Final Report

Summer Steelhead Survey, 2004 Season
Mattole River Watershed

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2004 Summer Steelhead Survey Report

The ninth annual summer steelhead survey was conducted in the Mattole River watershed (Figure 1) between July 19th and 26th, 2004. 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 usually between January and March. 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-three surveyors, working in teams of two or three, performed direct underwater observation counts in approximately 40.5 miles of the Mattole River and 6.05 miles of tributaries (46.1 total stream miles). The survey comprised eighteen reaches that ranged in length from 1.3 to 4.8 miles (see Table 1). A total of sixteen (16) adult summer steelhead (>16 inches in length) and forty (40) half-pounders (12-16 inches in length) were counted during the survey. These figures are higher than those counted in 2003, which were the lowest per stream mile ever counted during the past nine years of summer steelhead surveys. The greatest number of adults counted was 45 in 44.9 surveyed miles in 1998. The maximum count for half-pounders was 126 fish in 32.7 surveyed miles in 2000 see (Figure 2).

Juvenile steelhead were noted in all survey reaches, while juvenile coho salmon were observed in only four reaches (see Table 2). Juvenile Chinook salmon were observed in the upper most reach 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 and Chinook 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 or more 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, rather noted for presence or absence, 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

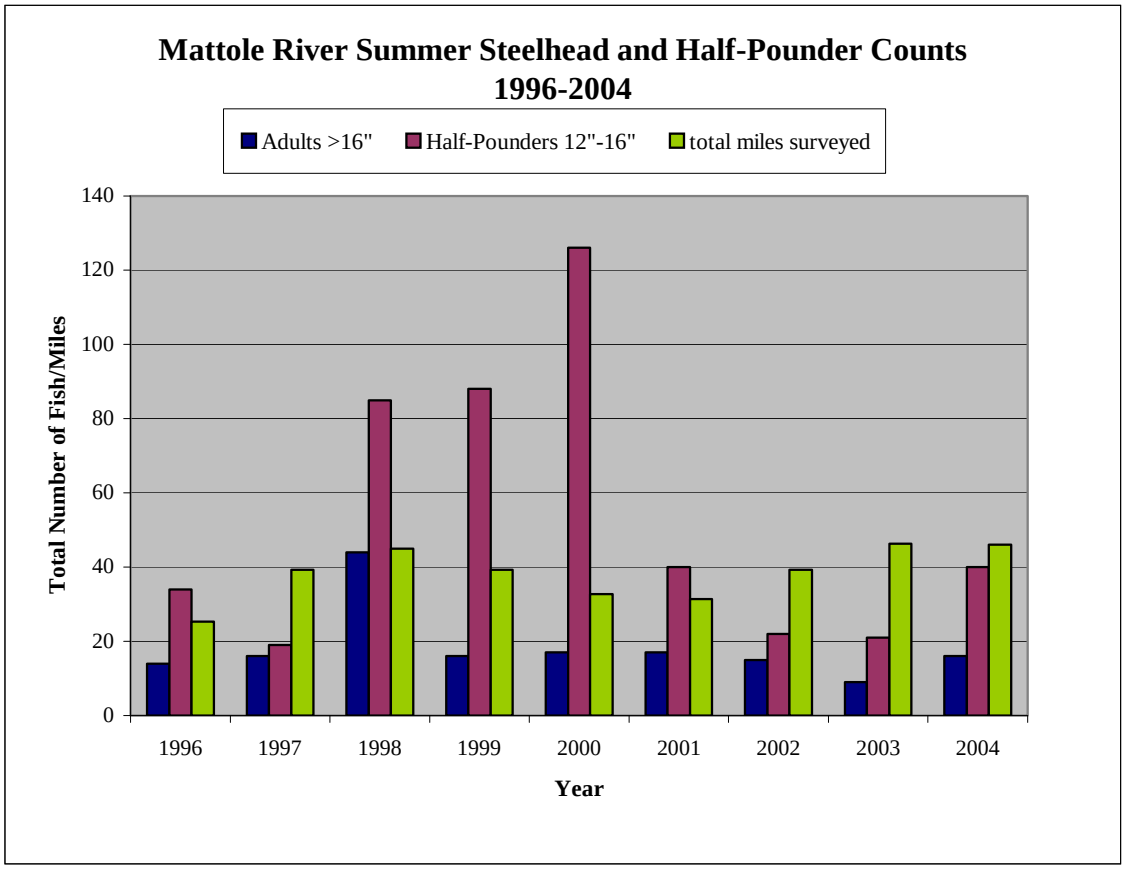

Figure 2. Graph of Mattole River Summer Steelhead Adults and Half-Pounder sightings and mileage from surveys conducted in the Mattole River between 1996-2004.

