

Final Report

Summer Steelhead Survey, 2003 Season Mattole River Watershed

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Report prepared by Deva Wheeler and Mijanou Brown

Mattole Salmon Group
P.O. Box 188
Petrolia, CA 95558-0188

phone 707-629-3433 • fax 707-629-3435 • msg@mattolesalmon.org

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2003 Summer Steelhead Survey Report

The eighth annual summer steelhead survey was conducted in the Mattole River watershed (Figure 1) between July 21 and 31, 2003. The purpose of the summer steelhead survey was to enumerate summer-run steelhead and “half-pounders,” and to identify their preferred holding habitat in the mainstem Mattole River and in the lower section of two major tributaries, Bear Creek and Honeydew Creek. In addition, locating “cold-water areas” in the survey reaches and identifying the distribution of three species of juvenile salmonids was of prime concern.

Summer steelhead are adult steelhead that enter the river in spring, before the river mouth closes for the summer. They spend the summer instream before spawning during the ensuing rainy season. Half-pounders are 99% immature male and female steelhead that enter the river in the spring, ascend the mainstem and some large tributaries, and feed instream through the winter, after which they return to the ocean. Most half-pounders then spend only a few months in the ocean before they return to freshwater as maturing fish (Barnhart, 1996). Half-pounders are typically between 12 and 16 inches (12-16in.) in length, and they do not have parr marks.

Twenty-one surveyors, working in teams of two, performed direct underwater observation counts in approximately 40 miles of the Mattole River and 6.25 miles of tributaries to the River, (46.25 total stream miles). The survey comprised seventeen reaches that ranged in length from 1.4 to 4.8 miles (see Table 1). A total of nine (9) adult summer steelhead (>16 inches in length) and twenty-one (21) half-pounders (12-16 inches in length) were counted during the survey. These figures are the lowest per stream mile ever counted during the past eight years of summer steelhead surveys. The next fewest summer steelhead ever counted in the Mattole River summer steelhead survey was 12 in 32.7 miles in 2000. The greatest number counted was 45 in 44.9 miles in 1998. The maximum count for half-pounders was 126 fish in 32.7 miles in 2000. The second lowest count of half-pounders was 19 fish in 39.3 miles in 1997. It is unclear why the numbers of summer steelhead and half-pounders were so low this year. It is possible that the high spring flows enabled the steelhead to migrate in to tributaries, when they would otherwise be confined to the mainstem.

Juvenile steelhead were noted in all survey reaches, while juvenile coho salmon were observed in only two reaches (see Table 2). Juvenile Chinook salmon were not observed in any reaches during this year’s summer steelhead survey. Cold areas were noted in all survey reaches (see Table 3). These figures were typical for the last few years of summer steelhead surveys.

This report includes information on incidental stream and air temperatures (Table 3), survey reach lengths, location and personnel (Table 1) and numbers of steelhead greater than or equal to 12 inches in fork length (Table 2). In addition, the presence of all observed juvenile steelhead and coho salmon was noted (Table 2). This report also includes discussion, other observations, habitat descriptions and future recommendations. This type of information can be useful in determining the needs and habits of local riverine fauna, and establishing land-use practices that promote stewardship and conservation.

Survey Methods

The survey was conducted in as few consecutive days as possible to ensure similar hydrologic and thermal conditions on survey days. Each reach was surveyed by a team of two people, at least one of which had prior experience participating in the summer steelhead survey, and experience identifying juvenile salmonids. At least one surveyor from each team participated in an in-field juvenile salmonid identification workshop with a qualified biologist in waters bearing juvenile coho salmon and steelhead, and was also oriented to field methods and protocols with the project coordinator.

Surveyors snorkeled every area of the mainstem in their assigned reach that was deep enough to snorkel. Steelhead observations were recorded by size class. Steelhead with an estimated fork length of greater than sixteen inches (>16in.) were designated summer steelhead, and those with a fork length between 12 and 16 inches (12-16 in.) were called half-pounders. Length was the primary feature used in identifying “half-pounders”, therefore some number of the fish we called “half-pounders” could have been resident rainbow trout.

