallow runs 6-12 inches deep and 6-10 feet wide. The streambed is primarily

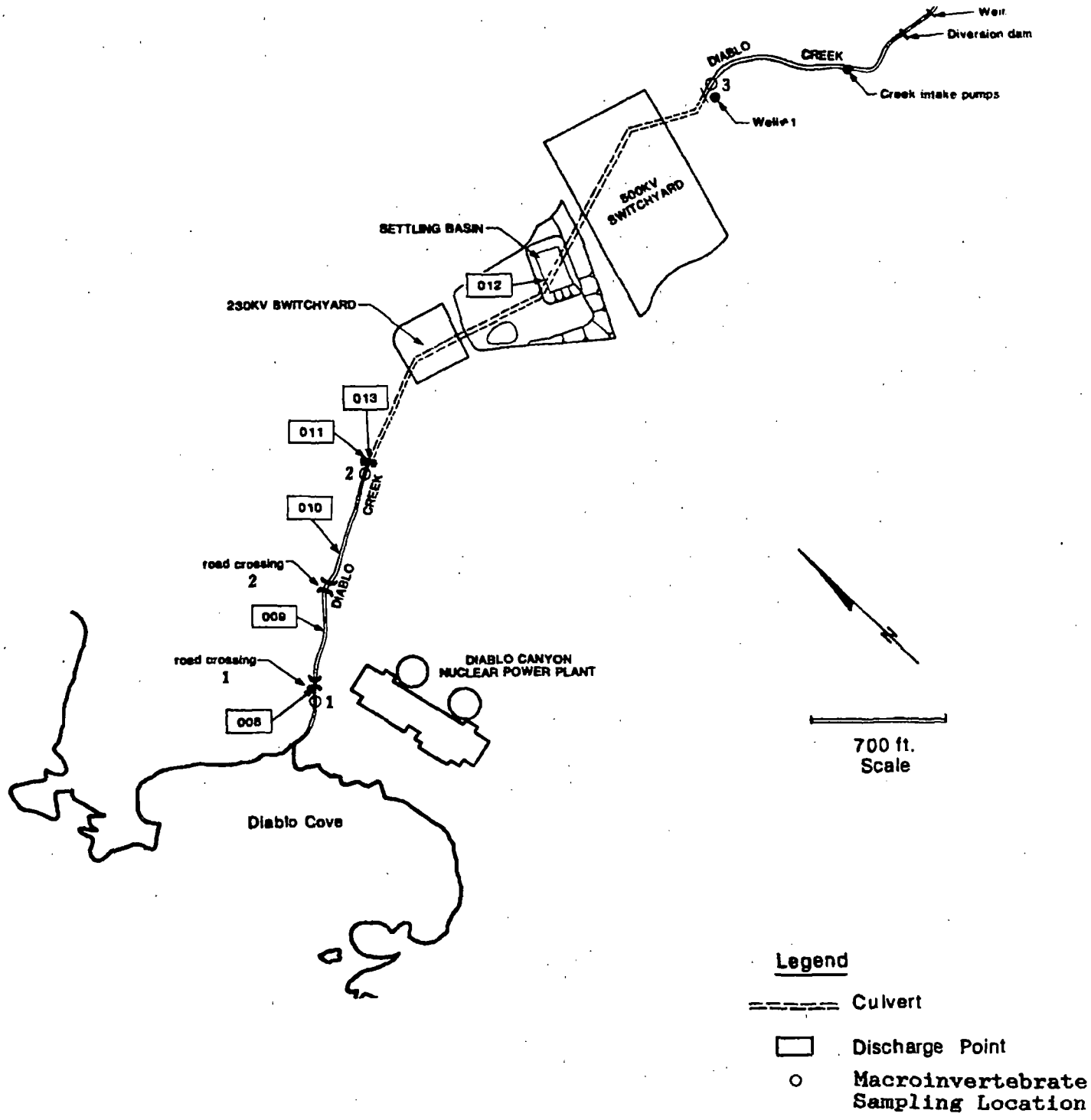

Figure 1. Diablo Creek showing location of discharge points 008 to 013.

composed of gravel and rubble; little silt was noted. Although most of the upper creek bank on the southern side has been stabilized with large rocks and boulders to within 40-50 feet of the live streambed, this section has a very dense riparian band of willows along its entire length which provides an almost complete overstory above the creek.

