

22F 90691

## 2002 RNSP REDWOOD CREEK SUMMER STEELHEAD TROUT SURVEY

- DATES:** July 29, 30, 31, and August 1, 5, 7, 2002
- LOCATION:** Redwood Creek, Humboldt County, California  
Mainstem reach from Lacks Creek - river km 46.525 to Hayes Creek (Redwood National and State Parks) - river km 8.425.
- DISTANCE:** 38.1 km (23.7 miles) {35 % of the 108-km (67.1-mile) long Redwood Creek mainstem}
- FLOWS:** Gaging Station: Orick [ORK] (USGS <http://water.data.gov/ca/>)  
Start of Survey: 26cfs End of Survey: 19cfs
- DIVERS:** David Anderson<sup>1</sup>, Baker Holden<sup>1</sup>, Kyle Max<sup>1</sup>, Terry Hines<sup>1</sup>, Ben Littlefield<sup>1</sup>, Frank Kemp<sup>1</sup>, Jeanne Mayer. ( <sup>1</sup>Person with prior summer steelhead diving experience on Redwood Creek.)
- METHOD:** Visual observation by diving with mask and snorkel, and surf wet suit (Roelofs 1983).  
Survey proceeded in the downstream direction.
- ACCESS:** Lacks Creek via Stover Ranch on Redwood Valley Road; Panther Creek via K&K road of Simpson Timber Company at Korbel; Coyote Creek in via the Bald Hills/Coyote Creek roads and hike along rehabbed road to mouth; hike/snorkel and camp on river two nights between Coyote Creek and Tom McDonald Creek, out via Tall Trees Trail to C-Line Road to Bald Hills Road; Tom McDonald in via Bald Hills Road to C-Line Road to Tall Trees Trail; Bond Creek in via A-9 road and hike road extension to Redwood Creek trail; and downstream of Hayes Creek out Redwood Creek trail to Redwood Creek lower trailhead parking lot.

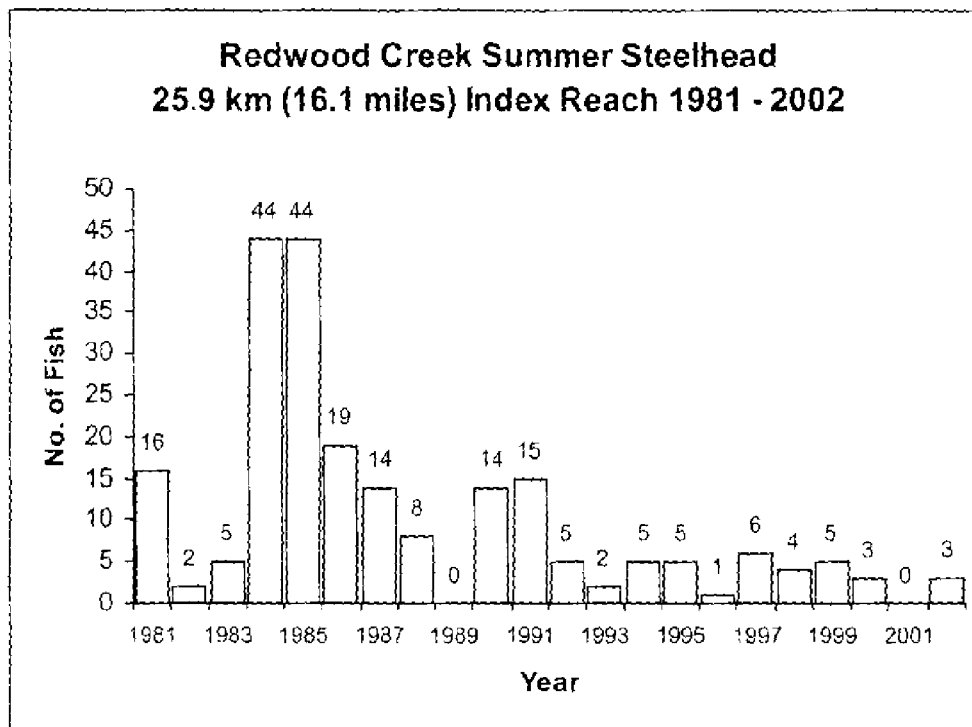
<b>ITINERARY:</b>	<b>Date</b>	<b>Survey Reach</b>	<b>Distance</b>	<b>SSHD No.</b>
	8/07	Lacks Creek to Panther Creek <i>Anderson, Hines, Mayer</i>	6.01 km	1
	8/07	Panther Creek to Coyote Creek <i>Holden, Kemp, Littlefield</i>	3.76 km	0
	7/29	Coyote Creek to downstream of Copper Creek <i>Anderson, Holden, Max, Hines</i>	5.49 km	1
	7/30	Downstrm of Copper Creek to upstream of G Creek <i>Anderson, Holden, Max, Hines</i>	4.70 km	1
	7/31	Upstrm of G Creek to Tom McDonald Creek <i>Anderson, Holden, Max, Hines</i>	5.98 km	0
	8/01	Tom McDonald Creek to Bond Creek <i>Holden, Hines, Kemp, Littlefield</i>	4.42 km	0
	8/05	Bond Creek to Hayes Creek <i>Anderson, Holden, Hines, Littlefield</i>	7.73 km	0