Each summer steelhead sighting was marked on a topographic map with a corresponding case #; the steelhead’s fork length was estimated and recorded, and the location and habitat in which it was sighted was described. For each half-pounder sighting, a fork length estimate and habitat description was recorded. Juvenile salmonids were not counted, but the habitat and location in which they were observed was recorded.

With calibrated hand-held thermometers, air and water temperatures were recorded at the beginning and end of each survey reach, and in tributaries and cold pools and seeps throughout the reach. As each temperature was recorded, the time of day was noted. In addition, all crayfish, bullfrog tadpole, and freshwater mussel sightings were recorded and mapped (see Table 2).

Figure 1. Location Map, Mattole River Watershed and Key Tributaries

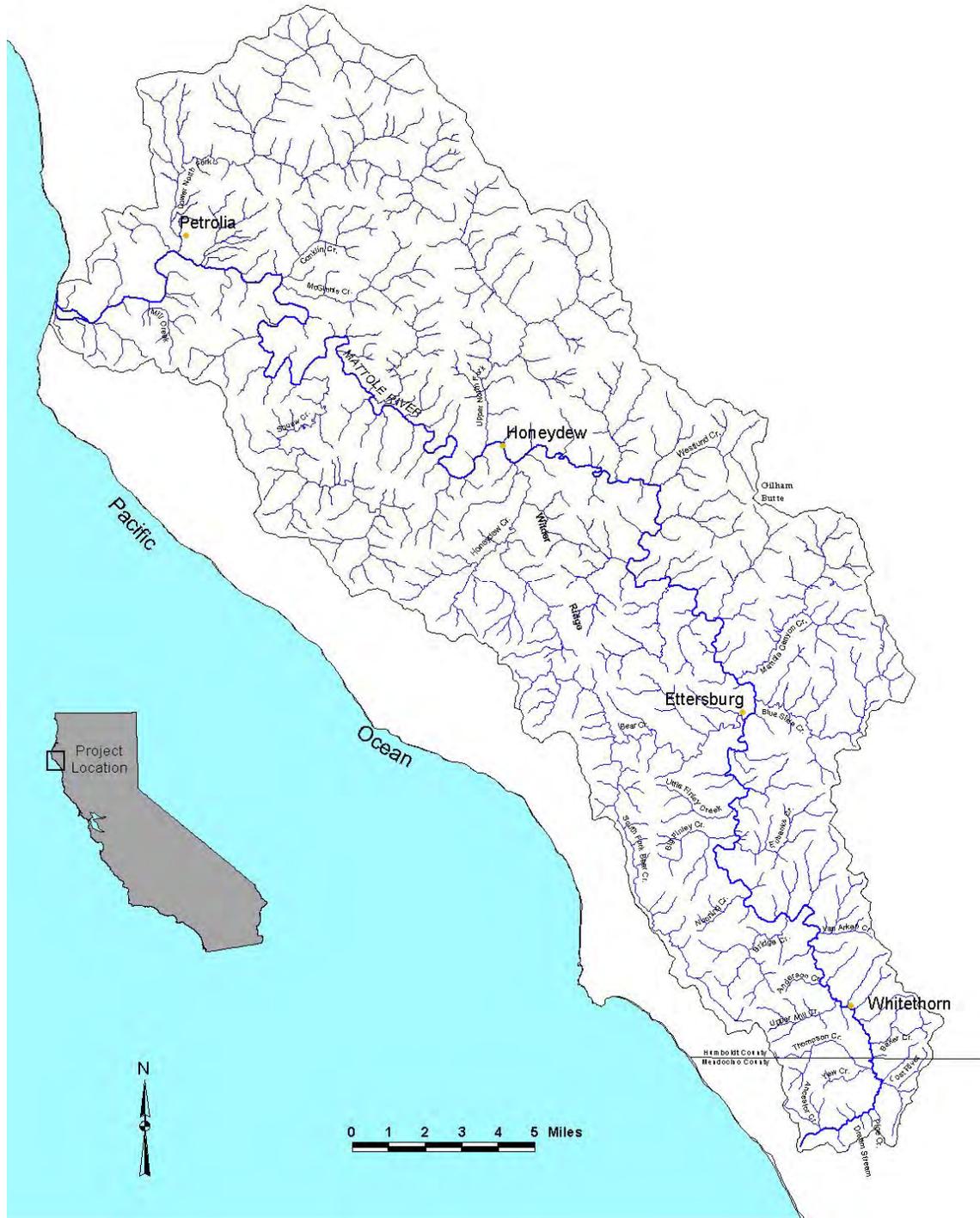


Table 1. Description of dive reaches, including: beginning and ending point; total mileage; dive personnel for 2003