The third habitat type extends six hundred feet from the end of the second section up to the exit of the large culvert, which carries the creek under the switchyards and settling basin. As in the previous section, this section has a very low gradient and consists of a series of long, shallow runs 2-5 feet wide separated by short riffles and/or an occasional pool. Although this section generally is the same as the section above (i.e. above the large culvert) and below it, its central portion does differ significantly by having very high (5-6 feet) vertical streambanks and a deepened and narrowed stream channel. Substrate is primarily composed of sand, gravel, and rubble; substantial amounts of silt were noted in the deeper (>12"), slower run areas and pools. The riparian corridor along this section varies from willows providing 50-70% overstory above the creek at the lower end, a middle section choked with cattails (Typha sp.), to a relatively open upper section of chaparral, coyote brush, and a few spindly willows which provide little or no overstory.

The final habitat type originates at the upper end of the large culvert and extends to approximatley 300 feet beyond the diversion dam and weir, a distance of 1400 feet. Again, this section is typified by long, wide, shallow runs with only very rare riffles or pools. Streambed substrate was primarily sand, gravel, rubble, and an occasional boulder. Excessive deposits of silt coated the stream margins 1-2 inches deep in many areas, with the most excessive amounts occurring above the diversion dam and weir.

These heavy silt deposits have apparently lead to a cementing (i.e. the top 2-3" of gravel and rubble form a brittle crust) of the streambed substrate in many areas of the creek above and below the diversion dam and weir. The live streambed occupies only one-quarter to one-half of the available stream channel at the lower end of this section. This ratio gradually increases moving upstream until the live streambed covers the entire available stream channel as a natural result of the canyon narrowing. The stream channel becomes noticeably deeper and narrower beyond the diversion dam and weir; undercut banks, riffles, pools, and boulders are much more prevalent in this upper section relative to the area below the diversion dam and weir. The riparian corridor consists of oaks (Quercus sp.), willows, and coffee berry (Rhamnus sp.), which provides 80-100% overstory above the creek.

METHODS AND MATERIALS

Benthic macroinvertebrates (benthics) were collected from three sampling locations (Figure 1) during the April survey of Diablo Creek. Locations 1 and 2 were selected as sampling sites based on substrate type, access, and relative position to identified discharge points. Location 3 was selected above all identified discharge points to act as a "control" site in the event that a toxic spill were to occur in the future, impacting locations 1 and 2.

Benthic sampling was conducted by using a D-frame net (i.e. a semi-circular fine mesh net with one flat side) and/or by hand. Net collection consisted of placing the flat side of the net against the stream bottom with the net opening facing upstream. The substrate directly in front of the net opening was then kicked briefly by foot to overturn gravel and rubble; dislodged benthic organisms then floated with the stream current into the net for subsequent collection. Substrate too large to be sampled

with this technique (i.e. >12" in dia.) was turned over and benthic organisms were picked off by hand. Collected organisms were fixed in a 5% solution of formalin and then transferred to an 80% solution of alcohol for preservation. All samples were sent to the Department of Water Resources[1] for identification to the lowest taxonomic level possible.

Amphibian and fish surveys were conducted in Diablo Creek in April and May. Because amphibians and fish readily move upstream and downstream when disturbed or stressed, the creek was divided into four sampling sections based on identified discharge points and physical barriers to their movement in response to any potential future discharge of toxic substances into the creek. Sections one and two were located downstream of the discharge points, and sections three and four were located above the large culvert to act as controls in the event that a toxic spill were to occur in the future, impacting sections one and/or two. Section one consists of the same section of stream as habitat type one; it originates at Diablo Cove and extends 300 feet upstream to road crossing 1. Discharge point 008 is located at the head of this section. Section two is composed of habitat types two and three, and extends 1200 feet from the upstream entrance of road crossing 1 to the exit of the large culvert. Discharge points 009 through 013 are all located in or discharge to this section. Section three consists of the lower two-thirds of habitat type four, extending 900 feet upstream from the entrance of the large culvert to the diversion dam and weir[2]. Lastly, section four is a 300 foot section of creek immediately upstream from a small pool impounded by the weir.