**TOTAL NUMBER OF ADULT SUMMER STEELHEAD TROUT OBSERVED IN 2002: 3**  
**(NUMBER OF ADULT SUMMER STEELHEAD TROUT (SSHD) OBSERVED WITHIN THE INDEX SECTION (LACKS CREEK TO TOM McDONALD CREEK - 16.1 miles): 3).**

## SUMMER STEELHEAD TROUT (*Oncorhynchus mykiss*)

Year 2002 was the 22nd consecutive summer steelhead trout survey of Redwood Creek, the first was 1981. Three adult summer steelhead (steelhead  $\geq 16.5$  inches), two 'half-pounder' steelhead (smaller immature sea-run steelhead returning after less than one year in the ocean), and 95 coastal cutthroat trout (*O. clarki*) (cutthroat  $\geq 10$  inches) were observed in a mainstem survey reach from Lacks Creek to Hayes Creek (Figure 2 and Table 1). The three summer steelhead were within the index reach. The number of adult steelhead within the index reach has declined over time (Figure 1 and Appendix I). Steelhead within the Northern California coastal steelhead ESU (evolutionary significant unit), which includes Redwood Creek, were federally listed by the National Marine Fisheries Service as threatened in June 2000.

Figure 1. Numbers of summer steelhead observed each summer since 1981 on a 25.9 km (16.1 mile) index reach of Redwood Creek (Lacks Creek to Tom McDonald Creek), Humboldt County, California.



The three adult summer steelhead were all found in pools, one associated with a westside tributary (Table 2). Past data from Redwood Creek show the majority of summer steelhead are observed in pools, and pools associated with the inflow of cooler water from tributaries (Anderson 1993).

No surveys were done specifically for summer steelhead upstream of our reach this year.