8th Annual Mattole Summer Steelhead Dive, 2003						
Reach #	Reach Name and Location	Survey Date	Personnel	Mileage	Summer Steelhead	Half-Pounders
1	Phillips Cr. (RM 60.4) to Lost River Cr. (RM 58.8)	NA	NA	NA (1.6)	NA	NA
2	Lost River Cr. (RM 58.8) to Stanley Cr. (RM 57.1), & Thompson Cr. (RM 58.4+ 0.15, mouth to confluence with Yew Ck.)	7/21	Jennifer Peters, Michelle Gilroy*	1.7+ 0.15	1	2
3	McKee Cr. (RM 52.8) to Crook's (RM ~51.3)	7/21	Campbell Thompson*, Jessica DeKolver*	~1.5	0	2 (possible residents)
4	Crook's (RM ~51.3) to Tom's Hole (Patty's) (RM ~49.4)	7/21	Deva Wheeler*, Maureen Roche*	~1.9	3	2 (possibly 1 resident)
5	Tom's Hole (RM ~49.4) to Big Finley Cr. (RM 47.4)	7/21	Mijanou Brown*, Colum Coyne*	~2.0	0	1
6	Big Finley Cr. (RM 47.4) to Shepp's (RM~46.0)	7/21	Cisco Benemann*, Noah Stafslie*	~1.4	0	0
7	us Bear Cr. (RM ~43.8) to Klossen's Hole (ds Mattole Canyon Cr.)(RM~39.9)	7/22	Colum Coyne*, Jessica DeKolver*	3.9	0	2
8	Gilham Cr. (RM 32.8) to Dry Cr. (RM 30.4)	7/22	Cisco Benemann*, Randy Speck*	2.4	1	1
9	Honeydew Slide (RM 27.0) to Bundle Prairie Cr. (RM 24.4)	7/23	Deva Wheeler*, Stephen Avis	2.6	2	0
10	Bundle Prairie Cr. (RM 24.4) to Triple Junction High School (RM 21.3)	7/22	Campbell Thompson*, Tabi Bolton	2.9	0	1
11	Saunders Cr. (RM 19.7) to Squaw Cr. (RM 14.9)	7/31	Olympia Franklin*, Drew Barber	4.8	0	1
12	Squaw Cr. (RM 14.9) to Lindley Bridge (RM 12.6)	7/22	Mijanou Brown*, Dian Bacigalupi	2.3	0	1
13	Lindley Bridge (RM 12.6) to Conklin Cr. (RM 7.8)	7/23	Mijanou Brown*, Tabi Bolton*	4.8	0	1
14	Conklin Cr. (RM 7.8) to Hideaway Bridge (RM 5.2)	7/23	Maureen Roche*, Dian Bacigalupi	2.6	0	0
15	Hideaway Bridge (RM 5.2) to Stansberry Cr. (RM 1.3)	7/24	Dave Fuller*, Drew Barber	3.9	0	0
16	Stansberry Cr. (RM 1.3) to Ocean (RM 0.0)	7/24	Mijanou Brown*, Walker Abel, Willow Van Horn	1.3	0	0
17	Bear Cr. (Geppert/Spencer's to mouth)	7/23	Colum Coyne*, Graeme Scott	~3.6	0	5
18	Honeydew Cr. (Maureen Catalina's to 2.5 miles us, at Bear Wallow Slide)	7/24	Maureen Roche*, Sam Yellen	2.5	2	2
Totals:			21 surveyors	~40 miles in mainstem Mattole, & ~6.25 miles in tribs	9	21

* denotes prior summer steelhead diving experience; '+' denotes tributary mileage; 'RM' = River Mile; ds = downstream; us = upstream; NA = not applicable

Table 2. Summary of summer steelhead, half-pounders, and juvenile salmonid observations between the headwaters and the mouth of the mainstem Mattole River, 2003.