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[1]Department of Water Resources, P.O. Box 607, Red Bluff, Calif. 96080.
[2]Diversion dam and weir, 200 feet long, make up the remainder of this length of stream.

Amphibian and fish sampling was conducted by two or three persons using a Smith-Root type VIII-A backpack electroshocker. One or two people acting as "netters" stood on either side of the "electroshocker" while proceeding upstream through each section starting from the bottom. Stunned amphibians and fish were momentarily netted long enough for identification to species and to note general length before being returned to the creek downstream of the area currently being sampled. Due to heavy riparian growth in section two, only about 50% of this area could be sampled; all of section one, three, and four, with the exception of the water impounded by the diversion dam and weir, were sampled. It was not possible to sample the diversion dam and weir areas due to water depth, width, and deep deposits of silt/mudd.

RESULTS

Results of the benthic samples are listed in Table 1. Thirty-three taxa representing four phyla of aquatic invertebrates were identified from Diablo Creek. The overwhelming majority of benthics collected were insects (27 taxa), followed by snails (3 taxa); aquatic worms, flatworms, and crustaceans (1 taxa each).

No adult amphibians were collected or seen during either the April or May surveys. During the second survey in May, 15-20 frog/toad tadpoles were observed in section three directly in front of the entrance to the large culvert. Due to the difficulty in keying out amphibian larvae, no attempt was made to collect or identify those specimens.

Results of the fish surveys are presented in Table 2. Only one species of fish, rainbow trout (*Salmo gairdneri*), was collected from the creek. A total of 34 trout were collected from the creek in April, all adults (>4")(Moyle 1976). During the May survey, 27 adult plus 5 young-of-the-year

Table 1. Macroinvertebrates collected from Diablo Creek on April 15, 1986.

Macroinvertebrate	Site 1	Site 2	Site 3
ANNELIDA			
Oligochaeta	X	X	X
ARTHROPODA			
Crustacea			
Isopoda (Terrestrial)	X		X
Insecta			
Coleoptera			
Dryopidae			
Helichus sp.		X	
Dytiscidae			
Agabus sp.		X	
Hydrophilidae			
Ametor sp.		X	
Diptera			
Chironomidae			
Chironominae			
Tanytarsus sp.	X		
Orthocladiinae	X		
Simuliidae			
Simulium sp.	X	X	
Stratiomyidae			
Euparyphus sp.			X
Ephemeroptera			
Baetidae			
Baetis sp.	X	X	X
Ephemerellidae			
*Drunella sp.**		X	X
Heptageniidae			
Cinygmula sp.			X
Ironodes sp.		X	
Rhithrogena sp.		X	X
Hemiptera			
Belostomatidae			X
Gerridae	X	X	X
Unidentified Immature	X		
Unidentified (Terrestrial)			X

*Formerly in Walkeri/Fuscata group (*Ephemeralla coloradensis*).

Table 1. continued

Macroinvertebrate	Site 1	Site 2	Site 3
Odonata			
Coenagrionidae			
Argia sp.		X	X
Plecoptera			
Nemouridae			
Amphinemura sp.	X	X	
Perlidae			
Calineura californica			X
Tricoptera			
Brachycentridae	X		
Micrasema sp.			X
Glossosomatidae	X		
Glossosoma sp.			X
Hydropsychidae			
Hydropsyche sp.			X
Lepidostomatidae			
Lepidostoma sp.		X	
Odontaceridae			
Parthina sp.	X	X	X
Rhyacaphilidae			
Rhyacophila sp.		X	X
MOLLUSCA			
Gastropoda			
Basommatophora			
Lymnaeidae			
Lymnaea sp.		X	
Physidae			
Physa sp.		X	X
Planorbidae			
Helisoma sp.	X		
PLATYHELMINTHES			
Turbellaria			
Planaridae			
Dugesia sp.	X	X	X

Table 2. Rainbow trout collected in Diablo Creek on April 15, and May 28, 1986.

	Date			
	April 15		May 28	
Section	Adult	yoy	Adult	yoy
1.	4	0	2	0
2.	8*	0	8	0
3.	9	0	11	4
4.	13	0	6	1

*Two of these fish were not stunned long enough to be positivley identified as trout, however, they are included here because no other species of fish was collected during either survey.