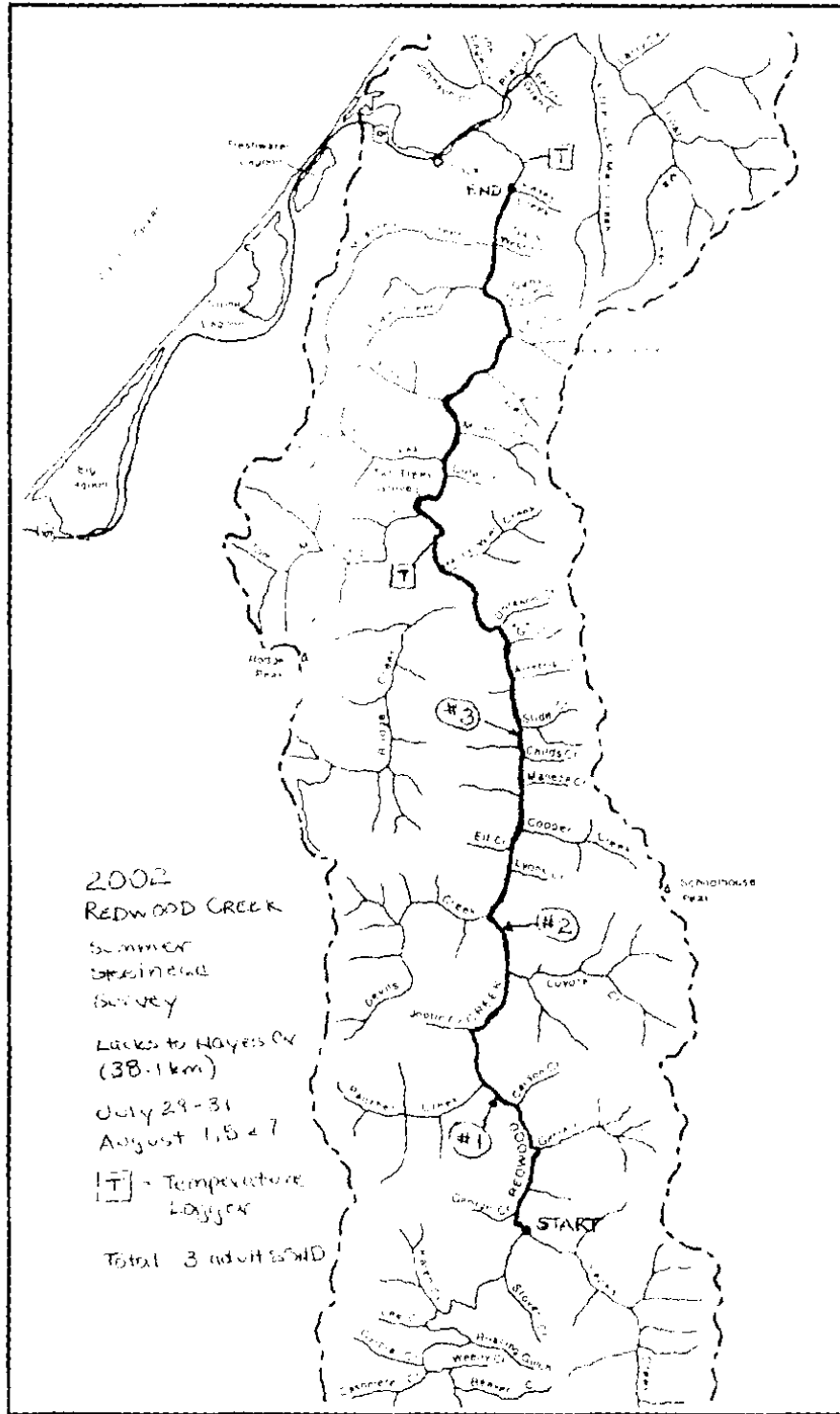


Figure 2. Location of the three adult summer steelhead observed during the 2002 snorkel survey of Redwood Creek, Humboldt County, California. Survey was between Lacks Creek and Hayes Creek from July 29 to August 1 and August 5 and 7, 2002.

Table 1. Numbers of adult summer steelhead ( $\geq 16.5''$ ), 'half-pounder' steelhead, coastal cutthroat trout ( $\geq 10''$ ), other fish and wildlife observed, and miscellaneous notes during the 2002 summer steelhead survey of mainstem Redwood Creek, Humboldt County, California. Survey conducted July 29 through August 7, 2002 by Redwood National and State Parks and covered 38.1 km (23.7 miles) [35% of the 108 km (67.1 mile) long Redwood Creek mainstem]. (Stream reaches are broken out to reflect past reported reaches. These original reaches were based on access points, the majority of which no longer accessible by vehicle.)

	Redwood Creek Mainstem Stream Reach	No. of Summer Steelhead Adults	No. of Half Pounders	No. of Cutthroat Trout	Other Fish and Wildlife Observed
<b>I N D E X  R E A C H</b>	Lacks to Panther Creek	1	1	11	Steelhead juveniles, old redds, Belted Kingfisher, American Dipper, Spotted Sandpiper, 12 Mergansers, Yellow Warbler, Bridled Titmouse, Red Crossbill, Allen's Hummingbird, Yellow Legged frogs, Western Toad, Pacific Giant Salamander, Alligator Lizard, Garter Snake, River Otter, Dragon and Damselles, Dogface Butterfly, Caddisfly larvae, and snails.
	Panther to Coyote Creek	0	0	2	Steelhead, chinook and coho juveniles, sucker, Yellow Legged frog, Pacific Giant Salamander and mergansers.
	Coyote to Copper Creek	1	0	11	Chinook juveniles, old redds, Spotted Sandpiper, Ravens, Turkey Vulture, Jugs snails, caddisfly larvae, and Yellow Legged frogs.
	Copper to Pig Pen Prairie (Slide Cr)	1	0	8	Three Spined Stickleback, 25 Mergansers, Marbled Murrelets, and Yellow Legged frogs.
	Pig Pen Prairie (Slide Cr) to Bridge Creek	0	0	18	Coho juveniles, Three Spined Stickleback, Sculpin, Garter snake, alligator lizard, Marbled Murrelets, Belted Kingfisher, and Caddisfly larvae.
	Bridge to Tom McDonald Creek	0	1	1	Three Spined Stickleback, Sculpin, Sucker, and Osprey.
	Tom McDonald to Bond Creek	0	0	17	Steelhead, coho, and chinook juveniles, Sculpin, Three Spined Stickleback, Western Toad, tadpoles, Belted Kingfisher, Spotted Sandpiper, American Dipper, Ravens, Little Brown bat, and mink.
	Bond Creek to Hayes Creek	0	0	27	Steelhead and chinook juveniles, Sucker, Sculpin, Three Spined Stickleback, tadpoles, Osprey, Stellar's Jay, Spotted Sandpiper, American Dipper, Belted Kingfisher, Turkey Vulture, swallow, Great Blue Heron, Jugs snails, caddisfly larvae, 41 elk, and 5 campers.
	<b>Total</b>	<b>3</b>	<b>2</b>	<b>95</b>	

Table 2. Results of the 2002 Redwood Creek summer steelhead survey, including date observed, number of adult steelhead, estimated length of fish (inches), habitat description, and river kilometer and UTM coordinates.

2002 Date	No. of SSHD	Est. Length (inches)	Habitat Description
8/07	1	24"	In pool under rock ledge. Pool associated with westside tributary with water temperature of 12°C. Pool temperature 19.5°C at 15:50. Pool dimensions: 225'L x 45'W x 4'D. (River km 41.0, UTM 0424210E 4548770N) (#1 on Map)
7/29	1	16"	In pool under log/rock cave in 6" of water. Pool temperature 19.5°C at 13:25. Pool dimensions 450'L x 90'W x 8'D. (River km 35.45, UTM 0422410E 4552040N) (#2 on Map)
7/30	1	16"	In pool on bottom substrate 'mouthing' in 5' of water. Many boulders and 'caves' in pool. Pool temperature 18°C at 11:44. Pool dimensions 300'L x 45'W x 10-12'D. (River km 29.40, UTM 0420710E 4557500N) (#3 on Map)

#### WATER DISCHARGE

Water flow (measured at Orick gaging station located downstream of the confluence of Prairie Creek at Redwood Creek) during the six day survey ranged from 26 to 19 cfs, beginning at 26 cfs on July 29 and ending at 19 cfs at the end of the survey on August 7, 2002. (This flow data is provisional and subject to revision.)

