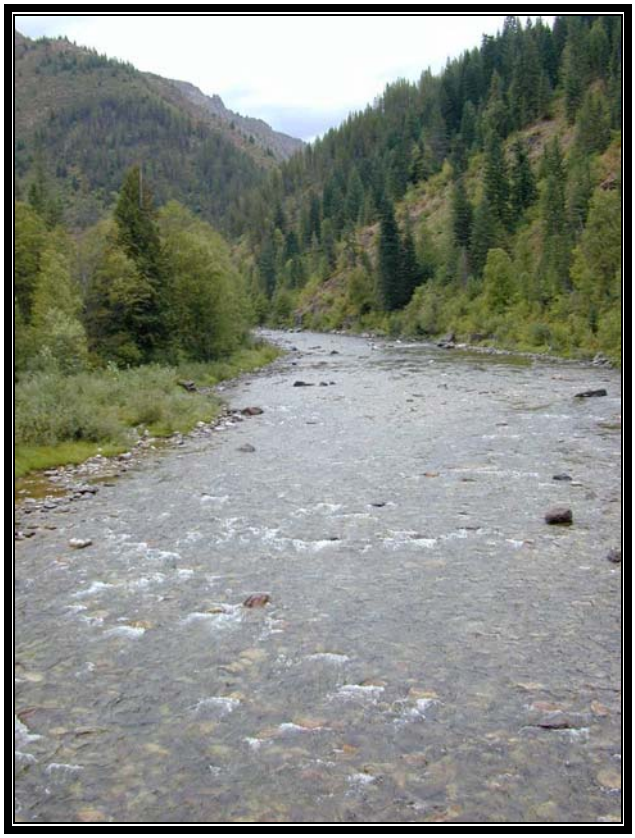
Upper North Fork Clearwater River Subbasin Assessment and Total Maximum Daily Loads



Department of Environmental Quality
October 2003

Appendix 6. Cold Springs Creek and Cool Creek Temperature TMDLs

An ArcView shapefile of
these data is on the diskette
located in the back of this document

Appendix 6. Cold Springs Creek and Cool Creek Temperature TMDLs

This appendix, along with ArcView shapefile data included on the enclosed diskette, constitutes the temperature TMDLs for Cold Springs Creek and Cool Creek. Figure 6-1 shows the distribution of stream segements needing increased percent canopy closure to meet the TMDLs targets. Tables 6-1 and 6-2 present the loading calculations data on a stream reach by stream reach basis. The location of each stream reach can be ascertained using the ArcView shapefile. The ArcView shapefile contains all the data used to create the percent canopy closure increase targets in Figure 6-1 and the data presented in Tables 6-1 and 6-2.

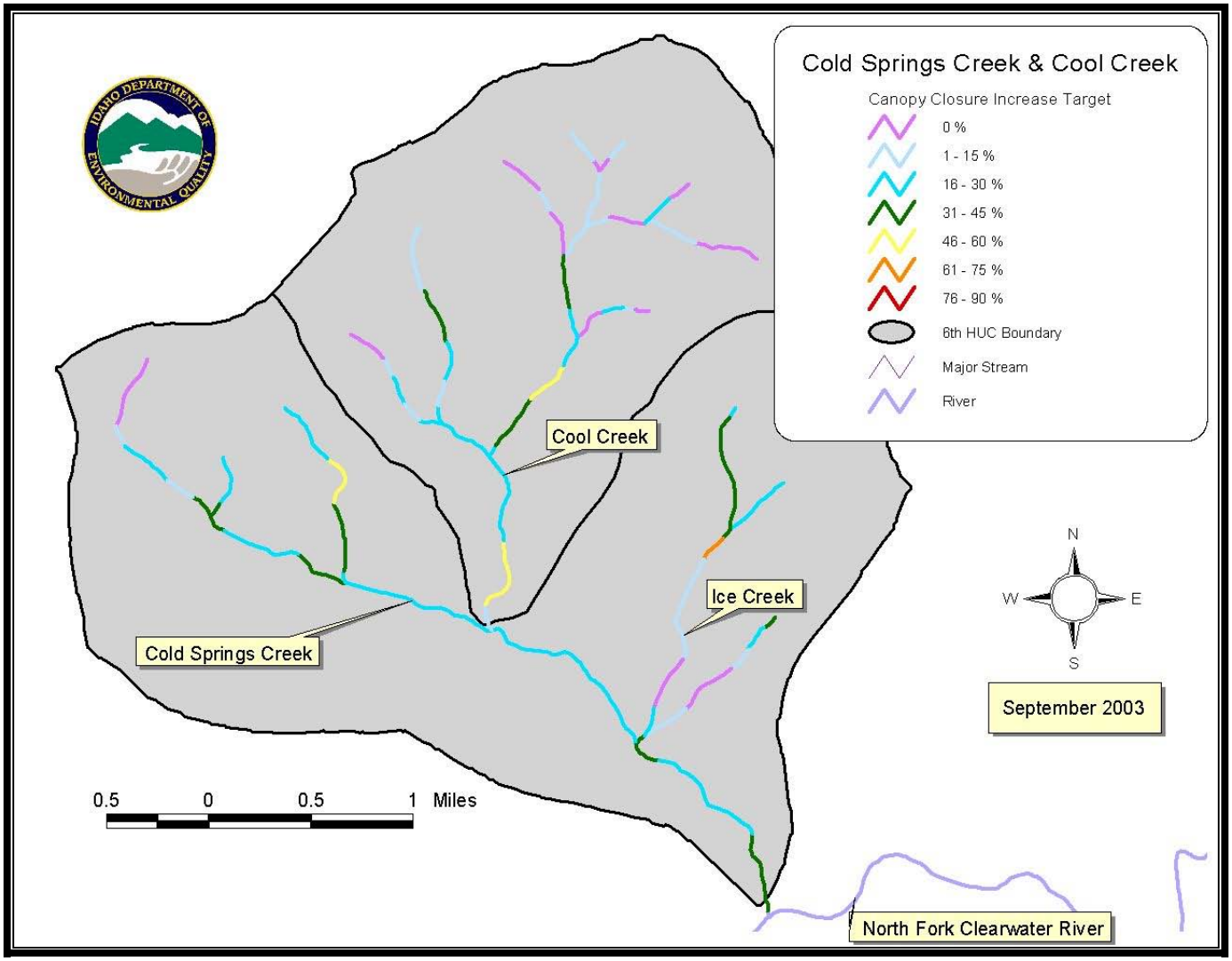


Figure 6-1. Targeted Percent Canopy Closure Increases for Cold Springs Creek and Cool Creek

Table 6-1. Cold Springs Creek temperature TMDL, stream reach by stream reach.

Stream Name	Elevat-ion[1]	Segment Length	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Cold Springs Creek	2,600	2,888	60	145	100	40	111	18	84
Cold Springs Creek	2,800	3,233	75	139	100	25	76	18	76
Cold Springs Creek	3,000	2,655	75	132	100	25	76	18	76
Cold Springs Creek	3,200	3,164	75	126	100	25	76	18	76
Cold Springs Creek	3,400	2,005	75	120	100	25	76	18	76
Cold Springs Creek	3,600	699	60	114	100	40	111	18	84
Cold Springs Creek	3,600	655	45	114	100	55	146	18	88
Cold Springs Creek	3,600	342	75	114	100	25	76	18	76
Cold Springs Creek	3,600	1,451	75	114	100	25	76	18	76
Cold Springs Creek	3,800	894	60	108	100	40	111	18	84
Cold Springs Creek	3,800	815	60	108	100	40	111	18	84
Cold Springs Creek	3,800	595	75	108	100	25	76	18	76
Cold Springs Creek	4,000	1,483	75	101	100	25	76	18	76
Cold Springs Creek	4,000	928	60	101	100	40	111	18	84
Cold Springs Creek	4,200	538	60	95	95	35	111	29	74
Cold Springs Creek	4,200	719	60	95	95	35	111	29	74
Cold Springs Creek	4,200	783	45	95	95	50	146	29	80
Cold Springs Creek	4,200	400	60	95	95	35	111	29	74

