

FUTURE FISHERIES IMPROVEMENT PROGRAM

REPORT TO 2003 LEGISLATURE AND FISH, WILDLIFE AND PARKS COMMISSION



**Montana Fish,
Wildlife & Parks**

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Cover photos (clockwise from top)

Off-channel stock water development on the upper Big Hole River

Bank stabilization project on the Missouri River near Craig

Self-cleaning fish screen installed in the Republican Canal, Bitterroot River

Riparian Fencing project on Steel Creek, a tributary to the Big Hole River

MONTANA FISH, WILDLIFE AND PARKS
Fisheries Division
Habitat Protection Bureau
Future Fisheries Improvement Program
and
Bull Trout and Cutthroat Trout Enhancement Program
Summary 1995-2002

The Future Fisheries Improvement Program (HB 349) provides funds for: “*the long term enhancement of streams and stream banks, in stream flows, water leasing, lease or purchase of stored water, and other voluntary programs that deal with wild fish and aquatic habitats.*” The Future Fisheries Improvement Program was supplemented in 1999 when the legislature enacted the Bull Trout and Cutthroat Trout Enhancement Program (HB 647) which “*provides for the enhancement of Montana bull trout and cutthroat trout populations through voluntary enhancement of spawning areas and other habitats for the natural reproduction of bull trout and cutthroat trout.*”

This report summarizes project funding and status of all projects that have been approved since these programs began in 1995 and 1999, respectively. The report also includes a brief narrative description of all projects approved since the last reporting period. Results of project monitoring are summarized in Appendix A.

Review Panel: Panel members during this report period included: **Jim Stone**, representing the North Powell County Conservation District, Ovando; **Roy Gabel**, commercial rancher, Huntley; **Doug Parrott**, commercial rancher and irrigator, Roundup; **Paul Callahan**, Land and Water Consulting, Aquatic Habitat Consultants, Missoula; **Duane Phinney**, fishery biologist, St. Regis; **Robert Twiford**, licensed angler, Malta; **Earl Dorsey**, licensed angler, Helena; **Jeff Wilson**, student, Capital High School, Helena; **Senator Jack Wells**, Bozeman; **Representative Dan Fuchs**, Billings; **Dr. Steve Custer**, hydrologist, Montana State University, Bozeman; **Greg Watson**, Plum Creek Timber Company, Missoula; and **Gordon Stockstad** (ex-officio), Montana Department of Transportation. The review panel met four times since the last report – January 2001, July 2001, January 2002, and July 2002. Project proposal deadlines are January 1 and July 1 of each year.

Staffing: Mark Lere has been the Program Officer since November of 1997. Mark is responsible for reviewing project applications, visiting the sites of proposed projects, communicating department recommendations to the review panel, completing MEPA requirements, coordinating with consultants and contractors who design and perform restoration projects, developing project proposals, working with landowners and other citizens who need help developing proposals, and maintaining the program data base.

Other program staff include: Biologist George Liknes who is responsible for project monitoring as well as developing and overseeing new projects. George maintains a database to track restoration project monitoring conducted by himself as well as other biologists. His monitoring

reports are attached (Appendices A and B). Biologist Lee Nelson (0.5 FTE, from HB 647) is responsible for cutthroat restoration efforts in the Elkhorn Mountains. Biologist Brad Shepard (0.25 FTE from HB 647) is responsible for statewide cutthroat trout restoration efforts. A temporary Fishery Field Worker (0.25 FTE from HB 647) is also assigned to help work on bull trout and cutthroat trout habitat restoration projects in the Blackfoot River drainage. Glenn Phillips, Chief of the Habitat Protection Bureau, continues to be responsible for overall program administration.

Operating Budget: Operating expenses during FY-01, FY-02, and FY-03 are summarized in Table 1.

Table 1. Future Fisheries Improvement Program (HB 349) operating expenses July 1, 2000-September 30, 2002.

Expense category	FY-01	FY-02	FY-03
Salaries and Benefits	96,676	84,915	12,623
Operating Expenses			
Services	1,604	337	590
Supplies & Materials	2,663	4,937	96
Communications	1,164	738	108
Travel	10,506	7,486	1,770
Rent	1,459	998	16
Repair & Maintenance	310	-	-
Education and Training	-	-	-
Miscellaneous	117	1,497	-
Total	114,499	100,908	15,203

Anticipated Expenses: House Bill 349 requires Fish, Wildlife and Parks to report anticipated expenses for the ensuing 10 years implementation of the program. During the first seven years of the program, we have committed, on average, about \$0.71 million/yr to projects. Over the next ten years we anticipate continuing to spend approximately \$1.5 million per biennium or about \$7.5 million over the next ten years.

Projects and appropriations: To date the Future Fisheries Review Panel and Fish, Wildlife and Parks Commission have fully or partial funded 313 projects. Additionally, both the review panel and the commission approved funding for the Tongue River project. The 1995 legislature earmarked \$510,000 for projects to enhance fisheries in the Tongue River; an additional \$275,000 was appropriated towards this purpose by the 1999 legislature. All of these funds

were used to construct a fish screen on the T&Y Diversion, to prevent the loss of fish down the diversion ditch. The Tongue River Project was jointly administered by the state of Montana, the Northern Cheyenne Tribe, and the United States Bureau of Reclamation.

Legislative appropriations to the Future Fisheries program include: 95-\$2,270,000; 97-\$1,385,000; 99-1,470,000; 01-\$1,010,000 Total-\$6,135,000. Additionally, the 1999 legislature appropriated \$750,000 from our general license account and \$500,000/yr (beginning in 2001) from the Resource Indemnity Trust Account to the Bull Trout and Cutthroat Trout Enhancement Program.

Table 2. Summary of projects approved, program dollars committed, and matching dollars committed during each funding cycle.

Funding Cycle	Projects Approved	Program \$ Committed	Matching \$ Committed
Winter 96	30	\$666,601	\$1,722,289
Summer 96	18	164,278	172,416
Tongue River (96&99)	1	785,000	115,000
Winter 97	27	435,807	767,052
Summer 97	18	266,617	1,677,408
Winter 98	23	320,520	712,300
Summer 98	26	483,397	410,187
Winter 99	20	360,860	571,981
Summer 99	30	379,114	937,735
Winter 00	30	285,847	1,049,606
Summer 00	14	206,298	200,847
Winter 01	22	288,128	444,927
Summer 01	13	190,243	541,902
Winter 02	24	348,639	534,995
Summer 02	17	539,881	1,408,107
Total	313	\$5,721,230	\$11,266,752

HB 647 also required that we work with the Montana Department of Transportation to determine if there are bull or cutthroat trout enhancement projects that may be partially funded by them. Restoration projects funded by the Department of Transportation included Camp Creek south of Hamilton, Kleinschmidt Creek near Ovando, and Therriault Creek near Eureka. We are also working toward mitigation agreements along transportation corridors where bull and cutthroat trout occur; mitigation funds will potentially be available for bull and cutthroat trout habitat restoration projects.

Table 3 summarizes the budget and status of projects that have been approved to date. Thirty-six of the approved projects are to improve fish habitat in lakes, reservoirs or ponds and the remaining projects are for habitat improvements in rivers and streams. Bull trout and cutthroat trout projects funded through HB 647 are highlighted in Table 3.

Table 3. Future Fisheries Improvement Program project funding and status (Program funds allocated and spent as of November 19, 2002). Projects highlighted in **bold** were funded under House Bill 647.

FFI#		PROJECT NUMBER, NAME & YEAR	APPLICANT	PROGRAM FUNDS COMMITTED (\$)	MATCHING FUNDS (\$)	TOTAL FUNDS COMMITTED (\$)	PROGRAM FUNDS SPENT (\$)	EXPECTED YEAR OF COMPLETION
		1996 WINTER FUNDING CYCLE						
001-96	1	Cress Spring Creek Fence	Landowner	\$5,328	\$12,172 ^{a,p}	\$17,500	\$5,328	Complete
002-96	2	Dunham Creek Fish Screen	FWP/Landowner	15,915	12,500 ^{a,r}	28,415	14,800	Complete
003-96	3	O'Brien Creek Restoration	FWP/Landowner	8,500	13,000 ^{a,l}	21,500	8,329	Complete
004-96	4	Gold Creek Pool Development	FWP/Landowner	25,652	29,000 ^{a,r}	54,652	25,652	Complete
005-96	5	Rock Creek Restoration	Consult/Landowner	12,450	9,758 ^a	22,208	12,450	Complete
006-96	6	Steel Creek Restoration	FWP/Landowner	10,000	19,325 ^s	29,325	9,415	Complete
007-96	7	Cottonwood Creek-Dreyer Diversion	FWP/Landowner	16,070	30,309 ^{a,r}	46,379	16,180	Complete
008-96	8	Meadow Creek Fence	USFS	2,000	2,000 ^s	4,000	0	Cancelled
011-96	9	Sweathouse Creek Enhancement	Landowners	13,305	1,500 ^{a,e}	14,805	9,609	Complete
013-96	10	Little Beaver Creek Riparian Fence	Landowner	1,966	1,200 ^a	3,166	2,125	Complete
014-96	11	Upper Big Hole River Flow Enhancement	USFWS/Landowner	20,000	45,000 ^{a,r}	65,000	20,001	Complete
016-96	12	Whites Gulch Riparian Fence & Revegetation	USFS	19,500	12,500 ^{e,s}	32,000	12,838	Complete
017-96	13	Deep Creek Channel Restoration	FWP/Landowners	65,000	280,000 ^{a,e,g}	345,000	70,000	Complete
018-96	14	Lake Francis Shoreline Stabilization	Cons. District	2,500	107,500 ^{a,e,i}	110,000	2,500	Complete
020-96	15	Dick Creek Restoration	USFWS/Landowner	6,800	0	6,800	6,520	Complete
021-96	16	Mol Heron Creek Flow Enhancement	Landowner	124,000	52,525 ^a	176,525	103,369	Complete
022-96	17	Fort Peck Breakwater - Spawning Reef	ACOE	12,500	920,000 ^{i,q}	932,500	12,000	Complete
024-96	18	Nelson Reservoir Spawning Vegetation	FWP	2,100	0	2,100	1,182	Complete
025-96	19	Nelson Reservoir Spawning Reef	FWP	5,750	1,000 ^t	6,750	5,817	Complete

FFI#		PROJECT NUMBER, NAME & YEAR	APPLICANT	PROGRAM FUNDS COMMITTED (\$)	MATCHING FUNDS (\$)	TOTAL FUNDS COMMITTED (\$)	PROGRAM FUNDS SPENT (\$)	EXPECTED YEAR OF COMPLETION
026-96	20	Fresno Reservoir Spawning Vegetation	FWP	2,400	0	2,400	863	Cancelled
027-96	21	Bear Paw Reservoir Spawning Enhancement	FWP	1,200	0	1,200	1,200	Complete
028-96	22	Slemmons Pond Dam Removal	FWP	5,000	10,000 ^m	15,000	2,401	Complete
030-96	23	Big Hole River Channel Restoration	TU/Landowner	62,500	7,500 ^{a,k,p}	70,000	57,230	Complete
031-96	24	Ruby River Bank Stabilization	FWP/Landowner	16,340	7,000 ^{a,r}	23,340	16,340	Complete
032-96	25	Elk Creek Restoration	TU/Landowner	18,075	15,000 ^{a,k}	33,075	0	2003
033-96	26	Dry Creek Rehab. & N. Fork Blackfoot	TU/Landowner	76,250	2,000 ^a	78,250	74,343	Complete
036-96	27	Madison Spring Creek Rehabilitation	Consult/Landowner	15,000	17,000 ^a	32,000	15,000	Complete
037-96	28	Elk Creek Rehabilitation	USFWS/Landowner	8,000	23,000 ^{a,b,j,n,r}	31,000	8,000	Complete
038-96	29	Locke Creek flow enhancement	TU/Landowner	2,500	1,500 ^{a,p}	4,000	0	Cancelled
039-96	30	NCAT - Agrimet Flow enhancement	NCAT	90,000	90,000 ^{k,x}	180,000	90,000	Complete
		SUBTOTAL 1996 winter funding cycle		\$666,601.00	1,722,289.00	\$2,388,890.00	\$603,492.00	
		1996 SUMMER FUNDING CYCLE						
041-96	31	Prickly Pear Creek Fence & Bank Stabilization	Landowner	2,000	500 ^a	2,500	2,637	Complete
042-96	32	St. Regis River Channel Restoration	FWP/Landowner	27,500	26,500 ^{e,f}	54,000	26,622	Complete
043-96	33	Little Sheep Creek Channel Restoration	USFS	10,729	20,620 ^s	31,349	6,979	Complete
044-96	34	Cottonwood Creek	FWP	18,200	22,500 ^f	40,700	16,500	Complete
045-96	35	North Fork Fish Screens	FWP/Landowner	10,500	20,000 ^{a,r}	30,500	10,500	Complete
046-96	36	Blackfoot River Bank Stabilization	Consult/Landowner	1,500	6,350 ^a	7,850	1,500	Complete
047-96	37	Sun River Bank Stabilization	FWP/Landowner	10,800	19,200 ^a	30,000	0	Cancelled
048-96	38	Blanchard Creek Riparian Fence	DNRC	8,000	0	8,000	8,144	Complete
049-96	39	Elk Creek Assessment	Watershed group	7,300	1,000 ^a	8,300	8,745	Complete
050-96	40	Beaverhead, Van Camp & Rattlesnake Slough	Landowner	22,923	9,500 ^a	32,423	22,923	Complete

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051-96	41	Bitterroot River Fence	Landowner	5,625	3,244 ^a	8,869	2,892	Complete
052-96	42	Blanchard Creek Feedlot Removal	Landowner	9,143	10,742 ^a	19,885	0	Cancelled
053-96	43	Echo Lake Bass Rearing Habitat	Bassmasters	1,414	1,200 ^c	2,614	2,387	Complete
054-96	44	Magpie Creek Fish Passage	Landowner	5,000	5,000 ^a	10,000	5,000	Complete
055-96	45	Teton River Bank Stabilization	Cons. District	4,300	14,300 ^{a,e,n}	18,600	1,700	Complete
056-96	46	Canyon Creek Bank Stabilization	Landowner	2,500	2,116 ^a	4,616	2,500	Complete
057-96	47	Missouri River Bank Stabilization	Landowner	15,000	7,800 ^a	22,800	15,000	Complete
058-96	48	Meadow Creek Riparian Fence	USFS	1,844	1,844 ^s	3,688	0	Cancelled
		SUBTOTAL 1996 summer funding cycle		\$164,278.00	\$172,416.00	\$336,694.00	\$134,029.00	
		1997 WINTER FUNDING CYCLE						
001-97	1	Elk Creek Channel Restoration	Watershed group	55,800	84,500 ^{a,g}	140,300	55,796	Complete
002-97	2	Fisher River Channel Restoration	Cons. District	3,300	4,000 ^{e,x}	7,300	2,288	Complete
003-97	3	Stinger Creek Channel Restoration	Cons. Foundation	40,000	32,000 ^{a,k,r}	72,000	39,945	Complete
004-97	4	Middle Fork Rock Creek Riparian Fence	USFS	26,000	26,000 ^{a,s}	52,000	26,000	Complete
005-97	5	Clark Fork River Riparian Fence	Landowner	1,600	1,062 ^a	2,662	1,668	Complete
006-97	6	Grantier Spring Creek Channel Restoration	Landowner	2,260	5,060 ^a	7,320	2,260	Complete
007-97	7	Camp Creek Restoration	TU/Landowners	39,300	65,000 ^{a,u}	104,300	0	(see 006-1999)
009-97	8	Chamberlain Creek Diversion	FWP/Landowner	10,442	18,178 ^{a,r}	28,620	10,442	Complete
010-97	9	O'Brien Creek Channel Restoration	FWP/Landowners	11,600	34,000 ^{a,m,r,s}	45,600	12,708	Complete
011-97	10	N. F. Blackfoot Hoxworth/Williams Fish Screen	FWP/Landowners	14,500	24,000 ^{a,p,r}	38,500	14,306	Complete
012-97	11	Monture Creek Fish Habitat Enhancement	FWP/Landowner	9,000	22,500 ^{a,p,r}	31,500	8,921	Complete
013-97	12	Salmon Creek & Dry Creek Habitat Restoration	FWP/Landowner	37,384	63,000 ^{a,k,p,r}	100,384	37,384	Complete
014-97	13	Mill Creek Channel Restoration	Consult/Landowner	38,246	32,000 ^a	70,246	0	Cancelled

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016-97	14	Stone Creek Channel Restoration	FWP/Landowner	8,910	5,700 ^{a,d,e}	14,610	8,909	Complete
017-97	15	Ruby River Channel Stabilization	FWP/Landowner	3,660	14,610 ^a	18,270	3,660	Complete
018-97	16	Mol Heron Creek Fish Screen – supplement	Landowner	21,000	0	21,000	46,000	Complete
020-97	17	Black Butte Creek Riparian Fence & Stabilization	USFS/Landowner	4,500	7,500 ^{a,n,s,x}	12,000	2,305	Complete
021-97	18	Missouri River Bank Stabilization	TU/Landowner	20,430	18,842 ^{a,j,k,p,r,x}	39,272	20,434	Complete
022-97	19	Sun River Bank Stabilization Survey	Consult/Landowner	6,000	6,000 ^a	12,000	5,044	Complete
023-97	20	Elk Creek Bank Stabilization	Consult/Landowner	11,000	27,700 ^{a,r}	38,700	11,000	Complete
024-97	21	Big Spring Creek Restoration	FWP	35,000	235,000 ^{f,i,m,x}	270,000	35,338	Complete
025-97	22	Dearborn River Chanel Stabilization	Landowner	4,000	5,000 ^r	9,000	0	Cancelled
026-97	23	Townsend Ranch Streams Restoration	USFS/Landowner	10,000	28,500 ^{a,n,s,x}	38,500	9,148	Complete
027-97	24	Bynum Reservoir Spawning Habitat	WU	9,900	3,400 ^{t,x}	13,300	9,415	Complete
028-97	25	Hauser Reservoir Spawning Habitat	WU	4,400	500 ^t	4,900	4,400	Complete
029-97	26	Dearborn River Bank Stabilization	Landowner	3,800	2,000 ^a	5,800	0	Cancelled
031-97	27	Fresno Reservoir Spawning Habitat	FWP	3,775	1,000 ^{t,x}	4,775	3,735	Complete
		SUBTOTAL 1997 winter funding cycle		\$435,807.00	\$767,052.00	\$1,202,859.00	\$371,106.00	
		1997 SUMMER FUNDING CYCLE						
033-97	28	Yellowstone River Bank Stabilization	FWP/Landowner	20,000	20,000 ^{a,k}	40,000	20,000	Complete
034-97	29	Mud Creek Channel Restoration	Cons. Foundation	15,000	20,000 ^{a,k,r,v}	35,000	14,950	Complete
035-97	30	Bitterroot River Riparian Fencing	Landowner	991	991 ^a	1,982	0	Cancelled
036-97	31	Rock Creek Channel Restoration	USFS	20,000	625,000 ^s	645,000	8,100	Complete
037-97	32	Cottonwood Creek Culvert to Bridge Conversion	FWP/County	10,000	15,000 ^{f,p,r}	25,000	10,000	Complete
038-97	33	McCabe Creek Culvert to Bridge Conversion	FWP/County	13,000	12,000 ^{f,p,r}	25,000	13,000	Complete
039-97	34	Johnson Creek Culvert to Bridge Conversion	FWP/Landowners	4,000	6,500 ^{m,p,r}	10,500	4,000	Complete

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040-97	35	Gilbert & Shanley Creeks Project Repair	FWP/Landowners	5,560	8,000 ^{a,r}	13,560	5,612	Complete
045-97	36	Mill Coulee Bank Stabilization	Consult/Landowner	13,603	33,000 ^{a,e,n}	46,603	14,898	Complete
046-97	37	Sun River Channel Survey	Cons. Dist./Consult	5,000	0	5,000	5,500	Complete
047-97	38	Sun River Bank Stabilization	Consult/Landowner	11,963	13,034 ^{a,d,e,n,r}	24,997	11,608	Complete
050-97	39	Canyon Creek Channel Restoration	NRCS/Landowner	12,000	17,000 ^{a,e,n,r}	29,000	13,200	Complete
051-97	40	Boulder River Channel Stabilization	Consult/Landowner	10,000	65,438 ^a	75,438	10,000	Complete
052-97	41	Careless Creek Bank Stabilization	NRCS/Landowner	2,000	435,700 ^{a,h,n,x}	437,700	995	Complete
053-97	42	Cottonwood Creek Migration Barrier	USFS	3,000	1,270 ^s	4,270	0	Superseded with 010-00
054-97	43	Union Creek Riparian Fence & Offsite Water	DNRC	10,500	29,250 ^{a,h}	39,750	0	Cancelled
055-97	44	Muskrat Creek Migration Barrier	FWP/USFS/BLM	10,000	25,225 ^{k,s}	35,225	6,509	Complete
056-97	45	Yellowstone River Bank Stabilization	FWP/Landowner	100,000	350,000 ^{a,x}	450,000	100,000	Complete
		SUBTOTAL 1997 summer funding cycle		\$266,617.00	\$1,677,408.00	\$1,944,025.00	\$238,372.00	
		1998 WINTER FUNDING CYCLE						
001-98	1	Bear Paw Lake Shoreline Rearing Habitat	FWP	4,750	0	4,750	4,810	Complete
003-98	2	Beaverhead River Riparian Fencing	USFWS/Landowner	15,000	20,000 ^{a,r}	35,000	15,000	Complete
004-98	3	Big Creek Channel Restoration	Cons. Dist./Consult	19,600	23,000 ^{a,e,s}	42,600	19,600	Complete
006-98	4	Bynum Reservoir Spawning Habitat	WU	3,500	1,500 ^{b,x}	5,000	3,500	Complete
007-98	5	Canyon Ferry Reservoir Spawning Habitat	WU	1,000	7,000 ^f	8,000	1,100	Complete
009-98	6	Cottonwood Creek Barrier - supplement	USFS	6,000	6,000 ^s	12,000	0	Superseded with 010-00
010-98	7	Deep Creek Channel Restoration	FWP/Landowner	10,400	22,000 ^{a,d,r}	32,400	10,304	Complete
011-98	8	East Fork Bull River Bank Stabilization	FWP/Landowner	5,325	1,775 ^{a,r}	7,100	5,728	Complete
012-98	9	Highwood Creek Bank Stabilization	Consult/Landowner	31,920	24,150 ^{a,e,r}	56,070	24,000	Complete

FFI#		PROJECT NUMBER, NAME & YEAR	APPLICANT	PROGRAM FUNDS COMMITTED (\$)	MATCHING FUNDS (\$)	TOTAL FUNDS COMMITTED (\$)	PROGRAM FUNDS SPENT (\$)	EXPECTED YEAR OF COMPLETION
013-98	10	Hughes Creek Channel Restoration	USFS	5,000	125,000 ^{k,s,x}	130,000	5,000	Complete
014-98	11	Kleinschmidt Creek Channel Restoration	Consult/Landowner	25,500	10,000 ^a	35,500	25,500	Completed
015-98	12	Mill Creek Channel Restoration	Consult/Landowner	30,000	60,500 ^{a,n,r}	90,500	0	Cancelled
016-98	13	Missouri River Bank Stabilization	TU/Landowner	34,629	19,600 ^{a,j,k,p,r}	54,229	34,629	Complete
017-98	14	Mud Creek Channel Restoration	Cons. Foundation	20,000	24,000 ^{a,r,v,x}	44,000	0	Cancelled
018a-98	15	Spring Creek Murphy Diversion Fish Passage	FWP/Landowner	5,546	12,979 ^{n,r}	18,525	5,546	Complete
018b-98	16	North Fork Blackfoot River Haggert Diversion	FWP/Landowner	13,300	21,300 ^{a,r}	34,600	13,301	Complete
018c-98	17	North Fork Blackfoot River Weaver Diversion	FWP/Landowner	4,500	6,500 ^{a,r}	11,000	3,213	Complete
018d-98	18	Blackfoot River Bank Stabilization	FWP/Landowner	6,750	11,750 ^{a,r}	18,500	5,853	Complete
021-98	19	Ruby River Diversion Improvement	CD/Landowners	25,000	154,031 ^{a,e,g,n,r}	179,031	8,740	2003
022-98	20	Smith Pond Development	FWP/Landowner	30,000	65,000 ^{f,u,x}	95,000	0	Cancelled
023-98	21	South Fork Dupuyer Creek Habitat Enhancement	USFS	2,800	2,000 ^g	4,800	0	Cancelled
024-98	22	Sweathouse Creek Bank Stabilization	Consult/Landowners	10,000	82,575 ^{a,r}	92,575	0	Cancelled
026-98	23	Spring Coulee Riparian Fence & Stabilization	Consult/Landowners	10,000	11,640 ^{a,n}	21,640	10,000	Complete
		SUBTOTAL 1998 winter funding cycle		\$320,520.00	\$712,300.00	\$1,032,820.00	\$195,824.00	
		1998 SUMMER FUNDING CYCLE						
027-98	24	Big Creek Flow Enhancement	Landowners	325,000	144,000 ^{a,r}	469,000	260,937	Ongoing
028-98	25	Bear Creek Channel Restoration	TU/Landowner	15,000	48,200 ^{a,h,m,o,r}	63,200	16,500	Complete
029-98	26	Blackfoot River Water Conservation	FWP/Landowner	3,050	9,175 ^{a,e,n,r}	12,225	1,560	Complete
030-98	27	Cottonwood & McCabe Cr. Bridges (supplement)	FWP/County	8,625	10,675 ^{f,p,r}	19,300	11,787	Complete
031-98	28	McCabe Creek Habitat Enhancement	FWP/Landowner	5,000	14,000 ^{a,p,r}	19,000	6,213	Complete
033-98	29	Nevada Creek Douglas & Helmville Fish Ladders	FWP/Landowner	3,000	5,400 ^{e,n,r}	8,400	3,000	Complete
034-98	30	Nevada Creek Quigley Fish Ladder	FWP/Landowner	2,980	12,980 ^{a,e,n,r}	15,960	211	2003