Other Adult Steelhead and Half-Pounder 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 conduct field surveys pertaining to temperature and other water quality monitoring, which often included snorkel surveys. It was during these surveys that a total of 2 adult steelhead and 1 half-pounder were observed, and their sizes estimated.

On May 27th, while installing a temperature logger in the Mattole River at the mouth of Big Finley Creek, a snorkel surveyor saw a ~14" half-pounder. The author observed a 20" summer steelhead in the deepest part of the bedrock pool in the Mattole River, at the mouth of Buck Miner Creek on July 5th while snorkeling recreationally, not during a MSG survey. During a temperature monitoring survey just upstream of the downstream migrant trap site near river mile 3.1, a snorkeller saw a 20" summer steelhead on September 16th.

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)
deer (4)
evidence of fishing (9,10,12,14)

freshwater mussels (3,4,5)
garter snakes (1,35,8,11,12,13,15,18)
Great Blue Heron (13,15)
kingfisher (13)
lamprey (2,4,17)
Mergansers (13,15)
newts (2,3,5,8,12,18)
salamanders (2,3,17)
sticklebacks (1,18)
trash (2,3,4,11,13,15)
turtles (4,5,8,10,11,12,13,15,17)
Yellow Legged frog (13,18)
people (3,4,8,10,11,15)

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 1,2,4, and 5. Chinook juveniles were only observed in reach one, the most upstream reach between river mile 60.4 and 58.8. 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 (Barnhardt, 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 – 75º 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 62º F, and MWMT values less than 64.4º 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.

Table 1 . Description of dive reaches, including: beginning and ending point; total mileage; dive personnel for 2004

9th Annual Mattole Summer Steelhead Dive, 2004

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)	7/25	Maureen Roche*, Vanessa Belz	NA(1.6)	0	0
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.)	7/23	Campbell Thompson*, Woody Day Tony	1.7+ 0.15	0	3
3	McKee Cr. (RM 52.8) to Bridge Cr. (RM ~51.3)	7/21	Mijanou Brown*, Boo, Zan, Grace, Carol, Woody, Tony	~1.5	1	0
4	Crook's (RM ~51.3) to Tom's Hole (Patty's) (RM ~49.4)	7/21	Colum Coyne*, Mijanou Brown*	~1.9	0	3
5	Tom's Hole (RM ~49.4) to Big Finley Cr. (RM 47.4)	7/28	Mijanou Brown*, Steve Fortney*	~2.0	4	3
6	Big Finley Cr. (RM 47.4) to Shepp's (RM~46.0)	…	Colum Coyne*, Noah Stafslien*	~1.4	0	4
7	Us. Bear Cr. (RM 42.7) to Klossen's Hole (ds Mattole Canyon Cr.)(RM~39.9)	…	Jessica DeKelver*, Sean Finley	2.8	0	0
8	Gilham Cr. (RM 32.8) to Dry Cr. (RM 30.4)	7/20	Campbell Thompson*, Randy Speck*	2.4	0	0
9	Honeydew Slide (RM 27.0) to Bundle Prairie Cr. (RM 24.4)	7/23	Deva Wheeler*, Carol Sullivan, Boo Man, Grace McKee	2.6	1	4
10	Bundle Prairie Cr. (RM 24.4 to Triple Junction High School (RM 21.3)	7/19	Sean James, Daniel ?	2.9	3	3
11	Saunders Cr. (RM 19.7) to Squaw Cr. (RM 14.9)	7/21	Reid Bryson*, Amanda Freeman	4.8	1	0
12	Squaw Cr. (RM 14.9) to Lindley Bridge (RM 12.6)	7/23	Drew Barber*, Amanda Malachesky, Vanessa Lilly	2.3	0	0
13	Lindley Bridge (RM 12.6) to Conklin Cr. (RM 7.8)	7/20	Cisco Beneman*, Steve Fortney*	4.8	0	0
14	Conklin Cr. (RM 7.8) to Hideaway Bridge (RM 5.2)	7/20	Unity Peterson, Deva Wheeler*	2.6	2	4
15	Hideaway Bridge (RM 5.2) to Stansberry Cr. (RM 1.3)	7/19	Mijanou Brown*, Steve Fortney*	3.9	0	2
16	Stansberry Cr. (RM 1. 3) to Ocean (RM 0.0)	…..	Ben Levering*, Doug Parkinson	1.3	2	0
17	Bear Cr. (Geppert/Spencer's to mouth)	7/22	Campbell Thompson*, Chris Larson	~3.6	1	5
18	Honeydew Cr. Maureen Catalina's to 2.5 miles us Bear Wallow Slide	7/19	Maureen Roche*, Reid Bryson*	2.5	1	13
Totals:			**23 surveyors**	**~40.05 in Mainstem ~6.05 in tribs**	**16**	**40**