Stream Name	Elevat-ion[1]	Segment Length	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Cold Springs Creek	4,400	788	75	89	89	14	76	43	43
Cold Springs Creek	4,400	677	60	89	89	29	111	43	61
Cold Springs Creek	4,600	700	60	83	83	23	111	57	49
Cold Springs Creek	4,600	676	60	83	83	23	111	57	49
Cold Springs Creek	4,600	720	60	83	83	23	111	57	49
Cold Springs Creek	4,800	741	60	77	77	17	111	71	36
Cold Springs Creek	4,800	632	60	77	77	17	111	71	36
Cold Springs Creek	5,000	577	60	71	71	11	111	85	23
Cold Springs Creek	5,000	406	45	71	71	26	146	85	42
Cold Springs Creek	5,200	545	75	64	75	0	76	101	0
Cold Springs Creek	5,400	790	75	58	75	0	76	115	0
Cold Springs Creek	5,600	585	75	52	75	0	76	129	0
Ice Creek	3,000	325	60	132	100	40	101	17	83
Ice Creek	3,000	483	90	132	100	10	38	17	55
Ice Creek	3,000	835	75	132	100	25	70	17	76
Ice Creek	3,200	802	90	126	100	10	38	17	55
Ice Creek	3,200	1,410	100	126	100	0	17	17	0
Ice Creek	3,400	1,370	90	120	100	10	38	17	55
Ice Creek	3,400	784	100	120	100	0	17	17	0

Stream Name	Elevat-ion[1]	Segment Length	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Ice Creek	3,600	767	90	114	100	10	38	17	55
Ice Creek	3,600	825	100	114	100	0	17	17	0
Ice Creek	3,800	719	90	108	100	10	38	17	55
Ice Creek	3,800	689	90	108	100	10	38	17	55
Ice Creek	4,000	738	30	101	100	70	164	17	90
Ice Creek	4,000	685	75	101	100	25	70	17	76
Ice Creek	4,200	326	60	95	95	35	101	28	72
Ice Creek	4,200	507	60	95	95	35	101	28	72
Ice Creek	4,200	425	60	95	95	35	101	28	72
Ice Creek	4,400	755	60	89	89	29	101	40	60
Ice Creek	4,400	1,080	45	89	89	44	133	40	70
Ice Creek	4,600	575	60	83	83	23	101	53	48
Ice Creek	4,600	864	45	83	83	38	133	53	60
Ice Creek	4,800	470	60	77	77	17	101	65	36
Ice Creek	4,800	576	45	77	77	32	133	65	51
Ice Creek	5,000	275	45	71	71	26	133	78	41

[1]More than one segment of a named water body may occur in the same 200-foot elevation zone. Generally this is because unnamed perennial tributaries are included in the analysis, a reach is split because of a radical percent canopy closure change, or a reach is split at the confluence of two tributaries (see map). The only way to know which data apply to which reach on the ground is to use the ArcView data set included with this report.
[2]Current Canopy Closure (%) is estimated from recent 1:15,840 stereo aerial photographs.
[3]CWE Modeled Canopy Closure (%) is the percent canopy closure predicted by the CWE temperature model as needed to protect stream temperatures for salmonid spawning and/or bull trout.

Table 6-2. Cool Creek temperature TMDL, stream reach by stream reach.

Stream Name	Elevat-ion[1]	Segment Length	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Cool Creek	3,400	694	90	120	100	10	38	17	55
Cool Creek	3,400	1,987	45	120	100	55	133	17	87
Cool Creek	3,600	1,575	75	114	100	25	70	17	76
Cool Creek	3,800	812	75	108	100	25	70	17	76
Cool Creek	4,000	1,502	75	101	100	25	70	17	76
Cool Creek	4,000	323	75	101	100	25	70	17	76
Cool Creek	4,000	1,523	60	101	100	40	101	17	83
Cool Creek	4,200	496	75	95	95	20	70	28	60
Cool Creek	4,200	606	75	95	95	20	70	28	60
Cool Creek	4,200	1,240	45	95	95	50	133	28	79
Cool Creek	4,400	364	90	89	90	0	38	40	0
Cool Creek	4,400	795	60	89	89	29	101	40	60
Cool Creek	4,400	666	75	89	89	14	70	40	43
Cool Creek	4,400	583	75	89	89	14	70	40	43
Cool Creek	4,400	820	60	89	89	29	101	40	60
Cool Creek	4,600	1,057	60	83	83	23	101	53	48
Cool Creek	4,600	754	60	83	83	23	101	53	48

Stream Name	Elevat-ion[1]	Segment Length	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Cool Creek	4,600	598	90	83	90	0	38	53	0
Cool Creek	4,600	1,378	45	83	83	38	133	53	60
Cool Creek	4,800	802	75	77	77	2	70	65	7
Cool Creek	4,800	947	75	77	77	2	70	65	7
Cool Creek	4,800	655	75	77	77	2	70	65	7
Cool Creek	4,800	544	75	77	77	2	70	65	7
Cool Creek	4,800	1,478	45	77	77	32	133	65	51
Cool Creek	4,800	1,211	90	77	90	0	38	65	0
Cool Creek	4,800	560	60	77	77	17	101	65	36
Cool Creek	5,000	377	75	71	75	0	70	78	0
Cool Creek	5,000	710	60	71	71	11	101	78	23
Cool Creek	5,000	955	75	71	75	0	70	78	0
Cool Creek	5,000	658	60	71	71	11	101	78	23
Cool Creek	5,000	561	75	71	75	0	70	78	0
Cool Creek	5,000	1,086	60	71	71	11	101	78	23
Cool Creek	5,000	294	60	71	71	11	101	78	23
Cool Creek	5,000	332	75	71	75	0	70	78	0
Cool Creek	5,200	630	60	64	64	4	101	93	8
Cool Creek	5,200	514	75	64	75	0	70	93	0

Stream Name	Elevat-ion[1]	Segment Length	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Cool Creek	5,200	646	60	64	64	4	101	93	8
Cool Creek	5,200	625	75	64	75	0	70	93	0
Cool Creek	5,200	1,446	60	64	64	4	101	93	8
Cool Creek	5,200	936	45	64	64	19	133	93	30
Cool Creek	5,200	905	60	64	64	4	101	93	8
Cool Creek	5,200	382	75	64	75	0	70	93	0
Cool Creek	5,400	471	75	58	75	0	70	105	0
Cool Creek	5,400	396	75	58	75	0	70	105	0
Cool Creek	5,400	556	75	58	75	0	70	105	0
Cool Creek	5,400	586	60	58	60	0	101	105	0
Cool Creek	5,600	777	75	52	75	0	70	118	0

[1]More than one segment of a named water body may occur in the same 200-foot elevation zone. Generally this is because unnamed perennial tributaries are included in the analysis, a reach is split at the confluence of two tributaries (see map), or a reach is split because of a radical percent canopy closure change. The only way to know which data apply to which reach on the ground is to use the ArcView data set included with this report.
[2]Current Canopy Closure (%) is estimated from recent 1:15,840 stereo aerial photographs.
[3]CWE Modeled Canopy Closure (%) is the percent canopy closure predicted by the CWE temperature model as needed to protect stream temperatures for salmonid spawning and/or bull trout.

Appendix 7. Grizzly Creek and Cougar Creek Temperature TMDLs

An ArcView shapefile of
these data is on the diskette
located in the back of this document

Appendix 7. Grizzly Creek and Cougar Creek Temperature TMDLs

This appendix, along with ArcView shapefile data included on the enclosed diskette, constitutes the temperature TMDLs for Grizzly Creek and Cougar Creek. Figure 7-1 shows the distribution of stream segements needing increased percent canopy closure to meet the TMDLs targets. Tables 7-1 and 7-2 present the loading calculations data on a stream reach by stream reach basis. The location of each stream reach can be ascertained using the ArcView shapefile. The ArcView shapefile contains all the data used to create the percent canopy closure increase targets in Figure 7-1 and the data presented in Tables 7-1 and 7-2.

