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2000 Mattole River Summer Steelhead Survey Summary.

2000 Summer Steelhead Survey Report

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The 2000 Mattole River Summer Steelhead Surveys took place from July 22nd through August 7th, representing the fifth consecutive year of direct observation counts of summer steelhead in the Mattole watershed. The purpose of this survey is to enumerate summer steelhead and identify their preferred holding habitat on the Mattole River. In addition, locating cold water areas in the river's mainstem and identifying the distribution of three sprcies of juvenile salmonids was of prime concern.

Snorkel observations were conducted on designated reaches with the help of twelve surveyors (Table1). Observations of steelhead were recorded by size class. Steelhead with an estimated fork length of greater than sixteen inches were designated summer steelhead. Summer steelhead are adult steelhead which enter the river in spring, before the mouth closes. They spend the summer instream before spawning during the ensuing rainy season. Half-pounders are 99% immature male and female steelhead which 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 in length, and they do not have the par marks, as do their resident counterparts. In this years summer steelhead dives, length was the primary feature used in identifying "half-pounders", therefore some number of the fish we called "half-pounders" were probably resident rainbow trout.

During the course of the survey, a total of seventeen (17) adults and one hundred and twenty-six (126) "half-pounders" were observed over approximately 32.7 miles surveyed (Table 2). In a few reaches in the headwaters area, juvenile salmon were counted, while in most of the survey reaches, only their observed presence or absence was noted (Table 2). As a part of a restoration evaluation project in the lower mainstem Mattole, more detailed data were collected in the lower five miles of the river. Between the Hideaway Bridge and the mouth of the Mattole, numbers of fish were estimated by size class in each pool, run and riffle, and habitat was described in each of these areas.

This report includes information on incidental stream and air temperatures (Table 3), survey reach lengths, location and personnel (Table 1), numbers of steelhead greater than or equal to 12 inches in fork length, as well as numbers of Western Pond turtles (Table 2). In addition, the presence of all observed juvenile coho and chinook salmon was noted. This report also includes discussion, 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.

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.

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Table 1. Description of reaches, including: beginning and ending point; total mileage; dive personnel for 2000

5th Annual Mattole Summer Steelhead Dive, 2000			
	Dive Reaches	Personnel	Mileage
1	Phillips (RM 60.4) to Lost River (RM 58.8)	Rustin and Bill Vallotto	1.6
2	Lost River (RM 58.8) to Stanley Ck. (RM 57.1)	Maureen Roche*, Jeff Lambourne	1.7
3	Thompson Ck. (RM 58.4+.15, 6 pool;s and dammed lake)	Maureen Roche*, Jeff Lambourne	0.1
4	McKee Ck. (RM 52.8) to Crooks (RM 5..3)	Rustin and Bill Vallotton	1.5
5	Crooks RM (51.1) to Big Finley Ck. (RM 47.4)	Colum Coyne*, Rob Yosha, Deva Wheeler*	3.9
6	Big Finley Ck. (RM 47.4) to Deer Lick Ck. (RM 45.8)	Colum Coyne*, Noah Stafslein*	1.6
7	Bear Ck. (RM 42.8 to Mattole Canyon Ck.(RM 41.1)	Bill Vallotton and Jeff Lambourne	1.7
8	Honeydew Slide (RM 27.0) to Woods Ck.(24.1)	Maureen Roche*, Rob Yosha	2.9
9	Lower Honeydew Ck. (RM 26.5+.6)	Not Surveyed	NA
10	Woods Ck.(RM 24.1 to Triple Junction HS (RM 21..3)	Deva Wheeler*, Seth Zucherman	2.6
11	Cook Gulch (RM 19.7) to Squaw Ck. (RM 14.9)	Not Surveyed	NA
12	Squaw Ck. (RM 14.9) to Lindley Bridge (RM 12.6)	Deva Wheeler*, Bird Jowaisas	2.3
13	Lindley Bridge (RM 12.6)to Conklin Ck. (RM 7.8)	Deva Wheeler*, Rob Yosha	4.8
14	Conklin Ck. (RM 7.8) to Hideaway Bridge (RM 5.2)	Michael Evenson*, Laurel House*	2.6
15	Hideaway Bridge (RM 5.2) to Stansberry Ck. (RM 1..3)	Deva Wheeler*, Maureen Roche*	3.9
16	Stansberry Ck. (RM 1. 3) to Ocean (RM 0.0)	Deva Wheeler*, Maureen Roche*	1.3
Total			32.7 miles

*denotes prior summer steelhead diving experience. (RM) denotes River Mile; (+) denotes tributary mileage

Table 2. Summary of summer steelhead, juvenile salmonids, and Western pond turtle observations from the headwaters to the mouth of the mainstem Mattole River, July 22 through August 7, 2000.