#### WATER TEMPERATURE

Water temperatures (°C) were measured with a hand held thermometer below the water surface in the main current of Redwood Creek and tributaries. At each tributary, the mainstem Redwood Creek temperature was measured upstream of the tributary. Temperature loggers also recorded Redwood Creek mainstem water temperature at two sites.

Mainstem Redwood Creek - Water temperatures measured during the 2002 survey in Redwood Creek ranged from 14.0°C (8/07/02 at 10:00am) to 21.5°C (7/31/02 at 3:25pm) (Appendix II). The unusually cold reach was in the vicinity of George Creek, downstream of Lacks Creek.

Two Onset TidBit recording temperature loggers were placed mid-depth in the current of mainstem Redwood Creek within the park. They recorded temperature at one-hour intervals.

One temperature logger was located upstream of Tom McDonald Creek/Tall Trees Grove (UTM 0416002E 4561508N). It recorded temperature from June 12 to October 8, 2002 (Figure 3). Maximum, minimum and mean water temperatures recorded were 23.5°C, 13.4°C, and 18.7°C, respectively. Maximum and minimum daily diurnal ranges were 5.3 and 0.8°C, respectively. The 50 percentile temperature (50 percentile where water is at or below temperature) was 18.7°C (Figure 3).

The other logger site was located in lower Redwood Creek upstream of the Redwood Creek trailhead (UTM 0413687E 4572020N). It recorded temperature June 12 through October 2, 2002. (Figure 4). Maximum, minimum, and mean water temperatures were 22.7°C, 11.1°C, and 17.2°C, respectively. Maximum and minimum daily diurnal ranges were 7.2 and 0.8°C, respectively. The 50 percentile temperature (percentile where water is at or below temperature) was 16.7°C (Figure 4). The probe was out of the water when retrieved on October 7. The remaining pool was isolated and there was no surface flow in the area. Lower Redwood Creek when mapped on October 25 went subsurface immediately downstream of Hayes Creek (Ozaki and Madej 2002).

Tributaries - Temperatures of water entering Redwood Creek from the east and westside tributaries during the survey ranged from 9.5°C (George Creek) to 19.0°C (Unnamed small eastside tributary at 17.5 river km) (Appendix II). Water temperatures of all tributaries were cooler than the corresponding temperature of mainstem Redwood Creek measured at the same time. Two named eastside tributaries, Chris and Hayes Creeks, were dry.

Westside tributaries were significantly cooler ( $p < 0.01$ ) than eastside tributaries; a pattern repeated in all past summer steelhead surveys. The mean water temperature of westside tributaries was 12.3°C ( $n = 20$ , std. dev. = 1.5°C) and temperatures ranged from 9.5 to 14.5°C. The mean water temperature of eastside tributaries was 13.8°C ( $n = 16$ , std. dev. = 2.0°C) and temperatures ranged from 11.0 to 19.0°C.

Fishery Effects - The 2002 year summer water temperatures are not an anomaly. Similar temperatures and trends have been recorded in past summer steelhead surveys and temperature monitoring, except for the cold mainstem reach in the vicinity of George Creek. Water temperatures in Redwood Creek are high for salmonid fish, above the preferred temperature range reported by Reiser and Bjornn (1979) for steelhead of 7.3 to 14.6°C. For Redwood Creek summer temperatures to decrease, the streamside canopy will have to be reestablished, and remaining canopy protected, particularly conifers.