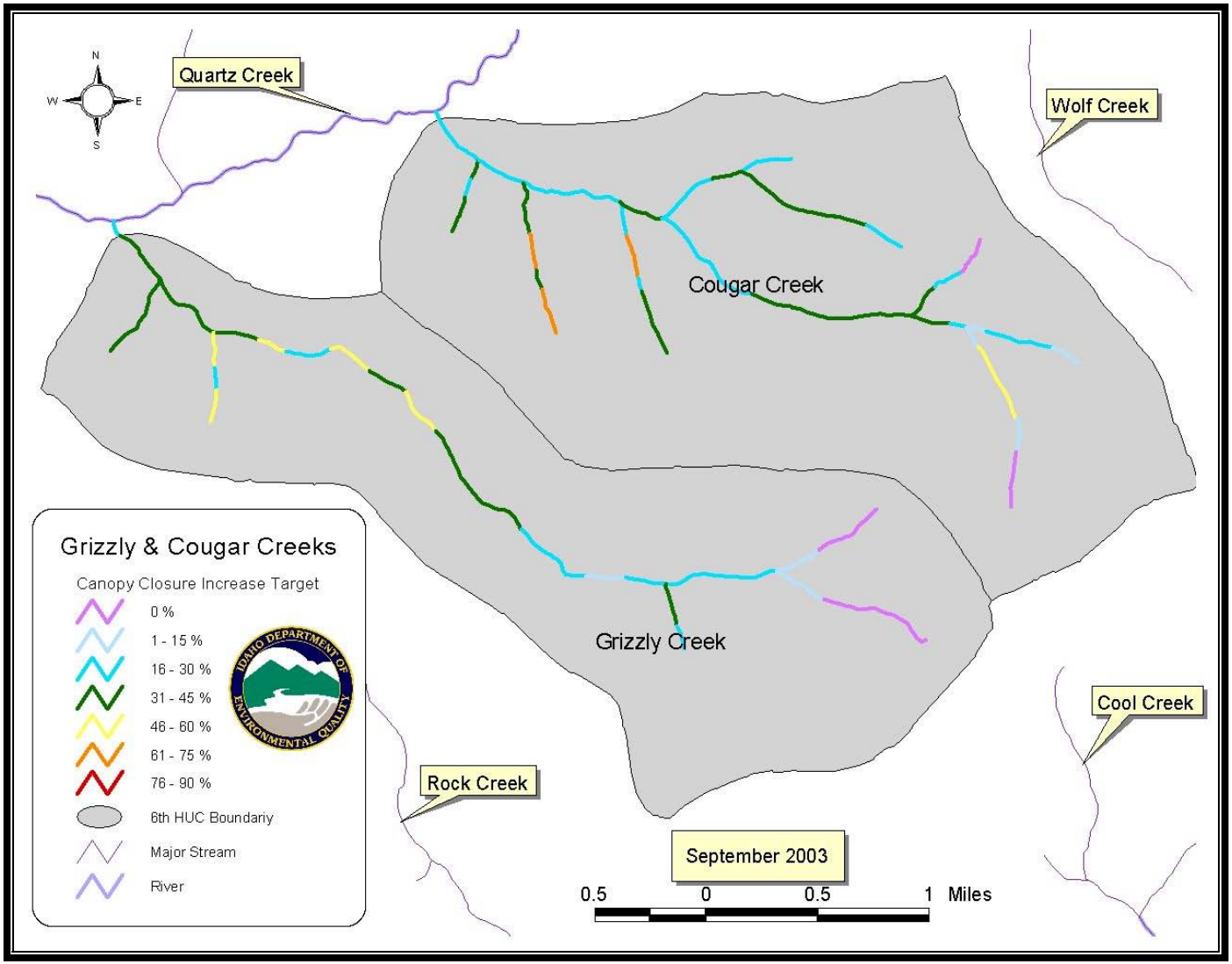


Figure 7-1. Targeted Percent Canopy Closure Increases for Grizzly Creek and Cougar Creek

Table 7-1. Grizzly Creek temperature TMDL, stream reach by stream reach.

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Grizzly Creek	385	2,200	75	157	100	25	76	18	76
Grizzly Creek	1,435	2,200	60	157	100	40	111	18	84
Grizzly Creek	565	2,400	60	151	100	40	111	18	84
Grizzly Creek	1,271	2,400	60	151	100	40	111	18	84
Grizzly Creek	609	2,600	60	145	100	40	111	18	84
Grizzly Creek	441	2,600	60	145	100	40	111	18	84
Grizzly Creek	1,089	2,800	60	139	100	40	111	18	84
Grizzly Creek	239	2,800	45	139	100	55	146	18	88
Grizzly Creek	432	2,800	60	139	100	40	111	18	84
Grizzly Creek	716	3,000	45	132	100	55	146	18	88
Grizzly Creek	253	3,000	45	132	100	55	146	18	88
Grizzly Creek	387	3,000	60	132	100	40	111	18	84
Grizzly Creek	1,104	3,200	75	126	100	25	76	18	76
Grizzly Creek	344	3,200	45	126	100	55	146	18	88
Grizzly Creek	303	3,200	60	126	100	40	111	18	84
Grizzly Creek	1,099	3,400	45	120	100	55	146	18	88
Grizzly Creek	524	3,400	75	120	100	25	76	18	76
Grizzly Creek	1,024	3,600	60	114	100	40	111	18	84
Grizzly Creek	404	3,600	45	114	100	55	146	18	88

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Grizzly Creek	1,179	3,800	45	108	100	55	146	18	88
Grizzly Creek	374	3,800	45	108	100	55	146	18	88
Grizzly Creek	1,535	4,000	60	101	100	40	111	18	84
Grizzly Creek	1,688	4,200	60	95	95	35	111	29	74
Grizzly Creek	2,027	4,400	60	89	89	29	111	43	61
Grizzly Creek	966	4,600	75	83	83	8	76	57	25
Grizzly Creek	974	4,600	60	83	83	23	111	57	49
Grizzly Creek	1,709	4,800	60	77	77	17	111	71	36
Grizzly Creek	1,004	4,800	60	77	77	17	111	71	36
Grizzly Creek	1,024	4,800	45	77	77	32	146	71	51
Grizzly Creek	569	4,800	60	77	77	17	111	71	36
Grizzly Creek	1,141	5,000	60	71	71	11	111	85	23
Grizzly Creek	1,320	5,000	60	71	71	11	111	85	23
Grizzly Creek	1,709	5,200	90	64	90	0	41	101	0
Grizzly Creek	1,646	5,200	90	64	90	0	41	101	0
Grizzly Creek	1,118	5,400	90	58	90	0	41	115	0

[1]More than one segment of a named water body may occur in the same 200-foot elevation zone. Generally this is because unnamed perennial tributaries are included in the analysis, a reach is split at the confluence of two tributaries (see map), or a reach is split because of a radical percent canopy closure change. The only way to know which data apply to which reach on the ground is to use the ArcView data set included with this report.
[2]Current Canopy Closure (%) is estimated from recent 1:15,840 stereo aerial photographs.
[3]CWE Modeled Canopy Closure (%) is the percent canopy closure predicted by the CWE temperature model as needed to protect stream temperatures for salmonid spawning and/or bull trout.

Table 7-2. Cougar Creek temperature TMDL, stream reach by stream reach.

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Cougar Creek	221	2,400	75	151	100	25	82	18	78
Cougar Creek	1,351	2,400	75	151	100	25	82	18	78
Cougar Creek	498	2,600	60	145	100	40	120	18	85
Cougar Creek	1,200	2,600	75	145	100	25	82	18	78
Cougar Creek	1,007	2,600	75	145	100	25	82	18	78
Cougar Creek	458	2,600	60	145	100	40	120	18	85
Cougar Creek	435	2,800	75	139	100	25	82	18	78
Cougar Creek	1,411	2,800	75	139	100	25	82	18	78
Cougar Creek	421	2,800	60	139	100	40	120	18	85
Cougar Creek	496	3,000	60	132	100	40	120	18	85
Cougar Creek	780	3,000	75	132	100	25	82	18	78
Cougar Creek	377	3,000	60	132	100	40	120	18	85
Cougar Creek	1,088	3,000	60	132	100	40	120	18	85
Cougar Creek	546	3,000	75	132	100	25	82	18	78
Cougar Creek	384	3,200	60	126	100	40	120	18	85
Cougar Creek	387	3,200	30	126	100	70	197	18	91
Cougar Creek	470	3,200	30	126	100	70	197	18	91

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Cougar Creek	1,192	3,200	75	126	100	25	82	18	78
Cougar Creek	770	3,200	75	126	100	25	82	18	78
Cougar Creek	478	3,400	30	120	100	70	197	18	91
Cougar Creek	556	3,400	30	120	100	70	197	18	91
Cougar Creek	1,161	3,400	75	120	100	25	82	18	78
Cougar Creek	757	3,400	75	120	100	25	82	18	78
Cougar Creek	465	3,600	60	114	100	40	120	18	85
Cougar Creek	337	3,600	75	114	100	25	82	18	78
Cougar Creek	1,062	3,600	60	114	100	40	120	18	85
Cougar Creek	341	3,600	75	114	100	25	82	18	78
Cougar Creek	706	3,600	60	114	100	40	120	18	85
Cougar Creek	408	3,600	60	114	100	40	120	18	85
Cougar Creek	624	3,800	30	108	100	70	197	18	91
Cougar Creek	922	3,800	60	108	100	40	120	18	85
Cougar Creek	927	3,800	75	108	100	25	82	18	78
Cougar Creek	1,364	3,800	60	108	100	40	120	18	85
Cougar Creek	1,346	3,800	60	108	100	40	120	18	85
Cougar Creek	474	4,000	30	101	100	70	197	18	91

