2004 FWP ANNUAL PROGRESS REPORT
- WATER LEASING STUDY -

Submitted to:

Montana Environmental Quality Council
Montana Department of Natural Resources and Conservation
and
Montana Fish, Wildlife & Parks Commission

Submitted by:

Montana Fish, Wildlife and Parks
Fisheries Division

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I. INTRODUCTION

Pursuant to Section 85-2-436(3)(a), MCA, the Montana Department of Fish, Wildlife, and Parks must complete and submit to the Department of Natural Resources and Conservation (DNRC), the Fish and Wildlife Commission (Commission), and the Environmental Quality Council (EQC) an annual water leasing study progress report. The report must include specific information for each lease including:

(i) **the length of the stream reach and how it is determined;**
(ii) **technical methods and data used to determine critical streamflow or volume needed to preserve fisheries;**
(iii) **legal standards and technical data used to determine and substantiate the amount of water available for instream flows through leasing of existing rights;**
(iv) **contractual parameters, conditions, and other steps taken to ensure that each lease in no way harms other appropriators, particularly if the stream is one that experiences natural dewatering; and**
(v) **methods and technical means used to monitor use of water under each lease.**

FWP completed one new lease agreement (for two leases) in 2004 - on Trail Creek in the Clearwater River basin. The Water Program has prepared the DNRC Change Application for these leases. DNRC also issued a Change Authorization for a lease FWP entered in 2003, on Cedar Creek in the Upper Yellowstone Basin.

The progress report must also contain a summary of stream reaches approved by DNRC for study (pursuant to 85-2-437, MCA), and a summary of leasing activity on all designated streams. If no new leases have been obtained in the reporting year, FWP must "provide compelling justification for that fact" in the report. The remainder of this report has been divided into six sections and associated appendices, described as follows:

Section II—background on the creation of the leasing program,
Section III – our review of the 2004 leasing year, including new lease agreements, and general issues and opportunities noticed or arising in 2004,
Section IV – additional detail on the 2004 leasing activity, including the statutorily required reporting elements for each,
Section V – the statutorily-required reporting on the streams designated, so far, for study and potential leasing under FWP's leasing program; and,
Section VI – a selection of program goals for 2005.
Appendix A lists our leasing objectives, which is what we currently use to evaluate lease offers, and seek additional lease opportunities.
Appendix B provides a sample FWP lease evaluation, showing what information FWP needs and uses to evaluate lease offers under the criteria provided in Appendix A.
Appendix C provides monitoring information for FWP's existing leases/conversions.

II. WATER RIGHTS AND THE FWP WATER LEASING PROGRAM

Montana's water law has traditionally focused on the rights and procedures associated with diverting water from streams and lakes and putting that water to a beneficial use (e.g., irrigation, fish and wildlife, domestic, mining, etc.) away from the source. Persons who appropriate water from a stream must have a right or permit to do so. A right or permit specifies how much water

can be diverted, for what purpose, during what time period, at what point on the stream, the location of the use of the water, and has a priority date assigned to it. The priority date determines who gets the water first; if there isn't enough to go around, the earliest date has the first claim (hence the maxim, "first in time, first in right").

Montana's Water Use Act encourages "*the water resources of the state ... be protected and conserved to assure adequate supplies for public recreational purposes and for the conservation of wildlife and aquatic life*" (85-1-1-1(5), MCA). It also seeks to "*provide for the wise utilization, development, and conservation of the waters of the state for the maximum benefit of its people with the least possible degradation of the natural aquatic ecosystems*" 85-2-101(3), MCA. Except in basins that are closed to new appropriation, the DNRC may issue new permits to divert surface water if the applicant can show (among other things) that water is reasonably available for the use proposed and that there is a means to ensure persons with senior rights can get the water to which they are entitled. There is no flow level where new appropriations are no longer granted. If water is physically available (even 1 in 10 years) and legally available (not claimed by senior water users) a permit can be issued. Generally, the system encourages maximum diversion and use of water from Montana's streams.

In the 1960's conservationists began to advocate for legal mechanisms to keep water instream. The 1969 Legislature passed "Murphy's Law" which allowed FWP to file instream flow claims on 12 blue ribbon trout streams. FWP was later authorized to apply for instream "reservations" to support fishery values. FWP pursued the authority to reserve water, and was granted a series of reservations in the Yellowstone basin (1978 priority date), the Missouri River basin above and below Ft. Peck (1985 priority date), and the Little Missouri basin (1989 priority date). Reservations are a valuable management tool, but due to their late priority dates they do not provide much drought relief.

In 1988, much of Montana suffered severe drought conditions. Low natural flows coupled with normal diversion rates exacted severe tolls on sensitive fisheries. Montana newspapers ran front-page photos of fish kills on dewatered streams. These conditions spurred the 1989 Legislature to consider additional tools and incentives for water users to protect fishery values. One highly controversial idea was to allow FWP to temporarily lease consumptive water rights for instream flows. The idea became a law, and since then FWP has pursued attractive leasing opportunities with willing lessors on seriously dewatered streams with high fishery restoration potential. The water leases are now making major contributions to select fisheries.

FWP's leasing statute was originally set to expire in 1999. It required the agency to prepare a final report of the leasing program to be adopted by the FWP Commission and DNRC. The report was then to be submitted to the EQC for completion by December 1, 1998. The EQC's Water Policy Subcommittee recognized its role in evaluating the leasing program. The EQC included a review of the program and related statutes in its 1997-98 Interim. The Subcommittee conducted public review of the progress and acceptance of the program. The EQC eventually proposed legislation that would renew FWP's leasing statutes for 10 years, increase the cap on the number of FWP lease streams, increase the maximum lease period for certain leases, require another "final" report in 2008, and allow other leasing programs to lease salvaged water. Though

the EQC was encouraged to be more aggressive in proposing changes (i.e., making the program permanent, removing the DNRC study stream approval requirement, etc.), the Council elected to act conservatively to ensure that the whole program wasn't lost. The EQC encouraged others during the 1999 Legislative Session "to use the legislative committee hearing and amendment process to further test the waters on additional changes to the DFWP's water leasing statutes" (EQC, 1998). The bill, as drafted, received overwhelming support in both houses, and was signed by the Governor on March 19, 1999. The EQC deserves credit for its long-term support of this program.

A summary of FWP's leasing history is provided in Figure 1.

Figure 1. FWP Instream Flow Leasing History, as of December 2004

SOURCE	LESSOR	LEASE TERM/EXP.	PRIORITY OF RIGHT	QUANTITY LEASED	PERIOD OF USE	COST
Mill Creek	Mill Creek Water and Sewer District	10 years Aug. 1, 2003-expired; being considered for renewal	95 rights with various priorities	41.4 cfs	48-60 hours in Aug. Diversion shut off after 10-day notice from FWP	$12, 750 per year[1]
Mill Creek	Individual	10 years April 1, 2003-expired; a portion available (and being considered for) renewal	June 30, 1880; June 1, 1903	2.0 cfs (1880) and 4.13 cfs (1903) (salvaged water)	May 1 -October 4	$7,500 per year
Blanchard Creek	Individual	10-year renewal June 20, 2009	May 11, 1913 (first right on stream)	3.0 cfs	April 15 -October 15	$2,000 per year
Tin Cup Creek	Six individuals	5-year renewal March 28, 2005	August 1, 1883 (first right on stream)	2.28 cfs April 1-April 14 4.32 cfs April 15-April 30 4.72 cfs May 1-October 19	April 1- November 4	$6,260 per year
Cedar Creek	US Forest Service	10 years Sep. 20, 2005	April 1, 1890; April 1, 1893; April 1898; April 1, 1904; April 7, 1972 (high water rights only)	6.77 cfs May 1-July 15[2] 6.39 cfs July 16-July 31 9.64 cfs August 1-August 31 6.39 cfs Sept 1 - October 15	May 1-October 15	$1.00 per year
Hells Canyon Creek	Three individuals	20 years Apr. 1, 2016	December 31, 1884 (1st right on stream), August 23, 1889; August 29, 1912	1.12 cfs (salvaged water)	April 1- November 4	$45,000 - One-time payment
Mill Creek	Individual	10 years May 1, 2006	June 1, 1891	2.64 cfs (salvaged water)	May 1-October 19	$4,200 per year
Chamberlain Creek	Individual	10 years Apr. 1, 2007	October 10, 1911	½ the flow up to 25 cfs	April 1 - October 31	$1.00 per year
Pearson Creek	Individual	10 years Apr. 1, 2007	October 10, 1911	Up to 8 cfs	April 1 - October 31	$1.00 per year
Cottonwood Creek	FWP[3]	9 years June 30, 2005	May 1, 1884	14.0 cfs April , 37.0 cfs May 1-June 30, 32.0 cfs July, 9.0 cfs August, 6.0 cfs Sept., 9.0 cfs Oct., 8.0 cfs November (salvaged water)	April 1- November 4	None
Mol Heron Creek	Private ranch	20 years Dec. 31, 2018	July 15, 1884; May 7, 1885; June 15, 1893; January 1, 1900; March 2, 1903; June 5, 1905; August 5, 1920; April 15, 1967	5.0 cfs to 27.0 cfs	April 15 - October 19	$100,000 - one-time payment
Big Creek	Two private ranches[4]	20 years April 15, 2020	March 12, 1883; June 30, 1901; May 31, 1909; May 15, 1910; May 15, 1910	1.0 – 16.0 cfs (rights dedicated to a land trust in perpetuity)	April 15 - October 15	$228,640 - one-time payment

