

RECONNAISSANCE-LEVEL SPAWNING AND HABITAT SURVEYS OF STEELHEAD TROUT, GUALALA RIVER, CALIFORNIA, 2001

by

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The following summary table and compilation of ten individual (daily) survey reports provide the results of initial reconnaissance-level surveys of steelhead trout spawning habitat conducted on the Gualala River, California during February-April 2001. Primary objectives were to: enumerate adult steelhead and their redds; characterize in general the habitat of the surveyed reaches; identify obvious problems and/or opportunities for habitat improvements; and collect baseline data for planning more intensive followup surveys beginning next year. I also recorded observations of juvenile steelhead and brief surveys of anglers, as time permitted.

Because of the reconnaissance-level nature of the surveys, these counts of adults and redds should be interpreted with caution. Each of the ten stream reaches was surveyed only once during the spawning season. The 2001 spawning season may have extended from the first rains in December through at least April. Thus, the figures for redds and adults should *not* be used to assess the presence or absence of spawning on a particular reach, or to estimate reach-specific or watershed total spawning escapement. Such estimates will be an objective of future, more intensive surveys, including multiple (within-season) surveys of selected reaches. Also, in the future, I intend to survey the other potential spawning reaches of the Gualala River system. The 56.8 stream miles covered (during the 59.3 survey miles) this year represent only about 50% or less of potential spawning habitat of the system.

Disclaimer: The surveys and this report were self-funded and conducted during my non-work hours, and not while in my official capacity as a biologist for the U.S. Fish and Wildlife Service.

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Table 1. Summary of steelhead spawning survey results, Gualala River, California, 2001.

MONTH /DAY	SURVEY LOCATION /REPORT NO.	NO. MI.	NO. REDDS	REDDS /MI.	NO. ADLTS	NO. CARCASS	FRY ABUN	AGE 1-3
02/04	Wheatfield Fk., near Wolf Creek #001	3.3	6	1.8	10	0	0	No
02/08	Wheatfield Fk., vicinity Soda Spgs. #002	4.9	11	2.2	17	0	0	No
02/15	Rockpile Cr. #003	1.4	0	0	0	0	0	No
02/16	Haupt Cr. #003	2.2	0	0	0	0	0	No
03/11	Britain Cr./House Cr. #005	9.8	7	0.7	13	2	0	No
03/17	South Fk. below Hauser Bridge #006	8.9	5	0.6	22	0	+++ ¹	No
03/23	Tombs Cr./Wheatfield Fk. #007	9.1 ²	16	1.8	11	2	++	Yes
03/31	Wheatfield Fk., nr. Berkeley YMCA #008	5.5	34	6.2	7	1	++	Yes
04/05	Wheatfield Fk., to S. Fk. Confluence#009	8.6	78	9.1	19	0	+	No
04/14	South Fk, to WF Fk. Confluence #010	5.6	12	2.1	0	0	+	Yes
TOTALS		59.3 ³	169	2.8	99	5		

¹Abundance is in proportion to the number of +s, and relative to the number seen on the South Fork survey on 03/17, which was the highest relative abundance.

²The final 2.5 miles of this 03/23 survey was surveyed earlier on 02/04. It is doubtful that any redds were counted twice, however, because season-high flow occurred between these two dates, likely obliterating evidence of redds found on the 03/23 date.

³A total of 56.8 stream miles were actually surveyed, since 2.5 miles on the Wheatfield Fork (Reports #001 and 007) were surveyed twice.

MEMORANDUM TO THE FILE #001

File: Gualala River Steelhead Study

From: Richard W. DeHaven

Subject: Spawning survey, Wheatfield Fork of Gualala River at vicinity of Wolf Creek confluence, February 4, 2001

I arrived (from Davis, CA) at the confluence of Wheatfield Fork and Wolf Creek (along Skaggs Springs Road between Las Lomas and Soda Springs, and about 10 miles east of Stewart's Point) at 8:45am. From my position on the road 150 feet above the river, one adult steelhead was immediately sighted on a shallow run below.

From 9:00am until 12:15 pm, I walked/waded upstream (and back downstream) 2.5 miles, while visually searching for redds and adult steelhead. From 12:15pm until 1:00pm, I did the same while walking/wading downstream on Wheatfield Fork from Wheatfield Fork/Wolf Creek confluence. Thus, a total of 3.3 miles of stream was surveyed over a 4-hour period.

Flow at the USGS Wheatfield Fork realtime stream gage during the time of the survey was about 70cfs (Stage: about 4.37 ft). Weather was clear and warm, and the stream was low and clear. The bottom could be seen in all but the deepest (two or three) holes. Nevertheless, there were still a fair number of potential fish "hiding" areas under rocks, behind small woody debris, and in occasional bedrock crevices.

A total of 10 adult steelhead (nine large; one medium-size) were seen. This includes two pairs of spawning fish, one apparent down-streamer (slowly dropping downstream alone, with no apparent spawning activity or mate), and five apparent pre-spawners (all bright silver color) in one hole 350 yards downstream of Wolf Creek confluence. Based on the available cover, stream conditions prevalent during the search, and the ability of the fish that were inadvertently frightened to virtually disappear into hiding places, I estimate that on this date I observed no more than 50% of the actual fish that were present in the surveyed reach.

A total of six distinct redds were seen. Two were active, with the two pairs of spawners that were seen. Four were inactive, and of these, three were relatively large, suggesting spawning by more than one pair. Redds were in typical habitat in medium-sized (2-4-inch) cobble at the tail-out of runs just ahead of riffles, or within riffles. Based on the conditions on this date, I estimate that the six redds I actually observed represented a minimum of 12 spawning pairs of fish, due to possible unidentified (missed) redds and multiple spawning on the redds seen.

Most of the 10 fish and 6 redds observed were in the vicinity of Wheatfield Fork/Wolf Creek confluence. Neither any adult fish nor redds were observed in the uppermost 1.8 miles of the surveyed reach. No juveniles were observed anywhere.

The surveyed reach has few very deep pools (except where the five adults were observed) and a general lack of any large woody debris. One nearshore landslide about 1.25 miles upstream of

the confluence has brought several large oak trees into or near the water; otherwise, any whole in-stream trees or large wood pieces are absent. The vast majority of the watershed in this reach is oak woodland used for cattle grazing. However, a few small areas of north-facing slope along the stream do transition into denser riparian growth, which includes small redwood trees.

Prepared: February 5, 2001

MEMORANDUM TO THE FILE #002

File: Gualala River Steelhead Study

From: Richard W. DeHaven

Subject: Spawning survey, Wheatfield Fork of Gualala River, vicinity of Soda Springs (Site), February 8, 2001

This was a continuation of the survey of Wheatfield Fork initiated on February 4, 2001 and reported in a separate memo to the file.