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Cougar Creek	654	4,000	60	101	100	40	120	18	85
Cougar Creek	759	4,000	60	101	100	40	120	18	85
Cougar Creek	1,494	4,000	60	101	100	40	120	18	85
Cougar Creek	890	4,200	60	95	95	35	120	31	74
Cougar Creek	760	4,200	60	95	95	35	120	31	74
Cougar Creek	938	4,200	60	95	95	35	120	31	74
Cougar Creek	980	4,400	60	89	89	29	120	46	62
Cougar Creek	390	4,400	60	89	89	29	120	46	62
Cougar Creek	485	4,400	75	89	89	14	82	46	44
Cougar Creek	522	4,400	75	89	89	14	82	46	44
Cougar Creek	749	4,400	60	89	89	29	120	46	62
Cougar Creek	945	4,600	60	83	83	23	120	62	48
Cougar Creek	957	4,600	30	83	83	53	197	62	69
Cougar Creek	611	4,600	90	83	90	0	44	62	0
Cougar Creek	308	4,600	90	83	90	0	44	62	0
Cougar Creek	986	4,800	30	77	77	47	197	77	61
Cougar Creek	697	4,800	60	77	77	17	120	77	36
Cougar Creek	796	5,000	60	71	71	11	120	92	23

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Cougar Creek	725	5,000	60	71	71	11	120	92	23
Cougar Creek	913	5,200	75	64	75	0	82	110	0
Cougar Creek	413	5,400	75	58	75	0	82	126	0

[1]More than one segment of a named water body may occur in the same 200-foot elevation zone. Generally this is because unnamed perennial tributaries are included in the analysis, a reach is split at the confluence of two tributaries (see map), or a reach is split because of a radical percent canopy closure change. The only way to know which data apply to which reach on the ground is to use the ArcView data set included with this report.

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Appendix 8. Gravey Creek and Marten Creek Temperature TMDLs

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Appendix 8. Gravey Creek and Marten Creek Temperature TMDLs

This appendix, along with ArcView shapefile data included on the enclosed diskette, constitutes the temperature TMDLs for Gravey Creek and Marten Creek. Figure 8-1 shows the distribution of stream segements needing increased percent canopy closure to meet the TMDLs targets. Tables 8-1 and 8-2 present the loading calculations data on a stream reach by stream reach basis. The location of each stream reach can be ascertained using the ArcView shapefile. The ArcView shapefile contains all the data used to create the percent canopy closure increase targets in Figure 8-1 and the data presented in Tables 8-1 and 8-2.

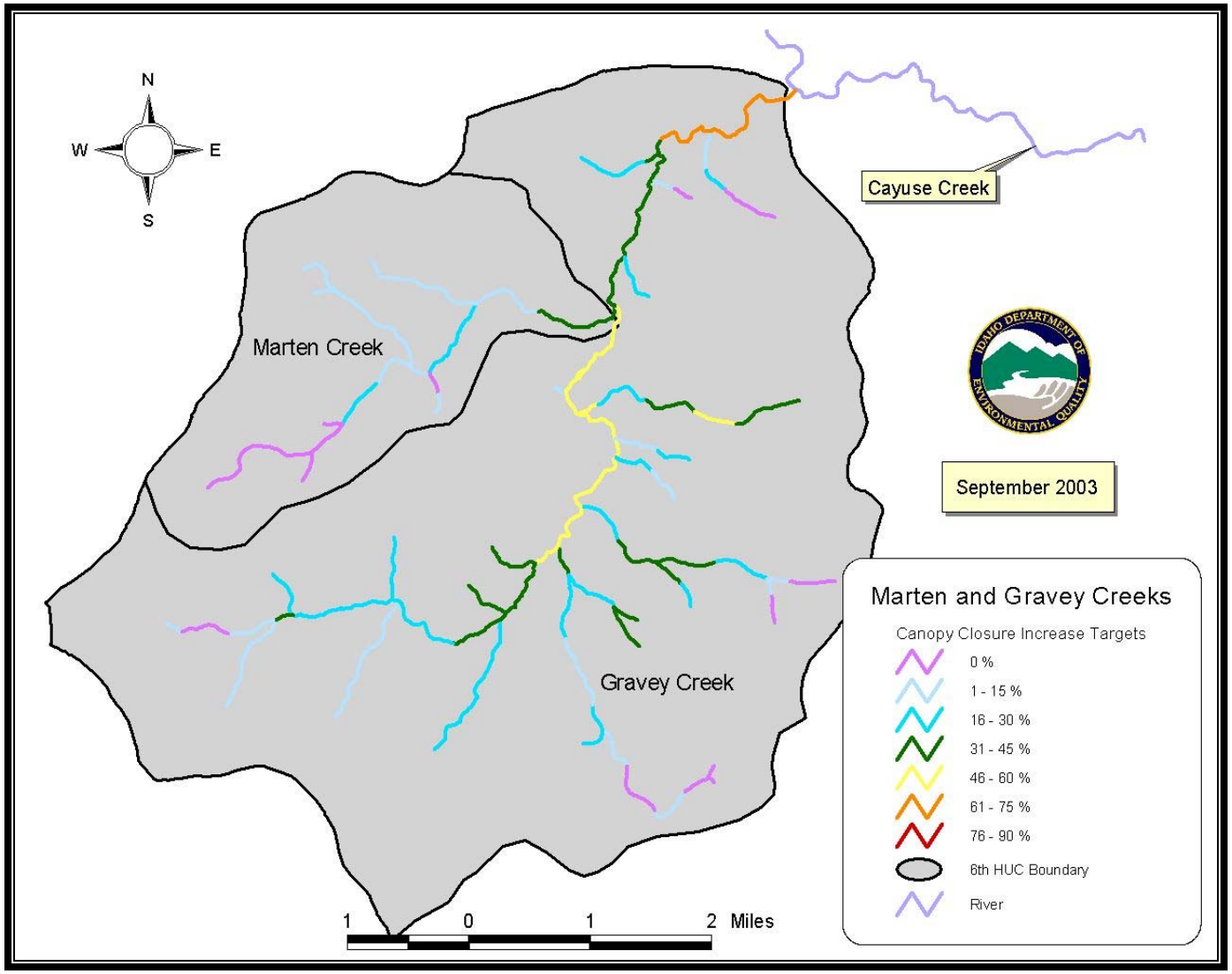

Figure 8-1. Targeted Percent Canopy Closure Increases for Gravey Creek and Marten Creek

Table 8-1. Gravey Creek temperature TMDL, stream reach by stream reach.

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Alder Creek	1,067	4,000	90	101	100	10	41	18	56
Alder Creek	858	4,200	100	95	100	0	18	29	0
Blowup Creek	963	4,200	45	95	95	50	159	31	81
Blowup Creek	2,684	4,400	60	89	89	29	120	46	62
Blowup Creek	2,403	4,600	45	83	83	38	159	62	61
Blowup Creek	1,901	4,800	30	77	77	47	197	77	61
Blowup Creek	1,202	5,000	30	71	71	41	197	92	53
Blowup Creek	1,816	5,200	30	64	64	34	197	110	44
Grass Creek	1,677	4,000	90	101	100	10	41	18	56
Grass Creek	1,211	4,200	75	95	95	20	76	29	62
Grass Creek	1,312	4,400	90	89	90	0	41	43	0
Grass Creek	1,196	4,600	90	83	90	0	41	57	0
Gravey Creek	2,936	4,000	30	101	100	70	181	18	90
Gravey Creek	5,321	4,000	30	101	100	70	181	18	90
Gravey Creek	559	4,000	60	101	100	40	111	18	84
Gravey Creek	1,576	4,000	60	101	100	40	111	18	84
Gravey Creek	3,957	4,000	60	101	100	40	111	18	84

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Gravey Creek	564	4,200	90	95	95	5	41	29	29
Gravey Creek	1,125	4,200	45	95	95	50	146	29	80
Gravey Creek	5,561	4,200	45	95	95	50	146	29	80
Gravey Creek	2,258	4,200	45	95	95	50	146	29	80
Gravey Creek	2,493	4,200	60	95	95	35	111	29	74
Gravey Creek	690	4,200	60	95	95	35	111	29	74
Gravey Creek	2,178	4,200	75	95	95	20	76	29	62
Gravey Creek	2,399	4,400	30	89	89	59	181	43	76
Gravey Creek	2,658	4,400	30	89	89	59	181	43	76
Gravey Creek	1,217	4,400	60	89	89	29	111	43	61
Gravey Creek	854	4,400	30	89	89	59	181	43	76
Gravey Creek	581	4,400	30	89	89	59	181	43	76
Gravey Creek	1,818	4,400	60	89	89	29	111	43	61
Gravey Creek	1,986	4,400	75	89	89	14	76	43	43
Gravey Creek	1,325	4,400	30	89	89	59	181	43	76
Gravey Creek	2,548	4,600	60	83	83	23	111	57	49
Gravey Creek	5,403	4,600	60	83	83	23	111	57	49
Gravey Creek	1,120	4,600	60	83	83	23	111	57	49
Gravey Creek	1,671	4,600	75	83	83	8	76	57	25