REACH	ADULTS (>16 in.)	HALF-LBS (12-16 in.)	Juvenile COHO	Juvenile CHINOOK	Juvenile STEELHEAD <12 inches	Fresh-water Mussels	Bull Frog Tadpoles	Crayfish	Turtles
Phillips Cr. to Lost River Cr.	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lost River Cr., to Stanley Cr. & Thompson Cr. (mouth to confluence with Yew Cr.)	1	2	Yes, throughout	No	Yes, throughout	No	No	No	0
McKee Cr. to Crook's	0	2 (possible residents)	Yes, still water and pool margins	No	Yes, throughout	~140	No	No	2
Crook's to Tom's Hole (Patty's)	3	2, (1 possible resident)	No	No	Yes, throughout	~275	No	1 live, 2 exo- skeletons	1
Tom's Hole (Patty's) to Big Finley Cr.	0	1	No	No	Yes, throughout	~1,000	No	~55 live	3
Big Finley Cr. to Shepp's	0	0	No	No	Yes, throughout	Yes	No	Yes	2
1 mi. us Bear Cr. to Klossen's Hole (ds Mattole Canyon Cr.)	0	2	No	No	Yes, throughout	No	No	No	2
Gilham Cr. to Dry Cr.	1	1	No	No	Yes, throughout	No	No	No	"numerous"
Honeydew Slide to Bundle Prairie Cr.	2	0	No	No	Yes, vegetative cover and in pocket water	No	No	No	3
Bundle Prairie Cr. to Triple Jct. High School	0	1	No	No	Yes, throughout	No	No	No	6
Saunders Cr. to Squaw Cr.	0	1	No	No	Yes, throughout	No	No	No	2
Squaw Cr. to Lindley Bridge	0	1	No	No	Yes, throughout	No	No	No	No
Lindley Bridge to Conklin Cr.	0	1	No	No	Yes, pools, live vegetation	No	No	No	3
Conklin Cr. to Hideaway Bridge	0	0	No	No	Yes, throughout pools, and low- gradient riffles	No	No	No	No
Hideaway Bridge to Stansberry Cr.	0	0	No	No	Yes, throughout complex wood	No	No	No	2
Stansberry Cr. to Ocean	0	0	No	No	Yes, vegetative cover, shallow cold areas, and in estuary	No	No	No	No
Bear Cr. (Geppert/Spencer's to mouth)	0	5	No	No	Yes, throughout	No	No	No	0
Honeydew Cr. (Maureen Catalina's to Bear Wallow Slide)	2	2	No	No	Yes, throughout oxygenated waters	No	No	No	No
Totals	9	21	2 reaches	None	All reaches	~1,415	None	~56	26+

Table 3. 2003 Mattole Watershed stream and air temperatures recorded by hand-held thermometers during summer steelhead survey.