Figure 1 (cont.). FWP Instream Flow Leasing History, as of December 2004

SOURCE	LESSOR	LEASE TERM/EXP.	PRIORITY OF RIGHT	QUANTITY LEASED	PERIOD OF USE	COST
Big Creek	Private ranch	10 years May 1, 2009	June 30, 1873 (1st right on stream)	10.0 cfs	May 1 - November 1	$8,000 per year
Rock Creek	Private ranch	20 years	March 23, 1881; May 15, 1881; June 1, 1892; May 1, 1898; September 29, 1904; May 10, 1907	5.0 - 27.22 cfs	April 15 - October 31	$138,346 - one-time payment
Locke Creek	Private ranch	30 years; December 14, 2031	March 6, 1915	7.5 cfs	April 20 – October 24	$45,000 – one-time payment
Cedar Creek	Private ranch	30 years: June 9, 2033	May 29, 1894 (4th right on stream; other high-priority rights already leased by FWP); June 11, 1971 (high water right); April 7, 1972 (high water right)	3.25 cfs 3.76 cfs (high water)	April 1 – November 4	$40,000 – one-time payment
Trail Creek	Resort (and) Homeowners Association	30 years: June 3, 2034	April 10, 1905 January 10, 1911	1.06 cfs 2.37 cfs plus an additional 0.5 cfs during periods of low flow	Both have periods of use: April 1 to October 31.	$1 to association for life of lease. $24,372 one-time payment to resort for diversion and conveyance improvements.

[1]Lessor pays for water commissioner and the installation of measuring devices on all on-farm turnouts from the pipeline.
[2]These rights are used to maintain a flow of 1.3 cfs at the mouth of Cedar Creek, eliminating effects on other water users.
[3]FWP converted its own water rights to instream flow under 85-2-439, MCA.
[4]Ranches transferred their rights to the Montana Land Reliance, who is the lessor.

III. A REVIEW OF THE 2004 LEASING YEAR

Drought conditions continued in most of Montana in 2004 until August rains brought much-needed relief. Once again, FWP water program staff spent much of their time responding to drought rather than pursuing additional water leases. These activities include enforcement of instream water rights against junior water users, and participation in the Governor's Drought Advisory Council. The following paragraphs describe noteworthy elements of the 2004 leasing year.

- **One new change to instream flow approved.** A lease agreement for supplemental instream water in Cedar Creek (upper Yellowstone), where FWP already held one lease, was signed in 2003. This project replaces Cedar Creek as an irrigation source by helping to fund the construction of a small water storage reservoir on an alternate creek with minimal fishery values. In exchange, a one-mile ditch was moth-balled, and all of the ranch's water rights were dedicated to instream flow for a period of 30 years. The first lease on Cedar Creek benefits the Yellowstone fishery; the additional lease simplifies water administration on the Creek, provides more reliable flows for Yellowstone cutthroat spawning and rearing, allows fish to more easily ascend a degraded culvert structure, and eliminates entrainment problems with the associated ditch. DNRC approved an application to temporarily change the leased water's purpose of use to instream flow.

- **Agreement completed for two new leases.** FWP signed a lease agreement with two water right holders on Trail Creek. Trail Creek is a tributary to the Clearwater River, near Seeley Lake, Montana. One of the parties has agreed to replace a leaky ditch with a pipe (funded by the Future Fisheries Program) which will save a significant amount of water, and to further reduce its diversion when flows are very low. FWP has leased the saved water. The other party has leased FWP all the water it once used for irrigation.

- **Six additional water conservation projects approved through FWP's Future Fisheries program.** In the 2004 funding cycle (January and July, with a drought-related special streamflow-only application window in April), six water conservation projects were funded through FWP's Future Fisheries Improvement program: (FFI projects described elsewhere in this report are not included in the list below.)

  Little Prickly Pear Creek (Sentinal Rock) instream flow enhancement. Little Prickly Pear Creek is an essential spawning stream for Missouri River rainbow trout and brown trout. This project involved installing a more efficient irrigation system and dedicating the salvaged water to instream use.
  Little Prickly Pear Creek (Rocking Z) instream flow enhancement. This project involves consolidating five irrigation ditches into two pumping stations, converting to a more efficient irrigation system, and dedicating the salvaged water to instream use.
  Boulder River water salvage. This project involves the development of a stockwater well in exchange for closing an irrigation headgate earlier in the fall, thereby leaving water in the river.

Jefferson River canal sealing. This project involved the use of poly-acrylimide sealant to treat the Creeklyn ditch to reduce ditch loss and maintain additional flow in the river.
Blackfoot/Clearwater Rivers flow enhancement. This project involves converting to a more efficient irrigation system, with subsequent water savings used to improve instream flow in the Blackfoot and Clearwater rivers.
North Fork Horse Creek irrigation efficiency and water salvage. This project involves converting to a more efficient irrigation system and dedicating the water savings to instream flow.

Readers interested in details of FFI projects may refer to FWP's Website - http://fwp.state.mt.us/habitat/futurefisheries/content.asp.

- **Painted Rocks instream water contract renewal.** This year, FWP entered a new contract with the DNRC for the annual purchase of water stored in Painted Rocks Reservoir on the West Fork of the Bitterroot River. Ten thousand acre-feet of stored water will continue to be used as it has in the past; to supplement flows in the Bitterroot River during the summer months. However, the former contract was due to expire. The new agreement will not expire, but will continue in perpetuity. FWP and Bitterroot River anglers and recreationists owe a debt of gratitude to Trout Unlimited for their help in negotiating and funding the new agreement. Thank you T.U.

- **Coordination with other agencies and groups.** FWP continues to work closely with other agencies and programs (Natural Resources Conservation Service (NRCS), U.S. Fish and Wildlife Service "Partners" program, Montana Land Reliance, Conservation Districts, the Montana Water Trust, Trout Unlimited, etc.). The result is greater collaboration and a broader spectrum of entities contributing to Montana's water conservation goals.

- **Supporting leasing/conversion by others.** FWP continues to assist water right holders interested in leasing to other parties, or converting their rights to instream flow. Such assistance includes potential funding through our Future Fisheries Improvement grant program, technical assistance with project planning, and information on water rights and the conversion process. FWP staff have also assisted applicants and DNRC with documentation that a conversion will benefit the fishery.

- **FWP leases and water reservations available on the Web.** The Montana Fisheries Information System (MFISH) allows a user to access a variety of information for various streams and rivers; from fish species present to the presence of instream water rights – including leases. This site may be accessed at http://maps2.nris.state.mt.us/scripts/esrimap.dll?name=MFISH&Cmd=INST. The site has proven extremely helpful to our field staff who must answer questions about water rights, as well as the public.

- **One Lease Rescinded.** FWP and a lessor agreed to rescind one water lease this year. The lease was located on Blanchard Creek in the Blackfoot Basin. The lease was unique in that it

allowed the lessor to decide on an annual basis whether to divert water or leave it instream. Unfortunately, the lessor had not provided instream water in several years and seemed unlikely to do so in the future. With no instream benefit, the lease was no longer worth administering.

- **Limitations posed by temporary nature of leases.** FWP has leased water for instream flow from Tin Cup Creek in the Bitterroot Basin for the last ten years. The lease has enhanced flows in this important spawning stream. Consequently, Tin Cup Creek has produced healthy numbers of fry for the Bitterroot fishery. Unfortunately, 2004 is the last year that FWP will be able to lease water from Tin Cup Creek. This is not because the lessors are not willing to continue the lease. It is because we are limited by statute to leasing water for ten years (30 years for a water conservation project), and renewing that lease only once, up to ten years. The Tin Cup agreement was originally negotiated as a five-year lease, and was renewed once for five years. Therefore, we may not legally renew the lease again.

  The leasing program, as it currently exists, is a valuable tool for restoration of fishery resources. However, the time limitations imposed by statute call into question its long-term effectiveness. Many other western states including Colorado and Oregon allow water to be permanently dedicated to instream flow. Montana fisheries would benefit if water could be permanently dedicated to instream flow.