On February 8th, I arrived (from Davis, CA) at the road culvert (Skaggs Springs Road) along Wheatfield Fork, 0.8-mile downstream of the confluence of Wheatfield Fork/Wolf Creek, where the February 4th survey ended. I arrived at this point at 0815 hrs. and began surveying (downstream) at 0830 hrs. I surveyed until 1300 hrs, covering 4.9 miles of river (based on car odometer along the adjacent road). Weather was clear, but cold (localized frost patches), and the river was significantly lower than on February 4th and quite clear. Flow at the USGS Wheatfield Fork realtime stream gage during the survey was about 56 cfs (4.26 ft). I walked and waded downstream while visually searching for adult fish and redds. Despite the river being lower, there were many more holes and covered places along this reach where the bottom could not be seen as compared to the previously surveyed reach.

A total of 17 adult steelhead were seen. Most fish were only briefly observed and could be classified only broadly--as either large (15 fish) or medium (2 fish) in size. One fish was definitely spent and moving downstream; the others appeared to be spawning or still moving upstream. No marks, tags, or fin clips were (or could have readily been) observed. Twelve of the fish were observed just downstream of the old washed-out road crossing near location 38°40.680/123°15.548. (This may be the old Soda Springs site). The channel here contains a large jumble of broken concrete slabs and pieces of road culverts, which may be briefly delaying fish movements and causing them to locally congregate. Based on the much greater amount of adult hiding places in the surveyed reach (compared to the previous reach), I estimate that I saw no more than about 25% of the actual adults that were present.

A total of 11 redds were found. Only one had currently active fish (one observed). Five of the redds were just downstream of the mouth of House Creek, which was quite low in flow and probably currently impassable to adult upstream movement. Locations of all redds were marked using a single sprayed "stripe" of orange marking paint applied to bedrock, a large rock, or bank above the high-water mark on the *left* (downstream aspect) bank perpendicular to the redd and river. This was done to facilitate overall spawning estimates if subsequent surveys are conducted on this reach later this season. A GPS "fix" was also recorded for each redd (or group of redds). Redd measurements (per CDFG guidelines) were not taken, however, so as to avoid any harm to incubating eggs or harassment of any nearby spawners. Locations of redds (proceeding downstream) were as follows:

1. 38°39.641/123°13.920----1 redd
2. 38°39.677/123°13.960----1 redd

3. 38°39.915/123°13.958----3 redds
4. 38°39.938/123°13.950----2 redds
5. 38°40.543/123°14.972----3 redds
6. 38°40.690/123°15.554----1 redd

Other noteworthy observations from this surveyed reach include:

1. The surrounding habitat transitions (going downstream) from mixed oak woodland to mixed riparian and mixed redwood forest.
2. The amount of fines in the substrates dramatically increases proceeding downstream, resulting in a distinct degradation of spawning habitat, especially over the last one-third of the reach. (This may be at least partially related to #6 below.)
3. Good to excellent spawning gravels do still occur just downstream of House Creek, however.
4. The entire reach generally has poor rearing habitat, due to shallowness and low frequency of pools, and general lack of cover in most pools. Habitat improvement evaluation could be warranted.
5. Large pieces of large woody debris (LWD) are almost totally lacking along the entire reach. LWD introductions could be beneficial and should be studied further.
6. Two of the Skaggs Springs Road culverts in this reach have in the past contributed significantly (and still are, to some degree) to erosion and sedimentation, as evidenced by eroded banks, downed trees and shrubs, and barren, exposed soil areas below the culvert drip-lines. These two culverts should continue to be examined to determine whether requesting the County to rectify the problems is warranted.
7. At approximately 38°39.677/123°13.960, a very large fir tree as fallen across the river, but is not in contact with the water. This tree could be “dropped” into the river channel with minimal effort by a team with chainsaws to provide a valuable habitat component.

Prepared: February 9, 2001

MEMORANDUM TO THE FILE #003

File: Gualala River Steelhead Study

From: Richard W. DeHaven

Subject: Spawning surveys, Rockpile Creek and Haupt Creek, February 15-16, 2001

(For reference, flow at the USGS Wheatfield Fork realtime gage was about 200 cfs and 150 cfs at noon on February 15 and 16, respectively.)

02/15/01: I arrived at the confluence of Wheatfield Fork and South Fork (upstream limit to fishing; also known as “Twin Bridges”) from Davis at 0800 hrs. Water was still moderately high and an excellent “fishable green” color. The hydrograph was obviously declining much more slowly after this storm than the previous one, likely due to the large amount of snow which fell (and was still present this AM) at higher elevations.

I launched the boat and began floating downstream at 0830 hrs. I rowed past three other boats (two drift boats and a rubber raft) containing eight total anglers who reported already (by 0900 hrs) catching and releasing 11 adult steelhead (eight spent; three fresh). I continued directly to Buckeye Creek, with the intention of surveying it, but the water (Est. 75-100 cfs), although moderately clear, was still too high for easy wading and good observations.

I then rowed directly to Rockpile Creek, which was lower (Est. 50-75 cfs) but more turbid, and decided it was surveyable. I walked/waded 1.4 miles upstream from the mouth from 1115-1215 hrs., but observed no adults or redds. The surveyed reach has excellent riparian cover from redwoods, alders, and several other woody riparian species. It also has excellent pools with overhead cover and good instream cover and structure, including several channel-spanning logs and small debris jams. On the other hand, spawning substrates throughout this reach are in poor condition due to sedimentation, mainly from sand. Large amounts of sand were also still moving as bedload down the thalweg of many reaches. Numerous excellent-appearing spawning areas where either partially or fully covered with sand rivulets. (The first hint of this problem was the large quicksand piles observed at the mouth of the creek.)

This reach of Rockpile Creek is also paralleled and crossed at least ten times by ATV (all terrain [4 x 4] vehicle) trails. I saw or heard no less than ten ATVs, some of which were obviously transporting timber company workers who were planting trees nearby. ATVs were seen crossing the stream four times, including through potential spawning habitat. Given the poor condition and disturbances of spawning habitat in the surveyed reach, it is likely that little successful spawning occurs here. This assessment is supported by two locals (including Gregory Warner, a 40+ year resident of the Gualala area) that I spoke to who said most spawning is high (up to at least 10 miles) up the creek above the damaged/disturbed sections. My confidence about the lack of any redds in the surveyed reach is high (only one “possible” that couldn’t be confirmed due to the numerous sand rivulets); however, the fact that I saw no adults means little, since hiding cover was abundant and any adult fish could have easily gone unobserved. The next spawning survey on Rockpile Creek should focus on a much higher reach, preferably also at a

significantly lower flow.