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035-98	31	Nevada Creek Fish Friendly Diversion & Fence	FWP/Landowner	2,590	15,370 ^{a,e,n,r}	17,960	2,590	Complete
036-98	32	Nevada Spring Creek Culvert to Bridge Conversion	FWP/Landowner	4,000	8,000 ^{e,r}	12,000	4,400	Complete
037-98	33	Rock Creek Channel Restoration	TU/Landowner	27,660	35,540 ^{a,k}	63,200	30,426	Complete
038-98	34	Shanley Creek Diversion & Riparian Fence	FWP/Landowner	2,800	6,800 ^{a,r}	9,600	2,307	Complete
039-98	35	Wasson Creek Fish Friendly Diversion	FWP/Landowner	1,250	2,400 ^{a,e,f,r}	3,650	272	Complete
042-98	36	Careless Creek Bridge & Riparian Fence	NRCS/Landowners	10,150	4,150 ^{a,h,n}	14,300	10,621	Complete
044-98	37	Cottonwood Creek Diversion	CD/Landowner	2,000	3,500 ^{a,e,n}	5,500	0	2003
045-98	38	Esp/Chamber Spring Creek Channel Restoration	CD/FWP/Owners	11,600	18,400 ^{n,r}	30,000	12,472	Complete
048-98	39	Prickly Pear Riparian Fence	Consult/Landowner	5,000	5,000 ^a	10,000	0	Cancelled
050-98	40	Red Lodge Creek Riparian Fence	NRCS/Landowner	4,050	1,350 ^{a,n}	5,400	0	Cancelled
051-98	41	Ross Fork Rock Creek Fish Ladder	USFS	2,000	4,000 ^e	6,000	1,891	Complete
052-98	42	Saddle Brook Pond Restoration	WU	12,000	3,340 ^{a,t}	15,340	13,218	Complete
053-98	43	Shields River & Elk Creek Riparian Fence	CD/Watershed Grp.	20,000	41,537 ^{a,n}	61,537	24,405	Complete
054-98	44	Smith Creek Riparian Fence	Landowner	2,595	1,670 ^{a,n}	4,265	2,855	Complete
055-98	45	Spokane Creek Channel Restoration	USFWS/Landowner	4,000	5,100 ^{a,r,x}	9,100	4,000	Complete
056-98	46	Staubach Creek Fish Barrier	FWP	3,000	3,500 ^{a,k}	6,500	3,000	Complete
057-98	47	Sweetgrass Creek Riparian Fence	Landowner	2,500	2,500 ^a	5,000	2,500	Complete
059-98	48	Thompson Chain of Lakes Habitat Structures	Bassmasters	1,060	1,600 ^e	2,660	898	Complete
060-98	49	Tiber Reservoir Spawning Habitat	Sportsmen's Club	2,487	2,000 ^a	4,487	1,417	2003
		SUBTOTAL 1998 summer funding cycle		\$483,397.00	\$410,187.00	\$893,584.00	\$417,480.00	
		1999 WINTER FUNDING CYCLE						
001-99	1	Big Hole River Stock Water	CD/FWP	7,035	1,200 ^{a,r}	8,235	7,035	Complete
002-99	2	Big Hole River Stock Water	Landowner/FWP	10,000	4,300 ^{a,n,r}	14,300	7,330	Complete

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004-99	3	Butler Creek Fence and Stockwater	Landowner/FWP	2,906	1,300 ^a	4,206	2,881	Complete
005-99	4	Bynum Reservoir Spawning Habitat	WU	4,000	2,500 ⁱ	6,500	3,900	Complete
006-99	5	Camp Creek Channel Restoration	Consult/Landowner	12,000	54,950 ^{a,k,r,u}	66,950	51,297	Adds to 007-97
007-99	6	Coal Creek Riparian Fencing	DNRC	2,400	6,600 ^h	9,000	1,886	Complete
008-99	7	Cottonwood Creek Bank Stabilization	Landowner/CD	3,150	5,718 ^{a,e,g}	8,868	3,150	Complete
010-99	8	Douglas Creek Fish Passage	FWP	25,000	18,000 ^{a,r}	43,000	25,000	Complete
012-99	9	Elk Creek (Scherrer) Channel Restoration	Landowner/FWS	5,000	11,500 ^{a,b,r}	16,500	5,000	Complete
013-99	10	Flatwillow Creek Bank Stabilization	Consult/Landowner	30,525	17,250 ^{a,k}	47,775	0	Cancelled
014-99	11	Horseshoe Lake Spawning Habitat	Bassmasters	1,000	1,150 ^a	2,150	950	Complete
018-99	12	Prickly Pear Creek Bank Stabilization	Consult/Landowner	28,775	28,775 ^{a,r}	57,550	23,775	Complete
020-99	13	Rock Creek Water Salvage & Channel Restoration	Landowner/FWP	138,346	231,283 ^{a,n,p,r,x}	369,629	152,181	Complete
021-99	14	Ruby River Feedlot Relocation	Landowner/NRCS	18,100	60,000 ^{a,n,r}	78,100	11,000	2003
023-99	15	Smith River Stock Water	Landowner/CD	12,500	12,500 ^{a,n}	25,000	12,500	Complete
024-99	16	Sun River Bank Stabilization	Consult/CD	13,712	21,500 ^{a,e,x}	35,212	13,032	Complete
025-99	17	Tenmile Creek Riparian Habitat	Watershed Group	4,501	1,000 ^a	5,501	4,401	Complete
026-99	18	Warren Creek Channel Restoration	USFWS	20,000	50,625 ^{a,n,r}	70,625	0	2003
027-99	19	S. Fork Willow Creek Riparian Fence	Landowner/FWP	7,000	34,630 ^{a,x}	41,630	7,200	Complete
028-99	20	Yellowstone River Huntley Fish Passage	Irrigation District	14,910	7,200 ^{a,x}	22,110	16,400	Complete
		SUBTOTAL 1999 winter funding cycle		\$360,860.00	\$571,981.00	\$932,841.00	\$348,918.00	
		1999 SUMMER FUNDING CYCLE						
030-99	21	Bad Canyon Creek Non-native Fish Removal	FWP	6,500	0	6,500	0	Complete
031-99	22	Beaverhead/Poindexter Bank Stabilization	Landowner/FWP	3,117	8,112 ^{a,r,x}	11,229	3,117	Complete
033-99	23	Big Coulee Creek Fish Barrier	FWP	1,560	1,000 ^s	2,560	1,000	Complete

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035-99	24	Canyon Ferry Reservoir Spawning Habitat	FWP	11,000	8,544 ^{lx}	19,544	10,310	Complete
036-99	25	Clark Fork River Riparian Fence and Bank Stabilization	Landowner/FWP	1,334	1,335 ^a	2,669	0	Cancelled
037-99	26	Cottonwood Creek Fish Barrier	FWP	9,550	1,600 ^{a,r}	11,150	6,113	Complete
038-99	27	Cottonwood Creek Fish Ladder Repair	TU/FWP	4,000	7,000 ^{a,r,x}	11,000	4,145	Complete
039-99	28	Daisy Dean Creek Off-site Water and Fencing	CD Watershed group	9,500	4,746 ^{a,e,n}	14,246	8,870	Complete
041-99	29	Elk Creek (Artz) Channel Restoration	Landowner/FWS	7,500	10,500 ^{a,g,k,r}	18,000	6,570	Complete
042-99	30	Grave Cr Diversion Repair and Fish Screen	CD/FWP	38,000	121,050 ^{a,k,s,x}	159,050	38,000	Complete
044-99	31	Kleinschmidt/Rock Cr. Water Lease	TU	6,000	9,000 ^{a,p}	15,000	0	Cancelled
045-99	32	Little Prickly Pear Cr. Fish Screen	FWP/Landowner	14,000	10,000 ^f	24,000	14,500	Complete
046-99	33	Little Prickly Pear Cr. Off-Site Water & Fence	FWP/Landowner	7,225	7,425 ^{a,r}	14,650	0	Complete
047-99	34	Lost Creek Corral Relocation	Landowner/FWP	29,832	92,250 ^{a,r,x}	122,082	27,703	Complete
048-99	35	Middle Fork Rock Cr. Riparian Fence	USFS	5,500	5,900 ^s	11,400	0	2003
049-99	36	Monture Creek Habitat Restoration	TU/Landowner	5,000	10,000 ^{p,r}	15,000	4,567	Complete
050-99	37	Ninemile Creek Bank Stabilization & Fencing	Landowner	5,000	14,325 ^a	19,325	5,000	Complete
051-99	38	O-Brien Creek Grade Control Repair	FWP	2,400	1,300 ^{m,r}	3,700	2,568	Complete
052-99	39	Pearson Creek Habitat Restoration	TU/Landowner	5,000	12,000 ^{a,d,r}	17,000	4,875	Complete
053-99	40	Prospect Creek Channel Restoration	Watershed group	34,000	121,174 ^{a,g}	155,174	34,000	Complete
054-99	41	Racetrack Creek Riparian Fence & Channel Restoration	Landowner/FWP	1,750	36,680 ^{a,x}	38,430	1,750	Complete
057-99	42	Ronan Spring Cr. Channel Restoration	Community Found.	10,000	2,500 ^{s,y}	12,500	10,000	Complete
058-99	43	Salmo Reservoir Lake Aeration	FWP	950	300 ^{a,d}	1,250	700	Complete
059-99	44	Shields River Bank Stabilization	CD	7,000	18,838 ^{a,h}	25,838	7,000	Complete
060-99	45	Shields River Bank Stabilization	CD	14,569	18,996 ^{a,e}	33,565	10,842	Complete

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061-99	46	S. Fk. Smith River Off-Site Water & Fence	Landowner/CD	9,975	9,975 ^a	19,950	0	2003
063-99	47	Spring Creek Fish Barrier	FWP/Landowner	6,000	1,000 ^f	7,000	6,000	Complete
064-99	48	Spring Creek Channel Restoration	Consult/Landowner	25,000	35,310 ^g	60,310	0	Cancelled
066-99	49	Staubach Creek Native Fish Protection	FWP/Landowner	3,157	3,000 ^g	6,157	3,157	Complete
069-99	50	Trout Creek Channel Restoration	FWP	94,695	363,875 ^{a,g,n,p,x}	458,570	0	2003
		SUBTOTAL 1999 summer funding cycle		\$379,114.00	\$937,735.00	\$1,316,849.00	\$210,787.00	
		2000 WINTER FUNDING CYCLE						
002-00	1	Basin Creek Culvert Replacement	CT Foundation	3,900	1,950 ^{a,s}	5,850	5,627	Complete
004-00	2	Upper Big Hole River Offstream Water	Big Hole Watershed	6,450	3,965 ^s	10,415	3,155	2003
005-00	3	Bitterroot River Riparian Fence	Landowner	4,336	4,546 ^a	8,882	3,734	Complete
007-00	4	Bynum Reservoir Spawning Habitat	Walleye Unlimited	3,160	3,000 ^f	6,160	2,896	Complete
008-00	5	Canyon Creek Riparian Fence	Landowner	1,485	1,650 ^a	3,135	1,081	Complete
009-00	6	Cottonwood Creek Channel Restoration	NRCS/Landowner	16,681	12,094 ^{a,g}	28,775	0	2003
010-00	7	Cottonwood Creek Fish Barrier	USFS	10,000	13,075 ^{k,s}	23,075	10,000	Complete
011-00	8	Dry Creek Riparian Fencing	FWP/Landowner	6,000	3,897 ^a	9,897	0	2003
012-00	9	Dupuyer Creek Channel Restoration	USFWS/Landowner	9,800	14,200 ^{a,r}	24,000	9,802	Complete
013-00	10	East Fork Bull River Channel Restoration	Landowner	14,150	20,273 ^{a,x}	34,423	15,565	Complete
014-00	11	Flatwillow Creek Riparian Fencing	Landowner	2,850	2,400 ^a	5,250	0	Cancelled
015-00	12	Flint Creek Off-site Water and Riparian Fencing	FWP/Landowner	16,500	47,920 ^{a,n}	64,420	14,197	2003
017-00	13	Lost Creek Headgate Repair & Channel Restoration	FWP/Landowner	31,860	163,020 ^{a,g,h,p,x}	194,880	0	2003
018-00	14	McCabe Creek Irrigation Efficiency	USFWS	15,084	85,000 ^{a,p,r}	100,084	15,084	Complete
022-00	15	N. Burnt Fork Cr. Riparian Fencing	Landowner/Consul.	8,700	15,880 ^a	24,580	0	Cancelled
023-00	16	Prickly Pear Creek Channel Restoration	FWP/Landowner	15,555	14,560 ^{a,g,r}	30,115	10,753	Complete

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024-00	17	Prospect Creek Channel Restoration	Watershed group	12,150	391,278 ^{g,h,x}	403,428	12,150	Complete
025-00	18	Racetrack Creek Off-site water & Riparian Fencing	Landowner/FWP	4,500	13,300 ^{a,n,x}	17,800	0	2003
027-00	19	Ruby Creek Flow Enhancement	USFWS/Landowner	3,000	3,000 ^{a,r}	6,000	3,235	Complete
028-00	20	S.F. Musselshell River Fish Passage	DNRC	3,146	2,979 ^a	6,125	2,696	Complete
029-00	21	S. Willow Creek Bank Stabilization & Riparian Fencing	Landowner	12,000	12,106 ^{a,n}	24,106	0	2003
030-00	22	Stillwater River Side Channel Restoration	Landowner	10,400	14,020 ^{a,n}	24,420	10,400	Complete
031-00	23	Sun River Channel Restoration	Consultant	5,000	73,025 ^{a,n,x}	78,025	5,000	Complete
032-00	24	Sweathouse Creek Fish Screen	FWP/Landowner	3,000	3,000 ^p	6,000	0	2003
033-00	25	Tenmile Creek Riparian Restoration	Watershed Group	3,549	3,536 ^{a,x}	7,085	3,549	Complete
034-00	26	Trail Creek Fish Ladder and Screen	Landowner	1,880	9,670 ^a	11,550	0	Cancelled
035-00	27	Virginia Creek Channel Restoration	Landowner	2,875	2,875 ^a	5,750	0	Cancelled
036-00	28	Warren Creek Channel Restoration	FWP	35,000	88,541 ^{a,r,x}	123,541	34,809	Complete
037-00	29	West Fork Wilson Creek Fish Barrier	FWP	12,500	7,500 ^{s,x}	20,000	12,500	Complete
038-00	30	Yellowstone River Riparian Restoration	Consultant	10,336	17,346 ^a	27,682	11,369	Complete
		SUBTOTAL 2000 winter funding cycle		\$285,847.00	\$1,049,606.00	\$1,335,453.00	\$187,602.00	
		2000 SUMMER FUNDING CYCLE						
041-00	31	Big Creek Fish Screen	Landowner	57,500	14,700 ^a	72,200	62,500	Complete
042-00	32	Bitterroot River Fish Screen	Ditch Company	42,000	50,000 ^{a,k}	92,000	0	2003 (see 033-2002)
043-00	33	Butler Creek Fish Passage	FWP	6,400	480 ^a	6,880	1,698	Complete
044-00	34	Canyon Ferry Perch Spawning Habitat	FWP	4,770	18,722 ^{l,x}	23,492	4,770	Complete
045-00	35	Dempsey Creek Corral Relocation	Cons. District	11,608	13,580 ^{a,n,x}	25,188	6,374	2003
046-00	36	Kolb Spring Creek Channel Restoration & Fencing	FWP/Landowner	55,530	36,275 ^a	91,805	56,484	Complete
049-00	37	Newlan Creek Riparian Fencing and Stockwater	Cons. District	1,290	10,760 ^a	12,050	0	Cancelled

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051-00	38	O'Brien Creek Riparian Fencing	FWP	940	715 ^a	1,655	940	Complete
052-00	39	Poorman Creek Channel Restoration	Consultant	4,165	18,015 ^a	22,180	4,165	Complete
053-00	40	Silver Butte Fisher Creek Bank Stabilization	NRCS	3,350	17,650 ^{a,m}	21,000	3,350	Complete
056-00	41	Tongue River Riparian Fencing	FWP/Landowner	3,920	2,250 ^a	6,170	2,611	2003
057-00	42	Trout Creek Fish Ladder	FWP	4,100	4,100 ^m	8,200	0	Cancelled
058-00	43	Wolf Creek Fish Passage	FWP	2,425	4,000 ^{m,k}	6,425	1,496	Complete
059-00	44	Region 6 Pond Aeration	FWP	8,300	9,600 ^d	17,900	8,515	Complete
		SUBTOTAL 2000 summer funding cycle		\$206,298.00	\$200,847.00	\$407,145.00	\$152,903.00	
		2001 WINTER FUNDING CYCLE						
002-01	1	Camp Creek Bank Stabilization	Landowner	5,000	3,632 ^{a,n}	8,632	0	Cancelled
005-01	2	Dunkleberg Creek Habitat Enhancement	Landowner/TU	1,000	1,000 ^{a,x}	2,000	250	Complete
006-01	3	Elk Creek Channel Restoration	USFWS/Landowner	7,000	19,500 ^{a,e,g,r}	26,500	3,500	Complete
007-01	4	Hauser Reservoir Perch Spawning Habitat	FWP	5,000	19,428 ^{m,t,x}	24,428	4,119	Complete
008-01	5	Marshall and Deer Creeks Fish Screens	FWP	13,100	4,400 ^m	17,500	1,377	2003
009-01	6	Mill Creek Culvert Replacement	Landowners	11,800	27,277 ^a	39,077	0	2003
010-01	7	Missouri River Riparian Restoration	Landowner/TU	13,000	39,800 ^{i,p,r,m,g}	52,800	8,043	Complete
011-01	8	Pinltar Creek Flow Enhancement	USFWS	9,000	11,300 ^{a,r}	20,300	8,996	Complete
012-01	9	Poorman Creek Flow Enhancement	TU/FWP	35,000	39,022 ^{a,g,r}	74,022	0	2003 (see 047-2002)
013-01	10	Rattlesnake Creek Side Channel Stabilization	Landowner	21,500	38,000 ^{a,x}	59,500	21,500	Complete
014-01	11	Rock Creek Channel Restoration	TU/Landowner	41,341	64,591 ^{a,m,p,r}	105,932	34,486	2003
015-01	12	Rock Creek Supplemental Funding	FWP/Landowner	10,000	0	10,000	10,000	Complete
016-01	13	Shields River Bank Stabilization	DNRC	4,000	4,000 ^a	8,000	1,899	2003
017-01	14	Sixmile Creek Diversion Repair	FWP/Landowners	4,000	20,035 ^a	24,035	3,739	Complete

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019-01	15	S.F. Warm Springs Creek Fish Barrier	FWP	3,500	3,675 ^{a,d}	7,175	0	2003
020-01	16	Teton River Diversion Stabilization	Watershed group	8,980	17,600 ^{a,r,x}	26,580	8,678	Complete
022-01	17	White Pine Creek Channel Stabilization	Watershed Group	20,000	31,000 ^{a,g,x}	51,000	2,768	2003
023-01	18	Non-native Fish Removal	FWP	17,400	57,600 ^{d,p,s}	75,000	15,256	Complete
		SUBTOTAL 2001 WINTER FUNDING CYCLE		\$230,621.00	\$401,860.00	\$632,481.00	\$124,611.00	
		2001 SPECIAL DROUGHT FUNDING CYCLE						
024-01	19	Big Hole River Soil Moisture Meters	Watershed Group	1,358	3,917 ^{e,r,x}	5,275	1,358	Complete
025-01	20	Blackfoot River Soil Moisture Meters	Watershed Group	4,849	4,850 ^x	9,699	4,849	Complete
027-01	21	Jefferson River Soil Moisture Meters	NCAT	6,300	6,300 ^{g,x}	12,600	0	2003
028-01	22	Locke Creek Irrigation Conversion and Lease	FWP/Landowner	45,000	28,000 ^{a,p}	73,000	45,000	Complete
		SUBTOTAL DROUGHT FUNDING CYCLE		\$57,507.00	\$43,067.00	\$100,574.00	\$51,207.00	
		2001 SUMMER FUNDING CYCLE						
031-01	23	Antelope Creek Riparian Fence	Landowner/FWP	\$30,000	\$42,252 ^{a,n,x}	\$72,252	\$18,625	2003
032-01	24	Antelope Creek riparian fence and off-site water	Landowner/FWP	\$20,320	\$33,855 ^{a,m,x}	\$54,175	\$0	2003
034-01	25	Bitterroot River Riparian Fence	Landowner	\$3,933	\$6,226 ^a	\$10,159	\$3,641	Complete
035-01	26	Big Otter Creek Corral Relocation	Landowner	\$4,220	\$4,220 ^a	\$8,440	\$0	2003
036-01	27	Bitterroot River Bank Stabilization	Landowner/ Consultant	\$6,050	\$37,875 ^{a,x}	\$43,925	\$0	2003
037-01	28	Boulder River Fish Ladder	Trout Unlimited	\$8,000	\$4,000 ^x	\$12,000	\$5,000	2003
039-01	29	Dunham Creek Channel Restoration	FWP	\$34,000	\$190,000 ^{p,r,x}	\$224,000	\$37,400	Complete
041-01	30	Little Sleeping Child Creek Fish Ladder	Landowner/ consultant	\$10,400	\$29,025 ^a	\$39,425	\$0	2003

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042-01	31	Nevada Spring Creek Channel Restoration	Landowner/ consultant	\$35,000	\$108,204 ^{a,e,p,r,x}	\$143,204	\$27,938	2003
043-01	32	Painted Robe Creek Off-site Water Development	NRCS/ Landowner	\$2,000	\$44,492 ^{a,g,h,n}	\$46,492	\$0	2003
046-01	33	Sullivan Creek riparian fence	Landowner/NRCS	\$1,460	\$3,479 ^a	\$4,939	\$0	2003
047-01	34	Sullivan Park Pond Construction	Glasgow WU/ FWP	\$30,600	\$37,074 ^x	\$67,674	\$0	Cancelled
049-01	35	Region 6 Pond aeration	FWP	\$4,260	\$1,200 ^d	\$5,460	\$4,271	Complete
		SUBTOTAL 2001 summer funding cycle		\$190,243.00	\$541,902.00	\$732,145.00	\$96,875.00	
		2002 WINTER FUNDING CYCLE						
001-02	1	Alderman Spring Creek channel restoration	Landowner/ Consultant	\$10,000	\$61,000 ^{a,n}	\$71,000	\$7,130	2003
002-02	2	Beaver Creek diversion repair	FWP	\$2,000	\$1,096 ^s	\$3,096	\$0	2003
003-02	3	Beaver Creek channel restoration	FWP	\$43,090	\$45,800 ^{h,m,x}	\$88,890	\$0	2003
004-02	4	Big Timber Creek channel stabilization	Landowner/ Consultant	\$22,500	\$95,873 ^a	\$118,373	\$0	2003
005-02	5	Canyon Ferry perch spawning habitat	FWP	\$7,500	\$9,604 ^{l,x}	\$17,104	\$7,047	Complete
006-02	6	Chicken Creek flume installation	Landowner/FWP	\$3,900	\$6,100 ⁿ	\$10,000	\$0	2003
007-02	7	Cottonwood Creek off-stream livestock water	State forest	\$15,000	\$8,608 ^{a,r}	\$23,608	\$0	2003
008-02	8	East Boulder River off-stream livestock water	Watershed Group	\$1,500	\$9,781 ^{a,x}	\$11,281	\$0	2003
009-02	9	Elk Creek spring corral bypass	Cons. District/ Landowner	\$1,000	\$4,834 ^{a,e}	\$5,834	\$0	2003
010-02	10	Elk Creek riparian fence & off-stream water	Cons. District/ Landowner	\$2,000	\$30,481 ^{a,e}	\$32,481	\$0	2003
011-02	11	Esp-Chambers Spring Creek off-stream water repair	FWP	\$2,111	\$2,110 ⁿ	\$4,221	\$0	2003
012-02	12	Harvey Creek channel restoration	FWP	\$63,616	\$25,500 ^{a,m,x}	\$89,116	\$0	2003

FFI#		PROJECT NUMBER, NAME & YEAR	APPLICANT	PROGRAM FUNDS COMMITTED (\$)	MATCHING FUNDS (\$)	TOTAL FUNDS COMMITTED (\$)	PROGRAM FUNDS SPENT (\$)	EXPECTED YEAR OF COMPLETION
013-02	13	Hauser Reservoir perch spawning habitat	FWP	\$5,500	\$17,548 ^{m,t,x}	\$23,048	\$5,500	Complete
014-02	14	Jefferson irrigation overflow fish migration barrier	Trout Unlimited	\$8,000	\$3,750 ^p	\$11,750	\$0	2003
015-02	15	Madison Spring Creek channel restoration	Trout Unlimited	\$9,300	\$18,407 ^{m,p}	\$27,707	\$9,300	Complete
016-02	16	Mathew Bird Creek bank stabilization	Gallatin Land Trust	\$2,250	\$13,623 ^{a,x}	\$15,873	\$0	2003
021-02	17	Rattlesnake Creek fish ladder	Trout Unlimited	\$67,800	\$67,000 ^{p,x}	\$134,800	\$0	2003
022-02	18	Rattlesnake Creek fish screens	FWP	\$14,750	\$7,500 ^m	\$22,250	\$8,900	2003
023-02	19	Rock Creek riparian fencing	Landowner/ Trout Unlimited	\$2,000	\$4,000 ^{a,p}	\$6,000	\$0	2003
024-02	20	Sappington Spring Creek spawning channel	Trout Unlimited	\$12,600	\$5,500 ^p	\$18,100	\$0	2003
027-02	21	Stone Creek channel restoration	Cons. District	\$18,000	\$82,000 ^g	\$100,000	\$18,000	2003
028-02	22	Ninemile Creek riparian fencing	Landowner/ Trout Unlimited	\$2,000	\$2,000 ^a	\$4,000	\$2,000	Complete
		SUBTOTAL 2002 WINTER FUNDING CYCLE		\$316,417.00	\$522,115.00	\$838,532.00	\$57,877.00	
		2002 SPECIAL DROUGHT FUNDING CYCLE						
030-02	23	Jefferson River ditch sealing	Trout Unlimited	\$7,850	\$3,000 ^p	\$10,850	\$7,150	Complete
031-02	24	Trail Creek irrigation efficiency	Landowners	\$24,372	\$9,880 ^a	\$34,252	\$0	2003
		SUBTOTAL DROUGHT FUNDING CYCLE		\$32,222.00	\$12,880.00	\$45,102.00	\$7,150.00	
		2002 SUMMER FUNDING CYCLE						
032-02	25	Mount Creek riparian restoration and fencing	Watershed group	\$24,600	\$247,688 ^{g,k,x}	\$271,688	\$0	2003
033-02	26	Bitterroot River Republican Ditch fish screen	FWP	\$61,000	\$227,796 ^x	\$288,796	\$0	2003 adds to 042-00
034-02	27	Blackfoot River water salvage – stockwater well	Landowner	\$5,000	\$0	\$5,000	\$5,201	Complete