IV. 2004 NEW LEASES

FWP finalized one new lease agreement in 2004. The agreement involves two lessors and two separate water rights on Trail Creek. Trail Creek originates in the Swan Mountains northeast of Seeley Lake, Montana. It flows south and west for approximately nine miles before entering Morrell Creek, roughly one mile above Morrell Creek's confluence with the Clearwater River. Much of the creek runs through Lolo National Forest land, and is unaffected by water diversions. However, the lower two miles of Trail Creek is often dewatered during the irrigation season due to water diversions.

In order to improve the Trail Creek Fishery, FWP has agreed to provide funding through the Future Fisheries Improvement Program to improve instream flows in the lower portion of the creek. The project entails replacing a highly pervious portion of a one-mile long open ditch with a pipeline. Water has been leased from a resort that irrigates a golf course and an association of nearby homeowners. In return for financial assistance for the project, the resort has agreed not to divert more than two cubic feet per second from Trail Creek (1.5 cfs during low flow periods) and has leased the salvaged water created by the improved conveyance efficiency to FWP for 30 years. To further protect flow in Trail Creek, the homeowners' association has agreed not to divert their water and has leased a portion of their water right to FWP for instream flow. Trail Creek supports bull trout, westslope cutthroat trout, and brook trout and provides important habitat for spawning and rearing of these fish. However, reproduction is adversely affected by seasonal dewatering, especially during low flow years. The primary intent of the proposed leasing project is to improve instream flows in lower Trail Creek. However, the project also includes replacement of the resort's headgate with an infiltration gallery or new headgate and fish

screen. Thus, a partial fish migration barrier and the possibility of fish entrainment in the diversion will be eliminated. Ultimately, the project is intended to enhance spawning and rearing habitat for bull trout and westslope cutthroat trout resulting in increased numbers of bull trout and westslope cutthroat trout in the Blackfoot-Clearwater drainage.

Figure 2. Statutorily-Required Information for Trail Creek lease.	
Statutorily-Required Reporting Element (see p.1 for full text)	**Response**
length of stream reach and how determined	Water that was formerly diverted from headgates approximately one and two mile upstream from Trail Creek's mouth will be left instream. Therefore, two miles of stream will benefit from the additional water. Because there is only one diversion downstream of the resort's diversion – and it is for only 40 gallons per minute, it is expected that the vast majority of saved water will not only make it to the mouth of Trail Creek, but remain instream in Morrell Creek and the Clearwater River.
technical methods and data used to determine fishery needs	The minimum flow required to sustain fishery habitat values in Trail Creek was determined in 2001. In late April a staff gage was installed just upstream of the resort's diversion and a discharge hydrograph developed. Personal observation and radio telemetry studies conducted itn the Clark Fork/Blackfoot River drainages indicate westslope cutthroat and bul trout require a minimum thalweg depth of .5 ft for adult spawning fish to migrate. At a flow of 8.76 cfs, minimum thalweg depth in several riffles near the resort was 4.0 inches. At 11 cfs, however, all riffles had a minimum .5 ft. Fisheries biologists also determined that the minimum flow necessary for production of insects (a primary trout food source) is 7 cfs. Comparison of collected flow data with USGS records indicate that base flow in an average year is likely adequate upstream of the resort's diversion. However, flow would often be inadequate below the diversion without the lease.
determining and substantiating the amount of water available for lease	The resort has leased 2.37 cfs, and an additional 0.5 cfs during low flow years. The homeowner's association has leased 1.06 cfs. In practice, the resort will divert no more than 2 cfs of its combined water rights from Trail Creek and will reduce its diversion to no more than 1.5 cfs when flows in Trail Creek fall below 6.5 cfs above its diversion. The association will not divert any water under its combined water rights from Trail Creek over the term of the lease. The above lease amounts were calculated as follows: The parties agree that the maximum number of acres likely historically irrigated under the resort and association's rights total 96 acres. Applying the DNRC claims examination rate of 17 gallons per minute per acre yields a minimum valid irrigation need of 3.64 cfs for the total 96 acres. According to DNRC staff, the proportion of acreage associated with the senior, association right is 15 acres, or 15.6% of the total historically-verifiable acreage. The historically-verifiable acreage associated with the claims held by the resort is the remainder, or 81 acres and 84.4% ofthe total. Apportioning the water according to the historically-verifiable acreage split, yields minimum historically-verifiable use rates of 0.57 cfs for the Association claim, and 3.07 cfs for the claims the resort and association hold in common. Resort consultants assert the approximately one-mile resort ditch loses 85% of its contents between the diversion point and the receiving pond, and the amount of historically-valid diversion should be increased accordingly. According to water right claim documentation, as amended, the association right appears to have an approximately ½ mile ditch between the diversion point and place of historic use. Both ditches travel over similar terrain. Presumably, if 85% loss occurs in 1 mile, approximately 42.5% would be expected to have occurred within ½ mile. Therefore, applying an 85% loss rate to the resort rights and 42.5% to the association right yields minimum historically-valid flow amounts of 4.37 cfs for the combined association/resort rights, and 1.06 cfs for the association right. FWP has leased the entire association historic use of 1.06 cfs. As stated, FWP has funded a pipe for the resort ditch that will eliminate ditch loss. We have leased the difference between what was historically used and what will be used with the pipe in place.

Figure 2. Statutorily-Required Information for Trail Creek lease.	
Statutorily-Required Reporting Element (see p.1 for full text)	**Response**
ensuring no adverse impact to other appropriators	This water right change and its associated project and lease will not adversely affect any other water right holders on Trail Creek. The DNRC water rights database shows only eight water rights on Trail Creek that are not owned by either the resort or association. One right, held by the US Forest Service has a point of diversion six miles upstream of the upper point of diversion that is part of this proposal (the resort/association diversion). Six of the remaining seven have points of diversion between the resort and the resort/association point of diversion. There is one point of diversion downstream of the resort/association point of diversion with a maximum flow rate of 40 gpm. It is not expected that there will be less water available at any of these points of diversion as a result of this change. Rather, water availability will increase because no water will be diverted at the upper point of diversion and less water will be diverted at the lower point of diversion.
monitoring water use under lease	Under the current lease, the private parties, in partnership with FWP, have agreed to maintain a stream-flow measuring device upstream of the resort's Trail Creek diversion. FWP will install and maintain a staff gauge or similar device downstream of the resort in order to monitor instream flows. The resort will install and maintain a measuring device on the outlet of the pipe that is accessible and readable by representatives of the resort, the Association and FWP. At least every two weeks during the period of use, and at least weekly under the 1.5 cfs maximum resort diversion conditions, association and/or resort representatives will check the measuring devices and record the date, flow and location of the observation. They will submit the year's records to FWP's representative by November 1st. FWP staff will also spot-check the devices. Recorders will report by phone to FWP's representative within one day of their observation of either: i) flows in Trail Creek upstream of the diversion point have fallen to 6.5 cfs or less; or ii) the difference between the flows recorded at upstream and downstream measuring devices is greater than the applicable resort diversion rate, indicating a potential need to recalibrate the devices.

V. DESIGNATED STUDY STREAMS

Montana statutes require FWP to obtain approval of its commission and DNRC to study a stream for leasing. Figure 3 lists the study streams approved to date, their relevant basins, the status of the approval, and the status of leasing on them. Statutory revisions in 1999 increased the allowed number of study streams from 20 to 40.

Figure 3. Status of Designated Study Streams and Leasing

Study Stream	Basin	Status of Request	Status of Leasing in Reach
1. Swamp Creek	Big Hole River	Final approval 3/5/90	No lease; FWP and right holder could not reach agreement on price for lease
2. Big Creek	Yellowstone River	Final approval 3/5/90	Two leases finalized in 1999
3. Mill Creek	Yellowstone River	Final approval 11/9/90	Three leases; two expired and will likely not be renewed.
4. Cedar Creek	Yellowstone River	Final approval 1/6/92	One lease in place; additional lease agreement finalized in 2003
5. Blanchard Creek	Blackfoot River	Final approval 9/25/92	Lease rescinded.
6. Hells Canyon Creek	Jefferson River	Final approval 9/25/92	Lease
7. Tin Cup Creek	Bitterroot River	Final approval 10/30/92	2004 was last year of lease.
8. Rattlesnake Creek	Clark Fork	Final approval 5/25/95	No lease; negotiations on hold
9. Mol Heron Creek	Yellowstone River	Final approval 11/28/95	Lease
10. Rock Creek	Blackfoot River	Final approval 11/28/95	TU lease negotiations on hold, past FWP negotiation information being used in efforts by Trout Unlimited
11. Chamberlain Creek	Blackfoot River	Final approval 1/3/96	Lease
12. Pearson Creek	Blackfoot River	Final approval 1/3/96	Lease
13. Rock Creek, near Garrison	Clark Fork River	Final approval 7/15/98	Lease
14. Locke Creek	Yellowstone River	Final approval 6/18/02	Lease
15. Trail Creek	Clearwater / Blackfoot River	Final approval 6/18/04	One lease agreement with two lessors.