REACH	ADULTS (>16 in.)	HALF-LBS (12-16 in.)	Juvenile COHO	Juvenile CHINOOK	Juvenile Steelhead <12 inches	Western Pond TURTLES
1	0	0	Yes	Yes	Yes	0
2	0	8	679	300	2002	0
3	0	0	91	0	147	0
4	4	13	Yes	Yes	Yes	2
5	3	5	No	No	Yes	2
6	1	1	No	No	Yes	3
7	1	30	No	No	Yes	0
8	5	15	No	No	1368	0
9	NA	NA	NA	NA	Yes	NA
10	0	0	No	No	Yes	3
11	NA	NA	NA	NA	NA	NA
12	0	0	No	No	Yes	1
13	1	3	No	No	Yes	2
14	1	1	No	No	Yes	1
15	0	4	No	No	25,152	1
16	1	16	No	100 + ?	18,761	2
Total	17	126	--	--	--	17

* Fish counts in the Mattole lagoon were compromised by consistantly poor visibility in the lagoon.

Table 3. 2000 Mattole stream and air temperatures recorded by hand-held thermometer on summer steelhead survey dates.

Streaam and Air Temperatures						
Date	Location	Reach	Time	Tributary Temp. (°F)	Mattole Temp. (°F)	Air Temp (°F)
7/26/00	ds Phillips Ck.	1	1000?	--	58	--
7/26/00	ds Lost River	2	930	--	59	61
7/26/00	Thompson Ck.	3	1230	59	59	63
7/26/00	Yew Ck.	3	1300	58	--	--
7/26/00	Baker Ck.	2	1530	59	62	62
7/26/00	Stanley Ck.	2	1630	60	64	74
7/27/00	ds Mckee Ck.	4	1000?	--	61	--
7/27/00	Crook's (us Nooning)	4	1500?	--	69	--
7/26/00	Crook's	5	1045	--	63	68
7/26/00	Nooning Ck.	5	1345	58	--	--
7/26/00	Tom's Hole, ds Nooning	5	1500	--	72/68	--
7/26/00	Big Finley Ck.	5	1945	60	70	68
8/7/00	Bear Ck.	7	1100?	--	69	--
8/7/00	Mattole Canyon Ck.	7	1530	--	72	--
7/27/00	Honeydew Ck.	8	1000	74	--	--
7/27/00	Honeydew Slide	8	1100	--	75	73
7/27/00	Lower North Fork	8	1500	80	76	75
7/27/00	Woods Ck.	8	1730	66	76	74
7/27/00	Woods Ck.	10	1200	62	71	80
7/27/00	Cold Pool ds Woods Ck.	10	1330	--	75/70	--
7/27/00	Kendall Gulch	10	1545	61	--	--

Table 3. Continued 2000 Mattole stream and air temperatures recorded by hand-held thermometer on summer steelhead survey dates.

Date	Location	Reach	Time	Tributary Temp. (°F)	Mattole Temp. (°F)	Air Temp (°F)
7/27/00	Triple Junction HS	10	1700	--	78	80
7/22/00	Squaw Ck.	12	1500	69	79	81
7/22/00	LB unnamed trib.	12	1515	58	71	--
7/22/00	LB, pool with cold seep	12	1600	--	70	--
7/22/00	RB, Grange	12	1615	--	70	--
7/22/00	Buck Miner's Hole	12	1630	60	70	--
7/22/00	Green Fir Ck.	12	1715	60	--	--
7/22/00	Wild Turkey Ck. and isolated pool	12	1800	56	57	--
7/22/00	Lindley Bridge	12	1815	--	78	75
8/2/00	Lindley Bridge	13	1130	--	76	75
8/2/00	Indian Ck.	13	1215	63	--	--
8/2/00	LB trib., ds Indian	13	1300	63	--	--
8/2/00	LB Pool, us McGinnis	13	1515	--	80/76	--
8/2/00	McGinnis Ck.	13	1545	79	--	--
8/2/00	Conklin Ck.	13	1600	79	80	80
7/27/00	Conklin Ck.	14	1315	76	77	76
7/27/00	RB, ds Conklin Ck.	14	1330	--	78/74	--
7/27/00	Roberts Hole	14	1415	--	80/74	--
7/27/00	Clear Ck.	14	1500	65	80	--
7/27/00	Cold Pool us Hideaway	14	1600	--	80/72	--
7/27/00	Hideaway Bridge	14	1630	--	80	--
7/31/00	Hideaway Bridge	15	1130	--	75	73
7/31/00	Lower North Fork	15	1215	78	76	--

Table 3 Continued. 2000 Mattole stream and air temperatures recorded by hand-held thermometer on summer steelhead survey dates.