FFI#		PROJECT NUMBER, NAME & YEAR	APPLICANT	PROGRAM FUNDS COMMITTED (\$)	MATCHING FUNDS (\$)	TOTAL FUNDS COMMITTED (\$)	PROGRAM FUNDS SPENT (\$)	EXPECTED YEAR OF COMPLETION
035-02	28	Blanchard Creek riparian fence	DNRC	\$21,305	\$14,518 ^h	\$35,823	\$0	2003
036-02	29	Cedar Creek water lease	Landowner/FWP	\$40,000	\$9,000 ^a	\$49,000	\$0	2003
037-02	30	Chimney Creek corral relocation and fencing	CD/NRCS	\$17,489	\$30,152 ^{a,e,n,r}	\$47,641	\$0	2003
038-02	31	Dearborn River water salvage project	FWP	\$50,000	\$105,900 ^{a,g,m,p,r}	\$155,900	\$0	2003
039-02	32	East Gallatin River bank stabilization	FWP	\$15,165	\$17,970 ^r	\$33,135	\$1,270	2003
040-02	33	German Gulch channel restoration	TU/FWP	\$103,425	\$432,834 ^{p,m,n,x}	\$536,259	\$0	2005
041-02	34	Locke Creek fish passage	GYC	\$3,262	\$10,897 ^{a,x}	\$14,159	\$0	2003
042-02	35	Marias River habitat enhancement	Sportsmen group	\$1,471	\$0	\$1,471	\$0	2003
043-02	36	Marshall Creek woody debris recruitment	FWP	\$8,350	\$8,500 ^{m,o}	\$16,850	\$747	2003
045-02	37	Missouri River bank stabilization repair	FWP/Landowner	\$11,653	\$2,730 ^{a,j,p}	\$14,383	\$0	2003
046-02	38	Ninemile Creek water salvage	Landowner	\$24,000	\$62,760 ^a	\$86,760	\$0	2003
047-02	39	Poorman Creek water salvage and diversion repair	TU	\$21,770	\$75,368 ^{a,p,n,r,x}	\$97,138	\$0	2003 adds to 012-01
048-02	40	Skalkaho Creek fish screens	FWP	\$128,431	\$157,994 ^x	\$286,425	\$0	2003
050-02	41	R-6 Ponds aeration	FWP	\$2,960	\$4,000 ^d	\$6,960	\$830	2003
		SUBTOTAL 2002 SUMMER FUNDING CYCLE		\$539,881.00	\$1,408,107.00	\$1,947,388.00	\$8,048.00	
		2003 WINTER FUNDING CYCLE						
002-03	1	Brackett Creek channel stabilization	Landowner/ consultant	\$20,000	\$705,398	\$725,398	\$0	2004
003-03	2	Canyon Ferry perch spawning habitat	FWP	\$7,500	\$9,704	\$17,204	\$0	2003
004-03	3	Cottonwood Creek fish passage	FWP	\$7,616	\$13,979	\$21,595	\$0	2003

FFI#		PROJECT NUMBER, NAME & YEAR	APPLICANT	PROGRAM FUNDS COMMITTED (\$)	MATCHING FUNDS (\$)	TOTAL FUNDS COMMITTED (\$)	PROGRAM FUNDS SPENT (\$)	EXPECTED YEAR OF COMPLETION
006-03	4	Dry Creek fish passage and irrigation improvement	FWP	\$12,000	\$85,096	\$97,096	\$0	2004

- a Applicant/private landowner
- b Audubon
- c Bassmasters
- d BLM
- e Conservation Districts
- f Counties
- g DEQ 319 grant
- h DNRC
- i Federal Aid (USFWS)
- j Federation of Fly Fishers
- k Foundation grants
- l Milltown mitigation
- m MPC
- n NRCS
- o Timber companies
- p Trout Unlimited
- q US Corp of Engineers
- r USFWS
- s USFS
- t Walleye Unlimited
- u MDOT
- v Confederated Salish/Kootenai Tribe
- x Other



Photo Illustration 1. Restoration of a 2,200-foot reach of Prickly Pear Creek located near the city of Helena. A proper dimension, pattern and profile were restored to this reach of stream, willow clumps and sod were transplanted along the stream bank and the riparian corridor was protected from overgrazing with the installation of fencing. Upper photo shows stream reach prior to restoration. Lower photo shows stream reach two months after restoration.



Photo Illustration 2. Installation of a series of step-pool structures in Warren Creek located near the town of Ovando. These step-pools provide for fish passage and create head to deliver water down a water irrigation diversion located on the left side of the photographs. Upper photo shows channel during construction of step-pool structures. Lower photo shows completed step-pool structures following construction.



Photo Illustration 3. Restoration of 3,200 feet of eroding river bank on the Missouri River located near the town of Cascade. This project involved bank sloping, placement of salvaged sod, transplanting of approximately 500 willow clumps and the installation of riparian fencing to improve habitat for resident rainbow trout and brown trout. Upper photo shows eroding river bank before restoration. Lower photo shows river bank after restoration.



Photo Illustration 4. Kleinschmidt Creek, located west of the town of Ovando, before (upper photo) and after (lower photo) channel restoration. This project involved restoring the dimension, pattern and profile of 12,000 feet of channel to improve habitat for resident brown trout, rainbow trout and brook trout.



May 1, 1998.



September 27, 2002.

Photo Illustration 5. Sweet Grass Creek, located near the town of Big Timber, before installation of riparian fencing (upper photo) and after installation of riparian fencing (lower photo). This project involved the installation of nearly one mile of fencing. The riparian corridor has been managed as an enclosure since the fencing was completed. A grazing management plan will be implemented when the corridor is treated as a riparian pasture in the future. The improved habitat provides benefits to rainbow trout, brown trout and Yellowstone cutthroat trout.



Photo Illustration 6. (Upper photo) Work crew preparing bundles of salvaged Christmas trees for placement in strategic locations in Canyon Ferry Reservoir. These tree bundles provide for spawning and rearing habitat for yellow perch, a very popular fishery in the reservoir. **(Lower photo)** Installation of a Denil style fish ladder located on the Boulder River east of the town of Whitehall. This ladder will provide for migratory passage over an existing irrigation diversion structure by spawning brown trout and possibly rainbow trout.

Appendix A

Future Fisheries Improvement Program Grazing Compliance Monitoring Report – 2002

by

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December 2002

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Introduction

This portion of the 2002 report summarizes tours and visual evaluations of select projects visited in 2002 to evaluate the effectiveness of grazing plans or exclosures on Future Fisheries Improvement Program (FFI) projects. The monitoring was conducted to help determine if various projects and subsequent management resulted in improvements to the riparian health and function, as well as plant vigor, especially for woody plants. As general rule of thumb, we looked for utilization of riparian shrubs not to exceed 50-60% of the current years growth. This type of monitoring is essential to ensure that projects funded provide benefits to fish populations and riparian areas. We plan on evaluating 27 projects during 2002. To date, we have visited all but 5 of the projects; consequently, this report presents observations on 22 of the projects. The report is organized first by the river basin where each project is located, then by the Future Fisheries Improvement Program (FFI) project number. All of the evaluations would be assigned a Data Quality Rating of "Judgement Only" since no actual measurements were taken.

We found high compliance with riparian grazing management strategies identified in project agreements or separate grazing management plans on 71% of the 21 projects we rated. Twenty four percent were judged as demonstrating moderate compliance. We felt low compliance was observed on only one project that we visited. Seventy seven percent of the projects appeared to show positive effects from the grazing management currently being utilized.

After visiting different projects over the course of this evaluation, it became clear that guidelines or plans for managing livestock grazing in riparian areas must be site-specific for each project that is developed. Most every project has unique conditions that are the key to ultimately improving fish habitat and to encourage recovery of vegetation, improvement of riparian and channel function, and protection of water quality.

Table 1. Summary of Future Fisheries Projects inspected to determine grazing compliance in 2002.

Drainage	Project name	Water name	Future Fisheries Improvement Program number	Riparian grazing compliance rating	Project effect
Beaverhead	Beaverhead River Riparian Fencing	Beaverhead River	FFI-003-1998	Not evaluated	---
Bitterroot	Sweathouse Creek Riparian Fence	Sweathouse Creek	FFI-011-1996	High for area observed	Positive for area observed
Bitterroot	Smith Creek Riparian Fence	Smith Creek	FFI-054-1998	High	Positive
Bitterroot	Coal Creek Riparian Fencing	Coal Creek	FFI-007-1999	High	Positive
Bitterroot	Bitterroot River Riparian Fence	Bitterroot River	FFI-005-2000	Not applicable	Neutral
Clark Fork	Middle Fork Rock Creek Riparian Fence	Middle Fork Rock Creek	FFI-004-1997	High	Neutral
Clark Fork	Butler Creek Fence & Stockwater	Butler Creek	FFI-004-1999	High	Positive
Clark Fork	Lost Creek Corral Relocation	Lost Creek	FFI-047-1999	High	Positive
Clark Fork	Racetrack Creek Riparian Fence & Channel Restoration	Racetrack Creek	FFI-054-1999	High	Positive
Clark Fork	Flint Creek Off-site Water & Riparian Fencing	Flint Creek	FFI-015-2000	Moderate (not fully implemented)	Positive, neutral
Judith	Cottonwood Creek Bank Stabilization	Cottonwood Creek	FFI-008-1999	High	Positive
Madison	Madison Spring Creek Rehabilitation	Madison Spring Creek	FFI-036-1996	Not evaluated	---
Missouri	Deep Creek Channel Restoration	Deep Creek	FFI-017-1996	High	Positive
Missouri	Prickly Pear Creek Fence & Bank Stabilization	Prickly Pear Creek	FFI-041-1996	Not evaluated	---
Missouri	Highwood Creek Bank Stabilization	Highwood Creek	FFI-012-1998	Moderate	Neutral
Missouri	Prickly Pear Creek Bank Stabilization	Prickly Pear Creek	FFI-018-1999	Not evaluated	---
Missouri	Canyon Creek Riparian Fence	Canyon Creek	FFI-008-2000	Not evaluated	---
Missouri/Smith	Black Butte Creek Riparian Fence & Stabilization	Black Butte Creek	FFI-020-1997	High	Positive
Missouri/Smith	Townsend Ranch Stream Restoration	Richardson, Grasshopper, 4-mile creeks	FFI-026-1997	Low	Neutral
Missouri/Smith	Smith River Stock Water	Smith River	FFI-023-1999	High	Positive
Musselshell	Careless Creek Bank Stabilization	Careless Creek	FFI-052-1997	High	Positive
Sun	Mill Coulee Bank Stabilization	Mill Coulee Creek	FFI-045-1997	Moderate	Positive

Drainage	Project name	Water name	Future Fisheries Improvement Program number	Riparian grazing compliance rating	Project effect
Sun	Elk Creek (Scherrer) Channel Restoration	Elk Creek	FFI-012-1999	Moderate	Positive
Marias	Dupuyer Creek Channel Restoration	Dupuyer Creek	FFI-012-2000	High	Positive
Yellowstone	Shields River & Elk Creek Riparian Fence	Shields River, Elk Creek	FFI-053-1998	Moderate	Neutral, Positive
Yellowstone	Sweetgrass Creek Riparian Fence	Sweetgrass Creek	FFI-057-1998	High	Positive
Yellowstone	Daisy Dean Creek Off-site Watering & Fencing	Daisy Dean Creek	FFI-039-1999	High	Positive

Beaverhead River Drainage

Beaverhead River Riparian Fencing

WATER NAME: Beaverhead River

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-003-1998

MONITORING: This project has not yet been evaluated. We hope to visit this site in before the end of the year.

STATUS:

PROJECT EFFECT:

Bitterroot River Drainage

Sweathouse Creek Riparian Fence

WATER NAME: Sweathouse Creek

DATA LOCATION: Great Falls Files

FFI NUMBER: FFI-011-1996

MONITORING: Partial project monitoring has been completed; we obtained photos on one landowners property. Four permanent photo points were established. The other landowner that participated in the project recently passed away. We plan on touring that portion of the property at a later date.

STATUS: Ongoing with preliminary results. The area reviewed has been managed as an enclosure. Recruitment of saplings was noted as well as multiple age stands of trees.

PROJECT EFFECT: Positive effect on riparian vegetation on the portion of the project inspected.

Smith Creek Riparian Fence

WATER NAME: Smith Creek

DATA LOCATION: Great Falls Files

FFI NUMBER: FFI-054-1998

MONITORING: Photos after. Six permanent photo points have been established.

STATUS: Ongoing with preliminary results. The area reviewed has been managed as an enclosure. The fenced area had well established stands of grasses and woody plants. Two gates providing access points into the fenced riparian area had been left open, but the stock (cattle, horses, and mules) in the irrigated hayfield had not made any substantive entry into the area. The water gap/crossing point showed heavy usage and had almost totally bare ground; the area could be stabilized further by installing log revetments or geoweb at the toe of the bank. The project appeared to result in a healthy appearing riparian area resistant to high flows and improved habitat.

PROJECT EFFECT: Positive effect

Coal Creek Riparian Fencing

WATER NAME: Coal Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-007-1999

MONITORING: Photos after. Ten permanent photo points have been established.

STATUS: Ongoing with preliminary results. The site was visited on 23 October. The fencing project has resulted in livestock being excluded from the stream area for the most part. Although a single minor sign of trespass by cattle was noted, overall utilization of new growth of woody vegetation appeared to be less than fifty percent on most species. The exception to that was red-osier dogwood, (*Cornus stolonifera*); although it comprised a low percentage of the shrubs present, selective browsing was suggested since almost all dogwood plants displayed heavy utilization of new stem (2 years old or newer) growth and a majority of the apical meristems had been removed. New growth on the dogwood was also heavily utilized high on the plants. Numerous game trails are located in the project area and moose droppings were observed; wildlife may have been responsible for much of the browsing observed. A length of the jack fence at the upstream end of the project had been damaged by blow-downs that broke all the rails of the fence; we temporarily blocked access by stock to this area by placing rails across the damaged area. Small fish, most which appeared to be westslope cutthroat trout, were observed in several pools in the project area.

PROJECT EFFECT: Positive effect.

Bitterroot River Riparian Fence

WATER NAME: Bitterroot River

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-051-1996, FFI-005-2000, FFI-034-2001

MONITORING: Photos after. Ten permanent photo points have been established along the finished portion of the project. An additional photo point was established where the next portion of the fencing project will be built.

STATUS: Ongoing. To date, two of the three projects have been completed and a total length of 12,875 feet of a high quality fence has been built. Since the northern most end of the fence simply ends and does not tie into a cross fence, the area is not yet managed as an enclosure. Vegetation utilization levels were similar on both sides of the fence. Also, wildlife was often observed while walking the fence-line.

PROJECT EFFECT: Neutral, project is not yet completed to make it functional.

Clark Fork River Drainage

Middle Fork Rock Creek Riparian Fence

WATER NAME: Middle Fork Rock Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-004-1997

MONITORING: Photos after. Nine permanent photo points have been established.

STATUS: Ongoing with preliminary results. Some shrubs in the enclosure upstream from the guard station showed regrowth and the beginning of recovery from the existing decadent plants. However, downstream from the guard station, browse was moderately or heavily utilized, which is hampering recovery. On some plants, old dead, decadent stems appeared to prevent the more recent growth from being even more heavily utilized. Herbaceous growth and utilization levels tended to look better than shrubs. No evidence of cattle use was observed. Wildlife may be a major factor affecting shrub utilization.

PROJECT EFFECT: Neutral in respect to woody plant recovery. However, the lack of livestock use is preventing conditions to worsen.

Butler Creek Fence & Stockwater

WATER NAME: Butler Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-004-1999

MONITORING: Photos after. Three permanent photo points have been established.

STATUS: Ongoing with preliminary results. The project site is a small area where the immediate banks have been fenced and are being treated as an enclosure. Vegetation on the enclosure looked very healthy and ungrazed. The landowner showed old photos where the project area's banks were bare ground prior to the project. A bridge is in place for stock to cross Butler Creek. The riparian area was much healthier than on the property immediately downstream.

PROJECT EFFECT: Positive effect.

Lost Creek Corral Relocation

WATER NAME: Lost Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-047-1999

MONITORING: Photos after. Four permanent photo points have been established.

STATUS: Ongoing with preliminary results. The area near the corrals where fencing had been completed showed substantially lower utilization of grasses than in other pastures. Also, within the fenced area, recruitment of cottonwood was noted while farther downstream outside the fenced area, no recruitment was observed. One of the challenges at this project site includes dealing with the impacts from past mining/smelting activities in the area and its effect on vegetation.

PROJECT EFFECT: Positive effect.

Racetrack Creek Riparian Fence & Channel Restoration

WATER NAME: Racetrack Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-054-1999

MONITORING: Photos after. Four permanent photo points have been established. Eric Reiland has some photos of the fenceline.

STATUS: Ongoing with preliminary results. The area is being managed as an enclosure; grasses and woody plants are responding with a positive improvement in the riparian vegetation. Examinations of point bars showed substantial willow recruitment.

PROJECT EFFECT: Positive effect.

Flint Creek Off-site Water & Riparian Fencing

WATER NAME: Flint Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-015-2000

MONITORING: Photos after. Nine permanent photo points have been established.

STATUS: Ongoing with initial/preliminary results. All aspects of this project have not yet been completed; consequently, some riparian areas have seen little relief and recovery. However, riparian areas still subjected to prolonged grazing appeared to be in better condition than neighboring pastures upstream. Many areas appeared to show trends that will allow the woody riparian vegetation to recover.

PROJECT EFFECT: Positive trend in most areas, neutral in others because project has not been fully implemented yet.

Judith River Drainage

Cottonwood Creek Bank Stabilization

WATER NAME: Cottonwood Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-008-1999

MONITORING: Photos after. Two permanent photo points were established in September 2002 by obtaining GPS locations. Photos from 2000 taken after bank stabilization was completed are also available.

STATUS: Ongoing with preliminary results. The area shows establishment of grasses and woody plants and an overall positive improvement in the riparian vegetation. The area is being managed as an enclosure. However, a bull had recently trespassed into the lower portion of the project area; no long term effects or impacts were noted in the small area affected. Woody vegetation in the floodplain on the left bank displayed the most substantial improvement, but shrubs/trees were also noted in the left bank where most stabilization work occurred.

PROJECT EFFECT: Positive effect on riparian vegetation.

Madison River Drainage

Madison Spring Creek Rehabilitation

WATER NAME: Madison Spring Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-036-1996

MONITORING: This project has not yet been evaluated. We hope to visit this site in before the end of the year.

STATUS:

PROJECT EFFECT:

Missouri River Drainage

Deep Creek Channel Restoration

WATER NAME: Deep Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-017-1996

MONITORING: Photos before/after. Eighteen permanent photo points were established in October 2002 by obtaining GPS locations. Photos taken by the Deep Creek watershed and spawning enhancement project coordinator taken at ten permanent photopoints in 1996, 1997, 1999, and 2001 are also available and provide an excellent record of improvements in riparian vegetation.

STATUS: Ongoing with preliminary results. The project area shows establishment of grasses and woody plants and an overall positive improvement in the riparian vegetation at all areas visited. Landowner compliance with grazing exclosures was judged to be good. Noxious weeds were noted in many locations on drier areas. However, in the immediate bank area, desirable vegetation appeared to be completing quite well with weeds. Shrub utilization appeared to be less than fifty percent. Red-osier dogwood (*Cornus stolonifera*) appeared to be actively selected and browsed more heavily than any other shrubs in the riparian zone.

PROJECT EFFECT: Positive

Prickly Pear Creek Fence & Bank Stabilization

WATER NAME: Prickly Pear Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-041-1996

MONITORING: This project has not yet been evaluated. We hope to visit this site in before the end of the year.

STATUS:

PROJECT EFFECT

Highwood Creek Bank Stabilization

WATER NAME: Highwood Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-012-1998

MONITORING: Photos before/after. Thirty-nine photo points were established in May 2002 by obtaining GPS locations.

STATUS: Ongoing with preliminary results. The project area on the Shepard property shows good establishment of grasses, along with some shrubs. Overall, a positive trend in herbaceous riparian vegetation was observed on the Shepard portion of the project; however, several treatment areas of the project do not appear to be functioning as designed.

On the McGowan Ranches, several small riparian areas looked healthy; areas of cottonwood recruitment, newer stands of willows, and buffer areas with herbaceous residual growth was noted. Landowner compliance within the grazing exclosure area near the bridge was judged to be good and this area looked very healthy. However, most reaches in pastures 1b, 2 and 3 appear to have heavy utilization of the current years growth for both herbaceous and browse species. The grazing development strategy suggested that browse utilization should not exceed 30% of the current years growth. We estimated that both herbaceous and browse utilization of the current years growth available to livestock was typically greater than 60-65% in most areas. Some areas in the upper portion of the project area are very gravelly and likely will not recover easily. However, most other areas could show substantial improvement from conditions observed in May 2002.

PROJECT EFFECT: Positive trend in some areas, but neutral in most areas.

Prickly Pear Creek Bank Stabilization

WATER NAME: Prickly Pear Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-018-1999

MONITORING: This project has not yet been evaluated. We hope to visit this site in before the end of the year.

STATUS:

PROJECT EFFECT:

Canyon Creek Riparian Fence

WATER NAME: Canyon Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-008-2000

MONITORING: This project has not yet been evaluated. We hope to visit this site in before the end of the year.

STATUS:

PROJECT EFFECT:

Missouri/Smith River Drainage

Black Butte Creek Riparian Fence & Stabilization

WATER NAME: Black Butte Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-020-1997

MONITORING: Photos after. Ten photo points were established in September 2002 and recorded by fixing the locations with a GPS receiver.

STATUS: Ongoing with preliminary results. Vegetation utilization levels were higher outside the riparian enclosure than inside the fence. Wildlife may be influencing the vegetative recovery in the riparian area. Willow plants were noted that showed evidence of browsing; the permittee reported heavy use of the area by elk after the hunting season. Utilization levels of herbaceous vegetation show positive trends in some portions of the enclosure, but not to the degree that could be expected. The enclosure is functional but riparian shrubs have been subjected to browsing and most don't appear vigorous. A substantial sprigging effort resulted in low recruitment of plants. Several trees had fallen over the barbed wire fence, but did not provide a means of access for cattle present in the upland pasture. The only sign of cattle observed in the enclosure was near the gate that provided access to the upland portions of the allotment.

PROJECT EFFECT: A mild positive effect.

Richardson, Grasshopper & Fourmile creeks

WATER NAME: Townsend Ranch Streams Restoration

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-026-1997

MONITORING: Photos after. Fifteen photo points were established on Richardson Creek and another ten were instituted on Grasshopper Creek in September 2002.

STATUS: Ongoing with preliminary results. Most of the riparian area available to livestock on Richardson Creek displayed heavy utilization of the current years growth for both herbaceous and browse species. Substantial bank trampling was also observed throughout the Horse Park meadow area. The exclosure at the spring source of Grasshopper Creek has provided recovery for both herbaceous and browse species as well as recruitment of browse species. Most areas on Grasshopper Creek between the exclosure and the Grasshopper Creek Campground showed heavier utilization than acceptable levels of the current years growth for both herbaceous and browse species; bank trampling was also observed on this stream. The grazing strategy has not sufficiently reduced use on either Richardson or Grasshopper creeks; other alternative solutions should be implemented.

PROJECT EFFECT: Neutral

Smith River Stock Water

WATER NAME: Smith River

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-023-1999

MONITORING: Photos after. Eight photos were taken in February 2001. Nineteen photo points were established in September 2002 utilizing a GPS receiver.

STATUS: Ongoing with preliminary results. In the Smith River riparian area, multiple age class stands of willows were noted. Substantial recruitment of willow was present. Both the browse and herbaceous vegetation showed low levels of utilization, even in areas where wildlife was using the area for cover. Higher utilization levels were found above the bridge than below the bridge. Adequate, functional buffer strips were present between the river and the hayfields. Higher utilization of herbaceous vegetation was observed along Thompson Creek; some browse recruitment was noted here also.

PROJECT EFFECT: Strongly positive effect on riparian vegetation on the Smith River portion of the project, mild positive effect on Thompson Creek.

Musselshell River Drainage

Careless Creek Bank Stabilization

WATER NAME: Careless Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-052-1997

MONITORING: Photos after. Previous project photos are available. In addition, we established twelve photo points in October 2002.

STATUS: Ongoing with preliminary results. Channel was dry or only pools were wetted in numerous locations when we visited the project in October 2002. Fencing at the water gap had impacted bank stability immediately opposite the water gap. Bare eroding banks have been replaced by a band of vegetation along the bank in many areas of the project; the band is narrow in some locations, wide in others. Bank revetment materials and an apparent high sediment load had encouraged development of an interesting channel form in some reaches. At areas near the goat pen on Wiley Micks property and at Sterling Zeir's hayfields, good shrub and tree recruitment was observed. Utilization of browse was low where we observed recruitment of browse species. However, some treated banks in the project area had not responded to revegetation efforts and continued to be unstable; grazing did not appear to be a factor involved with those problems.

PROJECT EFFECT: Positive

Sun River Drainage

Mill Coulee Bank Stabilization

WATER NAME: Mill Coulee

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-045-1997

MONITORING: Photos after. Follow-up photos were taken in August 2001 and April 2002. A total of eight permanent photo points were established. This project included three different property owners. Two photo points were established on the Giard property, two on the Brasfield property, and four on the Berg property.

STATUS: Ongoing with preliminary results. This project was initiated with three landowners in a subdivided area along Mill Coulee Creek. Compliance is variable. On the upstream area (the Giard property), a vegetative strip was present along most of the stream on the immediate banks. On the next downstream property, horses were unrestricted in the riparian area on the right bank and stream side vegetation was kept low near the house and lawn; the cooperator has since restricted access of horses to the riparian area. At the lower site, a small buffer strip had been maintained along the creek and no grazing occurred in the area; consequently, it was not fenced. A floodplain area had recently been mowed; a larger buffer strip along the stream should be provided in the future. However, on the other side of the creek, healthy stands of willows were noted.

PROJECT EFFECT: Positive effect in some areas, neutral in others.

Elk Creek Channel Restoration

WATER NAME: Elk Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-012-1999

MONITORING: Photos after. We established sixteen photo points.

STATUS: Ongoing with preliminary results. The project area is fenced and according to the USFWS extension agreement, the area should be being managed as an enclosure. Signs of trespass by livestock were noted when the project area was visited in June 2002. Additional reports of at least two other occasions of trespass were reported in 2002. Recruitment of browse species was observed, but utilization of recent growth was also observed. We do not know if the repeated entry into the area by livestock compromised the positive trend in the health of the riparian vegetation on this project.

PROJECT EFFECT: Positive effect

Marias River Drainage

Dupuyer Creek Channel Restoration

WATER NAME: Dupuyer Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-012-2000

MONITORING: Photos before/after/control. We established eight permanent photo points. Photos of the area are available from October 2000 when project work was underway. Follow-up photos were taken in May 2002.