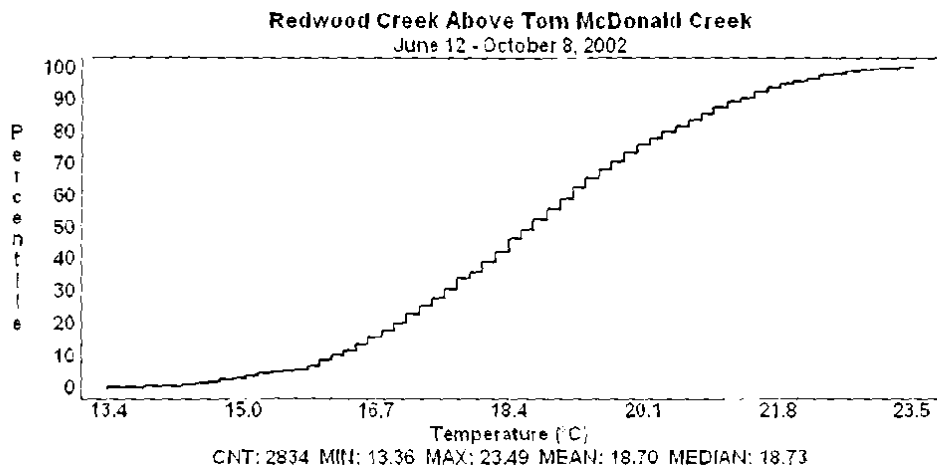
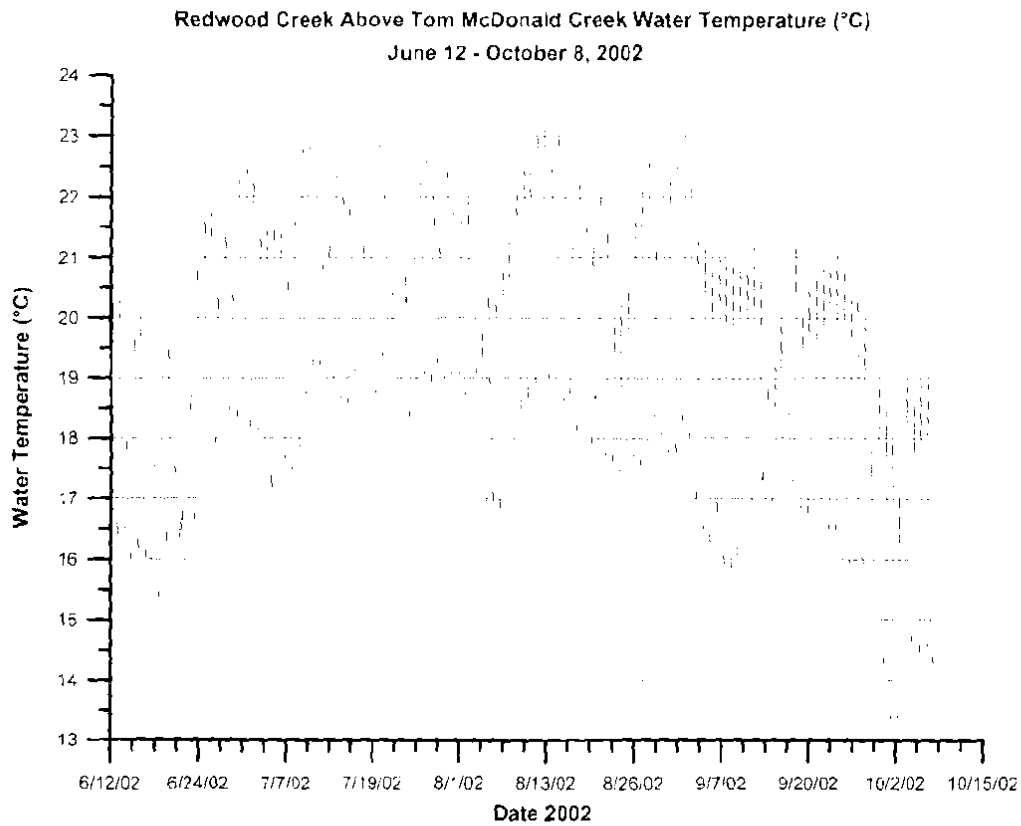


Figure 3. Mainstem Redwood Creek water temperatures (°C) from Onset TidBit temperature logger located upstream of Tom McDonald. The logger recorded water temperature every 1-hour in the current below the surface of the water from June 12 through October 8, 2002. Cumulative distribution temperature graph. The percentile is percent of temperature readings where water was at or below that temperature.