Returning from my hike up Rockpile Creek, I continued floating towards the takeout at the Highway 1 bridge crossing. I also fished periodically along the way, catching and releasing two large adult female steelhead (one spent; one fresh) in the vicinity of Pepperwood Creek. I also interviewed 10 more anglers who had caught and released a total of 12 adult steelhead (8 spent; 4 fresh). (In addition, I learned near the end of the float that one of the drift boats I had encountered in the morning reportedly ended the day with a total of 13 adult steelhead (“mostly spent”) caught and released for three anglers. Clearly, there were a lot of fish in the river this day. I reached the takeout and loaded the boat in a light rain at 1730 hrs.

02/16/01: My intent today was to survey about 7 miles of the South Fork by walking/wading from the Hauser Road bridge downstream to the Stewart’s Point Road bridge. However, at 0900 hrs, I judged the river to be too high for this (Est. 150-175 cfs). In addition, prior to starting, I had sought permission from the primary landowner at his residence adjacent to the Stewart’s Point Store and found him to be very hostile and uncooperative. To avoid possible trespass issues, subsequent surveys of this reach may have to be done via boat, as the river is well-established as being navigable to recreational boating (per Sonoma County General Plan and other sources), and small-boat access (bridge rights-of-way) is possible at both bridges.

Instead, I proceeded directly to Haupt Creek, a tributary to Wheatfield Fork. I arrived there and walked/waded upstream from the mouth for about 2.2 miles from 1108-1308 hrs, observing no adults or redds in the relatively clear water with an estimated 15-20 cfs flow.

The lack of any fish or redds may have been due to a large (channel-spanning X 10-feet-high X 35-50 of stream bottom) log and debris jam which exists about 700 feet upstream from the mouth (at 38°39.596/123°19.218). My initial reaction was that this debris jam may be impassible to adult upstream passage, especially at low flows. However, I subsequently learned from the local CDFG warden (Paul Mowers) that juveniles have been observed in the pool immediately upstream of the jam during late summer. Also, a local, long-term resident, Joe Henseley vehemently states that adults do readily pass upstream through this jam. Neither of these individuals has observed the log jam within the past 2 years, however.

This debris jam was formed from (a) a mass failure of the left bank (downstream aspect) which uprooted and deposited two or three large (>25-inch diameter) trees and sediment; (b) at least 20 other large trees which have subsequently become entrapped; and (c) several hundred smaller pieces of woody debris which is tightly packed into the mass. At the very least, this obstacle should be carefully monitored in the future and considered for removal if adult passage is determined to be prevented or impeded. If removal is eventually deemed appropriate, this could be done using either heavy equipment and accessing the site at low (summer) flows via the channel (and initially from a road to the channel about 100 yards upstream of Haupt Creek/Wheatfield Fork confluence), or with hand labor (Est. 20-25 person-days of work using chain saws, hand winches, and block-and-tackle gear).

The reach of Haupt Creek I examined has numerous good quality spawning areas with appropriately-sized gravels and cobbles only moderately degraded by sands and silt (and certainly not as degraded as Rockpile Creek). It also has a good number of deep pools, and generally abundant cover throughout in the form of riparian vegetation, instream wood, rocks, bedrock crevices, and bedrock plunge pools. In short, this looks like good-quality rearing as well as spawning habitat. I discovered evidence of a recent juvenile and/or habitat survey on this reach in the form of orange engineer's flagging on the vegetation at several locations. One such marker indicated "WSA-SH1-EOS-7-13-00."

On a side note, boot tracks I left on a sand bar on the way upstream were, by the time I came back downstream two hours later, accompanied by fresh tracks of a large mountain lion headed in the same general direction. For sake of subsequent peace of mind on these solo surveys, I have decided to assume these were totally independent events.

I returned to the car and headed for Davis at 1500 hrs., just before the next rainstorm began.

Prepared: February 18, 2001

MEMORANDUM TO THE FILE-#004

File: Gualala River Steelhead Study

From: Richard W. DeHaven

Subject: Angling survey, South Fork/Wheatfield Fork confluence downstream to Highway 1 bridge, March 1, 2001

(For reference, flow at noon today at the USGS Wheatfield Fork realtime gage was about 5.5 ft and 450 cfs.)

With Larry Thompson, departed Davis at 0440 hrs and arrived at confluence of the two forks at 0800 hrs. Started floating downstream in two small boats at 0830, with about 6-10 boats ahead of us. Angled and interviewed anglers downstream to Highway 1, arriving there at 1617 hrs. River was high, but a perfect fishable green color. We caught and released three likely 2-salt, spent adult female steelhead, and three juvenile steelhead smolts. We also interviewed 36 anglers (21 in boats; 16 bank anglers) who reported catching and releasing 25 adult steelhead—all spent. However, we only saw two of the reported fish actually being landed. Clearly there were few, if any, fresh adult fish in the river, and probably fewer adult fish than when I last floated this reach on 02/15/01.

Prepared: March 3, 2001

MEMORANDUM TO THE FILE #005

File: Gualala River Steelhead Study

From: Richard W. DeHaven

Subject: Spawning survey, House Creek, tributary to Wheatfield Fork of Gualala River, March 11, 2001

Extent of Survey: We parked our automobile along Skaggs Springs Road, about 5 miles east of House Creek/Wheatfield Fork confluence (at 38°40.426/123°09.756; and roughly in the center of S34, T10N, R12W) at 0830 hrs and alternately walked, climbed, and slid on our rear-ends about 2,000 feet down Buckhorn Ridge to a point on Britain Creek, 1.2 miles upstream of Britain Creek/House Creek confluence. This is where the survey began at 0923 hrs. From here, we surveyed downstream 4.9 miles to House Creek/Pepperwood Creek confluence, then continued downstream another 4.9 miles to House Creek/Wheatfield Fork confluence, arriving there just at dusk at 1830 hrs. Total length of stream surveyed was thus 9.8 miles (as determined from the USGS Tombs Creek topographic, 7.5-minute quadrangle map, using an electronic planimeter). However, about 1.8 miles of this was a very cursory survey, due to our accelerated pace in an effort to extricate ourselves from the river canyon before the onset of darkness. Overall, for the day, we averaged about 1.1 miles of stream surveyed/hr.

Personnel: DeHaven and Larry Thompson, biologists.

Weather/Water Conditions: Weather was clear, sunny and mild, with a maximum temperature of 66 degrees F at 1400 hrs. Flows were still moderately high in all reaches, with generally a green water color, which prevented viewing the bottom in the deepest locations, including the uppermost Britain Creek reach. For reference, the flow recorded at the USGS realtime gage on Wheatfield Fork was approximately 5.35 feet and 375 cfs at noon on the survey date.