VI. GOALS FOR 2005

FWP's Water Program has the following goals for the leasing program in 2005:

- **New leases.** The Water Program is currently evaluating several possible lease opportunities. We hope that some of these opportunities come to fruition in 2005. Up until now, FWP has found that leases have been most effective for re-watering short stretches of small streams. However, we are currently investigating the possibility of leasing water on two major rivers.

- **Enhanced Monitoring.** FWP monitors all of its leases to ensure that we are getting the water we have paid for. However, FWP's field fisheries biologists have largely been

responsible for checking staff gauges and recording flow information as well as performing biological monitoring. These duties are time consuming and often burdensome to our busy field staff. As a result, our data on stream flow in the lease streams are often incomplete. In 2005, the Water Program will be taking a more active role in collection of stream flow data. We will install continuous flow stage recorders in most of our lease streams. Water program staff, with the help of field biologists, will collect and examine the data to ensure that the leases are supplying the required water.

- **Continued coordination with other conservation entities.** We look forward to continued and enhanced coordination with NRCS, the U.S. Fish and Wildlife Service, Conservation Districts, Trout Unlimited, the Montana Water Trust, and others to enhance understanding of the program state-wide, and the integration of this tool into planning and restoration efforts by others.

APPENDICES

FWP Instream Flow Lease Objectives

Maximizing the 4 'A's

- **Advantageous** to the fishery

  Attractive leasing opportunities are those that address a stream flow problem that significantly limits potential fishery values.

- **Actual** water dedicated to instream flows

  Leases must involve valid water rights, and quantities leased should be large enough to benefit the stream.

- **Administrable** by the Department or other appropriate entity

  Leases should involve a reasonable combination of water right seniority and advantageous location so that the instream flow contribution can be ensured and defended through the lease period. Decreed streams and/or an existing water commissioner are an added plus.

- **Affordable**

  Do the benefits to the fishery justify the cost of the lease or the project creating the leasing opportunity?

Contact Montana Fish, Wildlife & Parks' (FWP) Instream Flow Specialists Bill Schenk at 406-444-3364 in Helena, or Andy Brummond in Lewistown at 406-538-4658 ext. 224 for more information.

Appendix B – A Sample Lease Evaluation

Review of Potential Water Lease

Little Prickly Pear Creek -- Lewis and Clark County

Prepared for: [redacted]

December, 1999

The following is a preliminary review of an instream flow lease proposal. It includes 1) a description of the proposal; 2) the results of a cursory review of the associated water rights, their relation to other rights in the watershed, and available information on water flow patterns; 3) a description of the fishery; and 4) a preliminary evaluation of the lease offer according to FWP's informal lease evaluation criteria.

Additional information, insights, and/or corrections to this preliminary review are welcome and can be incorporated into a revised review.

Background on Proposal

According to our recent conversation, the rights you are interested in leasing are the potential salvaged portions of the rights listed below.

Right Number (Diversion Point)	Purpose	Quantified Flow (cfs)/ Acres/ Volume	Priority Date	Relative Priority on Source (of 70)	Claims Senior to Offered Rights
41QJ-W- 097583 NWNENW20T13NR4W	Irrigation	none/ 8 acres/ 32 AF	5/18/1877	28th	100.09 cfs (all upstream)
41QJ-W-097581 NENENE25T13NR5W	Irrigation	12.00 cfs/ 50 acres/ 200 AF	4/1/1882	34th	additional 17.76 cfs
41QJ-W-097582 NWSWNE19T13NR4W	Irrigation	25.00 cfs/ 58 acres/ 232 AF	3/15/1902	61st	additional 110+ cfs
Total		**35+ cfs/ 116 acres/ 464 AF**			

You are proposing to convert from two informal diversions (and associated lengthy ditches for flood irrigation) to one diversion point for a sprinkler system to irrigate close to the same acreage. One diversion point is shared with another right. The diversion point for your most senior right (without quantified flow) appears to be near the access road to your home, near the approximate location of your proposed pump house.

Your estimate of water need under your new system is 2 cfs, leaving the consumed (non-return-flow) portion of the remainder instream under a lease with FWP. The claims associated with these rights

appear to presume an irrigation need of 4 acre feet (AF)/acre irrigated under the current regime, hence the total allowed volume listed above.

A sprinkler system will reduce both the flow and overall volume needed. Presuming a 70%-efficient sprinkler system in your climatic zone, a liberal estimate of overall irrigation need for grass hay is about 2.5 AF/acre, or 290 AF for the acreage you currently irrigate. Thus a rough estimate of salvage water generated would be a flow up to about 33 cfs, up to 174 AF in volume. This rate of flow, if run constantly, would reach this volume limit in about 2.5 days. A flow rate of 5 cfs would reach this limit in about 17.5 days. The quantity of flow in this calculation is attractive. However, the small relative volume may limit the duration this right could be enforced, if challenged. (There are examples of sprinkler systems using much less volume, so the 2.5 AF/acre figure may be high, but enough volume should be assured to meet crop needs.)

Patty noted that the creek downstream from your second diversion was dry this year from about August 4th to August 20th, until that diversion was shut off. There was also discussion that water shortages upstream spurred water users to hire a ditch rider, but that in most years some water reliably makes it to your upper two diversion points. Without further conversations with nearby water users, or reviewing aerial photos, we have limited additional information on the reliability of flows to and/or beyond your diversion points. Additional information of this type would be necessary to pursue lease negotiations and coordination with other users.

You are willing to administer the instream right (i.e. check measuring devices to ensure it stays instream), and are willing to lease the salvaged water for the maximum FWP lease period allowed under state law (30 years). The cost of the proposed improvements is $86,000. You are interested in funding assistance for this project through the Future Fisheries Improvement program or otherwise. You suggested a wier for the shared diversion might address the split right issue, and a measuring device in the Seiben diversion could be incorporated into project design for improvements to that diversion.

The Rights and the Watershed

As shown above, according to the state's water rights database, your quantified rights total 37 cfs. There are 27 claims senior to your highwater right; 6 more senior to your 1887 right; and another 27 senior to your 1902 right. There are 9 upstream rights on the mainstem of Little Prickly Pear Creek (adding to about 9 cfs) that are junior to your 1902 right. Information from the Montana Water Court indicates that no claims in your basin (#41QJ – Missouri River, from Holter to Sun River) have been examined in the state adjudication process, so the legitimacy of other listed claims is currently unknown. We are unaware of any prior decrees in your area.

Little Prickly Pear Creek is mapped on USGS maps as intermittent upstream of its confluence with Canyon Creek, then perennial from there to its terminus at the Missouri River. Your diversions are located near where Sheep Creek meets Little Prickly Pear Creek. There are seven tributary streams between your property and the town of Wolf Creek. Five of these tributaries are intermittent (go dry at some time in a typical year). The two others, Lyons Creek and Wolf Creek, are considered perennial.

Given that Canyon Creek may be a more reliable provider of flow to Little Prickly Pear in your area, we also looked into how your rights related to rights upstream on Canyon Creek. Interestingly, your high-water right is senior to all but 6 rights on Canyon Creek (totaling 7.9 senior cfs); your 1882 right

would rank 10th in priority, and your 1902 right would rank 16th in priority for Canyon Creek water. Approximately 9.3 claimed Canyon Creek cfs are senior to your 1882 right and about 32 cfs are senior to your 1902 right. Although making a call for water can be a controversial move, we do consider your ability to do so in evaluating rights being considered for lease. A USGS gauge which operated on Canyon Creek in 1921-23 shows a peak flow of 270 cfs (1922) and a minimum summer flow (1921) around 10 cfs. Water use may have changed a good deal since then, but your rights have a much better seniority situation in Canyon Creek than in upper Little Prickly Pear.

Regarding downstream flows, U.S. Geological Survey (USGS) flow records are available for a 5-year period (from 1962-67) for a site just upstream of Clark Creek confluence. During this period, the minimum recorded flow was 6.2 cfs for four days in August of 1963. (At the gauge discussed below, flows were between 19 and 20 cfs on the same days.) Monthly minimums were not calculated for this review. A variety of miscellaneous flow measurements from this time period (conducted for a study of the effects of Interstate construction) also exist, but were not evaluated for this review.