STATUS: Ongoing with preliminary results. The project area has been fenced and is being managed as an enclosure. No sign of trespass by livestock was noted and differences between inside and outside the fence are easily observed. The area shows improvement in the health of the riparian vegetation. The project site survived a major flow event last spring with no damage except for the last bend of the project.

PROJECT EFFECT: Positive effect

Yellowstone River Drainage

Shields River & Elk Creek Riparian Fence

WATER NAME: Elk Creek (Shields)

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-053-1998

MONITORING: Photos after. Five photo points were established on Elk Creek and two on the Shields River portion of the project with GPS locations. Another photo point was established on the hill near the water tank

cistern. We hope to obtain before photos from the Upper Shields Watershed group for at least one of the same locations to provide comparisons in the future.

STATUS: Ongoing with preliminary results. On both properties examined on Elk Creek, cattle use was apparent throughout the riparian area. On downstream reaches of the creek, portions of the riparian area looked healthy in locations that were not easily accessible to livestock. Farther upstream on Elk Creek, heavy utilization of browse (primarily willows) was noted on young plants. Most shrubs in this pasture were older, more decadent stands. A moose apparently spends portions of the year on the upper portion of the project area on Elk Creek. On the Shields River portion of the project, we toured an area that had been fenced off from a calving pasture. Browse and herbaceous utilization on the bank area appeared high; recovery of shrubs was low. Portions of the bank may be highly mobile at higher flows. We have requested copies of the grazing management plan provided for in the project agreement.

PROJECT EFFECT: Positive in some reaches, neutral in most areas.

Sweetgrass Creek Riparian Fence

WATER NAME: Sweetgrass Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-057-1998

MONITORING: Photos before/after. Five permanent photo points have been established with GPS locations. Photo series at the permanent photo points includes photos from 1998 (pre-project), 2000 and 2002 (post-project).

STATUS: Ongoing with preliminary results. The area is still being managed as an enclosure, but the NRCS has suggested that grazing may be resumed in the future. A grazing plan has not been developed. The area shows a dramatic improvement in the riparian vegetation.

PROJECT EFFECT: Positive

Daisy Dean Creek Off-site Watering & Fencing

WATER NAME: Daisy Dean Creek

DATA LOCATION: Great Falls files

FFI NUMBER: FFI-039-1999

MONITORING: Photos after. Seven permanent photo points have been established with GPS locations. We hope to obtain before photos from the Upper Shields Watershed group for some locations to provide comparisons.

STATUS: Ongoing with preliminary results. The area appears to be managed as an enclosure. The area shows a dramatic improvement in the riparian vegetation; this is especially noticeable around the corrals when before and after photos are compared.

PROJECT EFFECT: Positive effect on riparian vegetation.

Appendix B

**Future Fisheries Improvement Program
Fisheries Monitoring Report – 2002**

by

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Montana Fish, Wildlife and Parks
4600 Giant Springs Road
Great Falls, Montana 59405-0901**

December 2002

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Introduction

This report summarizes the results of monitoring conducted from 2000 to 2002 to evaluate the effectiveness of selected habitat restoration projects funded through the Future Fisheries Improvement Program (FFI). Monitoring was conducted to help answer the question; “Did the funded project improve target fish populations?” Monitoring is essential to understand what types of projects provide benefits to fish populations and which do not. However, the data in this report also needs to be viewed in relation to a broader context; stream flows and surface water have been below average for an extended period of time. In a time of prolonged low flows, we would expect substantial declines in fish communities, but sampling on some FFI projects documented fish abundance indices remained stable or increased despite extremely low base flows. These data suggest that for some streams extremely low flows can be partially mitigated by improved habitat or that efforts to mitigate low flow impacts by increasing flows through FFI efforts may be at least partially successful. However, in order to fully assess the benefits from some projects, future monitoring after near normal flows for several years will be necessary.

This report presents data collected for numerous projects on 31 different streams from east of Billings to the far northwestern corner of the state. These data, as well as conclusions, are considered preliminary because it often takes five years or more for fish populations to fully respond to habitat improvement treatments (Hunt 1976) and some of these data have not yet been fully analyzed. This report is organized first by the river basin where each project is located and then by the project name.

Big Hole River Drainage

Deep Creek Channel Restoration

WATER NAME: Deep Creek – Big Hole River

DATA PROVIDED BY: Jim Magee, FWP

DETAILED REPORT CITATION: FWP files, Dillon

FFI NUMBER: FFI-010-1998

A long meander loop in Deep Creek was cut off by high flows. The FFI project, completed during June of 1998, reconnected and restored the channel in this abandoned meander loop, eliminating the 10-fold decrease in channel length. Project objectives included restoration of the abandoned meander loop, increase in productive habitats for aquatic species, and bank treatment through a variety of means to provide riparian enhancement. The abandoned channel continues to be the main channel of creek; various degrees of success were noted regarding the re-establishment of a healthy riparian vegetation community. In some areas, transplanted willows and planted grasses are doing well but not in others. Although the project reach has increased stream length, we believe it has not yet fully reached its potential carrying capacity for fisheries habitat. The reach is functioning as a migration corridor for species entering Deep Creek from the Big Hole River for seasonal habitats or spawning runs and is inhabited by similar species assemblages that are present in adjacent sections of the creek. The project was successful in replacing an inefficient headgate and protecting water quality by preventing flooding in the landowner's calving grounds during high-water events.

In October 1998, 1999, and 2002, single electrofishing passes were conducted in a 1,000 feet-long section of the restored reach (treatment) in Deep Creek. An additional section of the same length was located in an untreated section upstream from the project area (Control), which was successfully sampled in 1998. No data was collected for the control section in 1999 because equipment broke down while sampling the equipment. Catches of most fish species were similar between the treatment and control sections in October 1998 (Figure 1). More ling and brook trout, but fewer rainbow trout, were captured in the treatment section in 1999 than in 1998. In 2002, sampling showed catch rates for all species except Arctic grayling at lower densities than observed in 1999; catch rates of fall spawning fish (mountain whitefish, brook trout, and brown trout) were the lowest numbers sampled since the project was initiated. Arctic grayling numbers have been relatively stable at a low number at each sampling. Fall sampling may not represent summer fish use of these sample sections. Movement of several species from the Big Hole River into Deep Creek may occur during the fall to seek winter habitats, as well as spawning movements by brown trout and mountain whitefish, and by other fish following spawning fish into the creek to prey on the eggs. Drought during the last three years may be a major factor responsible for decreased population densities. Further sampling will be needed to determine the final fish capacity of the treatment section. **Drought and seasonal use of the reach may largely be responsible for lower numbers observed in the treatment section in 2002 than in 1998 or 1999. Baseline data has been obtained, but no conclusions will be reached until better flow patterns are evaluated.**

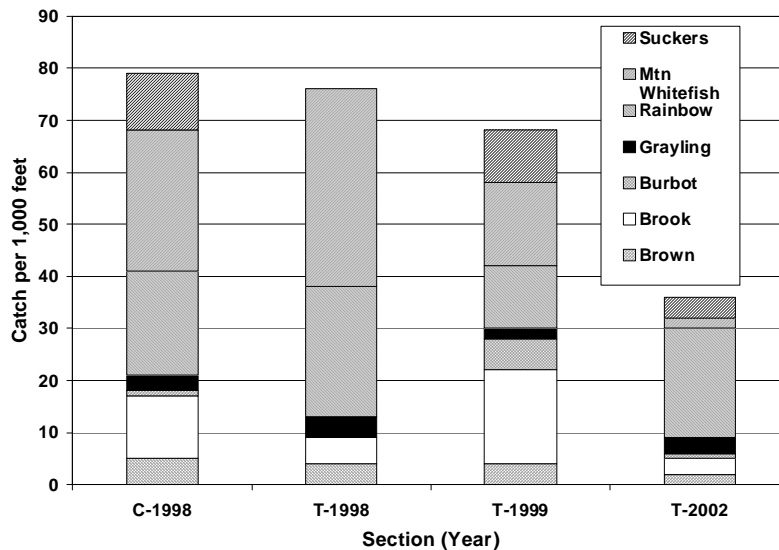


Figure 1. Relative abundance (catch in a single electrofishing pass per 1,000 feet of channel) of suckers, mountain whitefish, rainbow trout, grayling, burbot(ling), brook trout, and brown trout in an untreated control (C)and in a restored (treatment: T) section of Deep Creek in 1998, 1999, and 2002.

Blackfoot River Drainage

Cooperative private and public fisheries restoration efforts, of which FFI program has been one component, have been implemented within Blackfoot River drainage throughout the 1990's and into the 2000's. Cooperators include FWP, US Fish and Wildlife Service, US Bureau of Land Management, US Natural Resource Conservation Service, Montana Department of Transportation, Montana Department of Natural Resources and Conservation, North Powell Conservation District, Big Blackfoot Chapter of Trout Unlimited, private landowners, Chutney Foundation, National Fish and Wildlife Foundation, Montana Power Company, and Plum Creek Timber Company. Fish evaluations for specific FFI projects often could not be separated from other cooperative projects conducted during the same time and in the same drainages as FFI projects. Consequently, the following evaluations should be viewed as assessments for the total effort, rather than just FFI projects.

Bear Creek Channel Reconstruction

WATER NAME: Bear Creek – Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce et al. (2002)

FFI NUMBER: FFI-028-1998

Bear Creek is a small, second order tributary of the lower Blackfoot River with a base flow of 3-5 cfs. Bear Creek is one of the colder streams entering the lower Blackfoot River. It provides salmonid recruitment to the lower Blackfoot River sport fishery. During summer 2001, mean daily temperatures were in the low 50's with a maximum summer temperature of 66.4° F, or ~4.5° F degrees cooler than the Blackfoot River at the USGS gauging station.

Restoration activities in Bear Creek began in 1995 using funds other than FFI funds. The overall goal was to restore habitat degraded by historical activities in the channel, restore fish passage and thermal refugia, and improve recruitment of trout to the Blackfoot River. In 1998, FFI funds helped reconstruct 1,870 feet of channel and restore habitat in an additional 2,000 feet of Bear Creek that had been degraded from channelization and improper logging and grazing practices in the riparian area. This FFI project was part of a larger basin-wide collaborative effort that

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included improving grazing practices, fixing under-sized culvert barriers, increasing irrigation efficiencies, and removal of a winter livestock feed lot

Bear Creek supports populations of rainbow trout, brown trout and brook trout along with low densities of westslope cutthroat trout in the upper basin and very low densities of juvenile bull trout. In 2001, we continued fish population monitoring in a reconstructed section of Bear Creek. Total catch per unit effort (CPUE) for all salmonids (fish >4.0") increased from 7.7 in 2000 to 15.2 fish/100' in 2001 (Figure 2). Increased densities (fish > 4.0") were noted for all species in the sample. Conversely, total CPUE for fish <4.0" decreased from 18.6 fish/100' in 2000 to 8.2 fish/100' in 2001. Westslope cutthroat trout were not captured in this section in 1998, but were found in 2000 (Figure 2). In 2000 the first bull trout ever observed in Bear Creek was found in lower Bear Creek. **The relative abundance of fish greater than four inches and presence of native fish have continued to increase following restoration activities within the Bear Creek drainage.**

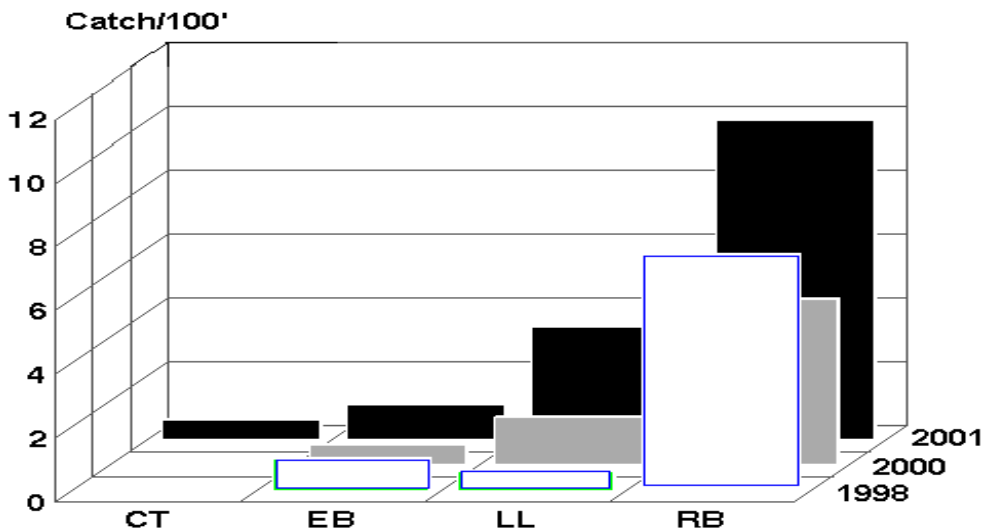


Figure 2. Catch per unit effort (CPUE) for salmonids (fish > 4.0'') for Bear Creek at mile 1.1, 1998-2001.

Blanchard Creek Fish Passage, Riparian Fencing, and Feedlot Removal

WATER NAME: Blanchard Creek –Clearwater River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce et al. (2002)

FFI NUMBER: RRA-045-1994, FFI-048-1996, and FFI-052-1996

Blanchard Creek, a tributary to the lower Clearwater River, is a spawning tributary for rainbow and cutthroat trout, and supports low densities of brown trout and brook trout. Rainbow trout primarily utilize the lower reaches, while cutthroat trout primarily utilize its upper reaches. Blanchard Creek has a long history of adverse land management activities, riparian degradation and loss of fish habitat. These include changes to the hydrograph (12% above natural) related to

timber harvest (DNRC unpublished data), side-casting of road grade material to the channel for road maintenance purposes, excessive livestock access to riparian areas and dewatering through irrigation. Blanchard Creek was historically dewatered in its lower one mile from irrigation, resulting in large fish population declines (Pierce et al. 1997). In 1991, the irrigator began increasing flows, and then entered into a water lease in 1993. The water lease was to maintain a 3 cfs minimum instream flow during the irrigation season. In 2001-02, the water-rights holder terminated the water lease, which resulted in the complete dewatering of the lower 1.1 miles of Blanchard Creek for an extended period in 2001 and a brief period in July of 2002. During the 1990's, the landowner continued to intensively graze the riparian area, which contributed to degradation of fish habitat and fish population declines. Fish passage over two irrigation diversions and the crossing under Highway 200 was very poor and probably negatively impacted the fishery in the lower reaches of the tributary. Two diversion structures and the culvert under Highway 200 were modified by adding fish ladders. Also, Plum Creek Timber Company and the DNRC improved management of livestock grazing within riparian areas. Fish populations in lower Blanchard Creek in the area of the diversions and water lease (stream mile 0.1) have been monitored from 1990 to 2002. Brown and westslope cutthroat trout began inhabiting this sample section in 1992, following increases in flows through this section. During the early years of the water lease, Blanchard Creek supported some of the highest rainbow trout densities found in tributaries of the Blackfoot River. However, since the early 1990s, sampling of trout has recorded a downward trend in densities for fish >4.0" (Figure 3). **In 2001, there were no fish in the dewatered section of Blanchard Creek, compared to a total trout density estimated at 59 fish/100' in 2000. In 2002, late season flows were restored to Blanchard Creek and resulted in the downstream recruitment of fish to the dewatered section. Fish population surveys in September, 2002 recorded a density of 2.6 /100' of stream.**

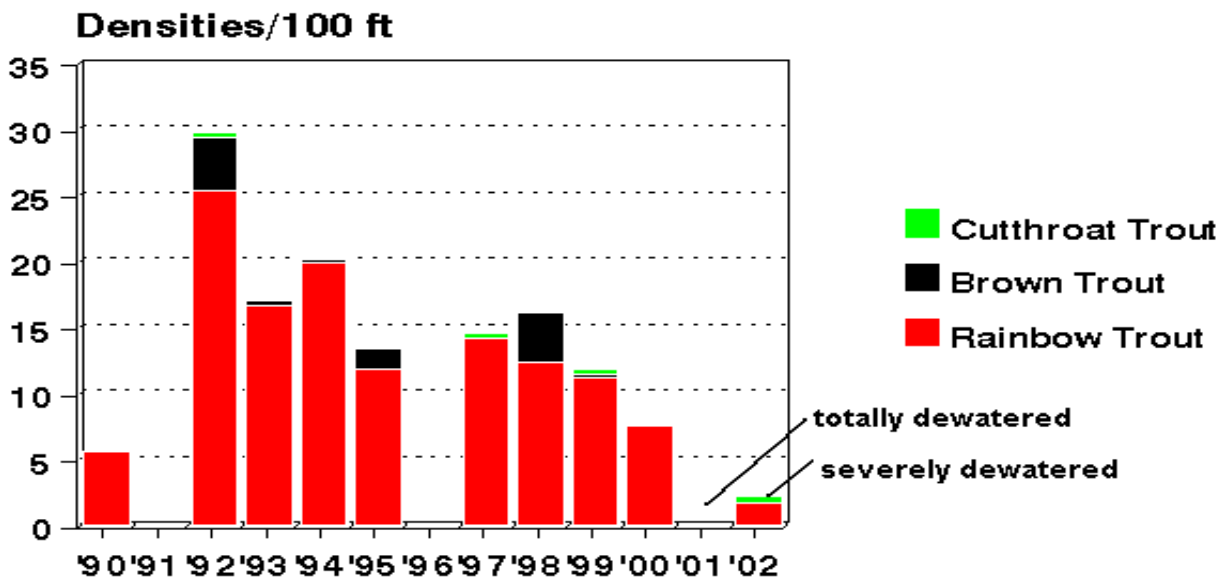


Figure 3. Estimated densities for fish >4.0" in Blanchard Creek at mile 0.1, 1989-2002.

Chamberlain Creek Fish Passage and Irrigation Diversion

WATER NAME: Chamberlain Creek – Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce et al. (in prep)

FFI NUMBER: FFI-009-1997

The upper reaches of Chamberlain Creek support relatively high densities of cutthroat trout. However, aquatic habitat in sections of lower Chamberlain Creek were severely altered, leading to historic declines in westslope cutthroat trout densities. Problems included channelization, de-watering, lack of fish passage, loss of instream wood, poor riparian livestock management, road encroachment and excessive sediment from road drainage. Chamberlain Creek supported a grade 3.9 whirling disease infection in 2000. Population levels of westslope cutthroat trout in this portion of Chamberlain Creek were severely depressed. Restoration objectives included improving spawning and rearing conditions for westslope cutthroat trout, improve recruitment of westslope cutthroat trout to the river, and provide thermal refuge and rearing opportunities for fluvial bull trout. Since 1990, Chamberlain Creek has been the focus of a comprehensive fisheries restoration effort. Projects include road drainage repairs, riparian livestock management upgrades, fish habitat restoration, irrigation upgrades (consolidate ditches, water conservation, eliminate fish losses to ditches, install a fish ladder on a diversion), and improved stream flows through water leasing. Restoration focused mostly in the lower mile of stream.

Chamberlain Creek supports a migration of fluvial westslope cutthroat trout from the Blackfoot River. Fluvial spawning occurs throughout the mainstem and extends into Pearson Creek and the East Fork of Chamberlain Creek. Beginning in 1997, we found low numbers of bull trout using the stream in areas affected by restoration. Sampling for a six-year period prior to 1997 captured no bull trout. These were the first bull trout recorded in Chamberlain Creek in 18 years of sampling. Spawning fish have used constructed pools for holding sites prior to spawning and one spawned in the bottom end (tail-out) of a pool. In 2002, we continued to assess fish populations in two locations affected by the water lease (Figure 4), plus a special study related to whirling disease. Westslope cutthroat trout populations at the two long-term monitoring sites (mile 0.1, 0.5) show improved densities in areas influenced by restoration during the 1990s (Figure 4). Surveys indicate a decline in cutthroat numbers (>4.0 inches) in the section at mile 0.1 from the peak level observed in 2000. **Rehabilitation work appears to have led to increased spawning use of Chamberlain Creek by adult westslope cutthroat trout from the Blackfoot River. Increased catches of rearing westslope cutthroat trout in the lower creek have also been noted and conditions have improved in the lower creek so that bull trout can once again use the stream for rearing, and perhaps spawning.**

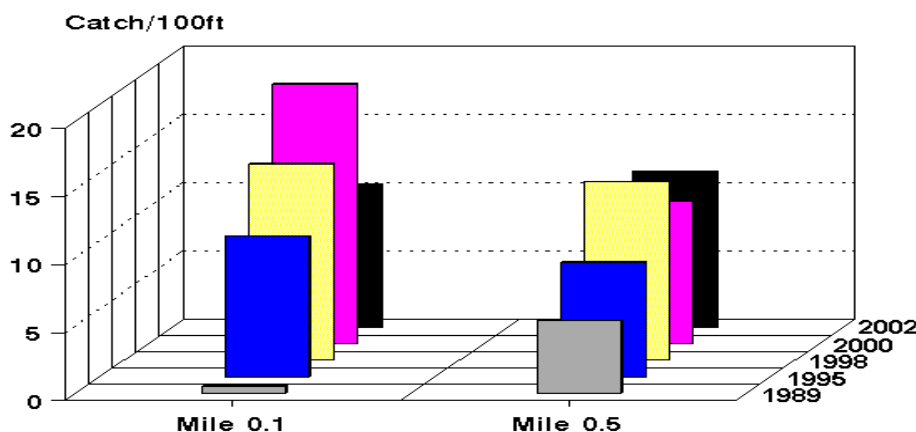


Figure 4. Electrofishing catch for westslope cutthroat trout (Fish >4.0") in lower Chamberlain Creek at two locations, 1989, 1995, 1998, 2000 and 2002. The 1989 data was collected in a portion of stream that had been recently modified by a bulldozer.

Cottonwood Creek Fish Friendly Diversion, Dreyer Diversion Lining, and Fish Screen Improvement

WATER NAME: Cottonwood Creek – Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce et al. (in prep.)

FFI NUMBER: RRA-056-1994, FFI-007-1996, and FFI-044-1996

Cottonwood Creek, a large tributary to the middle Blackfoot River, begins near Cottonwood Lakes and flows 16 miles to its junction with the Blackfoot River at river mile 43. Cottonwood Creek supports bull trout, westslope cutthroat trout, rainbow trout, brown trout and brook trout. Rainbow trout inhabit the lower mile of stream while brook trout and brown trout dominate the middle stream reaches. Westslope cutthroat trout and bull trout dominate the headwaters. Cottonwood Creek also supports a high-grade whirling disease infection in the lower stream reaches.

Impacts to fish populations and their habitats were present throughout the Cottonwood Creek drainage, although most of the major problems were addressed during the decade of the 1990s.

Fish ladders were installed on two major diversions, and two irrigation canal intakes were screened. A total 8,000 feet of irrigation canal was lined with an impermeable fabric to prevent water loss. An estimated 8,663 acre-feet of water salvaged by lining the ditch was annually leased for instream flow purposes. Associated with these projects were efforts to improve riparian livestock management and negotiate conservation easements in the middle reaches of Cottonwood Creek.

In 2002, we continued to monitor fish populations in Cottonwood Creek in the area (Dreyer Ranch) of a water lease. Before 1997 when the water lease took effect, Cottonwood Creek below the Dreyer diversion was completely dewatered during the irrigation season. The Dreyer ditch diverts water from Cottonwood Creek at stream mile 12.1. Past fish populations monitoring found that the previously de-watered portion of the stream now support bull, westslope cutthroat, and brook trout, as well as, sculpins and tailed frogs (Shepard 1998; Pierce and Schmetterling 1999). The 2002 fish population data show densities of westslope cutthroat trout have stabilized at much higher densities (Figure 5). **The previously de-watered portion of Cottonwood Creek now supports bull, brook, and westslope cutthroat trout along with sculpins and tailed frogs. Abundance of westslope cutthroat trout in this portion of the creek has increased and appears to have stabilized at much higher levels.**

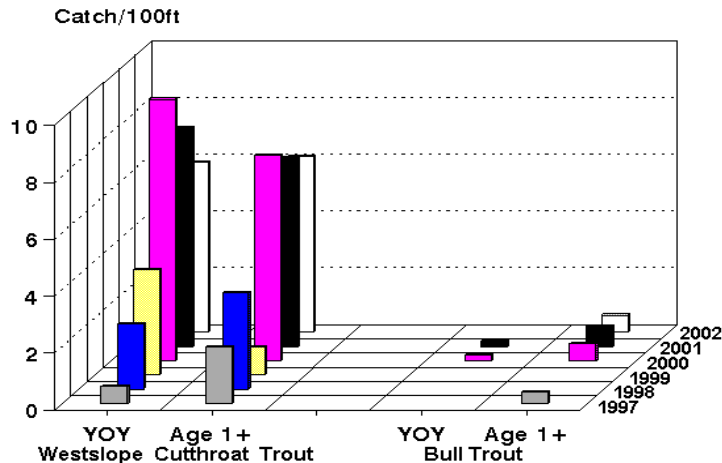


Figure 5. Electrofishing catch for native fish in Cottonwood Creek at mile 12.0, 1997-2002.

Dunham Creek Fish Screen and Channel Restoration

WATER NAME: Dunham Creek – Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce et al. (2002); Pierce et al. (in prep.)

FFI NUMBER: FFI-002-1996 and FFI-039-2001

Dunham Creek is the largest tributary to Monture Creek, and is an impaired spawning stream for fluvial westslope cutthroat trout (WSCT) and bull trout. Objectives of the projects completed have included eliminating the loss of native fish by installing a fish screen on an irrigation ditch, and restoring habitat conditions, migration corridors, and improving recruitment of bull trout and cutthroat trout to the Blackfoot River.

In the early 1970's, approximately 1.3 miles of the Dunham riparian area was clear-cut and burned; the stream was then channelized. This channelized section of stream became highly unstable, significantly increasing bank and bed erosion rates and resulting in channel braiding in downstream reaches. Before reconstruction, sediment deliveries in the project area were approximately 25-times greater than natural levels and increased significantly following high flow events of the late 1990s. The influx of unnatural, high levels of sediment entered the stream just upstream of the Dunham Creek bull trout spawning area. In 2001, reconstruction of approximately 1.3 miles of Dunham Creek to natural channel dimensions consistent with a stable (C4-type) channel was accomplished. The channel reconstruction emphasized natural channel morphology, habitat complexity, and included aggressive revegetation of disturbed banks to stabilize the stream and allow riparian vegetation to encompass the stream over a 10-15 year period, ultimately providing long-term stability.