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Gravey Creek	1,571	4,600	60	83	83	23	111	57	49
Gravey Creek	3,106	4,600	45	83	83	38	146	57	61
Gravey Creek	2,155	4,600	45	83	83	38	146	57	61
Gravey Creek	2,398	4,600	45	83	83	38	146	57	61
Gravey Creek	1,180	4,800	45	77	77	32	146	71	51
Gravey Creek	2,134	4,800	60	77	77	17	111	71	36
Gravey Creek	2,491	4,800	75	77	77	2	76	71	7
Gravey Creek	1,391	4,800	60	77	77	17	111	71	36
Gravey Creek	2,322	4,800	75	77	77	2	76	71	7
Gravey Creek	832	4,800	60	77	77	17	111	71	36
Gravey Creek	1,419	4,800	45	77	77	32	146	71	51
Gravey Creek	2,039	4,800	45	77	77	32	146	71	51
Gravey Creek	2,764	4,800	60	77	77	17	111	71	36
Gravey Creek	1,233	4,800	60	77	77	17	111	71	36
Gravey Creek	2,224	5,000	60	71	71	11	111	85	23
Gravey Creek	1,084	5,000	45	71	71	26	146	85	42
Gravey Creek	3,460	5,000	60	71	71	11	111	85	23
Gravey Creek	789	5,200	60	64	64	4	111	101	9
Gravey Creek	1,147	5,400	75	58	75	0	76	115	0

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Gravey Creek	389	5,400	75	58	75	0	76	115	0
Horseshoe Creek	2,413	4,400	60	89	89	29	120	46	62
Horseshoe Creek	2,218	4,600	45	83	83	38	159	62	61
Horseshoe Creek	2,602	4,600	45	83	83	38	159	62	61
Horseshoe Creek	2,504	5,000	45	71	71	26	159	92	42
Horseshoe Creek	1,014	5,200	60	64	64	4	120	110	8
Horseshoe Creek	1,972	5,400	75	58	75	0	82	126	0
Mire Creek	3,289	4,600	60	83	83	23	120	62	48
Mire Creek	2,396	4,600	45	83	83	38	159	62	61
Mire Creek	3,734	4,600	60	83	83	23	120	62	48
Mire Creek	2,245	4,800	75	77	77	2	82	77	6
Mire Creek	1,385	4,800	60	77	77	17	120	77	36
Mire Creek	791	4,800	45	77	77	32	159	77	52
Mire Creek	2,205	5,000	75	71	75	0	82	92	0
Mire Creek	769	5,200	60	64	64	4	120	110	8
Serpent Creek	1,356	4,400	45	89	89	44	133	40	70
Serpent Creek	1,098	4,400	60	89	89	29	101	40	60
Serpent Creek	1,793	4,600	60	83	83	23	101	53	48
Serpent Creek	3,256	4,600	75	83	83	8	70	53	24

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Serpent Creek	1,183	4,800	60	77	77	17	101	65	36
Serpent Creek	2,116	4,800	75	77	77	2	70	65	7
Serpent Creek	2,553	5,000	75	71	75	0	70	78	0
Serpent Creek	1,977	5,200	60	64	64	4	101	93	8
Serpent Creek	550	5,400	75	58	75	0	70	105	0
Serpent Creek	1,199	5,400	75	58	75	0	70	105	0

[1]More than one segment of a named water body may occur in the same 200-foot elevation zone. Generally this is because unnamed perennial tributaries are included in the analysis, a reach is split at the confluence of two tributaries (see map), or a reach is split because of a radical percent canopy closure change. The only way to know which data apply to which reach on the ground is to use the ArcView data set included with this report.

[2]Current Canopy Closure (%) is estimated from recent 1:15,840 stereo aerial photographs.

[3]CWE Modeled Canopy Closure (%) is the percent canopy closure predicted by the CWE temperature model as needed to protect stream temperatures for salmonid spawning and/or bull trout.

Table 8-2. Marten Creek temperature TMDL, stream reach by stream reach.

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
False Creek	788	4,400	75	89	89	14	76	43	43
False Creek	2,116	4,600	75	83	83	8	76	57	25
False Creek	2,387	5,000	60	71	71	11	111	85	23
Marten Creek	1,660	4,200	60	95	95	35	111	29	74
Marten Creek	2,457	4,200	60	95	95	35	111	29	74
Marten Creek	3,346	4,400	75	89	89	14	76	43	43
Marten Creek	1,767	4,400	60	89	89	29	111	43	61
Marten Creek	933	4,600	75	83	83	8	76	57	25
Marten Creek	1,946	4,600	60	83	83	23	111	57	49
Marten Creek	1,001	4,600	90	83	90	0	41	57	0
Marten Creek	2,138	4,600	75	83	83	8	76	57	25
Marten Creek	824	4,800	75	77	77	2	76	71	7
Marten Creek	2,272	4,800	60	77	77	17	111	71	36
Marten Creek	1,350	5,000	75	71	75	0	76	85	0
Marten Creek	824	5,000	75	71	75	0	76	85	0
Marten Creek	1,829	5,000	75	71	75	0	76	85	0

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Marten Creek	822	5,000	75	71	75	0	76	85	0
Marten Creek	3,544	5,200	75	64	75	0	76	101	0
Marten Creek	1,263	5,400	60	58	60	0	111	115	0
Shin Tangle Creek	729	4,600	75	83	83	8	76	57	25
Shin Tangle Creek	2,601	4,800	75	77	77	2	76	71	7
Shin Tangle Creek	967	5,000	60	71	71	11	111	85	23
Shin Tangle Creek	1,640	5,000	60	71	71	11	111	85	23
Shin Tangle Creek	2,031	5,000	60	71	71	11	111	85	23

[1]More than one segment of a named water body may occur in the same 200-foot elevation zone. Generally this is because unnamed perennial tributaries are included in the analysis, a reach is split at the confluence of two tributaries (see map), or a reach is split because of a radical percent canopy closure change. The only way to know which data apply to which reach on the ground is to use the ArcView data set included with this report.

[2]Current Canopy Closure (%) is estimated from recent 1:15,840 stereo aerial photographs.

[3]CWE Modeled Canopy Closure (%) is the percent canopy closure predicted by the CWE temperature model as needed to protect stream temperatures for salmonid spawning and/or bull trout.

Appendix 9. Middle Creek Temperature TMDL

An ArcView shapefile of
these data is on the diskette
located in the back of this document

Appendix 9. Middle Creek Temperature TMDL

This appendix, along with ArcView shapefile data included on the enclosed diskette, constitutes the temperature TMDL for Middle Creek. Figure 9-1 shows the distribution of stream segements needing increased percent canopy closure to meet the TMDL targets. Table 9-1 presents the loading calculations data on a stream reach by stream reach basis. The location of each stream reach can be ascertained using the ArcView shapefile. The ArcView shapefile contains all the data used to create the percent canopy closure increase targets in Figure 9-1 and the data presented in Table 9-1.