Methods: Both observers walked and/or waded along the streambed while visually searching for adult steelhead and their redds (active or inactive). Lengths of any fish observed were estimated in cm, and locations of redds were marked by a strip of orange spray paint placed perpendicular to the redd on the left (downstream aspect) bank above the high-water mark. Locations of redds and other key features were also recorded by latitude and longitude, using a hand-held GPS unit.

Findings—Adult Fish: The first adult fish seen was a carcass found just downstream of Britain Creek/House Creek confluence. Nine more live fish were seen from here to 1.5 miles downstream. Then, no fish were seen for more than 2.5 miles. Finally, along all of the remaining surveyed reach, five more fish (one=carcass) were seen. Size distribution of the 15 adult fish seen was: 9>70cm and 6>45-65cm. Because of: (1) the relative turbidity; (2) the numerous fish hiding places, due to relatively high flows; (3) the downstream survey aspect, which tended to flush many fish into hiding before they were seen; and (4) the cursory search during the last 1.8 miles, we estimate that less than 10% of the fish present in the surveyed reach were actually observed.

Findings–Redds: Seven redds were confirmed, generally in the same areas as where adults were recorded. In addition, two likely redds were found about half-way down Britain Creek. However, we believe it likely that numerous redds from spawning earlier in the season had become unidentifiable due to the recent season-high flows which had redistributed and relevelled bed material. The seven confirmed redds were located at: 38.39.331/123.10.891; 38.39.258/123.11.160; 38.39.195/123.11.294; 38.39.149/123.11.359; 38.39.015/123.11.578; 38.38.998/123.12.348; and 38.38.128/123.13.563.

Findings–Related Observations:

1. The unsurveyed reach of House Creek immediately upstream of House Creek/Britain Creek confluence appeared to have excellent spawning gravels and definitely the lowest turbidity we saw during the day. This reach may be supporting significant spawning and should be surveyed in the future for at least another 1 mile or so upstream. According to Paul Mowers, the local CDFG warden, above this point, there is an impassable 100-ft falls.
2. The surveyed portion of Britain Creek and its adjacent watershed has been heavily damaged by wild pigs, which have done extensive “rooting” and “tilling” under oak trees and within the stream channel itself. This is obviously part of the reason for the high sediment load in this creek. In addition, this creek has two significant logjams, the larger of which is at 38°40.433/123°09.756; these logjams should be monitored to determine if they are impediments to upstream adult fish passage at certain flows. If necessary, the larger logjam could be removed in 1-2 days by a ground crew using hand tools and equipment.
3. In addition, about 150 feet upstream of the mouth of Britain Creek is a bedrock plunge pool with a several-foot drop which warrants monitoring because it may be an upstream migration impediment or barrier at certain flows. If so, the associated bedrock could easily be modified by blasting to improve upstream access. Despite the wild pig damage, sediment loads, and possible barriers, Britain Creek does appear to have some good spawning and rearing habitat which needs to be fully utilized.
4. About 1.0 mile downstream of Britain Creek/House Creek confluence, a small, unnamed creek entered from the north which, despite its small size, was still transporting a heavy sediment load. In fact, this one small creek was apparently the source of most of the turbidity and “green” color we observed throughout House Creek (except above House Creek/Britain Creek confluence).
5. Two concrete dams exist on the central portion of the surveyed reach in S5, T9N,R12W, about 1.0 and 1.5 miles, respectively, upstream from House Creek/Pepperwood Creek confluence. Both structures appear to have been built for seasonal operation (based on their concrete, with flashboard, designs), and were thus not in operation when viewed on this date.

The uppermost dam at 39°39.081/123°12.657 is an estimated 18-20-ft-tall structure with a 6-8-ft-wide vertical opening for flash boards. This structure appears to be mainly for recreational use,

such as swimming in the summer, although minor water diversions were also indicated by the several small PVC pipes entering the impounded (or just downstream) portions of the river. The relatively narrow flashboard opening is a poor design in that logs and debris cannot readily pass through and may thus become impinged against the structure. Two such logs were impinged at the time of our viewing, causing the several-foot drop to the pool below to be increased by another 1-3 feet. These logs should be removed forthwith, using hand saws and/or block-and-tackle, to minimize any restriction of upstream adult fish passage, especially during low-flow conditions.

6. The second concrete dam is at 38°38.641/123°12.875 and is associated with an adjacent ranching operation. It is similar in structure to the first dam, but lower in height at about 10-12 feet. This structure appears to be used primarily for diversion, as evidenced by a large-capacity agricultural-type pump located in a pump house next to the site. This dam is also poorly designed, with a concrete splash pad below (downstream of) the flashboard notch. At low flows, this would likely be an upstream migration impediment or barrier, due to the lack of any jumping pool for migrating steelhead.

7. Despite the design flaws of both dams, adult steelhead had nonetheless passed upstream during the earlier high flows, because most of the adult fish and redds we observed this date were *upstream* of the uppermost structure. Nevertheless, in the interest of taking every effort possible to conserve and recover this federal- and State-listed species' population, at the very least, the flashboard notches of both structures should be rigorously maintained, and particularly kept free of any logs and debris which would otherwise increase the required jumping height to pass upstream. This is especially true during low-flow periods, when upstream passage problems may already be exacerbated.

8. We observed hundreds, if not thousands, of roughskin newts throughout all of the surveyed reach. These were both in the stream and (more abundantly) along the stream bank. Foothill yellow-legged frogs were also common throughout the surveyed reach.

9. *General Conditions and Habitat Values of Surveyed Reach:* The majority of the stream length we surveyed (estimate: 60%) flows through bedrock, which is either bare or has only a shallow covering of gravel, sand, or fines. The overall amounts of fines present indicates some moderate degree of watershed degradation, however conditions are far better than the massive damage that was indicated during my February 15th survey this year (*see* Report #003) on Rockpile Creek, a tributary to the South Fork. (However, it must also be considered that fines may more readily be passing out of the House Creek system than Rockpile Creek, because of the abundance of bedrock substrate.)

The frequency of deep pools varies widely in the surveyed reach, but is relatively low overall. Instream large woody debris (LWD) and overhead riparian cover and shade are patchy and also relatively low in abundance overall. Potential spawning substrates are also patchy but more moderate in abundance.

The flow in cfs of the stream increases linearly proceeding downstream in all reaches, except in the reach from about 0.6 mile upstream of the lowermost dam to about House/Pepperwood creeks confluence. The reason for the stream to be highly influent (losing) in this reach—about a 50% reduction in cfs in several areas—is unknown. It may simply be related to the low gradient and abundance of gravels, a subsurface sand lense, or other unknown geologic and human-induced factors.