Currently, there is one operating USGS real-time stream gauge on Little Prickly Pear Creek, located about ½ mile downstream from the confluence of Wolf Creek, just downstream of the I-15 access road bridge. This gauge has operated intermittently; from May 1962 to September 1967, and again from October 1991 to present. Streamflow information for this approximate 15-year period of record is provided below.

	Jan	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Monthly Average (cfs)	46.9	69.4	70.1	150	276	235	95.0	51.6	56.8	57.5	58.3	53.7
Monthly Minimum (cfs)	30.8	29.9	43.9	66.6	35.5	25.5	23.8	17.0	20.4	29.5	31.5	31.2

The lowest flow recorded at this gauge during the period of record is 9.9 cfs on August 13, 1992. In 1997 and 1998, the lowest flows at the gauge were in mid-January, with flows of 22 cfs and 25 cfs respectively. The lowest flow in the 1999 water year was 34 cfs in September (1 cfs lower than the minimum July and August flows for 1999). What this tells us is that, despite the number of claims upstream and the relative seniority of those claims, water is making it downstream, and the lower river (at the gauge) has not gone dry during the period of record, even in low flow years.

There are 10 junior mainstem water right claims (6 owners) downstream of your lowest diversion point. The closest downstream junior claims are two Sieben points of diversion (totaling 11.25 cfs), located just downstream of your access road. After Sieben, the next junior user is roughly 5 miles downstream (two small rights totaling 70 claimed gpm). Beginning roughly another 5 miles downstream of that is a series of two (Robert) Wirth diversions (totaling 13.5 claimed cfs), the town of Wolf Creek, then the of Sentinel/Lahti diversions (totaling 67.5 claimed cfs) just before the mouth.

In dry years, FWP staff have confirmed that a one-mile reach of the Creek (approximate) located immediately downstream of the Sieben diversion becomes severely dewatered. Groundwater inflows on the Sieben Ranch recharge the Creek before it enters the head of Wolf Creek Canyon. If water can be passed by the Sieben diversion, at least a portion of leased rights could provide benefits to this

section (potentially up to your middle diversion), and this water feasibly could be protected for about 10 miles downstream. However, the ability to realistically bypass water beyond the Sieben diversion remains unknown. (Although Sieben rights are junior to two of yours, it would be practical to analyze Sieben's water needs and use in relation to the amount of water typically in the stream.)

The Fishery

The portion of Little Prickly Pear between Canyon Creek and Clark Creek supports resident brown trout, rainbow trout, brook trout, and mountain whitefish. According to studies done in the 1980s, brown trout were the most abundant salmonid species, comprising about 52% of the game fish population in this reach. Next most common were rainbow (36%), then brook trout (10%), and whitefish (2%). Longnose and white suckers were abundant in the slower portions of the stream, primarily in the meadow zones. The stream sections altered by man-caused activities supported fewer trout than the natural, unaltered sections.

Recent radio-tagging studies have revealed that rainbow trout from the Missouri River migrate to, and spawn in, the reach of Creek located upstream of the Sieben diversion. Although not documented, we assume that brown trout from the Missouri River also do the same. The extent of beaver dam development in the Creek greatly influences the ability of rainbow trout and brown trout to migrate upstream. Beaver dams commonly are found throughout the drainage, but are especially concentrated on the Sieben Ranch. Because of the low stream flows that commonly occur in the fall, beaver dams likely hinder movement by fall spawning brown trout more than movement by spring spawning rainbow trout.

Several brown trout redds (fish nests) were observed near the lower diversion during our recent site visit in November. It is unknown whether these spawners were resident fish or persistent migrants from the Missouri River that managed to make it through the beaver dam gauntlet.

Whirling disease has been documented to occur extensively in Little Prickly Pear Creek, including the reach of stream located above the Sieben diversion. Recent studies have revealed that the disease is causing major problems with rainbow trout reproduction in the Creek. Brown trout, however, are much less affected by the disease. Because of passage problems during the fall, a water lease in the upper drainage provides greater benefits to rainbow trout than to brown trout.

The Canyon Creek-Clark Creek section of Little Prickly Pear is bordered entirely by private land. The stretch is moderately popular with local anglers.

FWP requested and was granted a 22-cfs instream flow reservation on this section of Little Prickly Pear Creek. The request was based on the need to maintain the existing resident trout populations; to provide spawning and rearing habitat for rainbow and brown trout from the Missouri River; and to help protect the habitat of those wildlife species which depend upon the stream and its associated riparian zone for food, water, and shelter. The priority date for the reservation is 1985, and the period of use is year-round. The official reservation monitoring location for this reach is on Sieben Ranch near the confluence of Clark Creek. The slight amount of flow information we have for this area shows that this instream flow reservation is likely not always achieved, especially during summer/fall depletion periods.

Evaluation

Montana Fish, Wildlife & Parks uses the following general criteria to organize their evaluations of instream flow lease inquiries – we attempt to "maximize the 4 'A's", as described below. (These criteria continue to be evaluated and improved as more lease inquiries are reviewed – suggestions are welcome!)

1) Advantageous to the Fishery -- Does the leasing opportunity address a stream flow problem that significantly limits potential fishery values?

At this point, FWP Helena staff feel that a potential lease of the above rights would provide a **low to moderate** benefit to the fishery. Streamflow within this reach of Little Prickly Pear Creek does not appear to be a major limiting factor to the fishery. Our conclusions are base on:

- Severe and regular dewatering appears to be limited to the relatively short segment of stream from the Sieben diversion to the head of Wolf Creek canyon.
- Resident fish populations in stream reaches that remain relatively unaltered (with good riparian vegetation and natural meanders) appear healthy.
- Migrant brown trout spawners from the Missouri River likely are limited more by barriers created by beaver dams than low water. Rainbow trout, both residents and migrants, currently are severely limited by the presence of whirling disease. A potential lease would not resolve the impacts created by either beaver activity or whirling disease.

However, a lease potentially would provide water to the reach of stream between your diversion and the head of Wolf Creek Canyon and could supplement flows downstream. The salvage project would also eliminate the need to berm the stream channel to obtain water and eliminate the possible entrainment of fish in at least the middle diversion. The upper ditch likely would remain operational due to the shared water rights associated with the ditch.

2) Actual water dedicated to instream flows

The rate of streamflow potentially generated by the proposed salvage project could be substantial (possibly up to a maximum of 33 cfs, or 1,320 miners inches). However, with the rights as claimed and some rough calculations, the potential volume of salvaged water is relatively small (about 174 acre feet). As a result, the small volume potentially could severely limit the duration that salvaged water could be protected from other appropriators. Unless the claims are amended, we consider this a **significant limitation** associated with this leasing opportunity.

If the volume issue were made less constraining, and depending on the portions of the rights regularly used, this lease would likely add some streamflow to Little Prickly Pear in periods and in a location where dewatering is limiting to fish. The dewatered section of creek is relatively short (less than 2 miles?). Downstream, where complete dewatering is less frequent, added water would provide low-flow "insurance" to both the fishery and other water users, as well as enhance the likelihood that FWP's instream reservation would be regularly met.

Field measurements (or additional engineering information), and discussions with nearby water users, would be necessary to further quantify the amount that could realistically be expected to be added (in comparison to recent use) to the stream. Calculations and/or measurements to address the volume limitation could also assist in further determining actual water that would be dedicated to instream flow.

3) Administrable by the Department or other appropriate entity – Does the lease opportunity involve a reasonable combination of water right seniority and advantageous location so that the instream flow contribution can be ensured and defended through the lease period? (Decreed streams and/or an existing water commissioner are an added plus.)

The water rights in questions are relatively senior to some upstream users, thus there is a mechanism (i.e. making a call on upstream juniors) to bring water downstream to meet irrigation and lease needs. In addition, the rights are relatively senior to users within about 10 miles downstream, but there is a major diversion just downstream from the proposed pumping location. We do not have sufficient information on the reliability of flows (and the related flow levels) to your diversions and beyond to determine how realistic the passing of water beyond the Sieben diversion might be. Only the 12 cfs claim (and the high-water right) is senior to Sieben; thus, only the historically "consumed" portion of this claim could legally be bypassed. The 25 cfs claim is junior to Sieben. It is likely that the installation of a measuring device in the Sieben diversion would be necessary to administer a lease. We do not know if Sieben would be amenable to such a device, nor do we currently know what level of investment would be necessary to install such a device.

The upper diversion (associated with 1882 offered right) is shared with another water user, eliminating the opportunity to "mothball' this diversion, and potentially requiring some oversight of the use of this diversion during the lease period.

FWP prefers leases that have a low potential that a call would be necessary to ensure flows to the leasing stretch, and we prefer situations where there are none or few downstream appropriators. Although you have offered to be actively involved in the administration of a potential lease, this lease offer is less than the "self-administering" situations we prefer. There is no decree, nor is there a water commissioner (or talk of one) assigned to this stream reach. Therefore, with what we know now, we consider this offer to be **moderately** administrable.