Fish populations were resurveyed at two monitoring sites (mile 2.3 and 4.2) in Dunham Creek before channel reconstruction. The 2.3-mile survey is located 0.6 miles downstream of the project, while the upper site (mile 4.2) is located in the reconstruction project site. Both sample sites show lower native fish densities in 2001 compared to earlier surveys. The surveys at mile 2.3 show declines for both WSCT and bull trout (fish >4.0") between 1998 and

2001 (Figure 6). In the project area (mile 4.2), estimated densities were also very low compared to 1998 samples (Pierce et al. 2002).

Recent population declines in Dunham Creek likely result from low flows related to drought, and a large influx of fine sediment, primarily sand, in spawning riffles downstream of the channelized reach. Longer term monitoring with better flow regimes that will allow Dunham Creek to respond to these changes are required to evaluate this project.

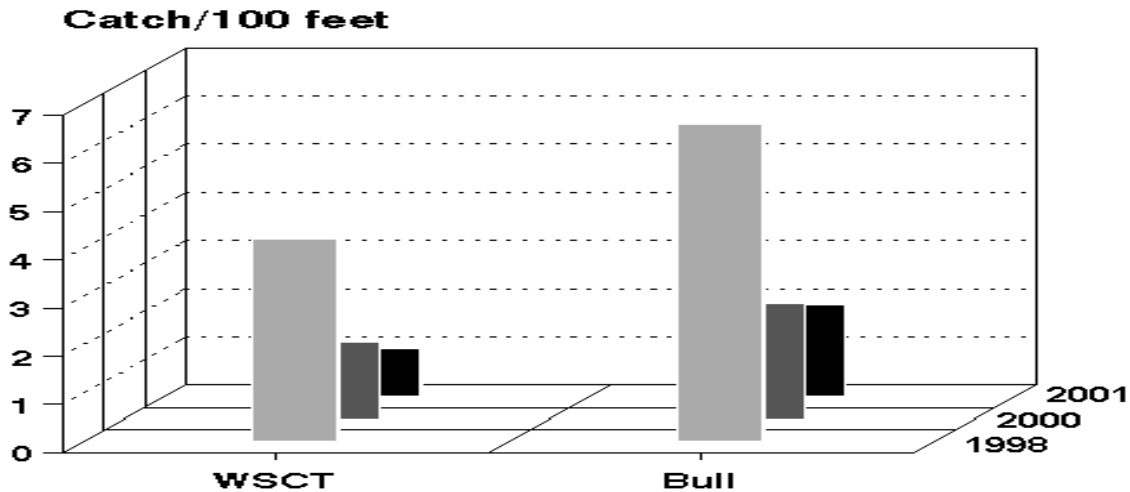


Figure 6. Relative abundance (catch per 100 feet) for westslope cutthroat (WSCT) and bull trout in Dunham Creek (fish >4.0”) at mile 2.3 in 1998, 2000 and 2001.

Gold Creek Pool Development

WATER NAME: Gold Creek – Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION : Pierce et al. (1997); Schmetterling and Pierce (1999); Swanberg (1996); Swanberg (1997); Pierce and Podner (2000); Schmetterling (2000); Pierce et al. (in prep.)

FFI NUMBER: FFI-004-1996

Gold Creek is the largest tributary to the lower Blackfoot River; almost all of its watershed is industrial forest. Past timber harvest of riparian conifers and the actual removal of large instream wood had reduced the diversity and complexity of stream habitat in the lower three miles of Gold Creek. Prior to restoration, pool habitats comprised less than 1% of the stream’s area in this segment of Gold Creek. Low densities of age 1+ fish, including native fish, resulted from this habitat simplification. In 1996, a habitat restoration project that focused on pool construction and maintenance which incorporated large woody debris was completed to restore pool habitat and morphological complexity as well as restore thermal refugia for Blackfoot River native fish. Monitoring undertaken for the Gold Creek Project includes: 1) monitoring of the habitat structures, 2) electrofishing, and 3) radio tracking of fluvial cutthroat and bull trout. Eight months after the project was completed, an estimated 50-year flood event passed through the project area; monitoring indicated that most of the restoration work survived this event (Schmetterling and Pierce 1999; Shepard 1998). Maximum depths of constructed pool habitats have been monitored from 1996 to 1999; while maximum pool depths initially decreased following the filling of pools with sediments during the 1997 flood event, maximum pool depths either stabilized or increased slightly following 1997.

Swanberg (1996 and 1997) and Schmetterling (2000) found that fluvial adult bull and westslope cutthroat trout from the Blackfoot River use the restored area of Gold Creek seasonally during their spawning migrations. Rainbow and brown trout also spawn in the drainage and resident populations of brook trout also inhabit the stream. Before restoration in 1996, we established a fish population survey section in the treated area (mile 1.9). Fish population surveys, undertaken on an annual basis since 1996, indicate overall positive trends for salmonids in the section (Figure 7). Although westslope cutthroat and bull trout declined from 2001, rainbow and brown trout increased from the year before; brown trout increased substantially and reached maximum levels since monitoring began in 1996 (Figure 7).

The Gold Creek mainstem and confluence area also provides thermal refugia for Blackfoot River bull trout. Gold Creek exerts a cooling influence on the lower Blackfoot River. In 2001, stream temperature monitoring near the mouth recorded maximum temperatures of 67°F, or ~ 4°F lower than the Blackfoot River near Belmont Creek at mile 21.9.

Preliminary data suggest that habitat structures in confined channel types remain in place following flood events better than structures placed in laterally extended types of channels; treated areas in lower Gold Creek support more fish following treatment than prior to treatment. Adult bull and westslope cutthroat trout from the Blackfoot River are using Gold Creek seasonally as a thermal refuge and for spawning. Brown trout numbers have increased.

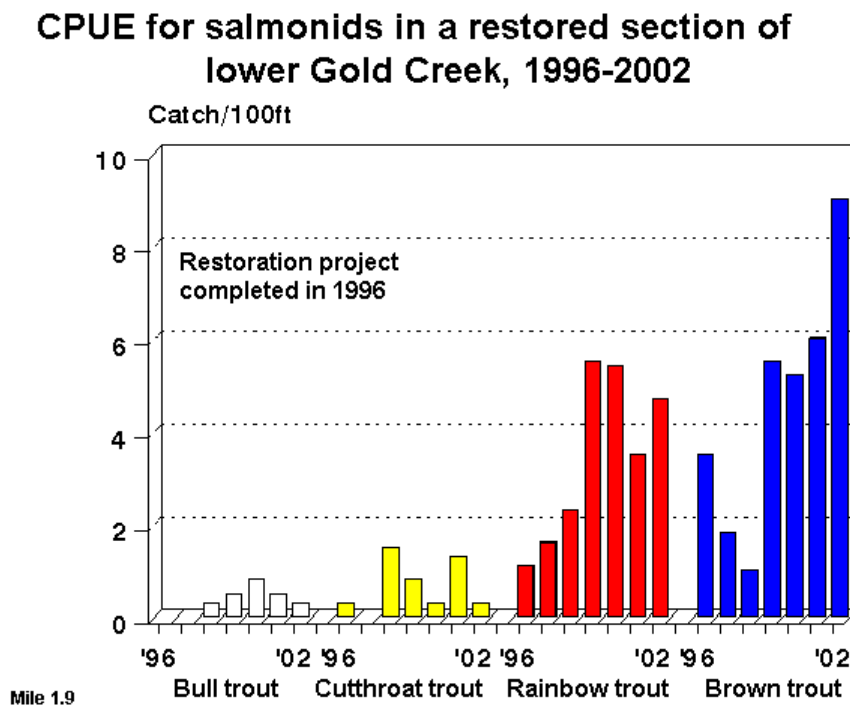


Figure 7. CPUE/relative abundance (catch in a single electrofishing pass per 100 feet of stream length) of bull, westslope cutthroat, rainbow, and brown trout in a sample section located at mile 1.9 on Gold Creek from 1996 to 2002.

Kleinschmidt Creek Channel Restoration, Phase II

WATER NAME: Kleinschmidt Creek – Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce (1991); Pierce et al. (1997); Pierce and Schmetterling (1999); Pierce and Podner (2000); Pierce et al. (2002); Pierce et al. (in prep.)

FFI NUMBER: FFI-014-1998

Kleinschmidt Creek, a spring creek to the North Fork Blackfoot River, has been severely degraded by past placement of rock dams and undersized culverts along with channel straightening and a long history of intensive riparian grazing with very little regard for riparian health and channel stability (Pierce 1991). Whirling disease is present in this stream. Approximately 2,500 feet of channel had been restored previously during a channel restoration project; phase II restored an additional 6,250 feet of channel in 2000-01. Four types of monitoring are included in this project: 1) pre- and post project habitat surveys, 2) fishery response to habitat restoration, and 3) temperature studies, and 4) pre- and post-project whirling disease evaluations (sentinel fish cage studies plus macroinvertebrate sampling including *Tubifex tubifex*).

Kleinschmidt Creek currently supports low numbers of brown trout and brook trout, along with very low densities of bull trout (Pierce and Podner 2000). Fish abundance surveys were obtained in 1998 and 1999 at two locations (mile 0.5 and 0.8) and in 1999 at another reference location at mile 1.1. The survey in 2002 at mile 0.5 shows a substantial response by brown trout numbers to channel restoration in 2001 when compared to pre-project estimates from 1998-2000 (Figure 8).

In 2001, post-project geomorphic and habitat features of Kleinschmidt Creek were assessed from mile 0.4 upstream. Following reconstruction, channel sinuosity increased 36%, pool frequency increased 517%, wetted channel area decreased 56%, and the frequency of instream woody stems increased 1,089%. Mean wetted-width decreased from 31.2' before the project to 10.2' after restoration. Mean maximum pool depth increased from 2.9' to 3.6'.

Water temperatures continued to be monitored and will be evaluated in the future. Whirling disease sentinel cage studies consistently recorded high-level infections; all cage results from 2000 showed the mean grade of infection was >3.06 in Kleinschmidt Creek (Pierce et al 2002).

Electrofishing showed a significant increase in brown trout densities following stream reconstruction. Future monitoring will test whether habitat and riparian health changes will moderate whirling disease infection levels.

Brown trout (age 1+) population estimates for Kleinschmidt before and after channel reconstruction

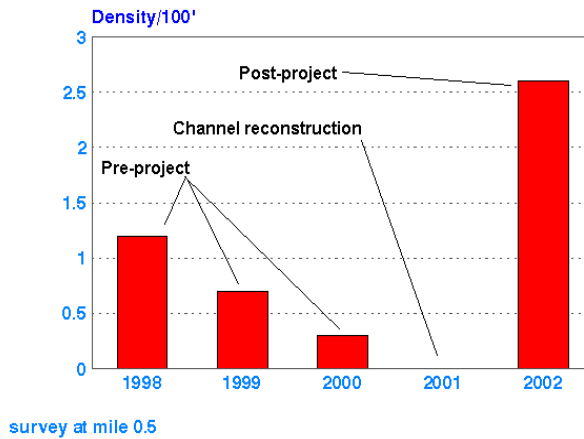


Figure 8. Population estimates (catch per 100 feet of stream channel) for age 1 and older (1+) brown trout in a sample section of Kleinschmidt Creek located at stream mile 0.5 from 1998 to 2002.

McCabe Creek Irrigation Efficiency Conversion, Barrier Removal, Debris Placement, Culvert to Bridge Conversion, Habitat Enhancement

WATER NAME: McCabe Creek – Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce and Podner (2000); Pierce et al. (2002)

FFI NUMBER: FFI-038-1997, FFI-031-1998

McCabe Creek, located in the Monture Creek bull trout recovery area, is a tributary to lower Dick Creek. McCabe Creek has had a long history of channel alteration and improper land management activities that have adversely impacted fish populations including poorly designed road crossing and irrigation diversions resulting in loss of fish in irrigation ditches as well as chronic dewatering, improper riparian grazing practices, and physical channel alterations. In 1999 a major restoration project was undertaken in McCabe Creek to: 1) consolidate four separate irrigation ditches into a single pipeline and screen the intake, 2) convert from flood to sprinkler irrigation to increase water efficiency, 3) place woody debris in the channel and plant shrubs along 0.5 mile of stream channel, 4) alter riparian livestock grazing practices to be more compatible for protecting riparian habitats, and 5) replace a poorly designed culvert at a county road crossing in hopes to restore instream flows and habitat conditions for bull trout and WSCT. In 2001, the project completed the irrigation conversion and developed offstream livestock watering and reconstructed approximately 0.5 mile of stream channel.

Thermographs that measured water temperatures were placed at two locations (mile 1.3 and 0.1), in 2001. Maximum August temperatures increased 11.3°F between mile 1.3 and mile 0.1. Despite this increase during August, McCabe Creek still discharged water 6.6°F degrees cooler than lower Dick Creek, which suggests that enhanced McCabe Creek flows should help moderate temperatures in lower Dick Creek.

Fish population were expected to benefit from increased stream flows, eliminating westslope cutthroat trout (WSCT) losses to ditches and restoring habitat complexity to a damaged stream channel. McCabe Creek is a WSCT dominated stream with low densities of brook trout in lower stream reaches; McCabe Creek likely supported bull trout historically. Prior to project implementation, fish population surveys sites were established at stream mile 2.3, below the lowermost irrigation diversion in an area that had been de-watered and damaged from improper livestock grazing and at mile 3.2, above most management impacts where stream and riparian habitat was in relatively good condition. Following these initial surveys, we screened the upper diversion near mile 3.2 in late 1999 and completed habitat restoration in the downstream reach; base streamflows approximately doubled due to increased irrigation efficiency. The relative catch of WSCT (>4.0”) in a single electrofishing pass was much lower at mile 2.2 than at mile 3.2 in 1999 prior to project construction (Figure 9). Following construction, abundance of both WSCT and brook trout (>4.0”) increased at mile 2.2; WSCT numbers at mile 3.2 also increased in 2000. Sampling from 2001 shows a continued increase in WSCT at mile 2.2, both brook trout at mile 2.2 and WSCT at both sites showed higher numbers than pre-project levels. **Baseline and post-project fish abundance data in McCabe Creek indicate that fish abundance in the more degraded portion of the stream showed a greater response to**

restoration work than portions of the stream in relatively good condition. However, all portions of the project area benefited from improved flow conditions and show higher fish densities in both sections than pre-project levels, in spite of drought conditions. The habitat restoration project, in particular shows an encouraging early response.

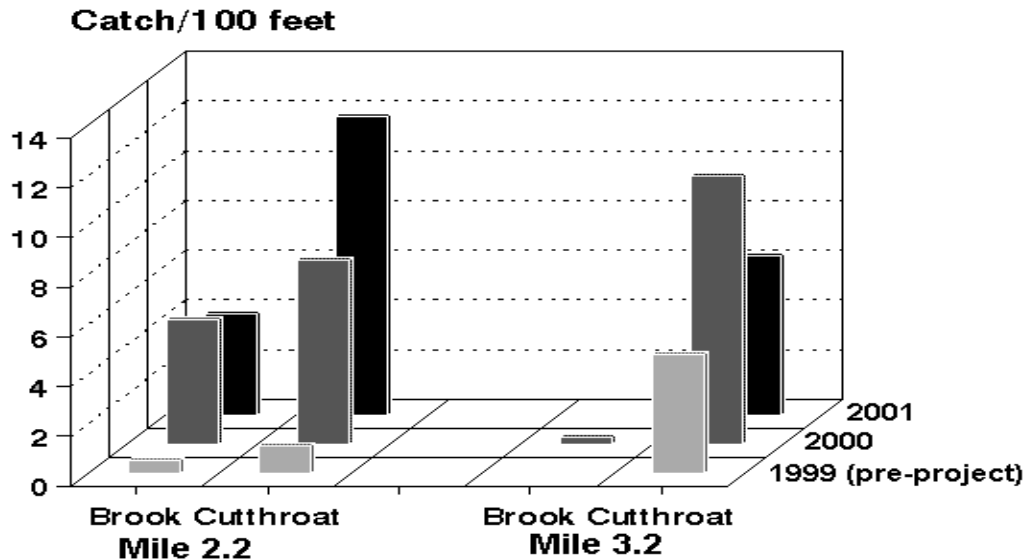


Figure 9. Relative abundance (catch in one electrofishing pass per 100 feet of stream channel) for westslope cutthroat trout and brook trout (fish >4.0”) in two sample sections on McCabe Creek from 1999-2001.

Monture Creek Fish Habitat Enhancement and Restoration

WATER NAME: Monture Creek – Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce et al. (1997); Pierce and Schmetterling (1999); Pierce and Podner (2000); Pierce et al. (2001); Pierce et al. (2002)

FFI NUMBER: FFI-012-1999, FFI-049-1999

Monture Creek, a large tributary to the middle Blackfoot River, is a primary spawning stream used by fluvial bull and westslope cutthroat trout inhabiting the lower Blackfoot River. Monture Creek also serves as thermal refugia for fluvial bull trout during periods of river warming. Reproduction of westslope cutthroat and bull trout occurs primarily in the mid- to upper basin. Rainbow trout and brown trout inhabit the lower portions of the drainage. Brook trout are found throughout the drainage.

During the 1990’s, improvements were made in riparian livestock management along 9.3 miles (about 80%) of the mainstem of Monture Creek. In 1997 a cooperative stream restoration project placed large woody debris in two sections of stream, totaling 17,606 feet of channel. Extensive restoration work and improved riparian livestock management have been done in many of the tributaries to Monture Creek. In addition, fishing regulation changes that went into effect in 1990 have led to increases in bull trout. Three types of information has been collected to monitor these projects: 1) woody debris frequency, 2) bull trout redd counts, and 3) estimating abundance of juvenile bull trout in five long-term sample sites. Woody debris frequency surveys were reported in Shepard (1998).

Monitoring results for 2001 included 1) bull trout redd counts, 2) fish population surveys in lower Monture Creek 3) and temperature monitoring at one location (mile 1.5). Redd (spawning site) counts have shown that bull trout

continue to respond to habitat restoration measures in Monture Creek. Numbers of bull trout redds consistently increased from 1989 to 1996, then maintained that level until starting to increase again in 2000 and 2001. In 2001, 93 redds were documented, compared to 80 redds in 2000. The relative abundance of juvenile bull trout has also increased dramatically from 1999 to 2001 in two sections on Monture Creek. based on a mark-recapture population estimate from a restoration project area on lower Monture Creek (Figure 10). The survey reach, established in 1999, includes two adjacent survey sections (upstream unrestored and downstream restored); the purpose of this was to evaluate fish population response to habitat restoration (Pierce and Podner 2000). In fall 1999, following the initial survey, we completed the restoration of the upstream section, which included riparian fencing and instream woody debris placement. The population survey, for both sections combined, estimated a total trout (fish > 6.0") density of 96 ± 28 fish/1,000' for 2001 compared to 74 ± 24 fish/1,000' in 1999. The point estimates were higher for all species except westslope cutthroat trout (Figure 10). For the newly restored upper section, total trout densities (fish >6.0") increased from 60 ± 29 fish/1,000' in 1999 to 119 ± 49 fish/1,000' in 2001. For the lower section, total trout densities (fish >6.0") decreased from 107 ± 48 in 1999 to 80 ± 33 fish/1,000' in 2000. **Data suggest that bull trout use and population levels in Monture Creek are increasing., as well as other non-native salmonids. This work suggests the restoration work incorporating woody debris has likely contributed to the increase.**

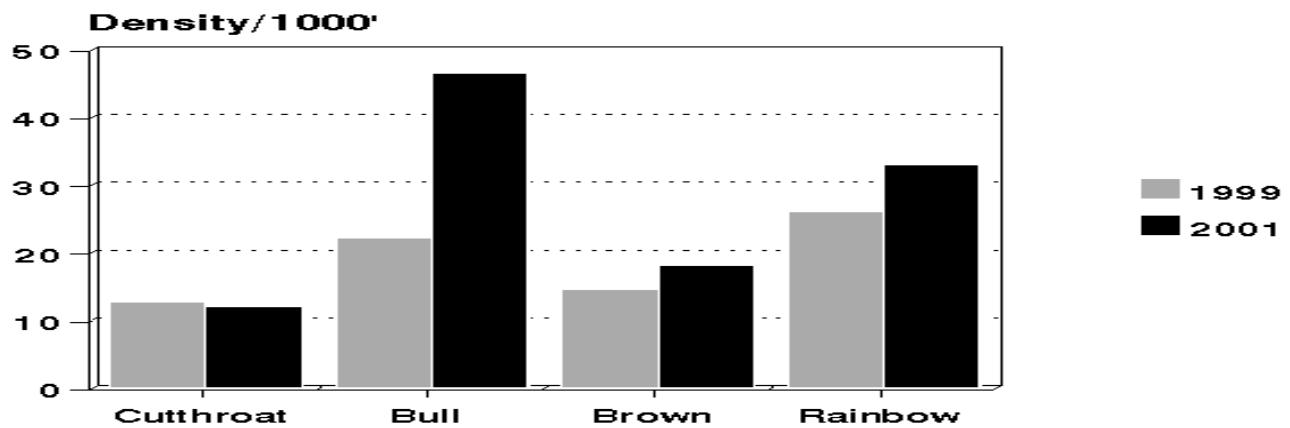


Figure 10. Estimated salmonid densities (fish >6.0") in lower Monture Creek, 1999 and 2001.

North Fork Blackfoot River Diversions

WATER NAME: North Fork Blackfoot River – Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce et al. (2002)

FFI NUMBER: FFI-018-1998

The restoration of the North Fork involves working throughout the lower watershed including North Fork mainstem, tributaries, and uplands to eliminate the loss of bull trout and westslope cutthroat trout to irrigation canals, manage riparian areas to protect habitat for native fish, and improve recruitment of native fish to the Blackfoot River. Restoration of the North Fork bull trout initially involved implementing compatible riparian grazing systems and eliminating fish entrainment on five canals on the North Fork. More recently, the North Fork restoration evolved a more holistic approach, enrolling landowners in conservation easement programs, incorporating water conservation measures in leaky ditches and restoring impaired tributaries including Spring, Rock, Kleinschmidt, Dry and Salmon creeks.

North Fork fish population monitoring program has included 1) bull trout redd surveys, 2) mark-and-recapture fish population estimates in the lower North Fork, 3) whirling disease sentinel cage studies, and 4) water temperature monitoring. The North Fork of the Blackfoot River is the primary Blackfoot River spawning tributary for fluvial bull trout. The North Fork also supports

populations of westslope cutthroat trout throughout the mainstem, along with rainbow, brown, and brook trout in the lower reaches. In 2001, we counted 75 bull trout redds in the index section of the North Fork compared to 123 in 2000, a decline of 47 redds. Poor access to the spawning site, low flows, and beaver activity contributed to this decline. In the downstream gaining area of an intermittent reach below a beaver dam, we found a concentration of bull trout redds dug by fish unable to access the known upper spawning sites. Past spawning surveys in this reach found no spawning in this location. This downstream spawning site is located in an area of groundwater upwelling, a habitat feature necessary for successful reproduction. Future young-of-the-year (YOY) monitoring should determine the success of bull trout reproduction in the lower North Fork. Following the spawning period, beaver dams, and very low flows also restricted the downstream movement of out-migrant bull trout.

Population estimates using mark-and-recapture surveys in August 2001 found a continued upward trend in the densities of larger bull trout for the lower North Fork monitoring section (mile 2.3-5.9) (Figure 11). Bull trout densities (fish >12") increased from 3.8 fish/1,000' in 1998 to 8.0 fish/1,000' in 2001. Poor upstream passage from the lower North Fork probably contributes to this increase. Conversely, catch statistics indicate fewer juvenile bull trout (6.0-12.0") compared to 1998. Densities of larger westslope cutthroat trout (fish >8.0') showed almost no change compared to 1998, and indicate a continued upward trend that began in the early 1990s. Brown trout (fish >12.0") continue to show slight declines. Rainbow trout (fish >12.0") densities declined from 3.3 in 1998 to 1.0 fish/1,000' in 2001 (Figure 11).

Sampling showed that bull trout numbers increased, but the number of bull trout redds declined. Low flow conditions related to drought likely prevented typical spawning migration. Longer term monitoring with better flow regimes are necessary to evaluate these projects.

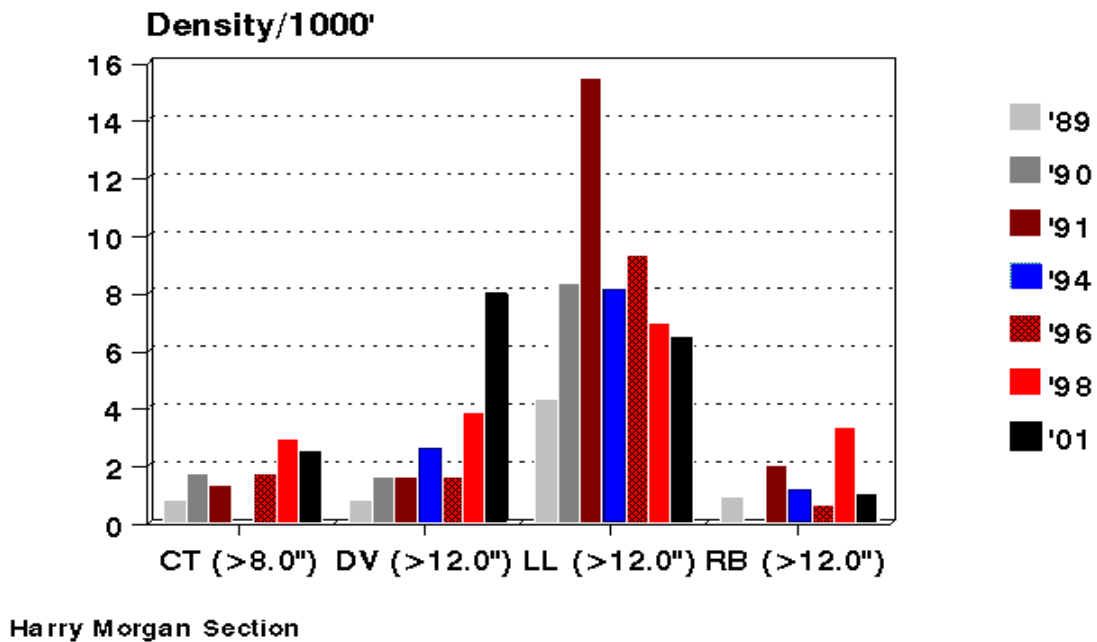


Figure 11. Estimated trout densities in the Harry Morgan Section of the North Fork Blackfoot River, 1989-2001.