Prepared: March 14, 2001

MEMORANDUM TO THE FILE #006

File: Gualala River Steelhead Study

From: Richard W. DeHaven

Subject: Spawning survey, South Fork Gualala River, March 18, 2001 (and brief angler survey at river mouth, March 17, 2001)

Extent of Survey: After being dropped off by local resident Joe (“Bronco”) Henseley, I entered the South Fork channel off of Hauser Bridge on Hauser Bridge Road at 0700 hrs. From there I alternately walked and waded downstream to the Clipper Mill Bridge located on the Stewart’s Point/Skaggs Springs Road. I arrived at Clipper Mill Bridge at 1430 hrs. Total length of stream surveyed was 8.9 miles, as measured from the Annapolis and Plantation USGS 7.5-minute quadrangle topographic maps, using an electronic planimeter. Today, I covered an average of 1.2 (stream) miles/hr. Also today, due to improved preparedness (no hurry due to approaching darkness), I was able to maintain a much more constant pace, which resulted in all portions of the surveyed reach being observed with an equal degree on intensity.

Weather and Water Conditions: Weather was clear, sunny and warm, with a maximum high temperature for the day of about 74 degrees F at 1400 hrs. The stream was relatively clear, with only a slight tint of green in the deepest areas. For reference, the flow recorded today at noon at the USGS realtime gage on Wheatfield Fork was about 120 cfs and 4.78 ft.

Methods: I visually searched throughout the stream for redds and dead or alive adult steelhead. The adult fish seen were estimated into size categories. I also visually searched in shallow, slow-moving areas for steelhead fry. Because my GPS receiver was unable to record accurate positions (due to poor reception from relatively steep canyon walls), I was unable to GPS-fix any of the redd locations. Therefore, I did not mark redd locations with florescent orange spray paint (on the adjacent bank) as I normally do.

Findings–Adult Fish: Up until 1110 hrs I had seen only five (live) adults; based on their behavior and condition, I judged that two of these were spent and three were fresh (had not spawned). Of these five, three were estimated at >70cm (FL) and two were in the 50-60cm range.

At 1330 hrs, about 1.2 miles upstream of the Clipper Mill Bridge, I observed 17 fresh adults in one very large, heavily-shaded pool just upstream from a 100-yd-long class 3 rapids with logjams. As I could only observe into about one-fourth of this very large pool, there may have been many more unobserved adults present. Of the 17 observed fish, 12 were >70cm and 3 were in the 55-65cm range. After the school of 17 adults, no more adult fish were seen between here and the climb-out bridge. Thus, the total score of adults seen for the day was 22.

Due to the abundance of cover, numerous deep holes where bottom could not be seen, and the downstream aspect of the survey, I estimate that I actually observed no more than 10% of the adult fish that were present in the surveyed reach.

Findings–Redds: I found only five redds that I felt I could ascertain with any degree of certainty. None had actively spawning fish present or nearby. A pair of redds was found side-by-side at 1230 hours, another adjacent pair was located at 1300 hours, and a single redd was found at 1315 hours. Based on my average travel rate of 1.2 miles/hr, their approximate locations can be estimated, if desired, from the appropriate USGS topographic maps.

Findings–Fry: This year's fry were now present. The first group was observed in shallow edge-waters at 0845 hrs. Subsequently, about a dozen more large groups and scattered individuals were periodically observed until about 1330 hrs. A noticeable increase in fry abundance was observed about 15 minutes prior to finding the first pair of redds and throughout the area where the five redds were seen.

Findings–Related Observations:

1. Upon arriving in the area on the evening of March 17th, I checked to see if any drift boats were loading under the H1 bridge. There was one boat there with three anglers who reported catching and releasing 20 adult steelhead during the day on the float down from the upper fishing boundary at Twin Bridges. They further stated that they thought about one-fourth of the fish had been fresh and the remainder spent. (Their vehicle was also stuck in the sand at the take-out, so I pulled them free with my 4 X 4 before leaving.)
2. This entire surveyed reach is through an unlogged (i.e., no recent logging, although much of the timber present may be second-growth) semi-wilderness area with very few (compared to other Gualala tribs) roads and relatively steep streambanks. The heavily-forested slopes are themselves very complex (unlike replanted areas), composed of dense growth of several tree and shrub species.
3. The first 2 miles of the surveyed reach is a classic, showcase example of complex, high-quality habitat. This portion has a relatively steep gradient. There are numerous and frequent deep pools, plunge-pools, runs, and riffles. There is abundant structure in the form of boulders of all sizes, large rocks, and numerous pieces of large and small woody debris (LWD; SWD), including several channel-spanning pieces of LWD. It appears that some of the LWD pieces may be hundreds of years old. There is also abundant overhead and instream riparian vegetation and SWD. And scattered among all of these high-quality features are a fairly good number of potential spawning areas and substrates.
4. Unfortunately, this section—and the entire surveyed reach for that matter—is heavily impacted by sediment. Sands are abundant in the upper portions. Moving downstream, silt gradually becomes more and more dominant; and quick-sand piles become more abundant. Many of the deepest remaining pools are filled in to varying degrees. Overall, however, sediment impacts were not as severe as I observed recently (02/15/01) on my brief survey of Rockpile Creek, tributary to the South Fork.

5. The middle one-third of the surveyed reach has a distinctly lower gradient than the other two one-third sections. There is also a lack of large rocks and boulders in this central section. Nevertheless, the three deepest pools observed during the day, all about 10-12-ft deep, were located in this central portion, where the river makes two consecutive, long, exaggerated "S" curves. The central one-third also has the greatest abundance of gravel and cobble. Several times, the flow in this reach became influent (losing), decreasing in cfs by close to one-half as it took a sub-surface route through these gravels and cobbles. This phenomenon was particularly noticeable in several long, low-gradient sections.

Prepared: March 19, 2001

MEMORANDUM TO THE FILE #007

File: Gualala River Steelhead Study

From: Richard W. DeHaven

Subject: Spawning survey, Tombs Creek, Tributary to Wheatfield Fork; and Wheatfield Fork, March 23, 2001

Extent of Survey: We were driven back into the Tombs Creek drainage drop-off, along several unimproved roads and through several locked gates, from Skaggs Springs Road, through the helpful efforts of a local, long-term resident. We reached Tombs Creek at a bridge about 4 miles upstream of Tombs Creek/Wheatfield Fork confluence at 0710 hrs. This is where the survey began. From here, we surveyed 4.0 miles downstream to the confluence with Wheatfield Fork, then another 5.1 miles downstream on Wheatfield Fork to its confluence with Wolf Creek. The confluence of Wheatfield Fork and Wolf Creek is where the survey ended at 1700 hours. This is also where Wheatfield Fork begins running adjacent to the Skaggs Springs Road. Our vehicle, “spotted” earlier in the morning, was parked at another local resident’s house adjacent to the mouth of House Creek, about 1.5 miles downstream from Wheatfield Fork/Wolf Creek confluence. Thus, after the survey ended, and we climbed back onto the road, we still had to walk another 1.5 miles to the vehicle. The total stream miles (measured with an electronic planimeter from the USGS Tombs Creek 7.5-minute topographic map) surveyed for the day was 9.1 miles, for an average of 0.9 miles/hr. This lower than usual survey rate was due to the slow going over numerous boulders and logjams during the first three miles of survey along Tombs Creek.