4) Affordable – Do the benefits to the fishery justify the cost of the lease or the project creating the leasing opportunity?

We do not feel the benefits to the fishery justify the requested FWP investment of $86,000. However, there are potential benefits, and FWP is willing to be a partner in assisting towards achieving those benefits.

Conclusion

FWP greatly appreciates your approaching us with this lease offer. We feel that the project would provide fishery benefits, but that those benefits will be localized, species-specific, and address issues that are only somewhat limiting to the fishery of Little Prickly Pear Creek. We also feel there are several important unanswered questions associated with the water right and flows.

We therefore recommend and can support a funding request to the Future Fisheries Program of $15,000. This amount assumes that: the volume restriction would be addressed so as to be less constraining on a potential lease; that additional secured funding sources would be documented in the Future Fisheries application; and that the project would include the lease elements as discussed herein.

Thank you for your interest in the program. Please contact Kathleen Williams, Water Resources Program Manager (406-444-3888), if you have questions or concerns about the information in this review.

Appendix C: FWP Water Lease Monitoring Information

Cottonwood Creek

Restoration objectives: improve degraded habitat; eliminate fish losses to irrigation ditches; and restore migration corridors for native fish.

Project Summary

Cottonwood Creek, a large tributary to the middle Blackfoot River originating near Cottonwood Lakes, flows 16-miles to its junction with the Blackfoot River at river mile 43. Cottonwood Creek supports bull trout, WSCT, rainbow trout, brown trout and brook trout. WSCT and bull trout dominate the headwaters. Genetic testing of WSCT in Cottonwood Creek in 2003 showed no introgression. Rainbow trout inhabit the lower mile of stream while brook trout and brown trout dominate middle stream reaches. Completed restoration measures involve water conservation and water leasing, upgrading irrigation diversions with fish ladders, fish screens at large diversions, and implementation of riparian grazing changes

Project Monitoring

In 2004, we continued to monitor fish populations in upper Cottonwood Creek in the area of a water lease, downstream of the Dreyer Diversion. The water lease was initiated in 1997, prior to which time a major diversion (Dreyer Diversion) completely dewatered a portion of Cottonwood Creek during the late irrigation season.

Fish population monitoring in the water lease area (stream mile 12.1) show increasing densities of WSCT following increased flows, and generally stable densities of age1+ WSCT during the drought.

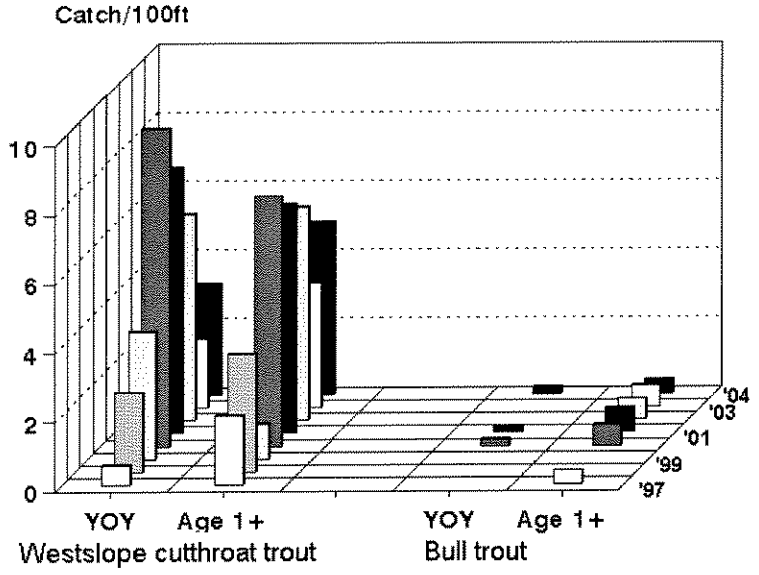


Figure 21. CPUE for WSCT in Cottonwood Creek at mile 12.1, 1997-2004.

Chamberlain Creek

Restoration objectives: improve access to spawning areas; improve rearing conditions for WSCT; improve recruitment of WSCT to the river; provide thermal refuge and rearing opportunities for fluvial bull trout.

Project Summary

Chamberlain Creek is a small Garnet Mountain tributary to the middle Blackfoot River, entering at river mile 43.9 with a base flow of ~2-3 cfs. Sections of lower Chamberlain Creek were severely altered, leading to historic declines in WSCT densities. Adverse changes to stream habitat included channelization, loss of instream wood, dewatering, excessive riparian livestock access, road encroachment, and elevated instream sediment from road drainage. Other problems included fish losses to irrigation ditches, impaired fish passage, and more recently the escalation of whirling disease in lower reaches.

Since 1990, Chamberlain Creek has been the focus of a comprehensive fisheries restoration effort. Projects include: road drainage repairs, riparian livestock management changes, fish habitat restoration, irrigation upgrades (consolidate ditches, water conservation, eliminate fish entrainment, fish ladder installation on a diversion), and improved stream flows through water leasing. Restoration occurred throughout the drainage but focused mostly in the lower mile of stream.

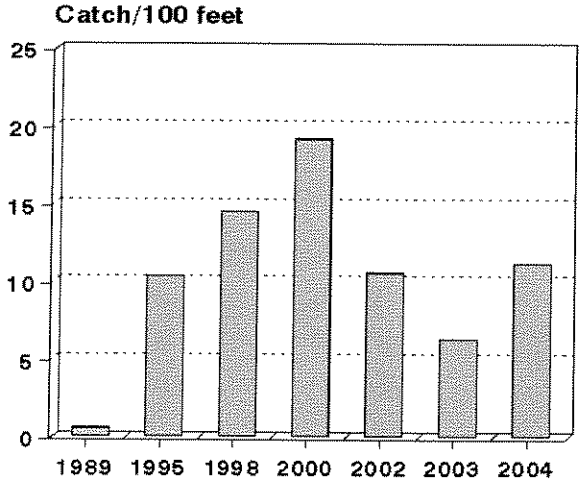


Figure 22. CPUE for WSCT (fish>4.0") in lower Chamberlain Creek (mile 0.1), 1989-

Fish Populations

Chamberlain Creek is a WSCT dominated stream over its entire length, with low densities of rainbow and brown trout in lower reaches. Chamberlain Creek supports a migration of fluvial WSCT 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. In 2004, we continued to monitor fish populations at mile 0.1 in a reach of stream influenced by the water lease. Densities remain much higher than pre-project. Recent density declines (2002-04) appear to be drought and/or possible whirling disease related.

Pearson Creek

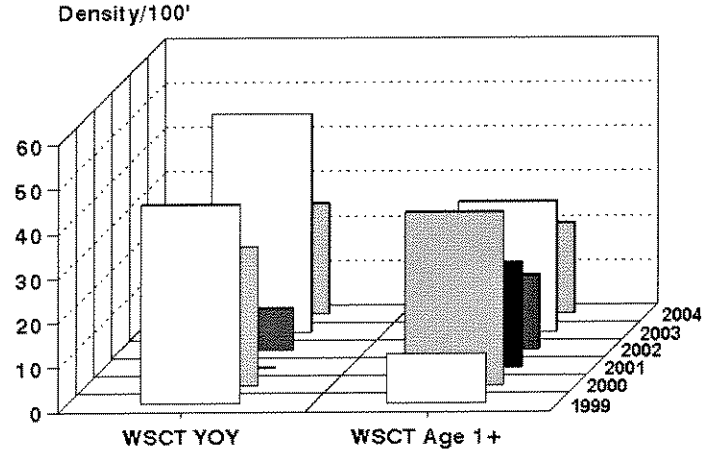
Restoration objectives: restore the stream to its original channel; improve stream flows, access to, and the condition of a historical fluvial WSCT spawning site.

Project Summary

Pearson Creek is a small tributary to Chamberlain Creek with a base-flow of approximately one cfs. Pearson Creek has a history of channel alterations, and adverse irrigation and riparian land management practices in its lower two-miles of channel. The Pearson Creek restoration effort included conservation easements, water leasing, channel reconstruction, riparian habitat restoration and improved riparian grazing management.

Fish Populations

In September 2004, we re-sampled cutthroat trout in lower Pearson Creek (mile 1.1) in a stream reach influenced by a water lease. Additional work completed in spring 2000 included riparian fencing and habitat enhancement with the addition of large wood to the project. Annual population surveys show large fluctuation in densities of young-of-the-year but generally stable densities of age 1+ cutthroat trout. During the current drought period (2000-2004), densities of age 1+ fish appear to be generally higher following fencing and habitat work completed in spring 2000.