2003 Stream and Air Temperatures Recorded During Summer Steelhead Survey						
Date	Location	Reach # & letter code	Time	Tributary Temp. (°F)	Mattole Temp. (°F)	Air Temp (°F)
7/21	Stanley Cr. pool	2A	1015	--	64	69
7/21	Stanley Cr.	2B	1020	59	--	69
7/21	ds Stanley Cr.	2C	1025	--	61 @ 8ft	69
7/21	0.2 mi ds Stanley Cr.	2D	1240	--	65	82
7/21	us Baker Cr.	2E	1335	--	66	--
7/21	Baker Cr.	2F	1340	62	--	--
7/21	Thompson Cr.	2G	1515	65	--	--
7/21	Yew Cr.	2H	1545	63	--	--
7/21	Thompson Cr. us Yew Cr.	2I	1545	68	--	--
7/21	Helen Barnum Cr.	2J	1710	60	--	74
7/21	Mattole at Lost River confluence	2K	1710	--	64	74
7/21	Lost River	2L	1710	61	--	74
7/21	McKee Cr.	3A	1125	62	--	72
7/21	Junction Hole	3B	1140	--	61 @ 10ft	--
7/21	Pool us Bridge Cr. pool	3C	1324	--	68 @ surface; 61 @ 6 ft	--
7/21	Bridge Cr.	3D	1400	63	--	87
7/21	RB trib ds Bridge Cr.	3E	1405	63	--	--
7/21	Crook's place	3F	1518	--	73	--
7/21	Crook's	4A	1100	--	65	78
7/21	RB trib.200 yards ds Crook's	4B	1115	55	--	--
7/21	Long bedrock pool ~1/4 mi us Nooning Cr.	4C	1330	--	67 @ surface; 62 @ 15 ft	--
7/21	20 ft deep pool w/ LB trib. 0.1 mi us Nooning Cr	4E	1345	--	67 @ surface; 62 @ 15 ft	--
7/21	Nooning Cr.	4H	1400	60	--	81
7/21	Mattole @ Nooning Cr.	4I	1400	--	79	81
7/21	Patty's (Tom's Hole)	4J	1615	--	75 @ surface; 65 @ 16 ft	78
7/21	RB trib on Patty McGuire's property	5A	1100	66	67	78
7/21	Small LB trib.	5B	1200	58	66	--
7/21	LB trib draining from a culvert	5C	1330	55	66 @ 2 ft	--
7/21	Large deep bedrock pool	5D	1430	--	72 @ surface; 70 @ 6 ft.	--
7/21	Eubanks Cr.	5E	1530	65	70	--
7/21	Big Finley Cr.	5F	1620	61	--	--
7/21	Mattole @ Big Finley Cr.	5G	1620	--	72 @ surface; 64 @ 11 ft	--
7/21	Big Finley Cr.	6A	1000	59.5	66.5 @ surface; 60.5 @ 12 ft	73
7/21	Corner pool with cave	6D	1130	--	68 @ 8 ft	73
7/21	Little Finley Cr.	6G	1300	--	70 @ 5 ft	74
7/21	Small tribs	6H	1345	65	69.5 @ 6 ft	74.5
7/21	Cold seep ds Little Finley	6I	1345	--	59.5 @ 4 ft	74.5

Table 3 cont'd. 2003 Stream and Air Temperatures Recorded During Summer Steelhead Survey