Weather and Water Conditions: The weather was overcast and mild until 1100 hrs, then sunny and clear until 1500 hrs, and then cloudy and only partly sunny until the end of the survey. High temperature for the day was about 70 degrees F at 1400 hrs. Water clarity was excellent in both Tombs Creek and Wheatfield Fork throughout the day. For reference, the flow recorded today at noon at the USGS realtime gage on Wheatfield Fork was about 85 cfs (4.60 ft).

Methods: We visually searched throughout the stream for redds and live adults. Lengths of adults were estimated in cm. Also, the stream margin was searched for live fry and adult carcasses. In proceeding downstream, we alternately waded across the stream and walked along the streambank as needed to pass obstacles. Because of poor GPS reception, Latitude and Longitude were not recorded for the redds. Therefore, we did not bother to mark the locations of the redds with florescent orange spray paint (on the adjacent bank) as is the usual procedure. The locations of the redds (within the surveyed reaches) we found can be roughly discerned on the basis of the time they were found, and the average survey rate of 0.9 miles/hr.

Personnel: DeHaven and Larry Thompson, biologists.

Findings—Adult Fish: The first two live adults (both appeared unspent) were seen 20 minutes after entering Tombs Creek. Twenty minutes later, three more adults were seen on an active

redd. Of the five total fish seen in Tombs Creek, two were >70cm and three were in the 60-70cm range.

Six live adults (all appeared unspent; one was >75cm, four were 65-70cm and one was in the 60-65cm range) and two carcasses (both 65-75 cm) were seen in and along Wheatfield Fork.

Based on the abundance of cover (see below) and downstream aspect of the survey, we estimate that we observed no more than 10% of the live adults that were present in the surveyed reaches.

Findings–Redds: Nine redds were found on Tombs Creek and seven were found on Wheatfield Fork. Locations of redds on Tombs Creek, in terms of the *time* (and *number* of redds in parentheses) that they were found were: 0735 (2); 0750 (1); 0839 (2); 0940 (1); 1005 (1); 1054 (1); and 1114 (1). Along the Wheatfield Fork, locations by time were: 1300 (1); 1322 (2); 1445 (1); 1640 (2); and 1650 (1) (near Wheatfield Fork confluence with Wolf Creek). We have no basis for estimating the percentage of redds present that we actually found. However, with two of us surveying, we no doubt found a greater percentage than a single observer (me) would have found.

Findings–Fry and Larger Juveniles: No fry were seen in Tombs Creek. This may suggest that the creek, which is small and has numerous potential low-flow barriers (see below), was not accessible to upstream migrating adults this season until after the latest series of storms which resulted in season-high flows and allowed fish access into this reach past the numerous plunge pools and debris jams.

However, we did begin seeing fry in the shallow stream margins and back-waters shortly after leaving Tombs Creek and starting down the Wheatfield Fork, just before noon. Fry were fairly abundant (although not as abundant as last week on the South Fork [see report #006]) until about half-way down Wheatfield Fork, then relatively sparse (perhaps due to bedrock conditions and lack of spawning substrates) until the end-of-survey.

We also observed about 15 age 1 and 2 juveniles throughout the Wheatfield Fork reach. These were the first such larger juveniles observed during this year's spawning surveys.

Findings–Related Observations:

1. The Tombs Creek reach that was surveyed is a classic example of the complete lack of environmental concern often associated with early redwood logging operations. For about 2.5 miles downstream from our starting point, all of the mature redwoods in the channel and on the nearby slopes had, at some time (probably 50-100 years ago) been logged. It appears that much of this timber may have been sawed to lengths suitable for floating downstream during flood flows, because numerous sawed logs are still imbedded in the many logjams occurring along this 2.5-mile reach. There were also several pieces of logging cable found in and among the logjams. Among these logjams, and the several bedrock plunge-pools which occur in this 2.5-mile reach, there are about 10 likely impediments to upstream adult migrations during low-flow conditions.

Nevertheless, this reach, and particularly the first 1.5 miles of it, has some very complex, and often high-quality spawning and rearing habitat. Important components of this habitat are the numerous remaining (from the earlier logging) large redwood stumps along the stream channel. This first 2.5 miles also has a relatively steep gradient. The lowermost 1.5 miles of the creek has a much lower gradient, and also much less habitat complexity and value. In addition, just before the confluence with Wheatfield Fork, we observed three PVC diversion pipes in the creek. Although these were not in operation at the time, they may be used later in the season and are likely non-permitted diversions (most likely used in illegal farming activity).

2. The Wheatfield Fork reach that was surveyed has spawning and rearing gravels in relatively low abundance, but they are in good-to-excellent condition. Unlike several other reaches (e.g., South Fork; Report #006) I surveyed recently, there appears to be a low sediment rate and low damage from fines. On the other hand, two habitat-limiting factors include: (a) an abundance of bedrock stream bottom (over about 2.5 miles) with only a shallow covering of sand, gravel and cobble; and (b) a general lack of large woody debris (LWD) and overhead riparian cover over much of the reach. Channel-spanning LWD is completely absent. The relatively low amounts of LWD are to be expected, since about half of this reach flows through moderately-sloped oak woodland with only minimal riparian vegetation.

3. Other fish and wildlife of interest recorded along the surveyed reaches include two lampreys (two species) seen in Tombs Creek, a few dozen foothill yellow-legged frogs seen along both surveyed stream reaches, and hundreds of roughskin newts, many of which were mating, seen throughout the survey.

Prepared: March 25, 2001

MEMORANDUM TO THE FILE #008

File: Gualala River Steelhead Study

From: Richard W. DeHaven

Subject: Spawning survey, Wheatfield Fork, from near the Berkeley YMCA Camp downstream to Haupt Creek confluence, March 31, 2001

Extent of Survey: This survey *began* where my February 8, 2001 survey *ended* (see Report #002), at a point 0.7 mile upstream from the Berkeley YMCA Camp on the Wheatfield Fork. I arrived at this point and started the survey at 0745 hrs, after first “spotting” my car at the climb-out at Haupt Creek confluence with the assistance of a long-time local resident. The survey distance was 5.5 miles (as measured with an electronic planimeter from the Annapolis USGS 7.5-minute topographic quadrangle map). I arrived at the climb-out at 1225 hrs, for an average survey rate of 1.2 miles/hr. Using this rate, the approximate location of key observations given below can be ascertained.