Estimated densities of westslope cutthroat trout for Pearson Creek at mile 1.1, 1999 –2004.

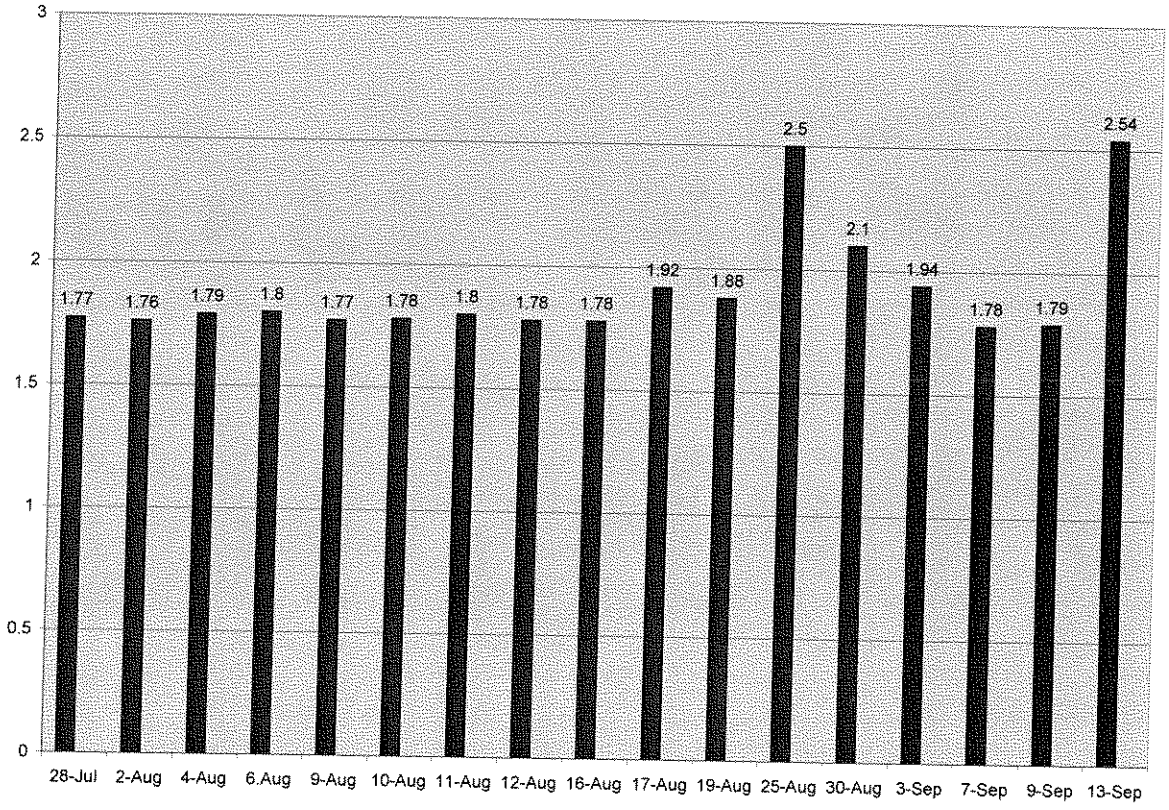
Tincup Creek

During 2004 the streamflows in Tincup Creek were stable and generally only slightly below, at, or above the amount of water leased by FWP (Figure 1).

The Target streamflow is just below 4 cfs. and was estimated to occur at a stage of 1.79-1.80. During the summer of 2004 we passed the site frequently and read the stage reading often. While the streamflow dropped down to about 3.3-3.4 cfs on a few occasions, it stayed near or above the lease level for most of the summer. It should be noted that during the dates outside of the chart, flow levels were clearly above the lease level so we did not stop to read the staff gage.

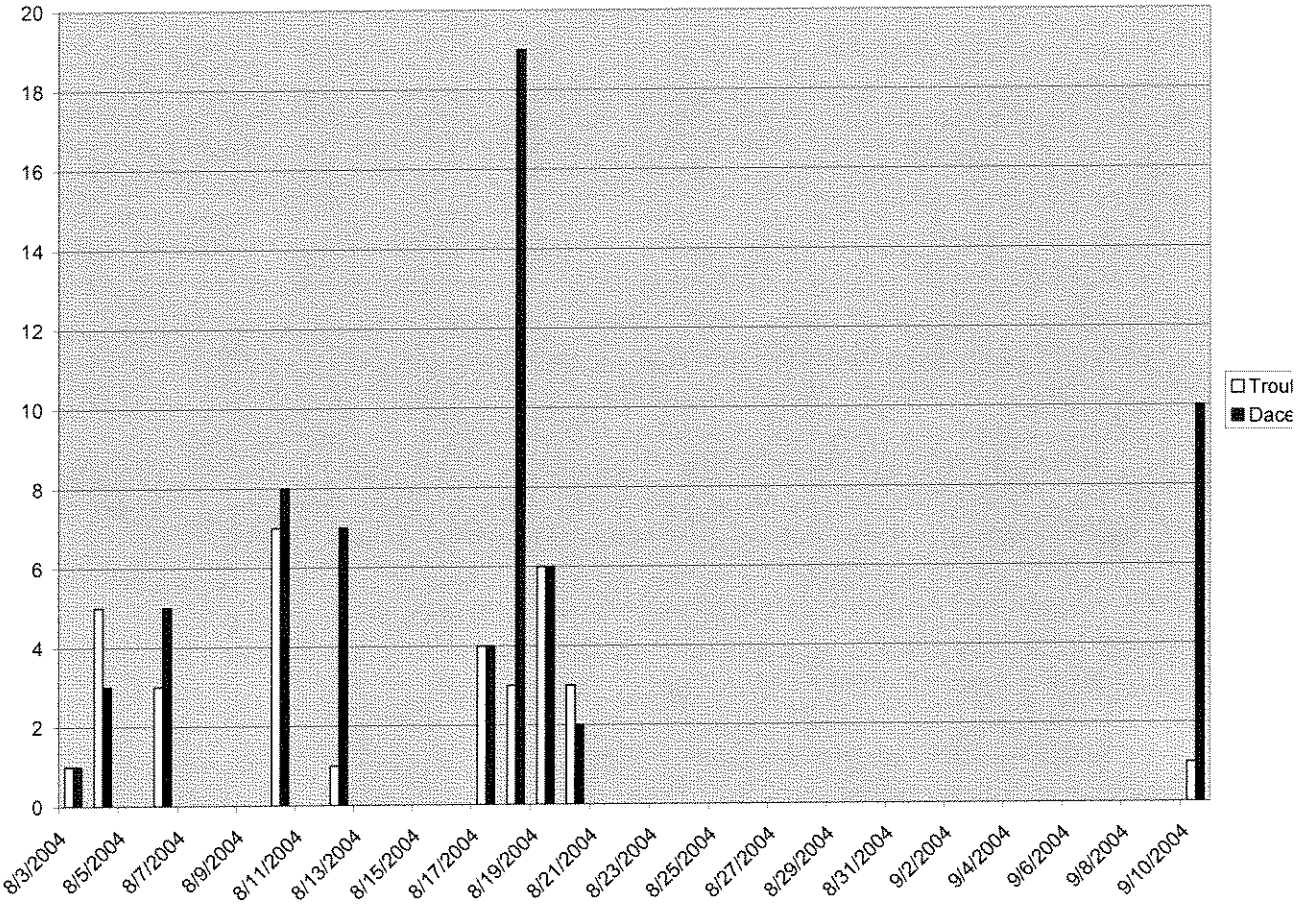
During 2004 we also placed a fry trap in Tincup Creek to capture downstream migrating fish. We were attempting to identify any recruitment of fish to the Bitterroot River at this time. The trap appeared to select against any fish larger than 2 inches so is not a complete picture of the fish passing downstream. Trout and longnose dace were captured in the overnight sets (Figure 2). Most of the fish captured were 1- inch long or smaller. Typically we set the trap about 3 times a week. After rainstorms the trap was often not functional and once streamflows increased in early September we could no longer effectively keep the trap functioning.

Figure 1. TINCUP CREEK STAGE 2004



The trapping data indicate that some trout are migrating downstream but the numbers do not appear to be high. If we trapped earlier in the summer we would capture more rainbow trout. Our target for the past few years has been westslope cutthroat, however we do not seem to have captured any in 2004.

Figure 2. Tincup Creek Frytrap, 2004



Rock Creek

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, reducing its potential as a spawning tributary and contributing excessive nutrients and sediment to the Clark Fork River. The project improved fisheries and wildlife habitat in both Rock Creek and the Clark Fork River through instream flow, nutrient and sediment reduction, habitat improvement, channel stabilization, and removal of fish passage barriers. It also provided spawning, rearing and over wintering 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 sprinkler irrigation and 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 the 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 habitats. 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 once 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.