Date	Location	Reach	Time	Tributary Temp. (°F)	Mattole Temp. (°F)	Air Temp (°F)
7/31/00	Jeffrey Gulch and pool	15	1230	68	76/69	--
7/31/00	RB, channel us Hansen Hole	15	1300	--	72	--
Date	Location	Reach	Time	Tributary Temp. (°F)	Mattole Temp. (°F)	Air Temp (°F)
7/31/00	LB, seep from exposed bank @ Ark	15	1315	--	79/63	--
7/31/00	Drewry Hole	15	1330	--	80/68	--
7/31/00	LB, us Titus Ck.—Tom Scott Ck.	15	1400	--	80/69-70	--
7/31/00	Titus Ck.	15	1430	60	--	--
7/31/00	Tom Scott Ck.	15	1500	56	--	--
7/31/00	Wingdam	15	1600	--	80/66	--
7/31/00	Mill Creek and pool	15	1630	61	80/64	--
7/31/00	LB channel, rejoins ms us Stansberry Ck.	15	1730	--	80/75	70
8/1/00	Stansberry Ck.	16	1030	58	68	64
8/1/00	LB, isolated pool	16	1100	--	69/64	--
8/1/00	Collins Gulch	16	1145	59	71	--
8/1/00	LB channel, Michael's structures and ds	16	1230	--	70/66	--
8/1/00	Lagoon	16	1245	--	74	65

* When two temperatures are given at one location, they represent the coldest at the location (i.e., in a deep cold area, or where a cold water source has influenced temperature) and the warmer temperature in that location (such as in the main flow of the river or just upstream from the cold area).

Abreviations: **us**: upstream; **ds**: downstream; **ms**: mainstem Mattole; **LB/RB**: left bank/right bank (looking downstream)

Other Sightings:

Juvenile steelhead, chinook and coho; bullfrog; threespine stickleback; Pacific lamprey (live individuals and carcasses); crayfish; merganser; great blue heron; green heron; osprey, belted kingfisher, egret; American dipper; rough-skinned newt; pacific giant salamander; garter snake; freshwater clam; black-tailed deer; wood duck; otter, cattle and humans.

Human Encounters:

Groups of swimmers were scattered about reaches five and twelve. Fresh fishing line and hooks were found in reach 6, upstream of Deer Lick Creek. A boy was also seen fishing with a dip net downstream of the Hideaway Bridge.

Habitat:

Channel aggradation, as well as downcutting resulting in new or deeper pools, were seen in both upper and lower reaches of the mainstem Mattole. Coho juveniles found in 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 through 4. Chinook juveniles were observed in reaches 1,2,4 and 16 (reach 16 comprises the lagoon and approximately one mile upstream). In efforts to conserve and restore habitat for the survival of this 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. Past Mattole Salmon Group temperature studies have found that little stratification occurs in pools < 6 ft. deep. In the cool, upper reaches of the mainstem, adult steelhead were most commonly observed in deep pools. In the lower reaches of the river, however, juvenile and adult fish were found almost exclusively in runs and pools containing live vegetative cover (such as overhanging willow roots), and/or woody debris. Where deep pools did exist in the lower mainstem, juvenile and adult steelhead seemed to prefer areas with cover, rather than these pools. Cool areas in the lower river tended to contain larger numbers of fish than their warm counterparts. When cold water and vegetative cover were combined, the largest numbers of fish were seen. Reaches containing only sparse woody cover supported the fewest juvenile steelhead. Reaches 10 and 13 were particularly scant in woody cover, and contained relatively few steelhead juveniles.

Discussion

Summer steelhead once populated many of California's large streams and rivers, including most large tributaries of the San Joaquin and Sacremento rivers. Today they are confined to a handful of north coast streams possessing either deep holding pools, or significant cool summer flows (Gertsung 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., in press). The study found juvenile coho salmon only in tributaries with MWAT values gerater than 62° F, and MWMT values greater 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.

It is not known how deep, stratified pools change through time. One study revealed that channel structural features, such as gravel bars encroaching into pools, strongly influenced the development of stratified pools (Nielsen and Lisle, 1994). The same study also described stratification, as a result of pool scour from winter flows, that remained relatively unmixed through summer. The authors suggest a long-term temporal scale is necessary to understand and analyze the geomorphic conditions leading to the formation of stratified pools, and the role such pools may play in fish communities that experience thermal stress.

Recommendations:

- Continue efforts to retain and introduce instream large woody debris for habitat complexity. Make repairs to aging log structures in the estuary so their intended benefits might be attained and enhanced.
- Compare collected point-source temperature data with computerized temperature logger measurements, and overlay these with fish distributions.
- Evaluate the relative importance of physical factors leading to thermal stratification of pools in different stream reaches.
- Reestablish riparian forest in order to provide bank stabilization, shade, cover and cooler summer temperatures, and provide source of woody debris for shaping complex instream habitat.
- Follow up identified research needs from Nielsen and Lisle (1994) and Day (1996).
- Future restoration and monitoring projects should be prioritized according to cost effectiveness and protection of vital refugia, and combined with cooperative conservation and management endeavors.

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