Weather and Water Conditions: Weather was clear and was billed as the warmest day of the year. Air temperature reached about 81 degrees F at about 1400 hrs. Water clarity was high. For reference, the flow recorded today at noon at the USGS realtime gage on Wheatfield Fork was about 64 cfs (4.48 ft).

Methods: I surveyed alone again today. I visually searched throughout the stream for redds and live adults. Lengths of adults seen were estimated in cm. Also, the stream margin was searched for live fry, older juveniles, and any adult carcasses. In proceeding downstream, I alternately waded across the stream and walked along the streambank as needed to pass obstacles, such as boulders and deep pools. Because of poor GPS reception, Latitude and Longitude were not recorded for the redds. Therefore, I did not bother to mark the locations of the redds with florescent orange spray paint (on the adjacent bank) as is the usual procedure. The locations of the redds (within the surveyed reach) I found can be roughly discerned on the basis of the time they were found, multiplied by the average survey rate of 1.2 miles/hr.

Findings—Adult Fish: Seven live adults and one adult carcass were observed. The carcass was that of a 72-cm male. The live fish had the following approximate size distribution: one=50 cm; four=65 cm; one=70 cm; and one=>75 cm. Four of the seven live fish were in one large, deep pool about 2,000 ft upstream of the Annapolis Road bridge. Based on their behavior and appearance, I believe that two of the fish were spent and five were fresh (not spawned yet). Based on the abundance of cover and downstream aspect of the survey, I believe that I observed no more than 25% of the live fish that were actually present.

Findings—Redds: A total of 34 redds was found. I have no basis for estimating the proportion of actual redds present that were located, but I am fairly confident that some went unobserved. Certainly, the coverage by just one person is not as efficient as two or more surveyors. Locations of the redds, in terms of the *time* from the starting point of the survey (and *number* in parenthesis) that they were found were: 0830 (2); 0852 (2); 0919 (5); 0925 (4); 0950 (2); 1004

(3); 1011 (1); 1016 (1); 1038 (3); 1047 (2); 1117 (3); 1200 (3); and 1203 (3). This was the largest number of redds observed on any 1-day survey so far this season.

Findings–Fry and Larger Juveniles: The first small groups of fry was observed at 0830 hrs. Fry were then periodically observed in small groups until the end of the survey at 1225 hrs. Fry abundance was generally less than what I observed recently on the South Fork on March 18 (*see* Report #006), but was similar to the abundance Thompson and I observed last week on 5.1 miles of the Wheatfield Fork (*see* Report #007). Unlike last week, however, I observed only 1 larger (Age 1) juvenile today, compared to about 15 last week on the Wheatfield Fork reach that was surveyed.

Findings–Related Observations:

1. The reach that was surveyed today can be characterized as follows: low or moderate degree of fines in most areas; low gradient; low amounts of large woody debris (LWD); a lack of channel-spanning LWD; a moderate amount of overhanging riparian vegetation; a low abundance of deep pools, and a high abundance of gravels and cobbles providing potential spawning substrates. In addition, throughout survey mile 4, there was an abundance of channel bedrock, with only a shallow covering of gravels and cobbles which likely provides spawning and rearing habitat of relatively lesser value.
2. The largest and deepest pool on the surveyed reach is where the four adults were seen 2,000 ft upstream of the Annapolis Road bridge. This pool appears to be about 10-12- ft-deep.
3. One unidentified lamprey was seen near the Annapolis Road bridge.
4. Vehicles have been driving across the river and damaging redds–also in the vicinity of the Annapolis Road bridge.

Prepared: April 1, 2001

MEMORANDUM TO THE FILE #009

File: Gualala River Steelhead Study

From: Richard W. DeHaven

Subject: Spawning survey, Wheatfield Fork, from Haupt Creek downstream to Wheatfield Fork/South Fork confluence, April 5, 2001

Extent of Survey: This survey *began* where my March 31, 2001 survey *ended* (*see* Report #008), on the Wheatfield Fork at Haupt Creek confluence. I arrived at this point and started the survey at 0818 hrs, after first “spotting” my vehicle at the climb-out at the Wheatfield Fork/South Fork confluence, which is known locally as “Twin Bridges.” As usual, I placed the car with the assistance of a long-time local resident. The survey distance was 8.6 miles (as measured with an electronic planimeter from the Annapolis and Stewarts Point USGS 7.5-minute topographic quadrangle maps). I reached the climb-out at 1400 hrs, for an average survey rate of 1.5 miles/hr. This was a noticeably faster rate than previous surveys, a general result of the easy walking (*see* habitat characterization below). Based on this *rate* of survey, the approximate location of key observations given below (in terms of the *time* from start of survey) can be roughly ascertained.

Weather and Water Conditions: Weather was clear, but unseasonably cool. Patches of frost were observed as I drove into the area along Skaggs Springs Road from Geyserville. Air temperature reached only about 55 degrees F at about 1400 hrs. Water clarity was very high. However, starting at about 1100 hrs, a strong southerly wind began blowing in advance of an approaching storm front. This greatly hampered visual observations during the last 3-4 miles of the survey. I believe that both adult steelhead and redds that would have otherwise been observed were in fact missed due to the wind causing surface turbulence which in turn greatly restricted visibility. For reference, the flow recorded today at noon at the USGS realtime gage on Wheatfield Fork was about 52 cfs, with a stage of about 4.41 ft.

Methods: I surveyed alone again today. I visually searched throughout the stream for redds and live adults. Lengths of adults seen were not estimated today, because most were only briefly seen or difficult to observe due to the water surface turbulence. Also, the stream margin was searched for live fry, older juveniles, and any adult carcasses. In proceeding downstream, I alternately waded across the stream and walked along the streambank as needed to pass any obstacles, such as boulders or deep pools. Because of poor GPS reception as well as the large number of redds found, Latitude and Longitude were not recorded for the redds. Therefore, I did not bother to mark the locations of the redds with florescent orange spray paint (on the adjacent bank) as was done earlier in the season. The locations of the redds (within the surveyed reach) that were found were roughly grouped by mile, based on the time that they were found and the average survey rate of 1.5 miles/hr.

Findings—Adult Fish: No carcasses of adults were found today. However, 19 adults were observed as follows (by time, from start of survey): 0938 hrs—12 in one large, deep pool; 1045 hrs—6 in one large, deep pool; and 1202 hrs—1. Based on their behavior and condition (when it

could be ascertained, I estimate that about two-thirds of the fish seen were not yet spent. Due to the surface turbulence and abundance of other types of cover, I believe that I observed no more than 10% of the adults that were actually present in the surveyed reach.