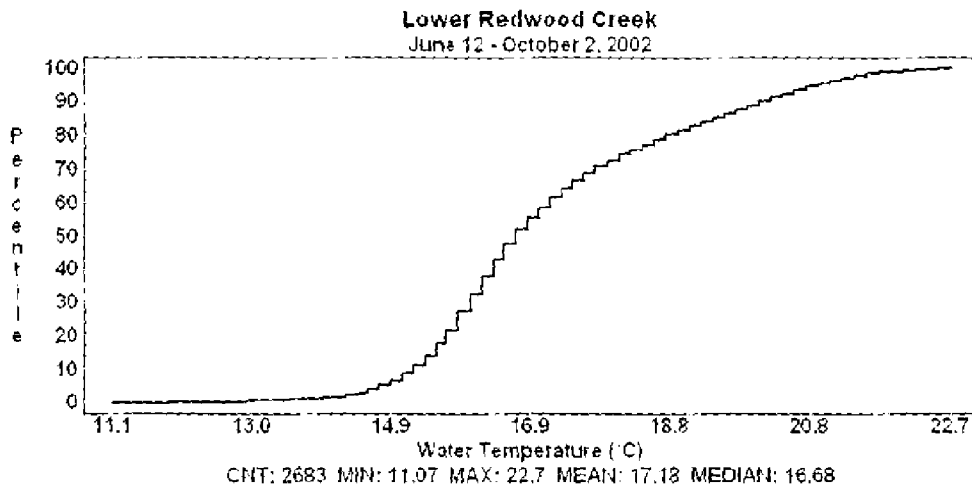
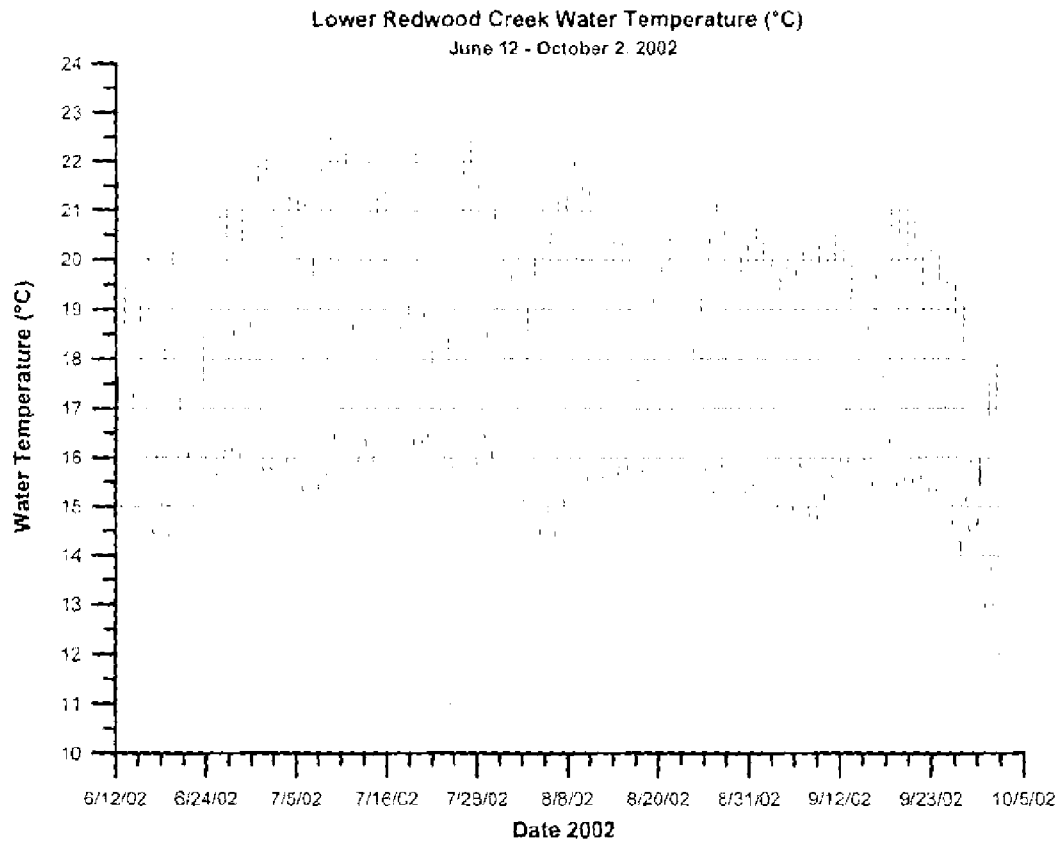


Figure 4. Mainstem Redwood Creek water temperatures (°C) from Onset TidBit temperature logger located upstream of the lower Redwood Creek trailhead parking lot. The logger recorded water temperature every 1-hour in the current below the surface of the water from June 12 through October 2, 2002. Cumulative distribution temperature graph. The percentile is percent of temperature readings where water was at or below that temperature.



## REFERENCES

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Appendix I. Numbers of Summer Steelhead Trout observed 1981 through 2002 and annual survey dates in the 25.9-km (16.1-mile) index reach (Lacks Creek to Tom McDonald Creek) and expanded survey reaches of Redwood Creek, Humboldt County, California by Redwood National and State Parks personnel and others.

Year	Index Reach (Lacks Creek to Tom McDonald Creek)	No. of Summer Steelhead	Total Reach Surveyed	
			Begin to End Creeks and Distance (km)	Survey Dates
1981	16	16	Beaver Cr to Orick (51.5)	8/10 - 13/81
1982 <sup>a</sup>	2	2	Stover Cr to Emerald Cr (22.5)	10/12 & 14/82
1983	5	7	HWY 299 to Tom McDonald Cr (44.4)	8/22 - 25/83
1984	44+	44+	Index Reach (25.9)	8/08 - 10/84
1985	44+	44+	Index Reach (25.9)	8/20 - 22.9/4/85
1986	19	19	Index Reach (25.9)	8/25 - 27/86
1987	14	15	1 mile downstream of Snow Camp Cr to Tom McDonald Cr (72.7)	7/14 - 16/87
1988	8	8 & (6 Spring	Index Reach (25.9)	7/26 - 28/88
1989 <sup>b</sup>	0	0	Lacks Cr to Bridge Cr (17.9)	7/31, 8/01 - 02/89
1990	14	14	Index Reach (25.9)	7/31, 8/01-03/90
1991	15	15	Index Reach (25.9)	8/05 - 08/91
1992	5 (4 & 1 carcass)	7 (6 & 1 carcass)	Lacks Cr to Hayes Cr (37.8)	8/03 - 06, 10/92
1993	2	3 2 <sup>c</sup> 3 <sup>d</sup>	Lacks Cr to Hayes Cr (37.8) Chezem Rd to Stover Cr (24.75) Ayres Cabin to Chezem Rd (14.3)	8/02 - 05, 09/93 8/18, 20, 27/93 8/28 & 30/93
1994	5	8 16 <sup>e</sup> 3 <sup>e</sup> 9 <sup>d</sup>	Lacks Cr to Hayes Cr (37.8) (Chezem Rd to Stover Cr (24.8) HWY 299 to Chezem Rd (2.0) Bradford Cr to HWY 299 (20.1)	8/01 - 04/94 8/04-06/94 8/15/94 8/13-14/94