Pearson Creek Woody Debris Placement

WATER NAME: Pearson Creek– Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce and Podner (2000); Schmetterling (2000); Pierce et al. (2002)

FFI NUMBER: FFI-052-1999

Pearson Creek is a small (base-flow of approximately one cfs) second order tributary to Chamberlain Creek that has had a history of channel alterations, irrigation de-watering, and improper land management impacts along its lower 2 miles. Between 1999 and 2000, instream habitat restoration, fencing of the riparian area along with off-channel water developments, shrub plantings along the streambanks, conservation easements, and water leasing were completed. We continued to monitor fish population response to the restoration project in the area of the water lease by performing single electrofishing passes at stream mile 1.1. Data from 1999 represents pre-project information while 2000 and beyond is post-restoration data.

Populations of westslope cutthroat trout young-of-the-year (YOY) and age 1 and older have declined since restoration work took place in a section (mile 1.1) on Pearson Creek (Figure 12). This sampling site is located in a stream reach influenced by a water lease and related riparian improvements (riparian fencing and habitat restoration). In 2001, we found no YOY in the survey section, compared to a YOY density of $31 \pm 3/100'$ in 2000. In 2002, our survey indicates successful reproduction in the project area. However, age I+ westslope cutthroat trout densities continued to decline in the survey reach. **Population declines of westslope cutthroat trout can be attributed to a combination of factors including 1) the loss of the 2001 year class, 2) continued drought, and 3) excessive livestock access to the project area due to the failure of an electric fence.**

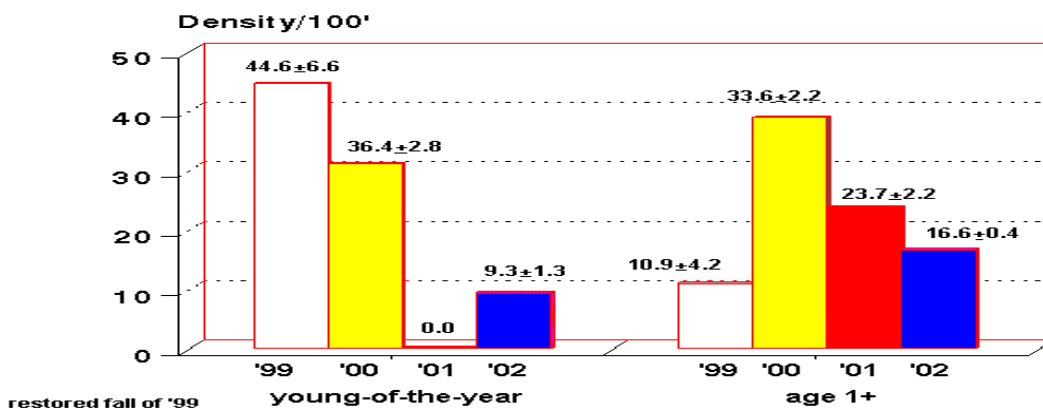


Figure 12. Westslope cutthroat trout densities for Pearson Creek at stream mile 1.1, 1999-2002.

Poorman Creek Channel Restoration & Flow Enhancement

WATER NAME: Poorman Creek– Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce et al. (2002)

FFI NUMBER: FFI-012-2001

In 1999, we assessed fish populations and habitat conditions in lower Poorman Creek. These surveys identified fish loss to ditches and extensive habitat problems in the lower 2 miles of the stream (Pierce and Podner 2000). These initial surveys helped set the stage for a comprehensive restoration project to improve riparian habitat conditions and enhance instream flows, eliminate fish losses to irrigation ditches, restore migration corridors, and improve recruitment of native

fish to the Blackfoot River. Currently in the development phase, the project will likely involve conversion of flood to sprinkler irrigation, eliminate fish loss to ditches, enhance instream flows with salvage water and develop compatible riparian livestock grazing methods.

Poorman Creek supports populations of westslope cutthroat, brown, and brook trout and is one of two Garnet Mountain streams to support bull trout reproduction. In 2001, we established fish population monitoring sites immediately up and downstream of the irrigation project, plus one in each of the two irrigation ditches. Estimated total trout densities declined significantly from 11.1 ± 1.6 fish/100' above the upper diversion (mile 1.5) to 2.9 ± 2.0 fish/100' below the lower diversion (mile 1.3). The catch per unit effort (CPUE) surveys indicate a portion of the decline can be attributed to fish losses in the upper ditch (mile 1.4) (Figure 13).

Baseline data that has been obtained that will be compared to future post-project data. Preliminary conclusions for the baseline data suggest fish losses to the irrigation system.

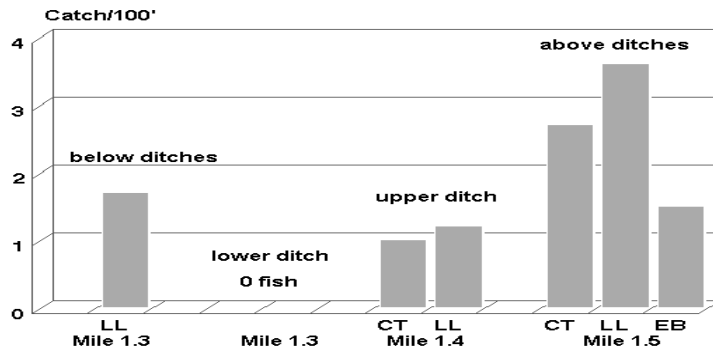


Figure 13. CPUE for Poorman Creek fish sampled up and downstream of two diversions and in the ditches, August 2001.

Rock Creek Restoration

WATER NAME: Rock Creek – Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Peters (1990), Pierce (1991), Pierce et al. (1997), Pierce and Schmetterling (1999), Koopal (1998); Pierce and Podner (2000); Pierce et al. (2002)

FFI NUMBER: FFI-005-1996, FFI-033-1996, and FFI-018-1998

Rock Creek, the largest tributary to the lower North Fork Blackfoot River, has been the focus of restoration activities throughout the 1990s. Rock Creek, a basin-fed stream over most of its length, receives significant groundwater inflows between mile 1.2 and 1.6. Rock Creek was degraded over most of its 8.2-mile length due a wide range of historical channel alterations and riparian management activities (Pierce and Peters 1990, Pierce et al. 1997).

In 2001, we reconstructed 5,800' of degraded and over-widened stream (mile 3.8-5.0 pre-project length) to an E4 channel type. This project reduced mean bankfull width from 23.0' to 7.9', increased mean bankfull depth from 0.4' to 1.3' and increased total stream length from 5,800' to 8,130'. The restoration project also incorporated instream woody debris and shrub plantings, along with fencing, offstream water and the removal of a streamside corral, which brings the total amount of restored stream to ~6.8 miles.

Rock Creek supports spawning migrations of brown and rainbow trout in lower reaches. Middle reaches provide westslope cutthroat and bull trout migration corridors to headwater areas. In 2001, fish populations were surveyed in a reach of channel reconstructed in 1999; the fish community shifted from a brook trout to a more brown trout dominated reach, with low densities of bull trout (CPUE=3 fish/100') now present in the reconstructed channel. **Preliminary data suggest that habitat restoration in Rock Creek may have influenced population shifts.**

Shanley Creek Diversion and Riparian Fence

WATER NAME: Shanley Creek – Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce et al. (2002)

FFI NUMBER: FFI-038-1998

Shanley Creek, the primary tributary to Cottonwood Creek, has been the focus of several riparian improvement projects. Since 1994, most of the restoration work focused on improving riparian grazing practices and upgrading irrigation systems to reduce fish losses and conserve water. Currently, the lower 1.8 miles of Shanley Creek are under riparian grazing management strategies. Fish populations were resurveyed at three locations influenced by restoration projects (mile 0.2, 1.4, and 1.6). In 1993, we established the downstream monitoring station (mile 0.2) in a degraded section of Shanley Creek prior to livestock exclusion. The middle survey section was sampled two years following the implementation of a rotational grazing system. The upper sample site was established immediately downstream of the Bandy Reservoir diversion before ditch screening. **The survey results indicate improved westslope cutthroat trout densities throughout these project reaches (Figure 14).**

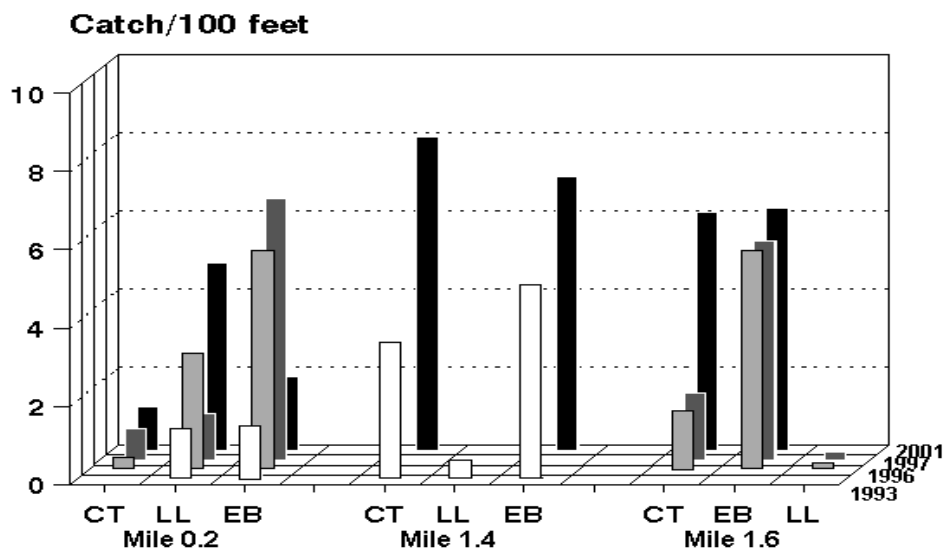


Figure 14. CPUE for salmonids (fish >4.0'') sampled at three locations in Shanley Creek.

Spring Creek (trib. to North Fork) Diversion Fish Passage

WATER NAME: Spring Creek (trib. to North Fork) – Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce et al. (2002)

FFI NUMBER: FFI-018-1998

Spring Creek, a small westslope cutthroat trout dominated tributary of the North Fork Blackfoot River, originates on the north side of Ovando Mountain. It flows 6 miles south where it enters the lower North Fork at mile 9.9 with a base flow of less than one cfs. Spring Creek has a history of irrigation impacts (dewatering and entrainment) to westslope cutthroat trout and fish passage problems (undersized culvert) affecting the upstream movement of juvenile bull trout. The restoration of Spring Creek fish populations began in 1998 with the installation of a new irrigation diversion retrofitted with a denil fish ladder at mile 1.8. In 2000, we replaced an undersized culvert (mile 0.5) with a baffled squash-pipe. The culvert and installation were designed to pass all fish including young-of-the-year (YOY) bull trout. The goal of the work was to restore migrations of juvenile bull trout and reduce losses of fish to irrigation ditches and maintain minimal instream flows. In 2001, we re-sampled fish populations above the new culvert on lower Spring Creek. The survey found the culvert was passing juvenile bull trout including YOY (Figure 15). **Sampling suggests that westslope cutthroat trout densities have increased and fish passage has been accomplished.**

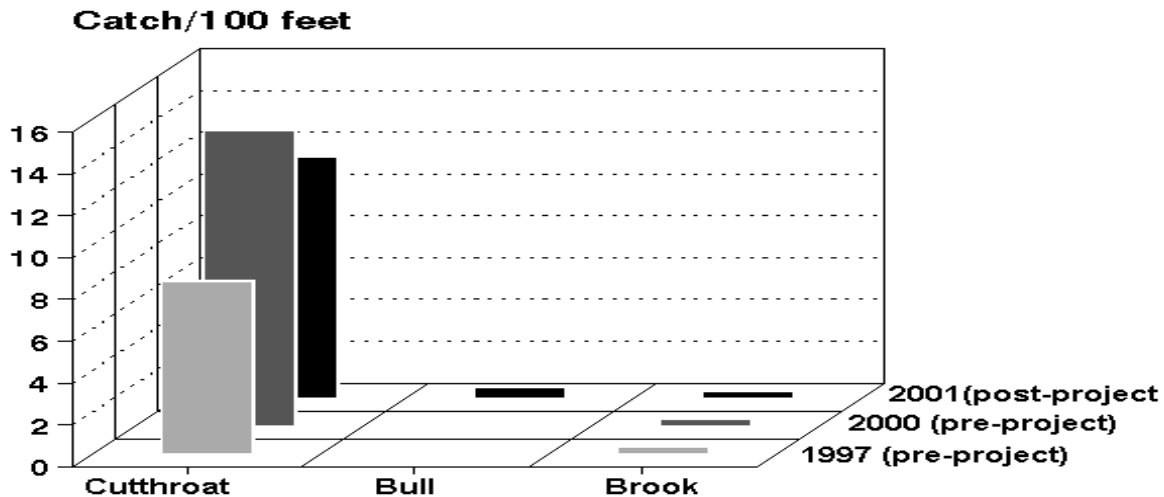


Figure 15. CPUE for fish captured upstream of the Spring Creek culvert crossing (mile 0.6), 1997, 2000 and 2001.

Warren Creek Channel Restoration

WATER NAME: Warren Creek– Blackfoot River

DATA PROVIDED BY: Ron Pierce, FWP

DETAILED REPORT CITATION: Pierce et al. (2002)

FFI NUMBER: RRA-031-1993, FFI-026-1999 and FFI-036-2000

Warren Creek, a small tributary to the middle Blackfoot River, originates on Ovando Mountain, flows 12 miles southwest through knob-and-kettle topography until its junction with the Blackfoot River at river mile 50. Warren Creek water is used for irrigated hay production and livestock watering. Irrigation withdrawal causes the middle section of Warren Creek to dewater, although the lower section gains inflow from springs and maintains perennial base-flow of 3-5 cfs. Some of the riparian areas in the mid-to-lower portion of the stream were cleared, heavily grazed, dredged and straightened, degrading salmonid habitat over most of the length of Warren Creek. In 2001, restoration was completed on lower Warren Creek with a comprehensive restoration project on 3.4 miles (mile 0.6 and 4.0) of the stream. The project focused on channel reconstruction in areas of historic channel dredging and increased stream length 46% from 6,080' to 8,870' in a straightened reach. Related projects included building floodplain within incised channels, livestock management changes (fences, well, offstream water) over the length of the project, replacement of an irrigation diversion, instream woody debris placement, riparian shrub plantings, and restoration of two drained wetlands.

Both fish population and temperature have been monitored in the project reach. Sampling of fish populations at three locations within the project area (mile 1.1, 2.1 and 3.6). The surveys indicate general improvement in densities for fish >4.0 inches from 2000 to 2001, but brown trout numbers declining at miles 1.1 and 2.1 between 2001 and 2002. (Figure 16). Brook trout (fish >4.0") densities showed continuous increases at the mile 3.6 sampling site. **Fish densities have been maintained or improved since restoration.**

CPUE (Fish >4.0") at three locations on Warren Creek

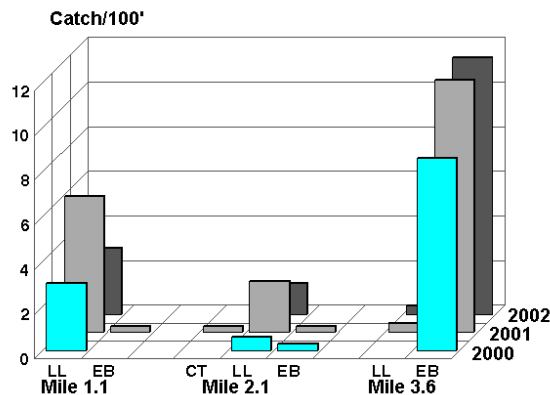


Figure 16. CPUE for fish >4.0" at three sampling locations on lower Warren Creek, 2000 (pre-project) and 2001-2002 (post project).

Clark Fork River Drainage

East Fork Bull River Bank Stabilization and Channel Restoration

WATER NAME: East Fork Bull River – Clark Fork River

DATA PROVIDED BY: Laura Katzman, FWP

DETAILED REPORT CITATION: Katzman (in Prep.)

FFI NUMBER: FFI-011-1998

Channel restoration and bank stabilization planned for a section of the East Fork of the Bull River on Robert Stein's property was completed in 2001. Pre-restoration fisheries abundance data was collected in 2000 and 2001 and post-restoration information was obtained in 2002 (Figure 17). Estimates for all species were substantially lower in 2002 than previous years. The 2002 data is likely not representative of a post-treatment fish population since the channel was dry during re-construction (water was rerouted in another channel for about six weeks) and fish likely have not yet completely re-populated the new channel. Thus, the abundance of fish will likely increase in future years and reflect the improved habitat quality in the reach. Weir and trapping data have also been collected near the project site.

Data collect from 2000-2002 should still be considered baseline data that will be comparable to future estimates and fish trap catches.

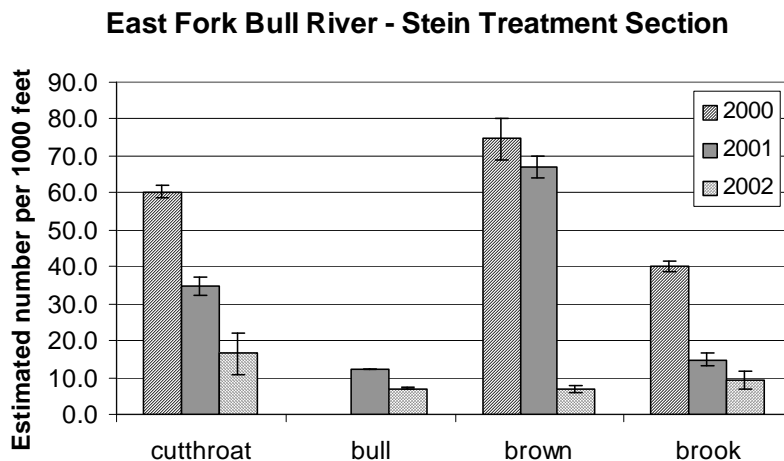


Figure 17. Number of westslope cutthroat, bull, brown, and brook trout estimated per 1,000 feet of channel length (standard deviations shown by vertical lines) in the FFI project treatment area during 2000 & 2001 (pre-treatment) and 2002 (post-treatment).

Elk Creek Channel Restoration

WATER NAME: Elk Creek – Clark Fork River

DATA PROVIDED BY: Laura Katzman, FWP

DETAILED REPORT CITATION: Katzman (in Prep.)

FFI NUMBER: FFI-049-1996

The lower portion of Elk Creek, a tributary to the Clark Fork River near Heron, Montana, was rehabilitated in late 1997. Rehabilitation consisted of bank stabilization and channel reconstruction. The stream supports populations of brook and westslope cutthroat trout. The objective was to increase numbers of trout, especially westslope cutthroat trout. Following extensive restoration, 25,000 westslope cutthroat trout fry were planted in 1999; in 2000, 36,000 additional fry were stocked. The goal of the restoration was to increase the number of trout and hopefully native westslope cutthroat trout. Fisheries abundance data was collected at five sites to monitor this restoration work. Pre-restoration data was collected in 1997 and post-restoration data from 1998 to 2002. High flows in 2002 caused some of the restoration projects in Elk Creek to fail to various degrees. As a result, the Elk Creek Watershed Council is in the process of reassessing portions of the Elk Creek channel to try to determine the cause of the failure of the projects and future restoration needs. Since much of the restoration being monitored is no longer meeting the original objectives, our monitoring will likely change in the future. Monitoring of fish populations found that trout populations went up dramatically in the New 1 restoration section in 2001 and 2002 (Figure 18). A substantial increase in the brook trout population was responsible for the rise; the habitat degradation that occurred in 2002 is not reflected in this section. In all other treated sections, population trends of all trout combined showed overall positive trends (Figure 18) and had shown increases not observed in the control section because of dewatering. **The data suggests that this FFI project has increased fish populations in the treatment areas. Habitat degradation may reverse observed trends.**

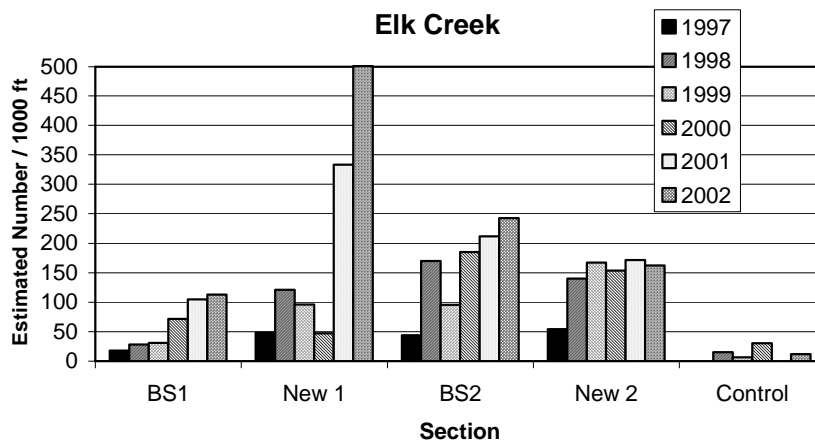


Figure 18. Number of trout (westslope cutthroat and brook trout combined) estimated for five sections of Elk Creek in 1997 (pre-project) and from 1998 to 2000 (post-project). Estimates were made in two bank stabilization treatment sections (BS1 and BS2), two sections where the channel was reconstructed (New 1 and New 2), and one control section in a Wilderness Area (Control).

Prospect Creek Channel Restoration

WATER NAME: Prospect Creek – Clark Fork River

DATA PROVIDED BY: Laura Katzman, FWP

DETAILED REPORT CITATION: FWP files, Thompson Falls, Katzman (in prep.)

FFI NUMBER: FFI-053-1999; FFI-024-2000

Extensive restoration was completed in lower Prospect Creek in 1999 and some additional restoration was completed in 2001. Monitoring of Prospect Creek has included trapping and

redd surveys occurred between 1999 and 2001. Flows in Prospect Creek during 2002 caused many of the restoration projects to fail to various degrees. As a result, the Prospect Creek Watershed Council is in the process of reassessing the channel and its future restoration needs. Much of the restoration is no longer meeting the original objectives; monitoring will be modified accordingly in the future.

The status of out-migrating juvenile trout was monitored in the Prospect Creek drainage using a rotary screw trap from March to October 2000 and April to July 2001. In 2000, 120 identifiable trout were captured in the screw trap and in 2001, 148 were captured. Most of the trout captured were rainbow and brown trout; however, some westslope cutthroat trout, bull trout, brook trout, and *Oncorhynchus* spp. were captured (Table 1). *Oncorhynchus* spp. was used to identify juvenile rainbow and cutthroat trout that had not yet developed the pigmented throat slash. Some of the westslope cutthroat trout captured appeared to be hybridized. All fish greater than 50 mm total length, except sculpin and recaptured fish, were given a caudal fin clip, alternating upper and lower clips on a weekly basis. These fish were released upstream approximately 75 meters at a predetermined site to determine trap efficiency. Although trap efficiencies have not yet been calculated, they were low. In 2000, 7 of 120 identifiable trout were recaptured (5.8%) while in 2001, 15 of 148 identifiable trout were recaptured (10.1%).

Table 1. Number and percent of bull trout (BLT), westslope cutthroat trout (WCT), rainbow trout (RBT), *Oncorhynchus* spp. (ONC), brown trout (BRN), and brook trout (BRK) captured at the Prospect Creek screw trap in 2000 and 2001.

	# BLT (%)	# WCT (%)	# RBT (%)	# ONC (%)	# BRN (%)	# BRK (%)
2000	5 (4)	13 (11)	56 (47)	11 (9)	30 (25)	5 (4)
2001	0	22 (15)	97 (66)	2 (1)	24 (16)	3 (2)

Redd counts were conducted in Prospect Creek from the confluence of Coyote Gulch to the upstream end of the canyon below the confluence of Clear Creek in November of 1999, 2000, and 2001. About 3,300 feet of the channel or 20% of the total length surveyed was improved with restoration projects prior to the 1999 counts. The distribution of redds observed in improved (treatment areas) and unimproved sections of stream in 1999 and 2000 were similar to the amount of available area. In 2001, fewer redds were observed and none were within improved sections of stream. It is possible that more brown trout spawned later than our survey and the distribution of redds at the end of the spawning season (which often extends into December) was more in proportion to the amount of improved and unimproved habitat available.

None of the depletion-removal population estimates sections monitored are influenced by Future Fisheries project work.

Information collected currently suggests that spawning fish have not yet responded to channel restoration in Prospect Creek. Also, since some restoration work is not now meeting the original goals and objectives, the monitoring data collected so far will likely be utilized as baseline data that we hope will improve following additional restoration work in the future.

Rock Creek (Garrison) Instream Flow and Habitat Improvement Project

WATER NAME: Rock Creek – Clark Fork River

DATE PROVIDED BY: Eric Reiland, FWP

DETAILED REPORT CITATION: Reiland (in prep.)

FFI NUMBER: FFI-020-1999

The Rock Creek (Garrison) Instream Flow and Habitat Improvement project was designed to improve fish and wildlife habitat and assist with riparian management on a degraded reach of Rock Creek. Rock Creek was dewatered, over-grazed, channelized, unstable and contained virtually no pool habitat within the lower 2.5 miles. This degraded condition eliminated its potential as a spawning tributary and resulted in it contributing excessive nutrients and sediment to the Clark Fork River. This project improved fisheries and wildlife habitat in both Rock Creek and the Clark Fork River through enhanced instream flow, nutrient and sediment reduction, habitat improvement, channel stabilization, and removal of fish passage barriers. It also provided spawning, rearing and overwintering salmonid habitat, increasing wild trout recruitment to the Clark Fork River. The Rock Creek project improved fish and wildlife habitat, while maintaining historical ranching traditions and building positive partnerships between landowners, government agencies and conservation groups.

The Rock Creek (Garrison) Instream Flow and Habitat Improvement project designed and installed an irrigation system to provide instream flows, as well as improved habitat, stabilized channel reaches and assisted with riparian management. The Project converted the ranch's flood irrigated pastures to a sprinkler irrigation system. All salvaged water was donated for instream flow (5-27 cfs). The lower 2.5 miles of Rock Creek had been annually dewatered for the past 35 years. In 2 years of monitoring, instream flows were never recorded below 7 cfs, even through the drought years of 2000 and 2001. Although dewatering was the most significant cause of habitat loss in lower Rock Creek, the channel still lacked pool habitat. Less than one pool per 300 feet was suitable for overwintering habitat in the lower 7,820 feet of channel. Above this reach, pool densities increase to approximately 3-7 pools per 300 feet. Channelization and removal of large woody debris have created insufficient habitat complexity. The project restored four meanders (bank stabilization and channel reconstruction), created 46 new pools and 16 new overhead cover areas. The habitat improvements, along with the instream flow water lease, generated new spawning opportunities for Clark Fork River trout and created excellent habitat for resident salmonids.