In fall of 2003 and 2004, brown trout redds were counted for the lower 2.5 miles of Rock Creek, but only once each year, during the first week of November. In 2003, the surveys found 4 definite redds, 9 probable redds and 4 test digs. In 2004, the number of redds increased to 5 definite and 4 probable. The redd counts indicate that brown trout are using the restored reaches of Rock Creek.

Electrofishing estimates were conducted in fall 2001 and 2002. In 2001, the lower channel (historically dewatered reach), the 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. The redd counts and population estimates indicate that brown trout and westslope cutthroat trout are using the restored reaches of Rock Creek.

Stream flows were recorded during the 2003 and 2004 irrigation seasons on Rock Creek. Velocity was recorded using a Marsh/Mcberny velocity meter. If no pivots were in operation, then flow was either recorded only upstream of the headgate or it was not measured. If any pivots were in operation, then discharge was recorded above the

headgate and below the return flow (fish bypass) pipe. Discharge locations were selected to provide uniform velocities and always recorded at the same locations each month. No site visit was conducted in May, and therefore no data exists for that month.

2004 Flow Data

Dates 2004	Number of operating pivots	Discharge (cfs)	
		Above headgate	Below headgate
April	0	---	---
May	0	---	---
21 June 2004	2	9.1	4.5
31 July 2004	1	*203.5	9.9
11 August 2004	0	---	---
18 September 2004	0	---	---
21 October 2004	0	---	---

* Discharge inaccurate due to faulty equipment

Hells Canyon Creek

The Hell's Canyon Creek water lease was monitored during 2004 to determine effectiveness and compliance with the lease agreement by landowners operating the Hell's Canyon Creek Gravity Pipeline. The pipeline was installed and the water lease implemented in 1996. Monitoring of pipeline withdrawal and stream flow from 1996 through 1999 did not reveal problems with meeting guaranteed minimum flows in Hell's Canyon Creek because each of these years provided average or above average stream flow in the vicinity of Hell's Canyon Creek.

During the extremely dry conditions experienced in 2004, however, the stream flow of Hell's Canyon Creek was critically low throughout the summer period, and the stream would have most certainly gone dry if the pipeline system and the associated water lease was not in place. Although the terms of the water lease were met during 2004, the low flows resulted in marginal conditions in the lower 2 miles of stream below the pipeline system. The guaranteed minimum flows for Hell's Canyon Creek established in the lease agreement were:

TIME PERIOD	MINIMUM FLOW (CFS)	PURPOSE
April 1 – July 15	1.60 cfs	maintain rainbow trout egg incubation
July 16 – Nov. 4	0.25 cfs	provide fry migration to avoid stranding

As in previous years, discharge of Hell's Canyon Creek exceeded the minimum flow value of 1.60 cfs prior to 15 July 2004. On 2 July, flow was measured at 7.4 cfs, which was well above the lease-required minimum of 1.6 cfs. On July 14, the flow dropped to 2.30 cfs and streamflow remained at a low level for the remainder of the irrigation season. Five flow observations were made at the mouth of Hell's Canyon Creek between 14 July and 29 September, and stream flow ranged from 1.1 cfs to 2.3 cfs during the period.

Since flow exceeded the 0.25 cfs recommended minimum throughout the summer, the pipeline was not routinely monitored during 2004 to determine irrigation withdrawal from the system. Trout fry monitoring at the bypass pipe of the fish screen was not monitored during 2004 due to manpower limitations.

Although summer flow was below normal during 2004, the typical flow of 1 to 2 cfs was higher than flows observed during 2000 to 2003. From 2000 through 2003, there is no question that Hell's Canyon Creek would have been completely dewatered downstream of the diversion if the water lease was not in place. Similarly, it is likely that Hell's Canyon Creek would have been completely dewatered during 2004 if the water lease were not in place. Several days during August stream flows were less than 3 to 4 cfs ABOVE the point irrigation withdrawal. Despite the low flows downstream of the diversion (frequently less than 1 or 2 cfs during July and August, the water remained relatively cool and hundreds of trout fry could be observed rearing in the leased waters of Hell's Canyon Creek below the diversion.

In addition to flow monitoring, FWP typically monitors trout fry migrations at the fish screen bypass to document the effectiveness of the fish screen at the head of the gravity pipeline. Based on fish trapping conducted between 7/1/03 and 9/30/03, an estimated 10,000 rainbow trout young-of-the-year were screened from the pipeline inlet during 2003. The peak of trout movement occurred in late July when several hundred fish per day were captured at the fish screen bypass. Fish movement was minimal during late August and early September, but sufficient flow was available to prevent stranding loss of fry in Hells Canyon Creek. Manpower was not available to conduct this monitoring in 2004.

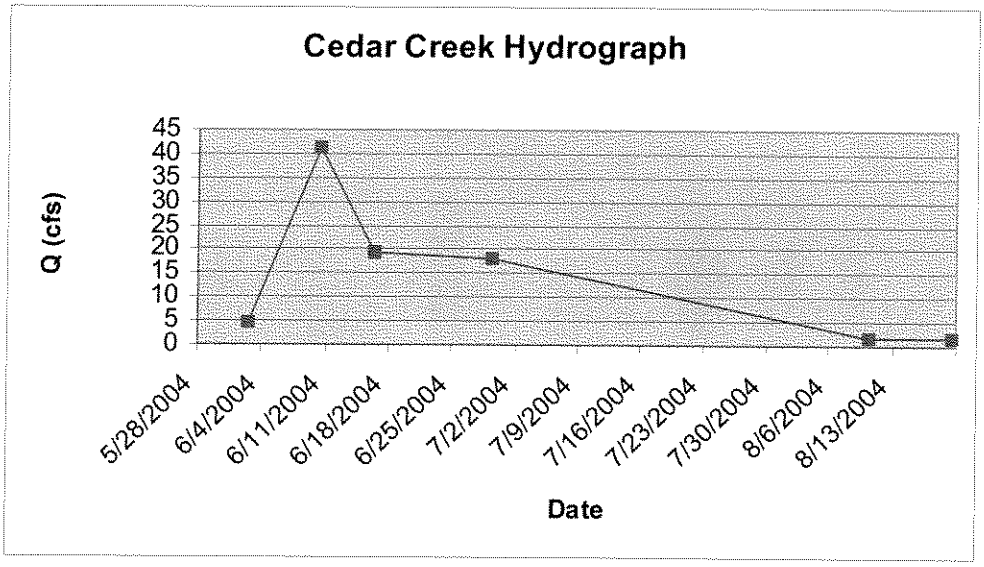
Annual electrofishing surveys of juvenile trout were conducted near the mouth of Hell's Canyon Creek in 2004. Juvenile rainbow trout abundance during October represents fish rearing throughout the summer in Hell's Canyon Creek, and these data indicate that significant rearing occurred in Hell's Canyon Creek during recent drought years (Table 1). The water provided by the water lease is critical for providing this rearing habitat for juvenile fish.

Table 1. Catch-per-unit-effort electrofishing surveys for juvenile rainbow trout (<120 mm) near the mouth of Hell's Canyon Creek, 1992 – 2004.

Year	Catch per 100 seconds of shocking time
1992	5.6
1995	3.0
1996	3.8
1997	4.0
1998	2.6
1999	1.6
2000	---
2001	3.3
2002	4.7
2003	6.2
2004	5.5

Big Creek
Water lease in place since mid-1990's resulted in significant increases in redd numbers (27 in 88, 39 in 89, to 142 in 2004). DeRito telemetry study documented adult spawners lost into irrigation ditch, but we found only juvenile fish in ditch electrofishing survey. We did document 3 YCT redds in the ditch. In our single overnight fry trapping, we documented that the ditch captured 40% of the total catch. Screening is likely to minimize entrainment of post-emergent fry if approach velocities are minimized.

Cedar Creek
Water lease in place since mid-1990's. While redd numbers in 2004 were less than late 1980's (72 in 1988, 138 in 1989), spawning wasn't complete when survey was conducted. We did not document loss of adult spawners, but the ditch captured 13 YCT fry compared to 43 in the stream (20% of total overnight catch). Installation of a screen would minimize entrainment of fry.



Mol Heron Creek

This ditch was screened with an infiltration gallery that proved ineffective. The irrigator partially dismantled the screen. Minor repairs of the structure should eliminate entrainment. We captured 21 YCT fry and 3 RB fry in an overnight set. In the stream, we only captured 2 YCT and 1 RB, but the fry trap wasn't fully functional. We did not document entrainment of YCT spawners, but found yearling RB in the ditch. The stream supports a strong spawning run of YCT. Culverts upstream of diversion are under scrutiny as passage barriers.