Year (con't.)	Index Reach (Lacks Creek to Tom McDonald Creek) No. of Summer Steelhead	Total Reach Surveyed		Survey Dates
		Total No. of Summer Steelhead	Begin to End Creeks and Distance (km)	
1995	6 (5 & 1 carcass)	8 (7 & 1 carcass)	Lacks Cr to Hayes Cr (37.8)	7/24 - 27/95
		8 <sup>c</sup>	Chezem Rd to Bair Rd (7.6)	8/28/95
		2 <sup>d</sup>	Bradford Cr to Ayres Cabin (7.85)	9/02/95
		18 Total	53.25 km	
1996	1	1	Lacks Cr to Hayes Cr (37.8)	8/05 - 08/96
		21 <sup>c</sup>	Chezem Rd to Stover Cr (24.8)	7/31, 8/1, 22/96
		1 <sup>d</sup>	Bradford Cr to Chezem Rd (22.1)	8/10-12/96
		23 Total	84.7 km	
1997	6	6	Lacks Cr to Hayes Cr (37.8)	8/04 - 07/97
		16 <sup>c</sup>	Chezem Rd to Stover Cr (24.8)	8/06 - 08/97
		15 <sup>d</sup>	Bradford Cr to Chezem Rd (22.1)	8/17, 24, 30/97
		37 Total	84.7 km	
1998	4	4	Lacks Cr to Hayes Cr (37.8)	7/27 - 30/98
		21 <sup>d</sup>	Bradford Cr to Stover Cr (46.9)	8/24-27, 31/98
		25 Total	84.7 km	
1999	5	10	Lacks Cr to Hayes Cr (38)	8/02-05, 09-10/99
2000	3	3	Lacks Cr to Hayes Cr (38)	8/01-03, 07-09/2000
2001	0	1	Lacks Cr to Hayes Cr (38.1)	7/31, 8/01-02, 07/2001
2002	3	3	Lacks Cr to Hayes Cr (38.1)	7/29-31, 8/1, 5, 7/2002

<sup>a</sup> Survey from Stover Creek to Emerald Creek, 14 miles, covering most of index section and best pool habitat.  
<sup>b</sup> Survey from Lacks to Bridge Creek, minus Garret to Panther Creek, a total of 11.1 miles. Covered best pool habitat.  
<sup>c</sup> Tom Weseloh -- California Trout  
<sup>d</sup> Matt Smith -North Coast Fisheries Restoration  
<sup>e</sup> Kirk Cohune

Appendix II. Water and air temperatures (°C) measured during the 2002 Redwood Creek summer steelhead trout survey. Locations are listed south to north. Redwood Creek (upstream) refers to water temperature measurement taken upstream of the tributary listed below. UN ES or WS refers to unnamed eastside or westside tributary, and number to river kilometer measured from the mouth of Redwood Creek. Alignment refers to tributary watershed position: East = Eastside, West = Westside, and REDW = mainstem Redwood Creek.

Location	Alignment	Date	Time	Temperature °C	
				Water	Air
Redwood Creek (upstream)	REDW	8/7/2002	9:15 AM	16.0	17.0
Lacks Creek	East	8/7/2002	9:15 AM	11.5	
Redwood Creek (upstream)	REDW	8/7/2002	10:00 AM	14.0	
George Creek	West	8/7/2002	10:00 AM	9.5	
Redwood Creek (upstream)	REDW	8/7/2002	11:28 AM	15.0	
UN WS 44.2514	West	8/7/2002	11:28 AM	11.0	
Redwood Creek (upstream)	REDW	8/7/2002	1:25 PM	17.5	
Garrett Creek	East	8/7/2002	1:25 PM	15.0	
Redwood Creek (upstream)	REDW	8/7/2002	3:10 PM	19.0	
UN ES 41.5873	East	8/7/2002	3:10 PM	12.0	
Redwood Creek (upstream)	REDW	8/7/2002	3:50 PM	19.5	
UN WS 41.0093	West	8/7/2002	3:50 PM	12.0	
Redwood Creek (upstream)	REDW	8/7/2002	4:36 PM	19.0	
Panther Creek	West	8/7/2002	4:36 PM	12.5	
Redwood Creek (upstream)	REDW	8/7/2002	9:30 AM	15.0	15.0
Panther Creek	West	8/7/2002	9:30 AM	11.0	
Redwood Creek (upstream)	REDW	8/7/2002	10:25 AM	15.0	
UN WS 39.5221	West	8/7/2002	10:25 AM	10.0	
Redwood Creek (upstream)	REDW	8/7/2002	11:00 AM	15.5	
Joplin Creek	West	8/7/2002	11:00 AM	13.0	
UN WS 38.2418	West	8/7/2002	11:43 AM	DRY	
Redwood Creek (upstream)	REDW	8/7/2002	1:43 PM	18.0	
Coyote Creek	East	8/7/2002	1:43 PM	13.0	
Redwood Creek (upstream)	REDW	7/29/2002	11:25 AM	18.5	18.5
Coyote Creek	East	7/29/2002	11:25 AM	15.0	
Redwood Creek (upstream)	REDW	7/29/2002	12:58 PM	19.0	
UN ES 35.714	East	7/29/2002	12:58 PM	14.0	
Redwood Creek (upstream)	REDW	7/29/2002	4:14 PM	19.0	
Devils Creek	West	7/29/2002	4:14 PM	13.5	
Redwood Creek (upstream)	REDW	7/29/2002	4:45 PM	20.0	
UN WS 32.8	West	7/29/2002	4:45 PM	13.0	