'*****'denotes prior summer steelhead diving experience; '**+**' denotes tributary mileage; '**RM**' = River Mile; **us** = upstream **ds** = downstream;
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, July 19-26 2004.

REACH	ADULTS (>16 in.)	HALF-LBS (12-16 in.)	Juvenile COHO	Juvenile CHINOOK	Juvenile STEELHEAD <12 inches	Freshwater Mussels	Bull Frog Tadpole	Crayfish	Turtles
Big Jackson to Lost River One lane County Bridge	0	0	Yes	Yes	Yes	No	0	No	0
Lost River Cr., to Stanley Cr. & Thompson Cr. (mouth to confluence with Yew Cr.)	0	3	Yes, throughout	No	Yes, throughout	No	0	No	0
McKee Cr. to Bridge Cr.	1	0	No	No	Yes, entire reach	60	3	No	0
Crook's to Tom's Hole (Patty's)	0	3	Yes near Nooning Creek	No	Yes, throughout	25	0	Yes	1
Tom's Hole (Patty's) to Big Finley Cr.	4	3	Yes, 2 sites pool tailouts, riffles	No	Yes, throughout	1, opened	0	No	4
Big Finley Cr. to Shepp's	0	4	No	No	Yes, throughout	~50	0	Yes	0
1 mi. us Bear Cr. to Klossen's Hole (ds Mattole Canyon Cr.)	0	0	No	No	Yes, throughout	No	0	No	0
Gilham Cr. to Dry Cr.	0	0	No	No	Yes, deeper water w/ cover	No	0	Ni	5
Bear Cr. Geppert Spencer;s to mouth	1	5	No	No	Yes, throughout	No	No	No	2
Honeydew Slide to Bundle Prairie Cr.	1	4	No	No	Yes, vegetative cover, cold areas	No	No	No	No
Bundle Prairie Cr. to Triple Junction Highschool	3	3	No	No	Yes, live veg/woody debris cover	No	No	No	Turtle eggs
Honeydew Cr. (Maureen Catalina's to Bear Wallow Slide)	1	13	No, also checked pools in WFork	No	Yes, pools, woody debris, undercut banks	No	No	No	No
Saunders Cr. to Squaw Cr.	1	0	No	No	Yes, throughout	No	No	No	5
Squaw Cr. to Lindley Bridge	0	0	No	No	Yes	No	No	No	4
Lindley Bridge to Conklin Cr.	0	0	No	No	Yes, entire reach	No	Unsure	No	3
Conklin Cr. to Hideaway Bridge	2	4	No	No	Yes, throughout	No	No	No	1
Hideaway Bridge to Stansberry Cr.	0	2	No	No	Yes, throughout	No	No	No	1
Stansberry Cr. to Ocean	2	0	No	No	Yes, vegetative cover, shallow cold areas, and in estuary	No	No	No	No
Totals	16	40	4 reaches	One reach	All reaches	~1.415	1 or 2	2 reaches	26

Table 3. Mattole stream and air temperatures were recorded by hand-held thermometers during summer steelhead survey dates, 2004.