(yoy)(2"<) trout were collected. Although the water impounded by the diversion dam and weir was not sampled, several dozen trout (presumably) were observed during each survey.

DISCUSSION

Because the purpose of this study was to develop a list of aquatic organisms relative to identified discharge points, quantitative sampling techniques were not employed. Therefore, only a limited discussion of each of the groups of aquatic organisms collected from Diablo Creek is possible.

The results of the benthic survey are indicative of those species which could be easily collected in the top 1-2 inches of stream substrate in the early spring. Sampling was probably further biased by the size and cryptic coloring/body shape when hand picking specimens from overturned rocks. Because benthic community structure (i.e. species presence and abundance) changes seasonally due to changes in water temperature, flow, and food availability, additional sampling during the other seasons (summer, fall, and winter) should be considered in order to develop a more complete list of benthic organsisms from the creek.

The only amphibians collected were frog/toad tadpoles from section three, immediately in front of the entrance to the large culvert. This area is notably different from the rest of this section and section four. The creek in this area is relatively wide, shallow, heavily silted, slow moving, has the only population of cattails in the upper two sections, and has very little overstory above the creek. All of these factors combine to make this site the best nursery area observed for frog/toad larvae in the upper two sections. Although similar conditions exist in section two, in the central portion of habitat type three, no amphibian larvae were observed or collected.

The purpose of the May survey was to verify the relative numbers of trout collected in the different sections in April, and to determine if and where natural reproduction was occuring in the creek. Although quantitative sampling was not the intent of the surveys, as previously stated, the following camparisons are made between the two surveys and between sampling sections based on the assumption that equal efforts were expended in each of the individual sections during each survey. Also, because the creek is relatively shallow, clear, and has a low gradient for most of its length, that the number of trout collected fairly well approximates the actual trout populations of those sections.

The number of trout collected in section one decreased by half between the April (4) and May (2) surveys. This decrease was probably a result of reduced visibility caused by the presence of long, thick, dense filimentous algal mats in this section which were not present during the first survey.

There was no change in the total number of trout collected between the April and May surveys in section two (8). During both surveys, the only trout collected in the lower half of this section (between the two road crossings) was in the pool immediately below road crossing 2, however, the distribution upstream changed completely. During the April survey, trout were distributed fairly evenly in the occasional pools and riffle areas between the long runs of this section. During the May survey, however, no trout were collected between road crossing 2 and the riffle/pool area directly below the exit of the large culvert. Five of the eight trout collected in this section, including the largest trout from all four sections (10-11"), were found just within the culvert. These fish were probably attracted to this area because of the cooler and deeper water, and prey items (i.e. benthics) which would be temporarily disoriented and blinded by their passage through the culvert.

The number of trout in section three increased slightly between the April (9) and May (11) surveys. Distribution of adult trout appeared to be generally the same in this section during both surveys. Only about one adult trout was collected per 100 feet of stream. This was probably a result of lack of cover (i.e. large boulders, logs, undercut banks overhanging vegetation, etc.) and wide, shallow runs which predominate in this area.

Four yoy trout were also collected near the intake pumps in this section. Due to high mortality among yoy trout, their populations generally equal or surpass that of adult trout populations in most streams. Only 4 yoy compared to 11 adult trout collected in this section may be the result of sampling too early (trout spawn from Feb.-June), yoy trout may have been too small to be collected (i.e. electroshocking efficiency is directly proportional to body size), or reproduction may have been reduced due to excessive amounts of fine sediments (silt) that were noted in both sections three and four (Phillips 1971, Phillips et al. 1975, Hall and Lantz 1969).

Section four exhibited the greatest change in the number of trout collected between the two surveys. Thirteen trout were collected in April, but only 6 were collected in May. This reduction may represent simple random variation within this section, or predation. Regardless of the cause, this section still had more trout per 100 feet than did any other section (2-4.3 vs 1<). This was probably due to the better habitat (narrower and deeper stream channel) and improved cover (boulders, logs undercut banks, etc.) than was present in the other sections.

One yoy trout was also collected in section four. Considering that this section had the highest density of adult trout, it should also have had a greater number of yoy trout as well. The reason for the low number of yoy trout for this section is probably the same as for section three.

REFERENCES

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