Date	Location	Reach # & letter code	Time	Tributary Temp. (°F)	Mattole Temp. (°F)	Air Temp (°F)
7/21	Trib, doesn't reach Mainstem	6M	1540	61.5	71 @ 4 ft	80
7/21	Pool at takeout	6O	1630	--	74 @ 8 ft	84
7/22	Gilham Cr	8A	1115	69.5	75	84
7/22	Pool ds Gilham Cr.	8C	1122	--	76 @ 3 ft	84
7/22	Mattole at dry LB trib	8D	1130	--	76 @ 7 ft	85
7/22	Mattole at LB creek	8E	1140	--	76 @ 7 ft	84
7/22	RB air bubbles, gas seep?	8F	1200	--	74 @ 2 ft	84
7/22	RB bubbles	8G	1210	--	70.5 @ 3 ft	84
7/22	LB fallen tree	8H	1215	--	76 @ 4.5 ft	85
7/22	LB boulder	8I	1225	--	77 @ 6 ft	85
7/22	RB cold seep big boulder	8J	1230	--	73 @ 5 ft	85
7/22	LB trib	8K	1245	--	74.5 @ 5 ft	85
7/22	Big boulder	8L	1300	--	78 @ 6 ft	86
7/22	Near house	8M	1300	--	78 @ 7 ft	87.5
7/22	Westlund Cr.	8P	1315	68	76 @ 4 ft	87.5
7/22	Run ds Westlund Cr.	8Q	1320	--	78 @ 6 ft	87.5
7/22	Middle Cr.	8S	1345	73	78 @ 12 ft	88
7/24	First pool ds Honeydew Slide	9A	1100	--	75	78
7/24	Upper North Fork	9B	1400	79	78	80
7/24	Mattole @ Bundle Prairie Cr.	9D	1600	dry	77	69
7/22	Mattole @ Bundle Prairie Cr.	10A	1100	dry	73	82
7/22	First riffle ds Bundle Prairie Cr.	10B	1200	--	78 @ surface; 68 @ 3 ft	--
7/22	Woods Cr.	10C	1210	64	--	--
7/22	Big backwater bedrock pool ds Woods Cr.	10E	1400	--	78 @ surface; 66 @ 10 ft	--
7/22	Backwater us Dirty Cr.	10F	1438	--	78 @ surface; 67 @ 6 ft	84
7/22	Backwater on LB	10G	1800	--	76 @ 2ft	--
7/22	RB pool directly us bridge	10H	1830	--	80 @ surface; 71 @ 7 ft	79
7/31	Saunders Cr.	11A	1021	--	71 @ 3 ft	74
7/31	DS Saunders Cr.	11B	--	--	69	--
7/31	Pool attached to Mattole Waterway	11C	--	64	66	--
7/31	RB trib	11D	--	59	--	--
7/31	RB trib	11F	--	56	--	75
7/31	RB trib	11G	--	54	--	--
7/31	RB trib	11H	--	59	--	--
7/31	Trib by Bob Hoyle's house	11I	--	64	--	--
7/31	Big Pool us Squaw Cr	11J	--	--	68 @ 9 ft	--
7/31	Squaw Cr.	11K	1715	69	76 @ 2 ft	74
7/22	Squaw Cr.	12A	1200	69	--	86
7/22	Mattole us Squaw Cr./ ds Squaw Cr.	12B	1200	--	76/74	86
7/22	Backwater pool at A WAY ds bedrock pool	12C	1230	--	75 @ surface; 73 @ 3.5 ft	--

Table 3 cont'd. 2003 Stream and Air Temperatures Recorded During Summer Steelhead Survey

Date	Location	Reach # & letter code	Time	Tributary Temp. (°F)	Mattole Temp. (°F)	Air Temp (°F)
7/22	LB trib. at A WAY/ backwater pool at mouth	12D	1245	60	64 @ 2.5 ft	--
7/22	Mattole, across cobble bar from backwater pool	12E	1245	--	75	--
7/22	Buck Miner Hole RB trib	12F	1300	63	--	--
7/22	Mattole at Buck Miner Hole	12G	1305	--	77 @ surface; 74 @ 4 ft	--
7/23	Mattole under Lindley Bridge	13A	1035	--	71 @ 2.5 ft	76
7/23	RB backwater pool, us unnamed seasonal trib.	13B	1140	--	77 @ surface; 74 @ 1.5 ft	--
7/23	LB unnamed seasonal trib	13C	1140	61	--	--
7/23	LB unnamed seasonal trib	13D	1220	61	--	--
7/23	RB trib at bend in river	13E	1400	60	76 @ 2 ft	77
7/23	RB unnamed trib us McGinnis Cr.	13G	1420	61	--	--
7/23	McGinnis Cr.	13H	1535	73	75	--
7/23	Conklin Cr.	13I	1550	78	79 @ surface	77
7/23	Conklin Cr.	14A	1000	66	70	68
7/23	Clear Cr.	14B	1300	60	--	--
7/23	East Mill Cr.	14C	1328	64	--	--
7/23	Hideaway Bridge	14D	1545	--	76	70
7/24	Mattole us, Lower North Fork Mattole	15A	1133	--	71	--
7/24	Lower North Fork Mattole	15B	1135	71	--	--
7/24	Confluence of Jeffry Gulch	15C	1153	--	68	--
7/24	Hanson Hole	15D	1320	--	72	--
7/24	Scheinman's	15E	1405	--	--	66
7/24	Rex's Wingdam Hole	15F	1530	--	69 @ 6 ft	--
7/24	Mill Cr.	15G	1545	58	--	--
7/24	Stansberry Cr.	15H	1730	58	--	67
7/24	Mattole us Stansberry Cr.	15I	1730	--	72 @ 2 ft	67
7/24	Stansberry Cr.	16A	1030	56	69	70
7/24	LB Lagoon mid-channel	16C	1200	--	72	--
7/24	RB Lagoon near large boulder	16D	1240	--	73	--
7/23	Bear Cr. ds RB trib	17A	1000	64	--	80
7/23	Bear Cr near RB trib	17B	1230	60 trib 68 Bear Cr.	--	--
7/23	Jewett Cr	17D	1400	70 trib 74 Bear Cr.	--	90
7/23	Mouth of Bear Cr.	17F	1530	78	--	--
7/24	Maureen Catalina's, step-run habitat	18A	1010	64	--	74
7/24	Lower East Fork Honeydew Cr.	18B	1300	68	--	--
7/24	Mid-channel pool us Lower East Fork Honeydew Cr.	18C	1310	64	--	--
7/24	Bear Wallow Slide, ~2.5 mi. us Catalina's	18D	1430	64	--	64