Location	Alignment	Date	Time	Temperature °C	
				Water	Air
Redwood Creek (upstream)	REDW	7/29/2002	5:05 PM	20.5	
UN WS 32.527	West	7/29/2002	5:05 PM	13.0	
Redwood Creek (upstream)	REDW	7/29/2002	5:30 PM	20.5	
Copper Creek	East	7/29/2002	5:30 PM	15.0	
Redwood Creek	REDW	7/30/2002	9:33 AM	17.5	16.5
Redwood Creek (upstream)	REDW	7/30/2002	10:34 AM	18.0	
UN WS 30.3914	West	7/30/2002	10:34 AM	13.0	
Redwood Creek (upstream)	REDW	7/30/2002	1:35 PM	20.5	
Slide Creek	East	7/30/2002	1:35 PM	15.0	
Redwood Creek (upstream)	REDW	7/31/2002	10:22 AM	18.5	
G Creek	East	7/31/2002	10:22 AM	13.0	
Redwood Creek (upstream)	REDW	7/31/2002	10:22 AM	18.5	
Dolason Creek	East	7/31/2002	10:22 AM	14.0	
Redwood Creek (upstream)	REDW	7/31/2002	11:02 AM	19.5	
UN ES 25.112	East	7/31/2002	11:02 AM	13.5	
Redwood Creek (upstream)	REDW	7/31/2002	11:33 AM	20.0	
Bridge Creek	West	7/31/2002	11:33 AM	14.5	
Redwood Creek (upstream)	REDW	7/31/2002	12:32 PM	19.5	
Emerald Creek	East	7/31/2002	12:32 PM	14.5	
Redwood Creek (upstream)	REDW	7/31/2002	1:52 PM	20.0	
UN WS 22.861	West	7/31/2002	1:52 PM	13.5	
Redwood Creek (upstream)	REDW	7/31/2002	3:25 PM	21.5	
Tom McDonald Creek	West	7/31/2002	3:25 PM	14.5	
Redwood Creek (upstream)	REDW	8/1/2002	10:25 AM	19.0	17.0
Tom McDonald Creek	West	8/1/2002	10:25 AM	13.0	
Redwood Creek (upstream)	REDW	8/1/2002	12:44 PM	20.0	
UN WS 19.5064	West	8/1/2002	12:44 PM	14.0	
Redwood Creek (upstream)	REDW	8/1/2002	2:09 PM	20.5	
Cole Creek	East	8/1/2002	2:09 PM	14.0	
Redwood Creek (upstream)	REDW	8/1/2002	2:38 PM	20.5	
Fortyfour Creek	West	8/1/2002	2:38 PM	12.5	
Redwood Creek (upstream)	REDW	8/1/2002	3:06 PM	20.0	
UN ES 17.4644	East	8/1/2002	3:06 PM	19.0	
Redwood Creek (upstream)	REDW	8/1/2002		20.0	
Miller Creek	East	8/1/2002		14.0	
Redwood Creek (upstream)	REDW	8/1/2002	4:06 PM	20.0	
Bond Creek	West	8/1/2002	4:06 PM	12.5	
Redwood Creek (upstream)	REDW	8/5/2002	9:45 AM	16.5	17.0

Location	Alignment	Date	Time	Temperature °C	
				Water	Air
Bond Creek	West	8/5/2002	9:45 AM	11.0	
Redwood Creek (upstream)	REDW	8/5/2002	10:10 AM	16.5	
UN WS 15.6936	West	8/5/2002	10:10 AM	11.0	
Redwood Creek (upstream)	REDW	8/5/2002	10:57 AM	16.0	
Cicquet Creek	East	8/5/2002	10:57 AM	11.0	
Redwood Creek (upstream)	REDW	8/5/2002	11:35 AM	17.0	
UN WS 13.806	West	8/5/2002	11:35 AM	10.5	
Redwood Creek (upstream)	REDW	8/5/2002	11:58 AM	17.0	
Oscar Larson Creek	East	8/5/2002	11:58 AM	11.0	
Redwood Creek (upstream)	REDW	8/5/2002	1:31 PM	18.0	
Chris Creek	East	8/5/2002	1:31 PM	DRY	
Redwood Creek (upstream)	REDW	8/5/2002	2:01 PM	19.0	
Elam Creek	West	8/5/2002	2:01 PM	10.5	
Redwood Creek (upstream)	REDW	8/5/2002	3:05 PM	19.0	
McArthur Creek	West	8/5/2002	3:05 PM	12.0	
Redwood Creek (upstream)	REDW	8/5/2002	4:22 PM	21.0	
Hayes Creek	East	8/5/2002	4:22 PM	DRY	