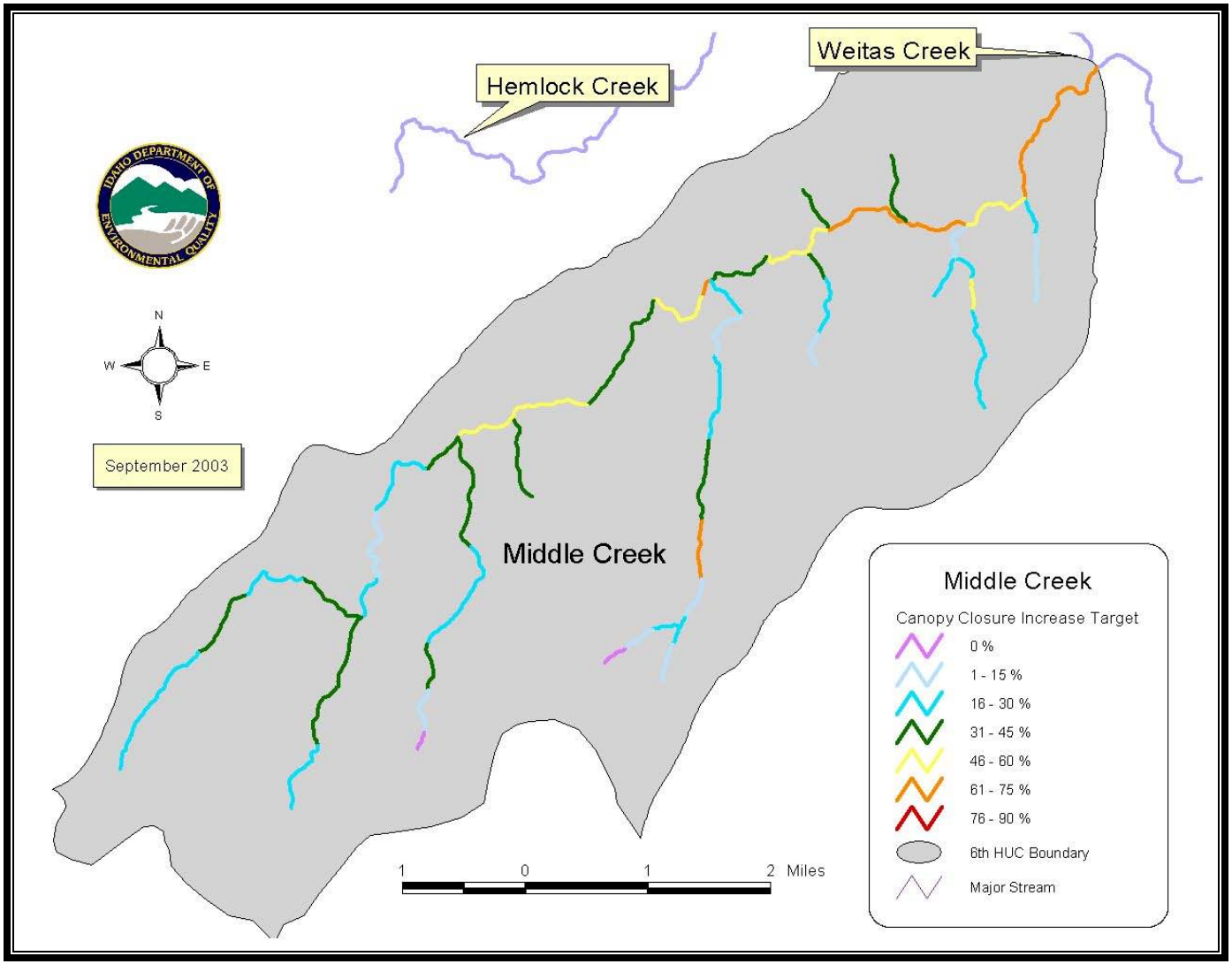

Figure 9-1. Targeted Percent Canopy Closure Increases for Middle Creek

Table 9-1. Middle Creek temperature TMDL, stream reach by stream reach.

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Beaver Dam Creek	6,280	4,600	45	83	83	38	133	53	60
Beaver Dam Creek	3,351	4,800	60	77	77	17	101	65	36
Felix Creek	1,801	4,000	60	101	100	40	101	17	83
Felix Creek	3,420	4,200	60	95	95	35	101	28	72
Felix Creek	2,444	4,400	60	89	89	29	101	40	60
Felix Creek	2,849	4,600	60	83	83	23	101	53	48
Felix Creek	2,100	4,800	45	77	77	32	133	65	51
Felix Creek	2,018	5,000	60	71	71	11	101	78	23
Felix Creek	805	5,200	75	64	75	0	70	93	0
Flame Creek	2,091	3,200	90	126	100	10	38	17	55
Flame Creek	1,282	3,400	75	120	100	25	70	17	76
Flame Creek	1,118	3,400	75	120	100	25	76	18	76
Flame Creek	1,360	3,600	45	114	100	55	133	17	87
Flame Creek	710	3,600	75	114	100	25	76	18	76
Flame Creek	1,235	3,800	75	108	100	25	70	17	76
Flame Creek	1,888	4,000	75	101	100	25	70	17	76
Flame Creek	1,434	4,200	75	95	95	20	70	28	60

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Middle Creek	1,272	2,800	30	139	100	70	181	18	90
Middle Creek	4,856	2,800	30	139	100	70	181	18	90
Middle Creek	793	3,000	75	132	100	25	76	18	76
Middle Creek	1,658	3,000	30	132	100	70	181	18	90
Middle Creek	3,279	3,000	45	132	100	55	146	18	88
Middle Creek	988	3,200	30	126	100	70	181	18	90
Middle Creek	908	3,200	75	126	100	25	76	18	76
Middle Creek	1,969	3,200	30	126	100	70	181	18	90
Middle Creek	3,989	3,200	30	126	100	70	181	18	90
Middle Creek	1,658	3,200	60	126	100	40	111	18	84
Middle Creek	750	3,400	45	120	100	55	146	18	88
Middle Creek	696	3,400	60	120	100	40	111	18	84
Middle Creek	1,150	3,400	90	120	100	10	41	18	56
Middle Creek	715	3,400	60	120	100	40	111	18	84
Middle Creek	823	3,400	60	120	100	40	111	18	84
Middle Creek	877	3,400	45	120	100	55	146	18	88
Middle Creek	2,180	3,400	45	120	100	55	146	18	88
Middle Creek	714	3,600	60	114	100	40	111	18	84
Middle Creek	854	3,600	30	114	100	70	181	18	90

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Middle Creek	1,761	3,600	90	114	100	10	41	18	56
Middle Creek	489	3,600	60	114	100	40	111	18	84
Middle Creek	699	3,600	60	114	100	40	111	18	84
Middle Creek	3,079	3,600	60	114	100	40	111	18	84
Middle Creek	3,055	3,600	45	114	100	55	146	18	88
Middle Creek	1,240	3,600	60	114	100	40	111	18	84
Middle Creek	858	3,800	75	108	100	25	76	18	76
Middle Creek	945	3,800	60	108	100	40	111	18	84
Middle Creek	4,478	3,800	60	108	100	40	111	18	84
Middle Creek	4,436	3,800	45	108	100	55	146	18	88
Middle Creek	1,849	4,000	45	101	100	55	146	18	88
Middle Creek	2,032	4,000	60	101	100	40	111	18	84
Middle Creek	1,786	4,000	75	101	100	25	76	18	76
Middle Creek	2,175	4,000	60	101	100	40	111	18	84
Middle Creek	3,696	4,200	75	95	95	20	76	29	62
Middle Creek	1,535	4,200	90	95	95	5	41	29	29
Middle Creek	1,661	4,200	60	95	95	35	111	29	74
Middle Creek	3,692	4,400	75	89	89	14	76	43	43
Middle Creek	2,039	4,400	60	89	89	29	111	43	61

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Middle Creek	3,264	4,600	45	83	83	38	146	57	61
Middle Creek	3,251	4,800	60	77	77	17	111	71	36
Middle Creek	3,301	5,000	30	71	71	41	181	85	53
Middle Creek	2,159	5,000	45	71	71	26	146	85	42
Middle Creek	4,192	5,200	45	64	64	19	146	101	31
Rocky Ridge Creek	2,085	3,600	75	114	100	25	70	17	76
Rocky Ridge Creek	2,439	3,600	90	114	100	10	38	17	55
Rocky Ridge Creek	3,973	3,800	75	108	100	25	70	17	76
Rocky Ridge Creek	3,570	4,000	60	101	100	40	101	17	83
Rocky Ridge Creek	2,556	4,200	30	95	95	65	164	28	83
Rocky Ridge Creek	1,886	4,400	75	89	89	14	70	40	43
Rocky Ridge Creek	500	4,600	60	83	83	23	101	53	48
Rocky Ridge Creek	766	4,600	60	83	83	23	111	57	49
Rocky Ridge Creek	1,233	4,800	60	77	77	17	111	71	36
Rocky Ridge Creek	1,710	4,800	75	77	77	2	76	71	7
Rocky Ridge Creek	836	5,000	60	71	71	11	111	85	23
Rocky Ridge Creek	632	5,200	60	64	64	4	111	101	9
Rocky Ridge Creek	1,135	5,400	75	58	75	0	76	115	0

[1]More than one segment of a named water body may occur in the same 200-foot elevation zone. Generally this is because unnamed perennial tributaries are included in the analysis, a reach is split at the confluence of two tributaries (see map), or a reach is split because of a radical percent canopy closure change. The only way to know which data apply to which reach on the ground is to use the ArcView data set included with this report.
[2]Current Canopy Closure (%) is estimated from recent 1:15,840 stereo aerial photographs.
[3]CWE Modeled Canopy Closure (%) is the percent canopy closure predicted by the CWE temperature model as needed to protect stream temperatures for salmonid spawning and/or bull trout.