Date	Location	Reach # & letter code	Time	Tributary Temp. (°F)	Mattole Temp. (°F)	Air Temp
7/25	R.M. 58.6 Co. Bridge	1A	1100	--	60	78
7/25	Helen Barnum Creek	1B	1130	59	60	--
7/25	Lost River	1C	1130	59	60	--
7/25	Mainstem at Big Alder pool	1D	1300	--	62	--
7/25	Dream Stream	1E	1330	59 @ 4 in.	--	--
7/25	Arcanum Creek	1F	1500	58 @ 4 in	--	--
7/25	Big Jackson Creek	1G	1600	58 @ 4 in	61	78
7/23	Lost River confluence	2A	1015	60	--	62
7/23	Stanley Creek	2B	1500	67	--	--
7/22	McKee Creek	3A	1100	58 @ 6 in	--	76
7/22	Main stem u.s. McKee Creek	3B	--	--	64 @ 6 in	--
7/22	Junction hole deep/shallow	3C	1200	--	62 @ 10 ft 64 @ 6 in	--
7/22	FWM1 sighting, pool u.s. R bend in river (bedrock)	3D	--	--	62 @ 12 in	--
7/22	Pool u.s. Bridge Creek deep/shallow	3E	1430	--	68 @ 8 ft 68 @ 12 in	--
7/22	In Bridge Creek u.s. of mainstem	3F	1435	63 @ 6 in	68 @ 6 in	--
7/21	Crook's Creek	4A	1030	61 @ 8 in	--	73
7/21	~100 ft d.s. of LB swale	4B	--	62 @ 4 ft	--	--
7/21	In bedrock gorge of LB pool	4C	--	--	--	--
7/21	RB at u.s. end of small curve	4D	--	67	--	--
7/21	In tight gorge pool	4E	--	62 @ 6 in 60 @ 7 ft	--	--
7/21	Nooning Creek	4F	--	58	--	--
7/21	Mainstem at mouth of Nooning Creek	4G	--	--	72 @ 6 in 64 @ 4.5 ft	--
7/21	RB seep	4H	--	--	68 @ 6 in 68 @ 1.5 ft	--
7/21	Upstream end of Tom's Hole	4I	--	--	72 @ 6 in 64 @ 4.5 ft	--
7/21	Deep middle of Tom's Hole LB	4J	--	--	70 @ 6 in 62 @ 12 ft	--
7/28	Tom's Hole (pool at Patty's)	5A	1230	--	67 @ 1.5 ft	--

Comment [ME1]:

7/28	Long pool with RB bedrock (4sthd)	5B	--	--	69 @ 6 in 68 @ 8 ft	--
7/28	Intermittent stream channel (dry) 200 yds us of Eubanks Creek on RB	5C	1545	74 @ 6 in	--	--
7/28	200 yards us of confluence (water goes subsurface for ~ 50 ft before confluence with mainstem)	5D	1555	59 @ 6 in	--	--
7/28	At mouth of Eubanks	5E	1600	74 @ 4 in	--	--
7/28	10 feet downstream of mouth of Eubanks	5F	1600	75 @ 1.5 ft	--	--
7/28	Head of pool @ Big Finley pool (confluence pool near logger)	5G	1620	68 @ 1.5 ft	--	--
7/28	Mouth of Big Finley Creek	5H	1620	64	--	--
7/28	Big Finley Creek	5I	1625	60	--	--
7/20	Gilham Creek / Main stem	8A	1145	61	72	--
7/20	Confluence @ Westland Creek	8B	1238	61	72	--
7/20	Confluence @ Middle Creek	8C	1330	--	--	81
7/20	Confluence @ Dry Creek	8D	1440	73	78	--
7/23	Downstream end of Honeydew Slide	9A	1045	--	75	82
7/23	Honeydew Creek	9B	1245	74	--	--
7/23	Mattole River @ Honeydew Creek	9C	1245	--	78	--
7/23	Cold seep, RB just upstream of Honeydew Bridge	9D	1315	62	--	--
7/23	Mattole under Honeydew Bridge	9E	1315	--	79 @ 2 ft	--
7/23	Mattole at Bundle Prairie Creek	9F	1445	--	78	81
7/19	Bundle Prairie Creek	10A	1515	74 @ 6 in	--	74
7/19	Small Eddy	10B	1540	--	72 @ 10 in	73
7/19	Cold pool @ slide/ no fish/ opaque w/green algae	10C	1615	--	71 @ surface 72 @ 3 ft	69
7/19	Kendal Gulch	10D	1800	59 @ 6 in	71 @ 6 in	70
7/19	Mattole River at Triple Junction High School	10E	1930	--	73 @ 10 in	70
7/21	Downstream	11B	1130	--	72 upstream 69 downstream (Mattole 2.5 ft)	--