- **Letter codes** (associated with reach #) correspond to locations as mapped on field forms.
- All water temperatures were taken at a depth of approximately 1 foot (or where water was thoroughly mixed), except where a greater depth is stated. Where "surface" is stated, a depth of approximately 1 foot is assumed.
- **Abbreviations:** **us:** upstream; **ds:** downstream; **ms:** mainstem Mattole; **LB/RB:** left bank/right bank (looking downstream); **trib:** tributary

Other Adult Steelhead Sightings

Described in this section are sightings of adult summer steelhead and half-pounders that occurred outside of the official summer steelhead surveys. Throughout the summer, Mattole Salmon Group personnel conducted field surveys pertaining to temperature and other water quality monitoring, which often included snorkel surveys. It was during these surveys that a total of 5 adult steelhead and 4 half-pounders were observed, and their sizes estimated.

On June 10, while installing a temperature logger near the mouth of Buck Miner Creek a snorkel surveyor saw a ~15" half-pounder. Just downstream from Buck Miner Creek an ~18" summer steelhead was observed on September 23, when surveyors were there retrieving the temperature loggers. During a juvenile salmonid survey in the Mattole estuary on July 8th surveyors observed a ~20" summer steelhead. On two separate occasions adult steelhead were observed in the "Wingdam Hole," on July 29th (~17" adult summer steelhead seen during a "cold pool" study), and on September 21 (~22" summer steelhead observed while surveyors were retrieving a temperature logger). Just upstream from the Wingdam, in a "cold area monitoring pool" directly below the Quonset Hut, a ~13" half-pounder was seen on July 29th.

On July 16th a ~15" half-pounder was seen in the mainstem Mattole River at the mouth of Mill Creek near Petrolia while surveyors were taking water quality measurements and performing juvenile salmonid counts. Just upstream from Stanley Creek near Whitethorn, a ~16" half-pounder was observed by surveyors taking water quality measurements. Finally, during a "reference reach" snorkel survey downstream of the Ettersburg Bridge, surveyors saw an ~18" summer steelhead.

Miscellaneous Observations:

Below is a list of other sightings gathered during the summer steelhead survey. The list uses vernacular terms and is by no means complete. Lack of a noted observation in a reach does not signify the absence of the animal or item in question. When no reach number is given, the animal was probably sighted in most or all reaches.

- American dipper (4)
- cattle (13)
- crayfish (4,5,6)
- deer (5,13)
- evidence of fishing (3,8,10)
- freshwater mussels (3,4,5,6)
- garter snakes (4,6,8,9,10,12,13,17)
- gopher snakes (9,11,18)
- Great Blue Heron (14)
- horses (13)
- kingfisher (14)
- killdeer (14)
- lamprey (2,3,4,13)
- Mergansers (9)
- newts (2,4,5,7,10,11,12,17,18)
- osprey (13)
- ouzel (18)
- river otter (6)
- salamanders (6,8)
- sticklebacks (3,4,5,11,15)
- trash (11,12)
- turtles (3,4,5,6,7,8,9,10,11,13,15)
- varied thrush (18)
- western toad (14,15)
- Yellow Legged frog (3,18)
- people (10,12,13)

Habitat:

Coho juveniles, found in only the upper reaches of the mainstem, were distributed among microcosms of complex habitat that included large wood, undercut banks, overhanging vegetation, boulders, and cool water temperatures. Juvenile coho were seen only in reaches 2 and 3. Chinook juveniles were not observed in any reaches. In efforts to conserve and restore habitat for the survival of these threatened species, the importance of complexity cannot be overemphasized.