Appendix 10. Sneak Creek Temperature TMDL

An ArcView shapefile of
these data is on the diskette
located in the back of this document

Appendix 10. Sneak Creek Temperature TMDL

This appendix, along with ArcView shapefile data included on the enclosed diskette, constitutes the temperature TMDL for Sneak Creek. Figure 10-1 shows the distribution of stream segements needing increased percent canopy closure to meet the TMDL targets. Table 10-1 presents the loading calculations data on a stream reach by stream reach basis. The location of each stream reach can be ascertained using the ArcView shapefile. The ArcView shapefile contains all the data used to create the percent canopy closure increase targets in Figure 10-1 and the data presented in Table 10-1.

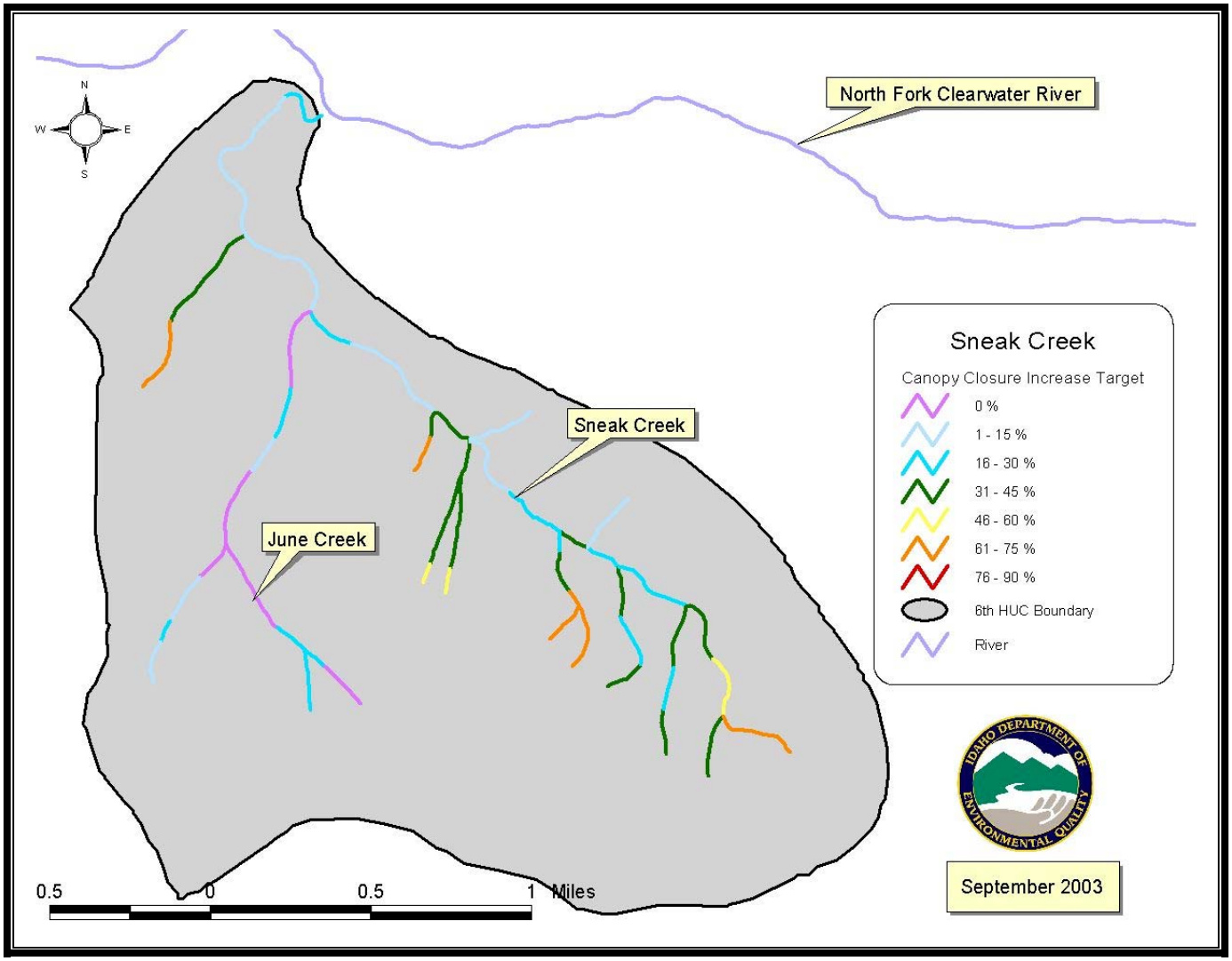

Figure 10-1. Targeted Percent Canopy Closure Increases for Sneak Creek

Table 10-1. Sneak Creek temperature TMDL, stream reach by stream reach.

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
June Creek	793	2,400	100	151	100	0	17	17	0
June Creek	616	2,600	100	145	100	0	17	17	0
June Creek	835	2,800	75	139	100	25	70	17	76
June Creek	681	3,000	90	132	100	10	38	17	55
June Creek	737	3,200	100	126	100	0	17	17	0
June Creek	577	3,400	100	120	100	0	17	17	0
June Creek	720	3,600	100	114	100	0	17	17	0
June Creek	473	3,800	90	108	100	10	38	17	55
June Creek	396	4,000	90	101	100	10	38	17	55
June Creek	380	4,200	75	95	95	20	70	28	60
June Creek	714	4,400	75	89	89	14	70	40	43
Sneak Creek	974	1,800	75	169	100	25	76	18	76
Sneak Creek	1,872	1,800	90	169	100	10	41	18	56
Sneak Creek	1,088	2,000	90	163	100	10	41	18	56
Sneak Creek	447	2,200	60	157	100	40	111	18	84
Sneak Creek	1,978	2,200	90	157	100	10	41	18	56
Sneak Creek	883	2,400	75	151	100	25	76	18	76

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Sneak Creek	598	2,400	60	151	100	40	111	18	84
Sneak Creek	434	2,600	60	145	100	40	111	18	84
Sneak Creek	1,411	2,600	90	145	100	10	41	18	56
Sneak Creek	440	2,800	90	139	100	10	41	18	56
Sneak Creek	742	2,800	60	139	100	40	111	18	84
Sneak Creek	440	2,800	60	139	100	40	111	18	84
Sneak Creek	433	2,800	60	139	100	40	111	18	84
Sneak Creek	320	3,000	30	132	100	70	181	18	90
Sneak Creek	618	3,000	30	132	100	70	181	18	90
Sneak Creek	642	3,000	60	132	100	40	111	18	84
Sneak Creek	382	3,000	90	132	100	10	41	18	56
Sneak Creek	1,214	3,000	90	132	100	10	41	18	56
Sneak Creek	520	3,200	60	126	100	40	111	18	84
Sneak Creek	452	3,200	30	126	100	70	181	18	90
Sneak Creek	708	3,200	60	126	100	40	111	18	84
Sneak Creek	733	3,200	60	126	100	40	111	18	84
Sneak Creek	742	3,200	90	126	100	10	41	18	56
Sneak Creek	1,084	3,200	75	126	100	25	76	18	76
Sneak Creek	356	3,200	75	126	100	25	76	18	76

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Sneak Creek	472	3,400	30	120	100	70	181	18	90
Sneak Creek	374	3,400	60	120	100	40	111	18	84
Sneak Creek	359	3,400	60	120	100	40	111	18	84
Sneak Creek	627	3,400	75	120	100	25	76	18	76
Sneak Creek	679	3,400	60	120	100	40	111	18	84
Sneak Creek	481	3,400	90	120	100	10	41	18	56
Sneak Creek	843	3,400	60	120	100	40	111	18	84
Sneak Creek	1,001	3,400	75	120	100	25	76	18	76
Sneak Creek	719	3,600	100	114	100	0	18	18	0
Sneak Creek	421	3,600	60	114	100	40	111	18	84
Sneak Creek	431	3,600	60	114	100	40	111	18	84
Sneak Creek	281	3,600	30	114	100	70	181	18	90
Sneak Creek	576	3,600	90	114	100	10	41	18	56
Sneak Creek	401	3,600	30	114	100	70	181	18	90
Sneak Creek	613	3,600	30	114	100	70	181	18	90
Sneak Creek	871	3,600	75	114	100	25	76	18	76
Sneak Creek	334	3,600	75	114	100	25	76	18	76
Sneak Creek	1,088	3,600	60	114	100	40	111	18	84
Sneak Creek	345	3,800	100	108	100	0	18	18	0