7/21	Deep cold pool on RB, protected from thalwag by large boulder	11C	1145	--	72 us. 68 ds. (Mattole: 8 ft deep)	--
7/21	Downstream	11D	--	--	70 us. 72 ds. (Mattole: 2 ft deep)	78
7/21	Very cold waterfall tributary w/ groundflow ~3 ypm	11E	--	--	76 us. 60 @ confluence 76 ds. (Mattole: 6 ft deep)	--
7/21	Cold tributary ~ 50 yds downstream of F ~ .5 ypm	11F	--	--	70 us. 61 @ confluence 76 ds. (Mattole: 2 ft deep)	--
7/21	Cold spot w/ no obvious source, maybe subsurface flow	11G	--	--	76 us. 72 ds.	--
7/21	"	11H	--	--	76 us. 72 ds.	--
7/21	Squaw Creek Confluence	11I	1528	--	79 us. 72 @ confluence 78 ds.	--
7/23	Mattole mainstem at Squaw Creek Confluence	12A	1115	--	72	67
7/23	Squaw Creek	12B	1115	68	--	--
7/23	Cool water spring @ A-way	12C	1150	--	59 @ 1.5 ft	--
7/23	Deep Hole @ Buck minors old place – no significant cold strata	12D	--	--	(8 ft deep)	--
7/23	Green Fir Creek – no significant influence on temp of mainstem	12E	--	--	--	--
7/23	Green Fir structures	12F	1445	--	74@ structures (4 ft) 77 @ thalwag (surface)	--
7/23	Wild Turkey Creek – flows into gravel 60 + ft from Mattole	12G	1500	58	78	--
7/23	Cool spring coming up @ bottom of back water pool	12H	1515	--	--	--
7/20	Lindley Bridge	13A	1000	--	69	--
7/20	1st trickle Left Bank	13B	1030	--	61	--
7/20	Second Creek off Marquarter's Ranch	13C	1100	57.5	--	--
7/20	Trickle LB	13D	1230	--	59	--
7/20	Top of Goose Neck RB	13E	1300	--	58	--

7/20	Heart ranch McGinnis Creek LB	13F	1345	71	--	--
7/20	Conklin Creek LB	13G	1400	78	--	--
7/20	Mattole mainstem	13H	1400	--	80	--
7/20	Mattole @ mouth of Conklin Creek	14A	1000	--	70	79
7/20	Conklin Creek	14B	1000	66	--	--
7/20	RB backwater pool at downstream end /Conklin Hole	14C	1030	72 @ 12 in 68 @ 9 ft	--	--
7/20	Mattole at Hideaway Bridge	14D	1300	--	78	78
7/19	~500 ft upstream of Hideaway Bridge	15A	930	--	72@ 7 in	74
7/19	In North Fork / upstream of North Fork in Mainstem	15B	1000	73 @ 6 in	72 @ 8 in	--
7/19	Pool @ Dick Scheinman's, bedrock	15C	--	--	72 @ 12 in 72 @ 10 ft	--
7/19	Mattole mainstem downstream of pink trailer (LB cold seep) / upstream mainstem	15D	--	--	72 @ 6 in 56 @ 6 in	--
7/19	Mattole mainstem rootwad pool on RB (both temps taken in pool)	15E	--	--	72 @ 6 in 70 @ 7.5 ft	--
7/19	Mattole LB, mouth of Tom Scott Creek upstream / downstream of Tom Scott Creek cold mixing	15F	--	--	72 @ 6 in 58 @ 8 in	--
7/19	In Tom Scott Creek	15G	--	52 @ 3 in	--	--
7/19	Backwater LB upstream of Wingdam Pool / surf	15H	1400	--	68 @ 1.25 ft 70 @ 8 in	--
7/19	In Wingdam Pool / surf	15I	1400	--	68 @ 14 ft 72 @ 8 in	--
7/19	Downstream of second wingdam / surf	15J	1415	--	68 @ 14 ft 74 @ 8 in	--
7/19	Upstream of Mill Creek cold area / surf	15K	1430	--	68 @ 6.5 ft 72@ 8 in	--
7/19	In Mill Creek	15L	1430	59 @ 8 in	--	--
7/22	Bear Creek (start of reach)	17A	1245	64	--	87
7/22	Bear Creek	17B	1409	67 @ surface 64 @ 7 ft	--	--