Fisheries investigations for the Rock Creek (Garrison) Instream Flow and Habitat Improvement Project included redd counts and electrofishing population estimates. In fall 2000, 2001 and 2002, brown trout redds were counted for the lower 2.5 miles of Rock Creek. Redds were counted three times with at least one week between counts. In 2000, the surveys found 4 definite redds, 9 probable redds and 4 test digs. In fall 2001, the number of redds increased to 16 definite and 4 probable. In fall 2002, the number of redds increased to 28 definite, 8 probable and 3 test digs.

Electrofishing estimates were conducted in fall 2001 and 2002. In 2001, the lower channel (historically dewatered reach) survey found 29 brown trout per 100 yards and 46 brown trout per 100 yards in the upper project area (9 fish > 10" and 15 fish > 10", respectively). In 2002, the lower channel (historically dewatered reach), the survey found 30 brown trout per 100 yards and 71 brown trout per 100 yards in the upper project area (18 fish > 10" and 25 fish > 10", respectively). The number of adult brown trout has almost doubled since the 2001 sampling, many of which may be spawning adults from the Clark Fork River. Westslope cutthroat trout were also sampled in the upper reach, indicating that they may be pioneering the area of restored habitat. Prior to project completion, the channel had been dewatered for the past 35 years.

Baseline redd counts and fish population estimates have been conducted to evaluate this project. The redd counts and population estimates indicate that brown trout and westslope cutthroat trout are increasing the use of the restored reaches of Rock Creek.

Judith River Drainage

Big Springs Creek Brewery Flats Channel Restoration

WATER NAME: Big Springs Creek – Judith River

DATA PROVIDED BY: Anne Tews, FWP

DETAILED REPORT CITATION: Tews et al. 2002; Tews et al. (In prep.)

FFI NUMBER: FFI-024-1997

Big Springs Creek in the Brewery Flats area consisted primarily of a straight, rock-lined channel with high velocities due to channelization that occurred around 1910. Future Fisheries Improvement Program funds were used to restore a more natural meandering channel-type by lengthening this section of channel from 2500 feet to 3900 feet. On the ground work started in 1998; water was placed in the new channel in after electrofishing was completed in September 2000.

Mark recapture data for trout populations were collected in August or September from three sections of Big Spring Creek. Sites included the Burleigh (5860 feet) and Brewery Flats sections above Lewistown and the 4394 feet Carroll Trail (Tresch) section below town. The Brewery Flats Section changed from 3704 feet (1995-2000) to 5104 feet in length thereafter. In 2000, a section only 3740 feet in length was electrofished at Carroll Trail. We have been electrofishing the entire Brewery Flats Fishing Access Site since 1995. Most of the section underwent restoration. However, reaches above and below the restored reach (total=1200 feet) are also included in the estimates. The restored reach comprises 3900 of the 5104 feet length. The Carroll Trail (Tresch) and Burleigh sections have somewhat natural meander pattern and are considered control sections for this project.

The Brewery Flats project increased the length of stream in the sampling section and we have noted a corresponding increase in the total number of trout in the section since 2000 (Figure 19). However, we have not yet observed an obvious improvement in fish production in Brewery Flats since reconstruction even though in both years since construction there have been higher than average numbers in the section (Figure 20). Rainbow trout numbers in the Brewery Flats Section were very similar to 2001, while brown trout numbers dropped slightly (Figures 21 and 22). Estimates of larger (>10 inches) rainbow trout have been amongst the highest ever observed since the project was completed (Figure 21). Drought has apparently taken a toll on rainbow recruitment throughout Big Spring Creek; near record low numbers of small rainbow trout were found in both the Burleigh and Carroll Trail Sections. The Carroll trail section had only had fewer small rainbow trout in 1976; it was the 3rd lowest ever reported for the Burleigh Section (Figure 23).

Average size of rainbow trout equal to or greater than 10 inches has increased by about an inch in all sections. Rainbow trout in the Brewery Flats Section are still about 1 inch shorter than rainbow trout in the Carroll Trail and Burleigh sections.

Baseline data have been collected to evaluate the FFI project for the Brewery Flats channel restoration. Additional time is required to allow the channel to adjust and function naturally and for woody vegetation to develop. The increased channel length created by this project will result in higher overall numbers, even if fish densities (number of fish per acre or mile) stay the same. However, we anticipate that fish densities will also increase as restoration induced habitat conditions continue to improve.

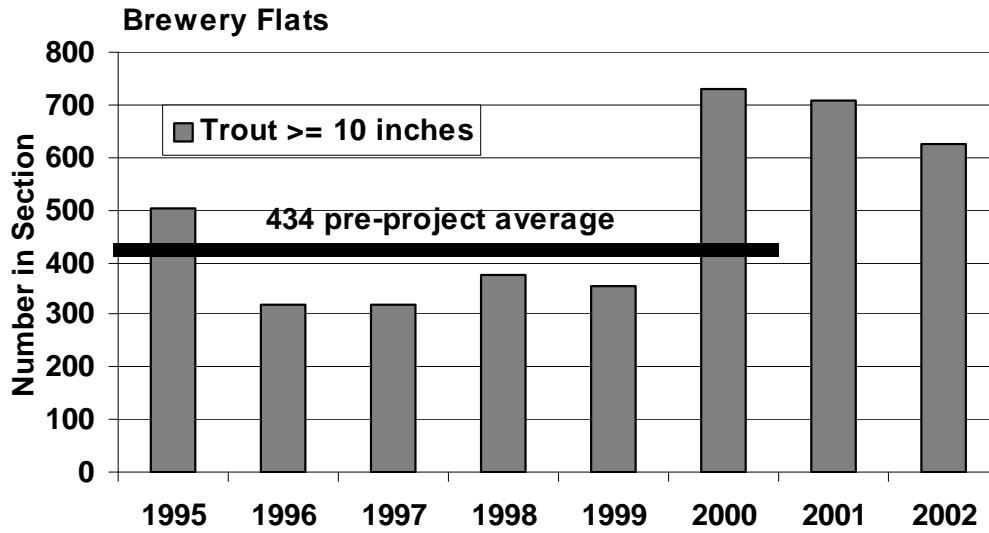


Figure 19. Estimated total number of trout 10 inches and longer in the Brewery Flats Section of Big Springs Creek, (1995 to 2002). PROVISIONAL DATA.

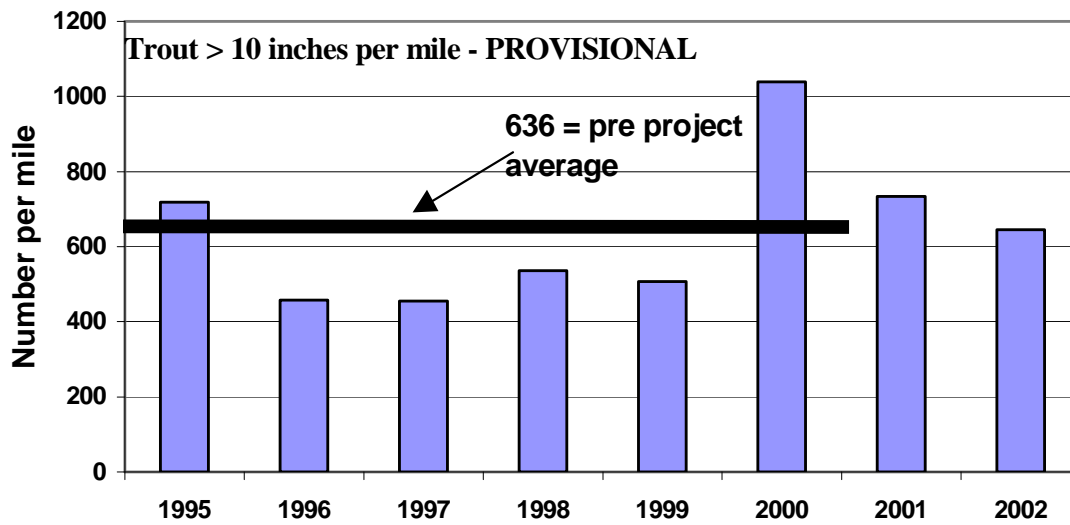


Figure 20. Provisional estimates of the number of trout per mile longer than 10 inches in the Brewery Flats Section of Big Springs Creek from 1995 to 2002. PROVISIONAL DATA.

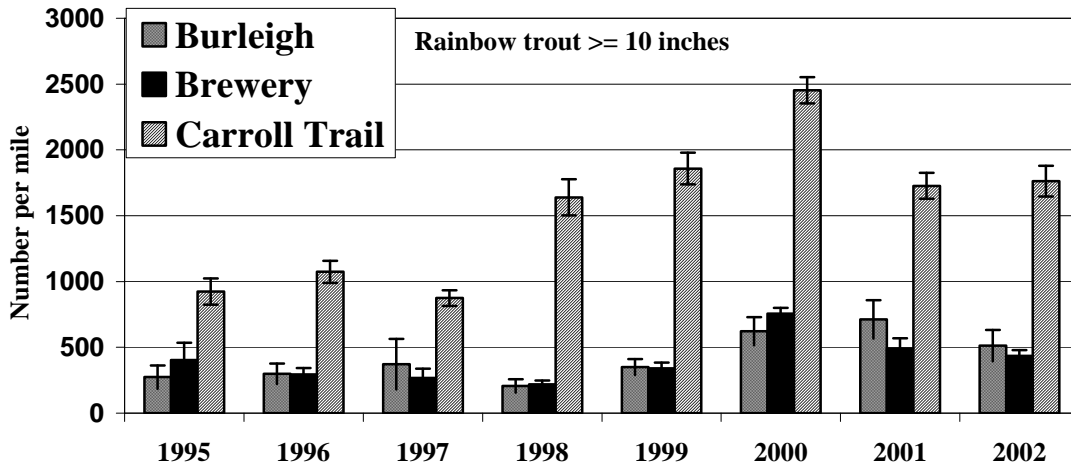


Figure 21. Estimated number and 95% confidence intervals (vertical lines) of rainbow trout 10 inches and longer per mile in three sections of Big Springs Creek from 1995 to 2002. PROVISIONAL DATA.

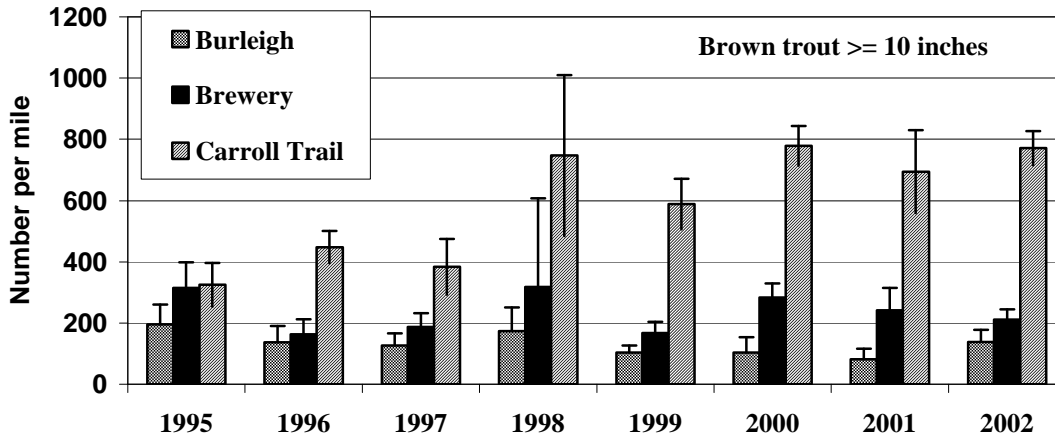


Figure 22. Estimated number (95% confidence intervals= \pm vertical lines) of brown trout 10 inches and longer per mile in three sections of Big Springs Creek, 1995 to 2002. PROVISIONAL DATA.

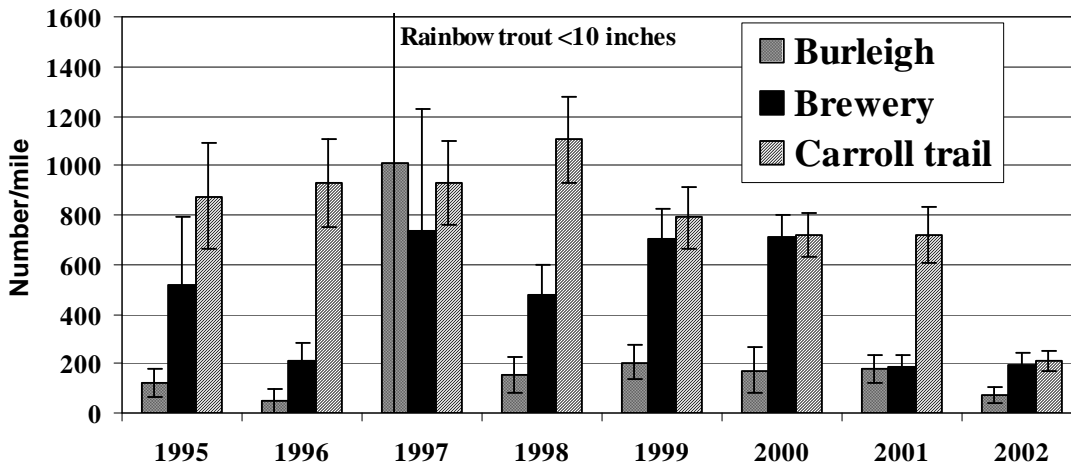


Figure 23. Estimated number (95% confidence intervals= \pm vertical lines) of rainbow trout per mile less than 10 inches in length from three sections of Big Springs Creek, 1995 to 2002. PROVISIONAL DATA.

Cottonwood Creek Bank Stabilization

WATER NAME: Cottonwood Creek – Judith River

DATA PROVIDED BY: Anne Tews, FWP

DETAILED REPORT CITATION: FWP files, Lewistown, Tews et al. (In prep.)

FFI NUMBER: FFI-008-1999

On 12 April 2001, a 765 feet section of Cottonwood Creek on the David Leninger Ranch was electrofished with a backpack unit; this section included the bank stabilization project area. The section sampled had been subjected to severe dewatering, although the channel had remained wetted in 2000 largely because of inflows from a tributary, Beaver Creek. In summer 2002, water levels were similar to conditions in 2000. A depletion estimate for brown trout, 17 ± 1 per 1,000 feet was obtained; the average length was 10.5 inches. In addition to brown trout, the only other game fish sampled was mountain whitefish; however, longnose dace, longnose suckers, mottled sculpin, mountain suckers, and white suckers were also captured (Figure 24).

Water temperatures were monitored at this site in 2002 from June 27 –November 7. Maximum water temperatures recorded exceeded 85°F in mid-July, suggesting poor thermal regime for survival of salmonids.

Fish population data collected in the project area shows low densities of fish following project completion. Dewatering and associated high water temperatures appear to be limiting factors that were not addressed by the project. No conclusions can be made until better flow regimes are achieved and drought conditions abate.

Cottonwood Creek - April 2001

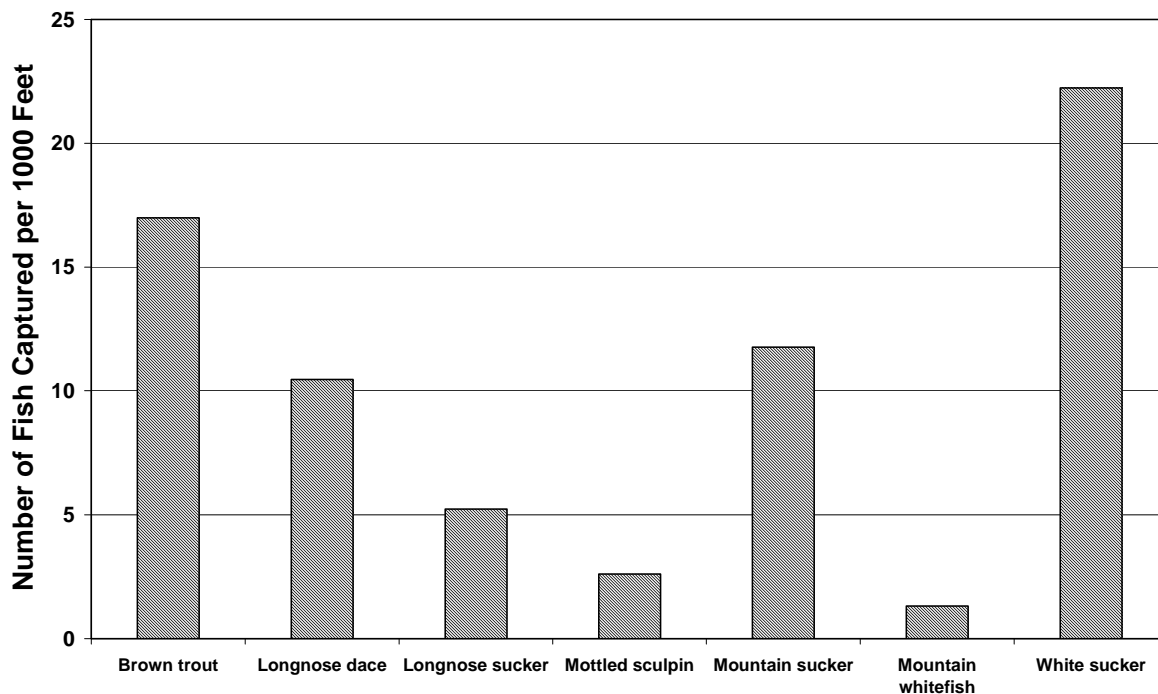


Figure 24. CPUE/Relative abundance of fish from 2 passes in a section located on Cottonwood Creek, Leninger Ranch, on April 12, 2001.

Missouri River Drainage

Deep Creek Channel Restoration

WATER NAME: Deep Creek - Missouri River above Townsend

DATA PROVIDED BY: Ron Spoon, FWP

DETAILED REPORT CITATION: Hydrotech (2002), FWP files, Townsend, MT

FFI NUMBER: FFI-017-1996

In 1996, a plan was formulated and implemented to address watershed problems in the Deep Creek drainage upstream from Canyon Ferry Reservoir near Townsend, Montana. Restoration activities that included watershed restoration, stream stabilization and habitat enhancement to address water quality and fisheries concerns were completed between 1996-1999.

Brown trout redd counts were completed during the fall in an upper reach (Clopton Lane to Highway 12 Bridge) in 1991 (pre-project) and post-project in 1999 and 2001. Beaver dams in the reach were also counted to provide trend information. The number of brown trout redds observed in the reach increased dramatically between 1991 and 1999 but then declined in 2001 (Figure 25). The decline in 2001 may be partially or whole related to the timing of the redd count, which was two weeks earlier than in 1999. However, the number of redds observed in 2001 was still twice that of pre-project levels.

Beaver activity has also greatly increased from 1991-2001 (Figure 25). In 1991, all dams were located in the lowest sections of the redd count reach; today, they are distributed throughout the reach. Although this created impassable barriers and inundated spawning sites, it also created rearing, adult holding and winter habitat, which may have increased brown trout population levels in the reach. The increased number of resident brown trout could also be at least partially attributable to the habitat and stabilization work. Many of the revetments that stabilized eroding banks have been inundated. **Data indicates brown trout redd counts increased and remained at higher levels than in the pre-project survey. An increase in the number of beaver dams and restoration work likely stimulated an increase in brown trout numbers in the reach.**

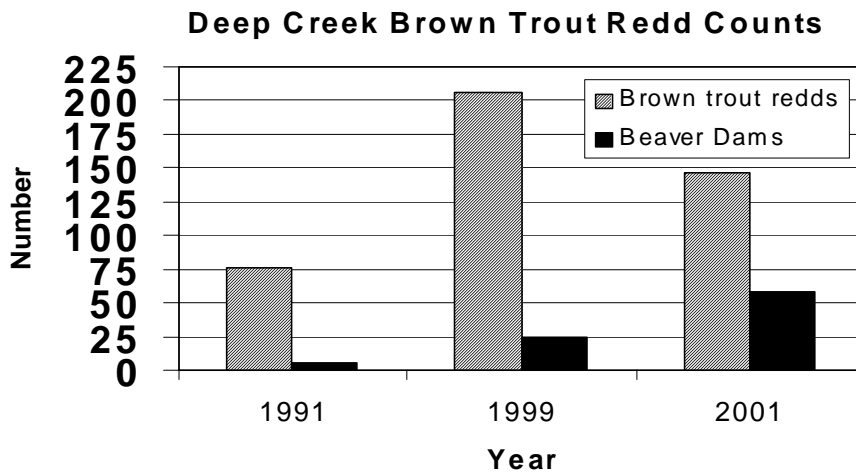


Figure 25. Brown trout redd counts and beaver dam numbers in Deep Creek, 1991 to 2001.

Prickly Pear Creek Bank Stabilization \ Prickly Pear Creek Channel Restoration

WATER NAME: Prickly Pear Creek-above and below Sierra Road(Anders and Burnham)

DATA PROVIDED BY: Brad Shepard, FWP

DETAILED REPORT CITATION: Shepard (2000), FWP files, Great Falls, MT

FFI NUMBER: FFI- 018-1999; 023-2000

A channel restoration project on Prickly Pear Creek within the Anders' property was evaluated on April 15, 1999, prior to its construction, by conducting a mark-recapture population estimate for both brown and rainbow trout in an approximately 1.9 mile long section of Prickly Pear Creek from the Police Academy down to Anders' private bridge. This sample section was segregated into four subsections (A-D) with the lower subsection (D) lying totally within the proposed project area (Table 2).

Table 2. Description and lengths (ft) of subsections within the sample section of Prickly Pear Creek below the Sierra Road.

Subsection	Length (ft)	Upper Boundary	Lower Boundary
A	1750	Police Academy bridge	Second fence below bridge
B	1900	Second fence below bridge	Just above power line
C	2500	Just above power line	Fence at top of Anders
D	3900	Fence at top of Anders	Anders' bridge

A mobile electrode system was used to sample this section of stream. A modified Peterson's population estimate was made. On June 7, 2000 a mark run was initiated; however, sampling was terminated prior to completing subsection B due to extremely hot weather warming water temperatures from 59° F at 11:30 AM to almost 70° F by 1:30 PM causing stress to the fish. Approximately 1350 feet of subsection B was sampled. Only average lengths and weights and length frequencies were computed for fish captured in 2000.

The FFI project above the Sierra Road (023-2000) was not evaluated in 2000, prior to its construction, because drought conditions led to the total dewatering of this portion of the creek as early as June 1, 2000 by irrigators (personal communication, Mark Lere, Montana FWP, Helena).

In 1999, the 1.9 mile long section below the Sierra Road contained an estimated 277 (SD: ± 17.1) brown trout and 216 (SD: ± 9.7) rainbow trout 5 inches and longer. When this estimate was subdivided by subsection and standardized to the estimated number of fish per 1,000 feet of channel length, it was obvious the segment of channel proposed for restoration contained significantly fewer trout than the other portions of the channel sampled, except for rainbow trout between the Anders' Section (D) and subsection B (Figure 26). Numbers of brown trout per 1,000 feet in subsection B were significantly higher than the other three subsections, while numbers of brown trout in subsection D (the proposed treatment section) were significantly lower than the other three sections. Numbers of rainbow trout were not significantly different between the four subsections. During sampling four young walleye were captured in subsection D during the marking run, but none were captured during the recapture run.

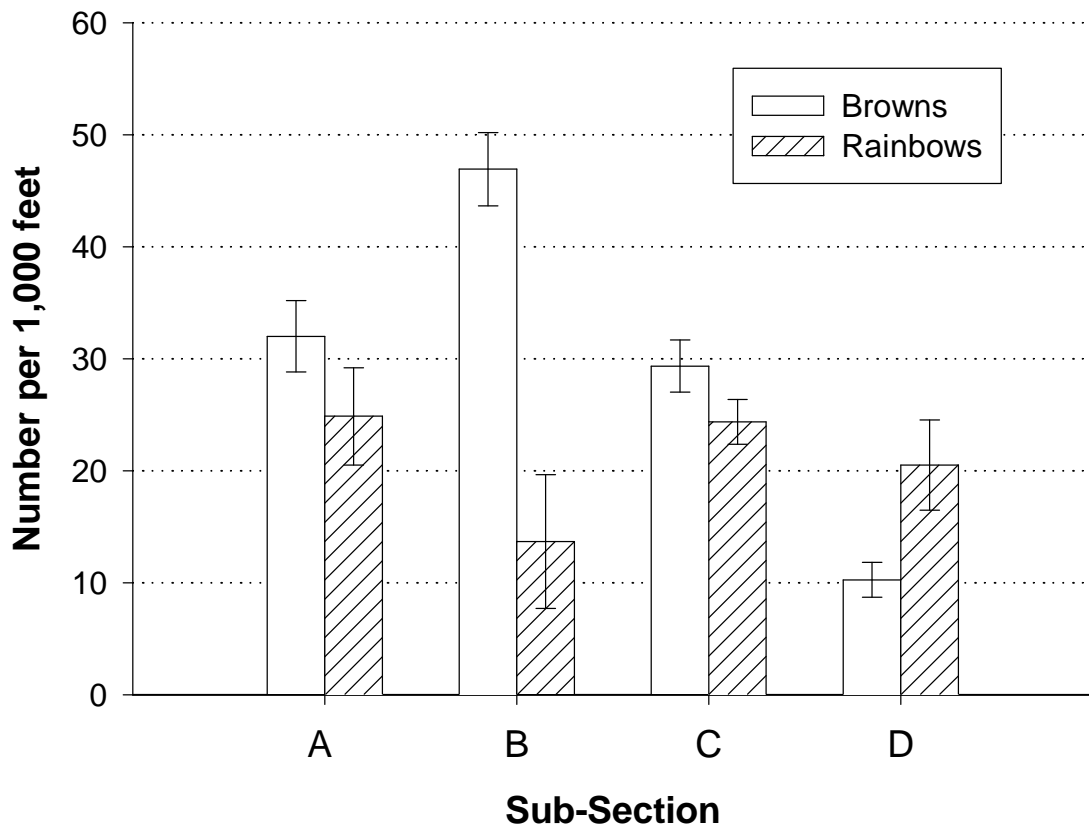


Figure 26. Population estimates (vertical lines represent standard deviations) of brown and rainbow trout 5 inches and longer in four subsections of Prickly Pear Creek below the Sierra Road in April 1999.

Brown trout averaged longer and weighed more than captured rainbow trout although relatively large fish of each species were captured. Rainbow trout in subsection D, the proposed FFI treatment section averaged longer in 1999 than in the other 3 subsections, but brown trout averaged shorter. The four walleye captured in 1999 were from 11.3 to 12.5 inches long. Length frequency information suggests that no major differences existed in length frequencies for rainbow and brown trout between the subsections (Figures 27 and 28).