Seeps, springs and cold pools were observed throughout the basin, often isolated by long stretches with high-temperature waters between them. Most of the existing deep pools were stratified and noticeably cooler at the bottom.

In other survey reaches, half-pounders and summer steelhead were seen in deep pools and runs with vegetative cover. Especially in the lower reaches of the river, where water temperatures tend to be higher, all age classes of fish were found almost exclusively in runs and pools containing live vegetative cover (such as overhanging willow roots), and/or woody debris. Deep, well oxygenated pools containing vegetative cover seemed to be the habitat type most preferred by fish of all age classes in all survey reaches. Cool areas in the lower river tended to contain larger numbers of fish than their warm counterparts.

Discussion

Today, issues of habitat and species loss command the attention of local, state and federal agencies, community members, and scientists. An understanding and awareness of the watershed's response to human activities, as well as the inherent and economic value of local natural resources, remains incomplete. Monitoring projects like the summer steelhead survey provide meaningful biological information to fill existing gaps in our knowledge. In addition, the quantitative and qualitative analysis of collected field data may indicate levels of functionality throughout the watershed along a spectrum of spatial and temporal scales.

Summer steelhead once populated many of California's large streams and rivers, including most large tributaries of the San Joaquin and Sacramento rivers. Today they are confined to a handful of north coast streams possessing either deep holding pools, or significant cool summer flows (Gerstung 1996). As indicated in previous Mattole Salmon Group summer steelhead reports, cold-water refugia appear to be very important to both adult and juvenile salmonids during summer in the Mattole River basin. The direct relationship between cold-water refugia and salmonid habitat utilization was particularly evident in the lower, warmer reaches. Use of thermally stratified pools by adult summer steelhead has not been reported in more northern rivers, which tend to maintain sufficiently cool summer flows. However, the Mattole summer steelhead population is subjected to elevated stream temperatures and low summer flows, which may result in high metabolic demands to survive thermal stress.

Water temperatures also appear to greatly affect the range and preferred habitat of juvenile salmonids. For juvenile steelhead, temperatures ranging from 68 – 75° F can lead to growth suppression and early mortality (Brett 1979). A recent study of the distribution of juvenile coho salmon, in relation to temperature, in 21 tributaries of the Mattole River, was completed by the Mattole Salmon Group and Redwood Sciences Laboratory (Welsh et al. 2001). The study found juvenile coho salmon only in tributaries with MWAT values less than 62° F, and MWMT values less than 64.4° F. MWAT is determined by the highest average of mean daily temperatures of any 7-day period, and MWMT is determined by the highest average of maximum daily temperatures over any 7-day period. Coho were found in 9 of the 21 streams surveyed.

Recommendations:

- Continue conducting summer steelhead snorkel surveys in major tributaries, as was begun this year.
- Continue efforts to retain and introduce instream large woody debris for habitat complexity in the lower Mattole River, as exemplified by two projects completed by the Mattole Salmon Group this summer: the new log structure built in the Mattole estuary, and the "Wingdam enhancement project".
- Compare collected point-source temperature data with computerized temperature logger measurements, and overlay these with fish distributions and habitat features such as cold areas.
- Reestablish riparian forest in order to provide bank stabilization, shade, cover and cooler summer temperatures, and provide sources of woody debris for shaping complex instream habitat.

- Maintain the studies of cold pools and other cold areas, begun in 2003 by the Mattole Salmon Group, to examine which habitat features, such as oxygenation and cover, lead to the greatest use of these cold areas by juvenile and adult salmonids, and concentrate restoration efforts to maximize usability of these areas.
- As was implemented this year and in past years, continue placing temporary floating willow structures to provide shade and cover to salmonids in key pools and in the estuary/lagoon during the summer months.

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