7/22	Bear Creek	17C	1640	66 @ surface 62@ 10 ft	--	--
7/22	Bear Creek @ Jewett Creek	17D	--	66	--	--
7/19	Honeydew Creek Catalina	18A	1030	63 @ 9 in	--	72
7/19	Cave Pool	18B	1115	64 @ 3 ft	--	--
7/19	Eat Fork Confluence/ Honeydew Creek 64	18C	--	66	--	--
7/19	Cow Pie Creek	18D	1230	70 @ 4 in	--	--
7/19	West Fork / Honeydew Creek (us 65, ds 64)	18E	--	64	--	--
7/19	Honeydew Creek @ Bear Wallow Slide	18F	--	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 ft. (or where water was thoroughly mixed), except where a greater depth is stated. Where "surface" is stated, a depth of approximately 1ft. is assumed.
Abbreviations: **us**: upstream; **ds**: downstream; **ms:** mainstem Mattole**; LB/RB**: left bank/right bank (looking downstream); **trib**: tributary

Conclusion

Mattole River summer steelhead face harsh ecological conditions while they spend the summer in the freshwater environment. "In Pacific Northcoast rivers, water temperature has been identified as a key ecological factor influencing the distribution of adult summer steelhead," (Baigun, 2003, Nielsen et al. 1994). This remnant population of summer steelhead is approaching population levels that may not persist. With this regard, efforts should be made to address the elevated water temperatures and simplified habitat in pools in the mainstem Mattole River. Baigun studied the environmental factors affecting adult summer steelhead in Steamboat Creek Oregon. From his research he concluded, "that deep pools represent valuable habitats for steelhead in the Steamboat Creek basin," and suggests "that other pool characteristics interact with temperature, driving habitat choice even at the within pool scale" (Baigun, 2003). The Mattole Salmon Group is currently compiling 9 years of summer steelhead data into a State of the Salmon Report. The final product will include GIS maps of adult summer steelhead sightings, a table of locations, and a report that will incorporate status and trend data, findings, and conclusions. The following recommendations address the situation in the Mattole River. It is critical to restore and enhance the habitat conditions in the Mattole River and tributaries so that this wild species can continue to survive here.

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.

Literature Cited

Baigun, C. 2003. Characteristics of Deep Pools Used by Adult Summer Steelhead in Steamboat Creek, Oregon. . North American Journal of Fisheries Management 23(4):1167-1174

Barnhart, R., Gerstung, E. 1996. Half-Pounders. Streamkeepers Log (Newsletter of California Trout), Special Steelhead Edition, Entry No. 72.

Brett, J.R. 1979. Environmental factors and growth. Pages 599-675 *in* W.S. Hoar, D.J. Randall, and J.R. Brett, editors. Fish physiology, volume 8. Academic Press, New York.

L. Preston, M. Gilroy, B. Jong. June 2, 2002. *Coho Salmon Presence/Absence Modified Ten Pool Survey Protocol*. DFG Northern California – North Coast Region).

Neihlson J.L., T.E. Lisle, and V. Ozaki. 1994 Thermally stratified pools and their use by steelhead in northern California streams. Transactions of the American Fisheries Society. 123:613-626.

Welsh, Hartwell H. Jr., Garth R. Hodgson, Bret C. Harvey, and Maureen F. Roche. 2001. Distribution of Juvenile Coho Salmon in Relation to Water Temperatures in Tributaries of the Mattole River, California. North American Journal of Fisheries Management 21(3): 464-470