Findings–Redds: A total of 78 redds were found. This is the most found on any survey to date this year. Moreover, because of the surface turbulence over the last half of the survey (as well as the one-person survey method), I have no doubt that a considerable number of redds went unobserved. Arranged roughly by river mile (RM) surveyed, numbers of redds recorded were as follows: RM1=17; RM2=24; RM3=13; RM4=9; RM5=9; RM6=2; and RM7-8.6=4. As can be seen, the first 3 miles surveyed showed the highest intensity of recent spawning. Given that redds were almost certainly missed, the observations become even more noteworthy.

Findings–Fry and Larger Juveniles: In contrast to the relative abundance of redds, fry were low in abundance (compared to the past three surveys—*see* Report #s 6-8). The first fry were not observed until 1049 and this was only a small group. Only about six more small groups were later found. This indicates that while this reach may be relatively heavily utilized for late-season spawning, there may be much less early season spawning activity. No larger Age 1-3 juveniles were seen today.

Findings–Related Observations:

1. This reach has the greatest abundance per mile of potential spawning habitat that I have observed on any reach surveyed to date this season. The gradient is relatively low. Habitat is mostly a series of long runs and riffles. Deep pools are low in abundance. There is a broad (and generally barren) gravel and cobble-covered adjacent flood plain averaging 100-200 feet in width. There is a distinct absence of any bedrock substrate, large boulders, and large woody debris (LWD), except for an occasional in-place redwood stump (from past logging). However, usually one side of the channel has moderate-to-high abundance of overhanging riparian vegetation and small woody debris (SWD), which, along with numerous undercut banks, afford good cover and hiding conditions.
2. Unfortunately, spawning habitat substrate quality declined markedly due to ever-increasing fines as I proceeded downstream. The first 3 miles (with the highest redd activity) were high in quality with only low or moderate amounts of fines; the next 2 miles had moderate levels of fines; and the last 3.6 miles were badly degraded by sands and silt. The key sources of sediment were not readily apparent, however, the most intense recent logging activity was roughly adjacent to RMs4-6.
3. Most of the adjacent watershed appears to be second-growth (from past logging) redwoods and mixed coniferous forest. Evidence of recent logging exists along the south bank (especially RMs4-6), but not along the north bank.
3. This is one of the few surveyed reaches to date this season with no or low abundance of ATV (or other vehicle) tracks in the channel and across the flood plain. In fact, I didn't see a human-

made track of *any* kind until reaching RM 7.8, near the jump-out bridge at the end of the survey.

4. This would be an excellent reach for an annual, late-season, index-type of spawning survey to be conducted. It is also an important spawning reach that should be protected from further spawning substrate degradation due to sedimentation.

Prepared: April 8, 2001

MEMORANDUM TO THE FILE #010

File: Gualala River Steelhead Study

From: Richard W. DeHaven

Subject: Spawning Survey, South Fork, from Clipper Gap Bridge (Stewart's Point Rd) downstream to South Fork/Wheatfield Fork confluence, April 14, 2001

Extent of Survey: This survey *began* where my March 17, 2001 survey *ended* (*see* Report #006), at the Clipper Gap Bridge on Stewart's Point Road. I arrived at this point and started the survey at 0855 hrs, after first "spotting" my vehicle at the climb-out at the Wheatfield Fork/South Fork confluence, which is known locally as Twin Bridges or Valley Crossing. The survey distance was 5.6 miles (as measured with an electronic planimeter from the Annapolis and Stewarts Point USGS 7.5-minute topographic quadrangle maps). I reached the climb-out at 1305 hrs, for an average survey rate of 1.3 miles/hr. Based on this *rate* of survey, the approximate location of key observations given below (in terms of the *time* from start of survey) can be roughly ascertained as necessary.

Weather and Water Conditions: Weather was clear and mild. Maximum air temperature for the day was about 63 degrees F at about 1400 hrs. Water clarity was very high. For reference, the flow recorded today at noon at the USGS realtime gage on Wheatfield Fork was about 31 cfs, with a stage of about 4.26 ft. In addition, I estimate that the flow at noon on the surveyed reach of the South Fork was in the range of 15-20 cfs.

Methods: I surveyed alone again today. I visually searched throughout the stream for redds and live adults. Also, the stream margin was searched for live fry, older juveniles, and any adult carcasses. In proceeding downstream, I alternately waded across the stream and walked along the streambank, as needed to pass any obstacles, of which there were few. I did not attempt to get a GPS "fix" on the redd locations or bother to mark the locations of the redds with florescent orange spray paint (on the adjacent bank) as was done earlier in the season, since this was the final survey of this season. However, as can be done for data from the last few surveys, the locations of the redds (within the surveyed reach) that were found can be approximated using the time from start of survey and the average survey rate of 1.3 miles/hr.

Findings—Adult Fish: Neither any live adults nor carcasses of adults were found today.

Findings—Redds: A total of 12 redds were found. Numbers of redds found by time (hrs) were: 0907=2; 0946=3; 0959=2; 1044=1; 1104=2; 1220=1; and 1230=1.

Findings—Fry and Larger Juveniles: This season's fry were present, but generally lower in abundance than found during surveys conducted on other reaches on March 17, 23, and 31, of this year. The first fry were not observed until 0920 and this was only a small group. Only about five more groups were later found. However, one short reach walked at about 1226 had very abundant fry. For the whole survey, only one larger Age 1+ juvenile was

seen at 1150 hrs.

Findings–Related Observations:

1. This reach has a low gradient. Habitat is mostly a series of very long, broad, and shallow runs interspersed with occasional riffles. Deep pools are absent; moderately deep pools are low in abundance. There is a distinct absence of any bedrock substrate, large rocks, or boulders. However, almost always, the low-flow channel is against one bank which has moderate-to-high abundance of overhanging riparian vegetation and both large and small woody debris (LWD; SWD), which, along with numerous undercut banks, afford moderate-to-high quality cover. Also, there is nearly always a broad (and generally barren) gravel- and cobble-covered flood plain averaging 100-150 feet in width adjacent to the low-flow channel.

2. The high abundance of sediment throughout the surveyed reach was a great disappointment. Most pools were at least partially filled in and many of the potential spawning sites were armored by the presence of the fines. Moreover, there were often long reaches with only sand and silt, with little or not clean cobble to provide cover and food production for juveniles. This appears to be a continuation of the problem noted on the reach just upstream of here that was surveyed on March 17, 2001. The source of this sediment problem on the South Fork need to be investigated further.

3. At the flow today, any adult passage would be very doubtful, since there are thousands of linear feet of very shallow (<3-inches) areas.

4. Most of the adjacent watershed appears to be second-growth (from past logging) redwoods and mixed coniferous forest. Evidence of recent logging was not be observed, but may have been present.

5. Unlike most of the 78 redds found on last week's survey, redds observed today appeared to be substantially older, perhaps from spawning up to several weeks ago. This inference is supported by the lack of any adults seen along this reach as well.

Prepared: April 17, 2001