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Sneak Creek	269	3,800	100	108	100	0	18	18	0
Sneak Creek	332	3,800	45	108	100	55	146	18	88
Sneak Creek	421	3,800	45	108	100	55	146	18	88
Sneak Creek	336	3,800	30	108	100	70	181	18	90
Sneak Creek	492	3,800	30	108	100	70	181	18	90
Sneak Creek	659	3,800	60	108	100	40	111	18	84
Sneak Creek	1,037	3,800	60	108	100	40	111	18	84
Sneak Creek	1,045	3,800	45	108	100	55	146	18	88
Sneak Creek	392	3,800	60	108	100	40	111	18	84
Sneak Creek	603	3,800	30	108	100	70	181	18	90
Sneak Creek	709	3,800	75	108	100	25	76	18	76
Sneak Creek	287	4,000	100	101	100	0	18	18	0
Sneak Creek	415	4,000	75	101	100	25	76	18	76
Sneak Creek	755	4,000	60	101	100	40	111	18	84
Sneak Creek	667	4,000	60	101	100	40	111	18	84
Sneak Creek	760	4,000	30	101	100	70	181	18	90
Sneak Creek	172	4,200	75	95	95	20	76	29	62
Sneak Creek	311	4,200	75	95	95	20	76	29	62
Sneak Creek	421	4,200	75	95	95	20	76	29	62

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Sneak Creek	858	4,400	90	89	90	0	41	43	0
Sneak Creek	689	4,400	60	89	89	29	111	43	61

[1]More than one segment of a named water body may occur in the same 200-foot elevation zone. Generally this is because unnamed perennial tributaries are included in the analysis, a reach is split at the confluence of two tributaries (see map), or a reach is split because of a radical percent canopy closure change. The only way to know which data apply to which reach on the ground is to use the ArcView data set included with this report.

[2]Current Canopy Closure (%) is estimated from recent 1:15,840 stereo aerial photographs.

[3]CWE Modeled Canopy Closure (%) is the percent canopy closure predicted by the CWE temperature model as needed to protect stream temperatures for salmonid spawning and/or bull trout.

Appendix 11. Deception Gulch Temperature TMDL

An ArcView shapefile of
these data is on the diskette
located in the back of this document

Appendix 11. Deception Gulch Temperature TMDL

This appendix, along with ArcView shapefile data included on the enclosed diskette, constitutes the temperature TMDL for Deception Gulch. Figure 11-1 shows the distribution of stream segements needing increased percent canopy closure to meet the TMDL targets. Table 11-1 presents the loading calculations data on a stream reach by stream reach basis. The location of each stream reach can be ascertained using the ArcView shapefile. The ArcView shapefile contains all the data used to create the percent canopy closure increase targets in Figure 11-1 and the data presented in Table 11-1.

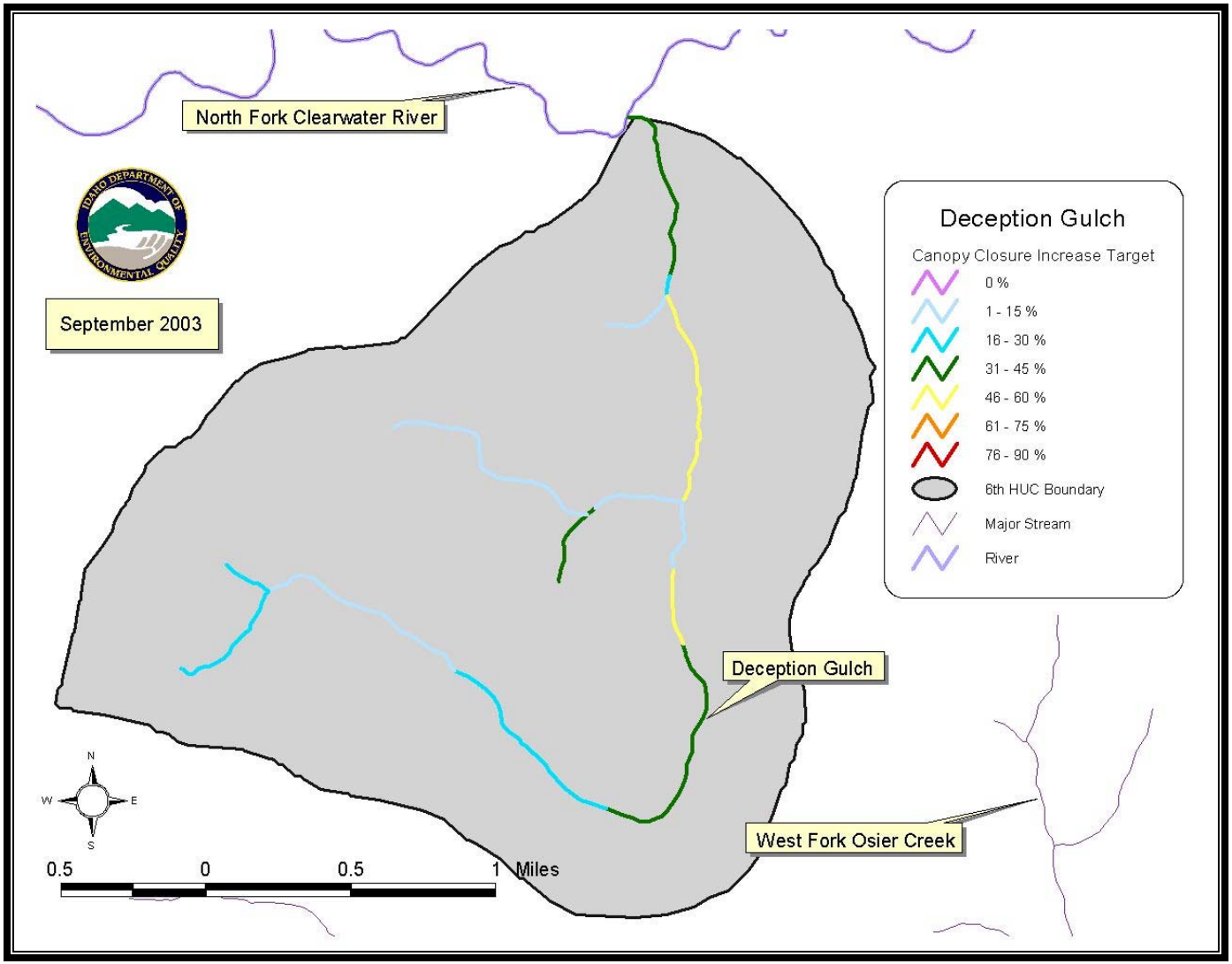

Figure 11-1. Targeted Percent Canopy Closure Increases for Deception Gulch

Table 11-1. Deception Gulch temperature TMDL, stream reach by stream reach.

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Deception Gulch	3,356	3,400	60	120	100	40	101	17	83
Deception Gulch	1,376	3,600	90	114	100	10	38	17	55
Deception Gulch	356	3,600	75	114	100	25	70	17	76
Deception Gulch	3,940	3,600	45	114	100	55	133	17	87
Deception Gulch	184	3,800	60	108	100	40	101	17	83
Deception Gulch	1,670	3,800	90	108	100	10	38	17	55
Deception Gulch	1,397	3,800	60	108	100	40	101	17	83
Deception Gulch	653	3,800	90	108	100	10	38	17	55
Deception Gulch	1,366	3,800	90	108	100	10	38	17	55
Deception Gulch	1,366	3,800	45	108	100	55	133	17	87
Deception Gulch	2,210	4,000	90	101	100	10	38	17	55
Deception Gulch	4,510	4,000	60	101	100	40	101	17	83
Deception Gulch	1,541	4,200	90	95	95	5	38	28	26
Deception Gulch	3,867	4,200	75	95	95	20	70	28	60
Deception Gulch	2,542	4,400	75	89	89	14	70	40	43
Deception Gulch	1,508	4,600	75	83	83	8	70	53	24
Deception Gulch	2,398	4,800	60	77	77	17	101	65	36

Stream Name	Stream Segment Length	Elevat-ion[1]	Current Canopy Closure[2]	CWE Modeled Canopy Closure[3]	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m^2)	(watts/m^2)	(%)
Deception Gulch	915	4,800	60	77	77	17	101	65	36

[1]More than one segment of a named water body may occur in the same 200-foot elevation zone. Generally this is because unnamed perennial tributaries are included in the analysis, a reach is split at the confluence of two tributaries (see map), or a reach is split because of a radical percent canopy closure change. The only way to know which data apply to which reach on the ground is to use the ArcView data set included with this report.

[2]Current Canopy Closure (%) is estimated from recent 1:15,840 stereo aerial photographs.

[3]CWE Modeled Canopy Closure (%) is the percent canopy closure predicted by the CWE temperature model as needed to protect stream temperatures for salmonid spawning and/or bull trout.