Monitoring of these subsections post-construction of the FFI project will provide evidence of whether the FFI project improved the fish population within the treated portion of the stream channel. Monitoring of this section in 2000 was not possible due to extremely high water temperatures that made sampling impossible. It would have been preferable to obtain an additional year of “pre-treatment” data. We attempted to electrofish this section during spring 2002, but high flows quickly followed warm water temperatures and very low flows prevented us from sampling. **Pre-treatment, baseline data has been obtained. We plan to re-sample the section in 2003 or 2004 to assess post-treatment conditions.**

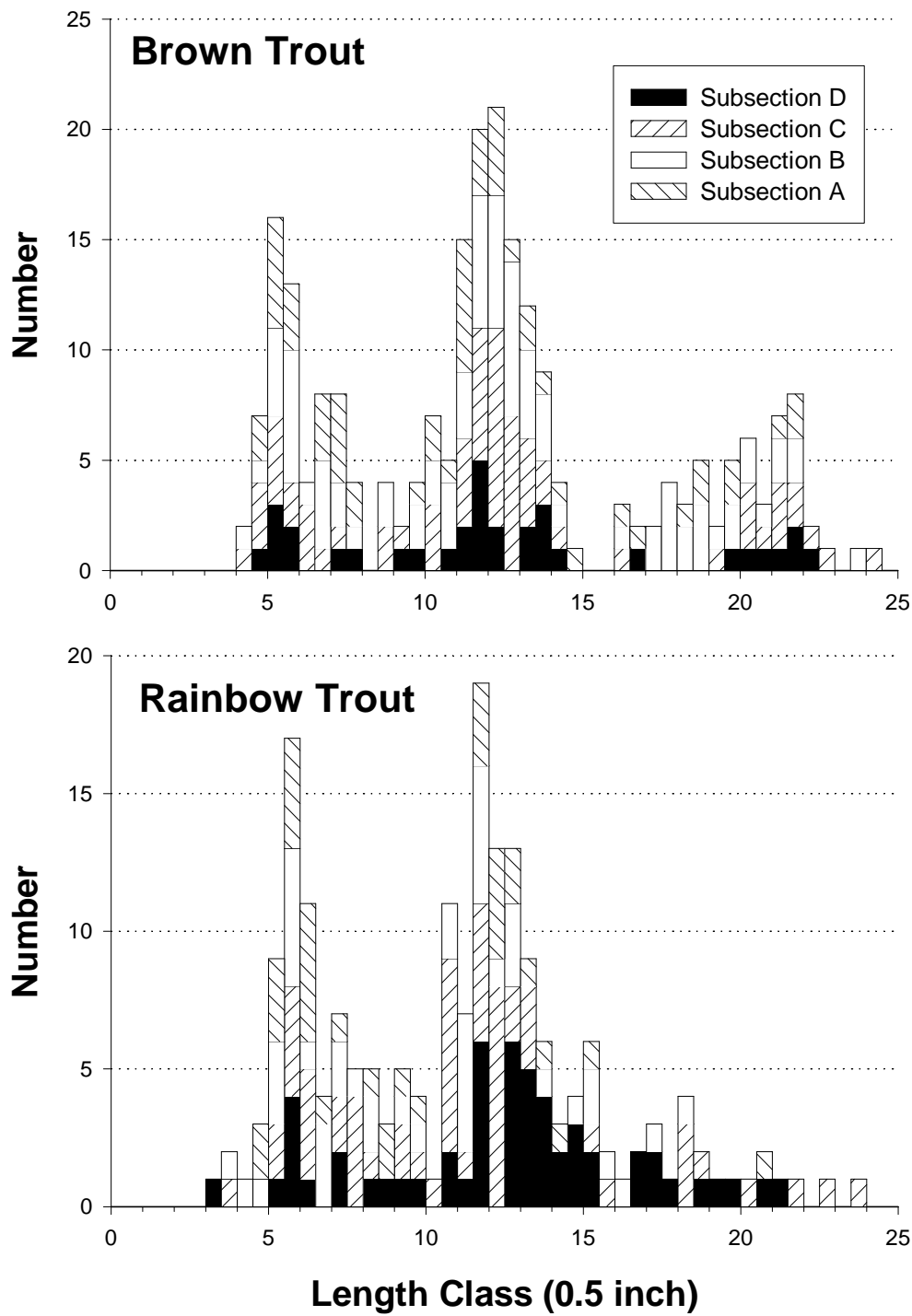


Figure 27. Length frequency histograms for brown trout (top) and rainbow trout (bottom) by subsection captured in Prickly Pear Creek during April 1999.

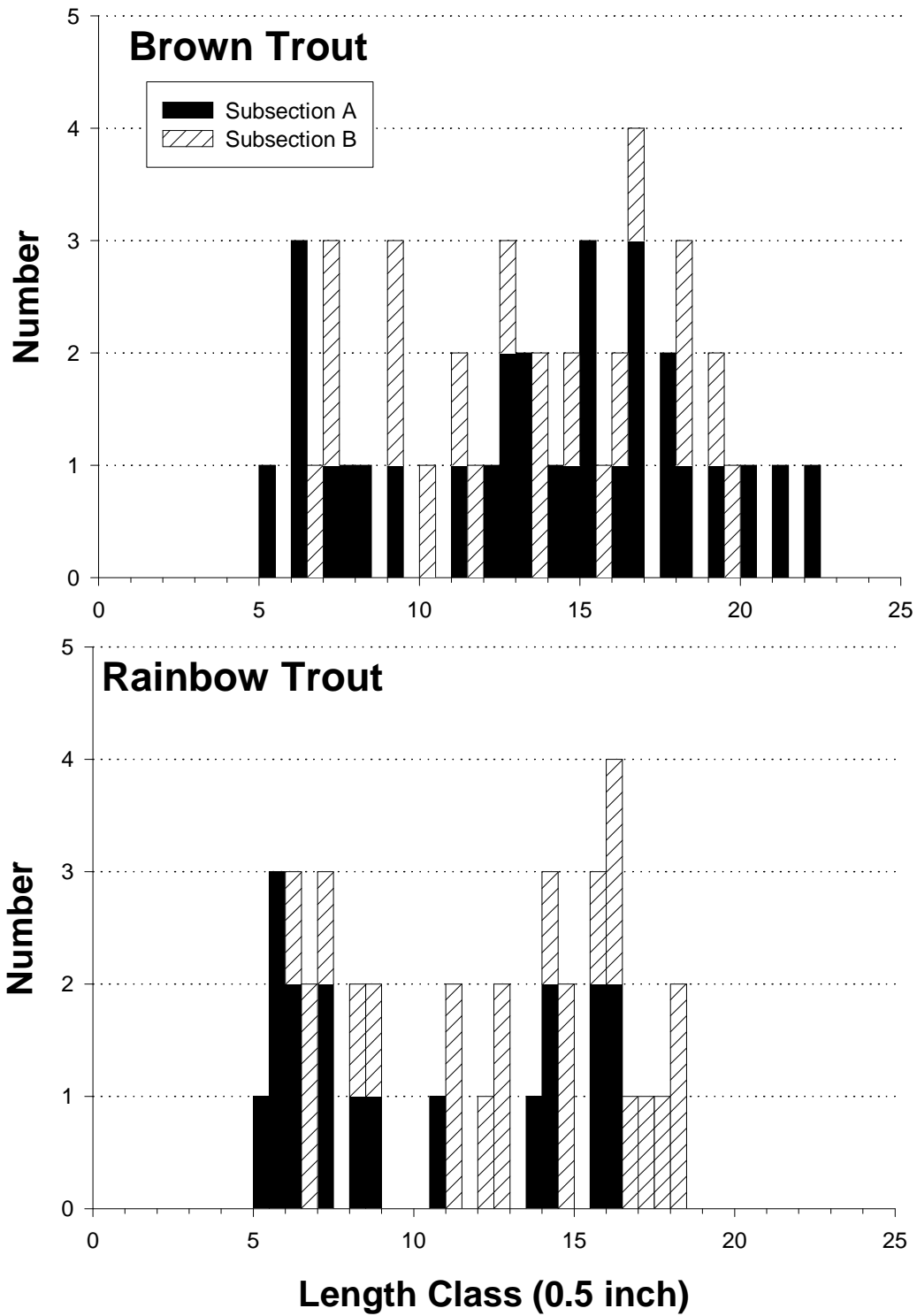


Figure 28. Length frequency histograms for brown trout (top) and rainbow trout (bottom) by subsection captured in Prickly Pear Creek during June 2000.

Sun River Drainage

Elk Creek Bank Stabilization \ Channel Restoration (Krause)

WATER NAME: Elk Creek – Sun River

DATA PROVIDED BY: Bill Hill, George Liknes, FWP, Sue McNeal, USFWS

DETAILED REPORT CITATION: Tews et al. (In prep.): FWP files, Great Falls

FFI NUMBER: FFI-023-1997, FFI-006-2001

Two sections on upper Elk Creek at the Krause Ranch that were electrofished in April 2000 were re-surveyed in April 2002. The upper section, located downstream of the bridge on the county road, was a channel restoration project that was completed in 1999. The relative abundance of rainbow and brook trout were similar in 2000 (Figure 29). Rainbow trout were found at similar levels in 2002, but brook trout numbers showed a substantial decline when compared to 2000; however, both rainbow and brook trout abundance showed a declining trend from 2000 data (Figure 29). Mottled sculpin were numerous. Removal population estimates were obtained in 2002. We estimated rainbow trout densities at 51 per 1,000 feet (95% CI = 42-70), a brook trout point estimate of 11 per 1,000 feet (95% CI = 10-26), and a mottled sculpin population estimate of 88 per 1,000 feet (95% CI = 81-103). The mean length of rainbow and brook trout increased in the upper section between 2000 and 2002.

The lower section, located downstream of the ranch buildings, was a channel restoration project that was completed in 2001 after the baseline survey in 2000. The 2000 data represents pre-treatment data and 2002 represents preliminary post-treatment abundance. The relative abundance of rainbow trout increased following channel restoration (Figure 30). Both brook and brown trout catch declined from 2000 (Figure 30). Mottled sculpin were present. We also obtained removal population estimates in a 992 feet reach in the lower treatment area in 2002. We estimated rainbow trout population levels at 44 per 1,000 feet (95% CI = 40-53), brook trout densities of 26 per 1,000 feet (95% CI = 24-33), and a brown trout estimate of 12 per 1,000 feet (95% CI = 10-22).

Changes in the species composition of the trout population between 2000 and 2002 in both the upper and lower section may be a response to improved pool habitat, cover, and sediment conditions in the treated reaches, especially when taking into consideration drought conditions during that period. The increase in rainbow trout abundance suggests a response to the project.

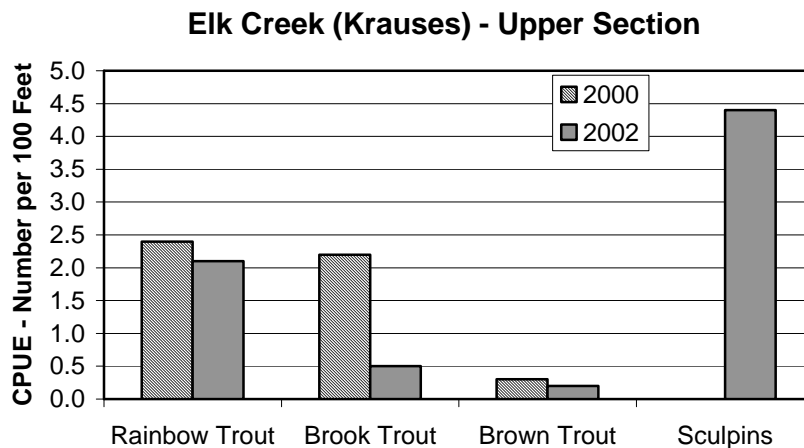


Figure 29. Relative abundance (catch per 100 feet) for rainbow, brook, and brown trout and mottled sculpin, in the upper section located on the Krause Ranch on Elk Creek in 2000 and 2002. PROVISIONAL DATA.

Elk Creek (Krauses) - Lower Section (992 Feet)

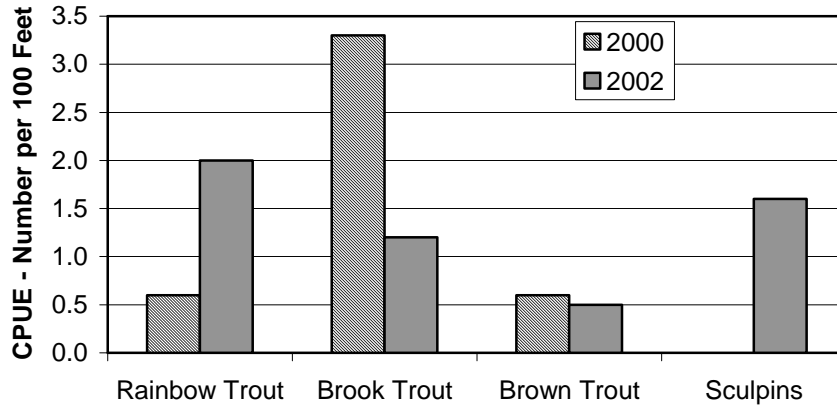


Figure 30. Relative abundance (catch per 100 feet) for rainbow, brook, and brown trout and mottled sculpin, in the lower section located on the Krause Ranch on Elk Creek in 2000 and 2002. PROVISIONAL DATA.

Sun River Inventory and Design - Simms to Fort Shaw; Bank Stabilization

WATER NAME: Sun River – Missouri River

DATA PROVIDED BY: Brad Shepard, Bill Hill, George Liknes and Steve Leathe, FWP

DETAILED REPORT CITATION: Tews et al. (2002); Tews et al. (In prep.)

FFI NUMBER: FFI-022-1997, FFI-046-1997, FFI-047-1997, FFI-024-1999, FFI-031-2000

A pilot study was done in 1997 to determine the effort needed to estimate fish populations in several sections of the Sun River (Shepard 1998). A limited effort has been continued since that time. In 2000, sections were sampled near the towns of Augusta, Simms, and Sun River. In 2002, estimates were again obtained near Augusta. Some of these sampling efforts have provided poor quality population estimates and all have provided CPUE information (Figure 31). These data consistently suggest that the Sun River supports low population densities of rainbow and brown trout and population levels appear to have decreased from 2000 to 2002. The principal factor limiting trout populations are low summer river flows and extreme flow fluctuations during times of low flow. **Available data indicate low fish densities reside in the Sun River, although the river supports some large brown trout. Low summer flows combined with major flow fluctuations are likely limiting trout populations at the present time.**

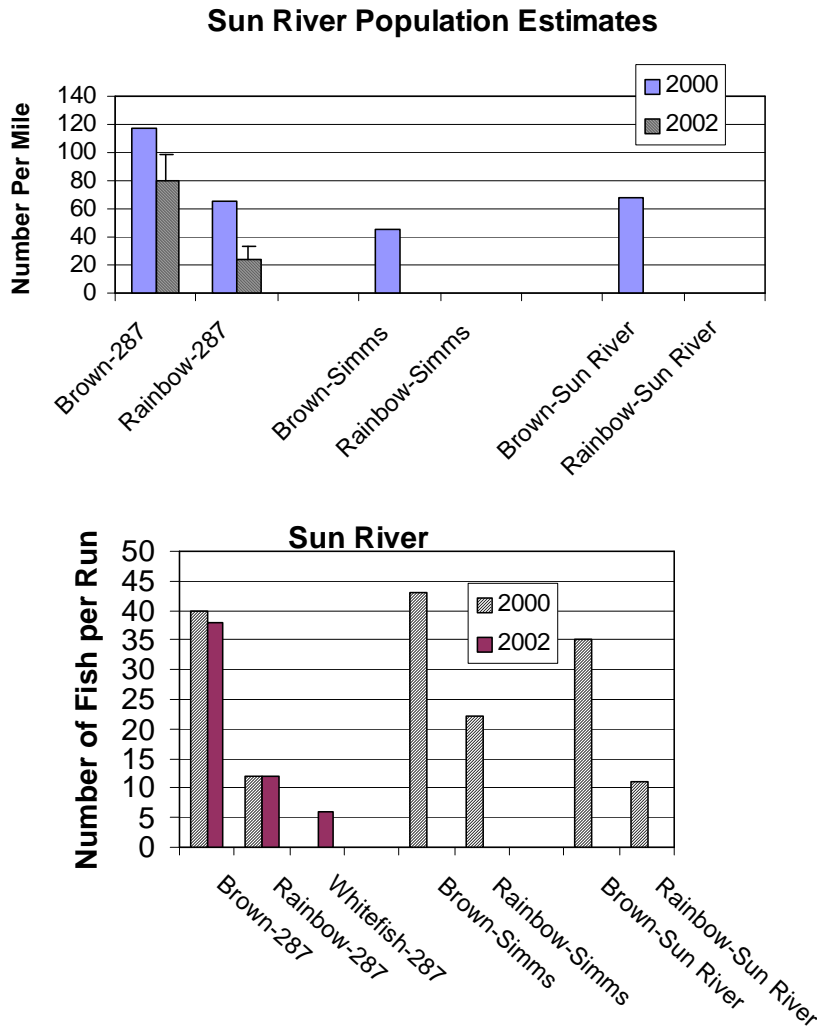


Figure 31. Population estimates and CPUE/relative abundance (catch per electrofishing run) for rainbow and brown trout and mountain whitefish from three monitoring sections on the Sun River in 2000 and 2002. PROVISIONAL DATA.

Yellowstone River Drainage

Big Creek Irrigation Efficiency

WATER NAME: Big Creek – Yellowstone River

DATA PROVIDED BY: Leanne Roulson, Garcia and Associates

DETAILED REPORT CITATION: Roulson (2002)

FFI NUMBER: FFI-027-1998

A water lease linked to improving irrigation efficiency in the lower Big Creek drainage was initiated in 1999. This lease provides water to lower Big Creek to improve the success of spawning trout, primarily Yellowstone cutthroat trout (YCT), from the Yellowstone River in lower Big Creek. Fry trapping to monitor this lease began in Big Creek in 1999, so three years of data is now available. About 3,500 YCT fry were captured in 1999 during 35 days of

trapping, over 11,000 fry were trapped in 2000 during 44 days of trapping, and in 2001, nearly 4250 were sampled in only eighteen days (Figure 32). Although the total number of fry sampled decreased substantially in 2001 when compared to 2000, the catch per trap day remained similar to levels observed in 2000 (Figure 32). However, compared to other tributaries that contribute YCT fry to the Yellowstone River (Mill and Mol Heron creeks), Big Creek produced a relatively high total catch and catch per day of YCT fry in 2000 (Figure 32). **Anecdotal evidence suggested that water availability during the summer months in Big Creek has been enhanced since the lease; in 2001, discharge met the lease agreement. We expect higher Yellowstone cutthroat trout recruitment to the Yellowstone River as a result.**

Mol Heron Creek Flow Enhancement and Fish Screen

WATER NAME: Mol Heron Creek – Yellowstone River

DATA PROVIDED BY: Leanne Roulson, Garcia and Associates

DETAILED REPORT CITATION: Roulson (2002)

FFI NUMBER: FFI-021-1996 and FFI-018-1997

A water lease and modification of an irrigation diversion in lower Mol Heron Creek drainage was initiated in 1998. This lease provides water to lower Mol Heron Creek and the irrigation diversion was modified to provide upstream passage to fish to improve the success of spawning trout, primarily Yellowstone cutthroat trout (YCT), from the Yellowstone River in lower Mol Heron Creek. Fry trapping to monitor this lease began in Mol Heron Creek in 1996. From about 1,000 to 4,100 YCT fry have been annually captured during 1996 to 2002 from 10 to 35 days of trapping (Figure 32). The total number of fry captured varied from 1026-1865 except in 1999 when more than 4000 fry were captured. The number of fry caught per day has decreased each year since 1999; the total number of fry captured in 2001 was the lowest since sampling began (Figure 32) and the third lowest in catch per unit effort. **Mol Heron Creek has the potential to provide a baseline level of Yellowstone cutthroat trout recruitment each year to the Yellowstone River with the potential for occasional years where recruitment is substantially higher. The number of fry emigrating each year since 1999 has declined.**

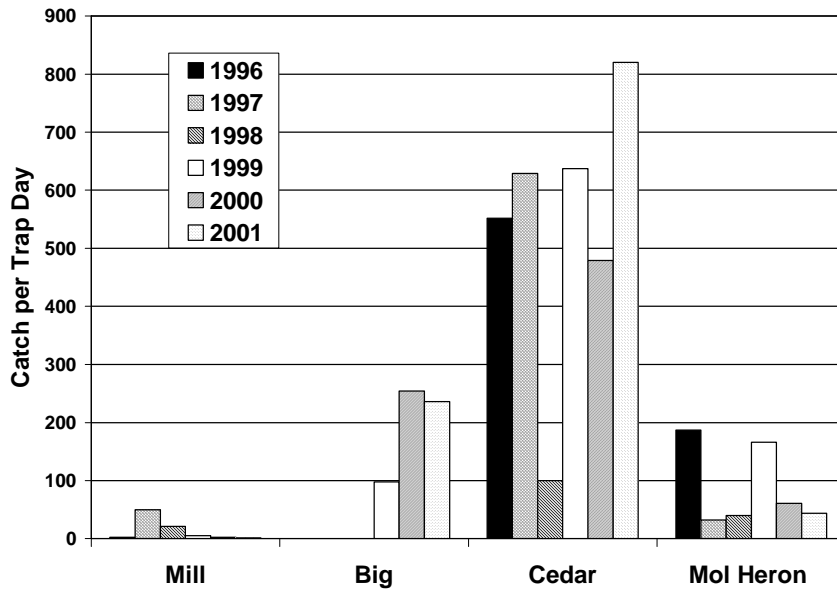
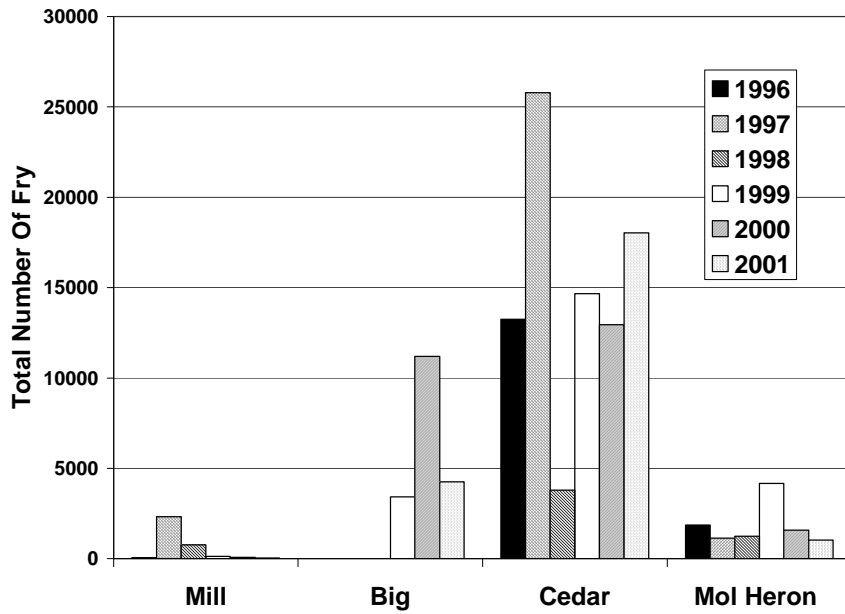


Figure 32. Total number (top) and catch per trap day (bottom) of Yellowstone cutthroat trout fry captured in fry traps while emigrating from Mill, Big, Cedar, and Mol Heron creeks from 1996 to 2001.

Yellowstone River Huntley Fish Passage

WATER NAME: Yellowstone River – Yellowstone River

DATA PROVIDED BY: Steve Hiebert, BOR

DETAILED REPORT CITATION: BOR Files, Denver

FFI NUMBER: FFI-028-1999

This project has attempted to eliminate a fish barrier across the main channel by creating a fish by-pass channel at Huntley Diversion Dam on the Yellowstone River. Monitoring was initiated in 2000 and 2001 after the by-pass was built. The objectives of monitoring were to evaluate upstream/downstream fish passage at Huntley Diversion Dam, examine the extent of fish use of the new bypass channel, and develop and/or modify fish sampling tools for by-pass evaluation. Fish sampling and monitoring techniques utilized to date include trap nets, both minnow and large hoop nets, electrofishing of the bypass and main channel, fish tagging, where fish were marked below Huntley Dam, side scan fixed hydroacoustics, and hydraulic measurements to determine channel conditions. Trapping and electrofishing of the bypass channel documented substantial use and high densities of *Hybognathus spp.*, longnose dace, and mountain sucker, suggesting it has functioned as good habitat for small non-game species (Figure 33). Tagging indicates fish have moved past the dam, but despite the utilization of numerous methods, we have no concrete evidence that a fish has used the structure to travel from below the dam, up the by-pass channel, and out the top to the river above. Fish can use other high water channels during runoff to migrate upstream without being block by the dam. The lack of documented use of the by-pass for passage may be related to construction complications that resulted in a steep gradient in the lower portion of the bypass. If the lower channel gradient was reduced to 1.6 percent, fish passage and might be accomplished and documented.

The by-pass channel has functioned as good habitat for small non-game species. No direct observations on passage have been documented yet.

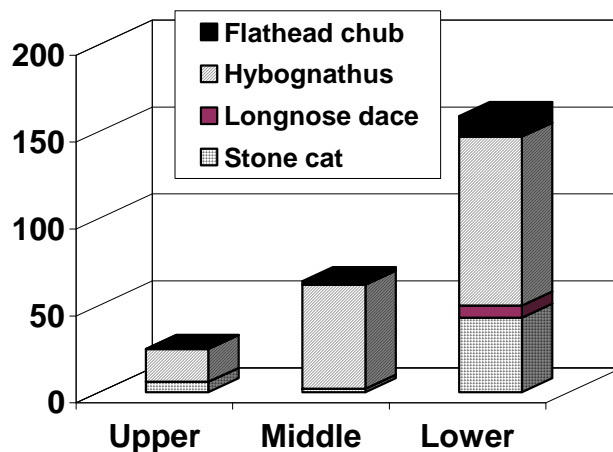


Figure 33. Minnow trap net catches at three sampling stations at the Huntley Diversion Bypass, July 2001.

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Numerous biologists and field technicians from various agencies contributed immeasurably to this report. I would especially like to thank Montana FWP biologists Bill Hill, Laura Katzman, Jim Magee, Ron Pierce, Eric Reiland, Ron Spoon, Anne Tews, Brad Shepard, and Kathleen Williams. Rob Clark assisted with fieldwork. Also, Steve Hiebert, BOR and Sue McNeal, USFWS were gracious in supplying information and help.

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