

**2006 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**

**December 2006**

## TABLE OF CONTENTS

### PART A – LEASING ACTIVITY REPORT

	<u>Page</u>
I. EXECUTIVE SUMMARY.....	A-3
II. INTRODUCTION .....	A-3
III. WATER RIGHTS AND INSTREAM FLOW PROTECTION .....	A-3
IV. FWP INSTREAM FLOW LEASING STUDY - BACKGROUND.....	A-5
V. DESIGNATED STUDY STREAMS & LEASES.....	A-6
VI. FISH, WILDLIFE AND PARK WATER PROGAM .....	A-7
VII 2006 LEASING YEAR – INSTREAM FLOW ACTIVITIES .....	A-10
VIII. LEASING PROGRAM CHALLENGES.....	A-12

### List of Figures

Figure 1. Status of Designated Study Streams and Leasing .....	A-6
Figure 2. FWP Instream Flow Leasing History, as of December 2006.....	A-8

### PART B – WATER LEASE MONITORING REPORTS

#### COLUMBIA BASIN

Cottonwood Creek .....	B-1
Chamberlain Creek .....	B-2
Pearson Creek .....	B-3
Rock Creek (Near Garrison, MT) .....	B-4

#### YELLOWSTONE BASIN

Big Creek .....	B-7
Cedar Creek .....	B-9
Mol Heron Creek .....	B-12
Locke Creek .....	B-14

#### UPPER MISSOURI BASIN

Hells Canyon Creek .....	B-19
--------------------------	------

## **Part A – LEASING ACTIVITY REPORT**

### **I. EXECUTIVE SUMMARY**

During the 2006 calendar year Montana Fish, Wildlife and Park's, Water Program did not develop or finalize any new leases. However, the agency did investigate new or revised opportunities. Stream and ditch flows were monitored on Trail Creek in the Big Blackfoot drainage and a short term "flushing / fish passage" flow tests were conducted on Mill Creek in the Yellowstone Basin and Hardy Creek in the Upper Missouri Basin. During Montana's sixth consecutive drought year our primary focus was, once again, upon protection and management of current water rights and stream flows.

### **II. INTRODUCTION**

Pursuant to Section 85-2-436(3)(a), MCA [2005], Montana Department of Fish, Wildlife, and Parks (FWP) must submit an annual water leasing study progress report to the Department of Natural Resources and Conservation (DNRC), the Fish and Wildlife Commission (Commission), and the Environmental Quality Council (EQC).

The progress report must also contain a summary of stream reaches approved by DNRC for study (pursuant to 85-2-437, MCA [2005]), 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 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.

### **III WATER RIGHTS AND IN STREAM FLOW PROTECTION**

Montana's water law currently provides several mechanisms to protect instream flows or water levels. These provisions were added relatively late in Montana's history and include:

1. Statutory directive ("Murphy Rights") a pre-1973 water rights,
2. Purchase or contract from new or existing water storage,
3. State based "Water Reservations",
4. Water Leasing, and the,
5. Designation of "Closed Basin" watersheds.

In the statutes creating Montana's general stream adjudication, the legislature directed FWP to file "Statements of Existing Water Right Claims" for public recreational uses (85-2-222 MCA [2005]). That legislative requirement has been further explored by the Montana Supreme Court

in a series of cases commonly referred to a “Bean Lake”. Their most recent holding also recognized that there could be other judicially recognized pre-1973 instream water rights. Through, the adjudication proceedings those claims are being reviewed and decided accordingly.

Montana’s water law, based upon the theory of prior appropriation, 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 water right to do so. Prior to the creation of Montana’s water right permitting process, a right was defined by its historic and beneficial use. All water rights, both permitted and pre-1973 existing rights, have specific limits that define the beneficial use including, but not limited to,

- how much water can be diverted,
- for what purpose,
- during what time period,
- at what point on the stream,
- the location of the water use, and
- a priority date that controls when water is diverted.

The priority date is the only feature that ranks and 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 legal system provides for a system of Water Commissioners – court appointed water agents who regulate diversions. However, that statute cannot be fully utilized until Montana’s general stream adjudication is completed. Therefore, on most streams, water management and allocation is currently a “water user-to-water user” activity. FWP, like any other water user, is obligated to protect and manage water rights they hold, including those for instream flow.

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.

Generally, the prior appropriation water right system encourages maximum diversion and use of water from Montana’s streams. Except in basins that are closed to new appropriation, the DNRC may issue new permits to divert surface water. The applicant for a new water use permit must 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 minimum instream 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.

#### **IV FWP INSTEAM FLOW WATER LEASING PROGRAM - BACKGROUND**

Non-diversionary uses of water and rights for water have gained increasing statutory and legal recognition in the last four decades. The ability to exchange and transfer water rights is a fundamental, long-standing, and court recognized, aspect of an inchoate right such as a water right. However, the ability to transfer an existing right to instream flow was not statutorily authorized until 1989.

In the 1960's, conservationists began to advocate 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. The concept of state based water reservation was established in the Montana Water Use Act of 1973. Reservations provided an avenue for *public entities* to seek water for future use or to protect in stream flows or water levels.

Under these provisions, FWP was 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 water conservation tool, however, due to their late priority date, and therefore junior status, they often do not provide much protection for stream flows during drought.

In the late 1980's, much of Montana suffered severe drought conditions. Low natural flows coupled with hot dry conditions that demanded higher than normal diversion rates for consumptive water users, exacted severe tolls on stream flows and, in turn, sensitive fisheries. Montana newspapers ran front-page photos of fish kills on dewatered streams.

These conditions spurred unsuccessful attempts to create new mechanisms to protect instream flow via "market based" mechanisms between willing buyers and sellers. (State Water Plan subsections: "Agricultural Water Use Efficiency" and "Instream Flow Protection", Montana Department of Natural Resources and Conservation, February 1989).

The 1989 Legislature considered 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. After considerable legislative debate and testimony, the idea became law. Since then, FWP has pursued leasing opportunities with willing lessors on seriously dewatered streams with high fishery restoration potential. These water leases are now making important 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 reviewed the program and related statutes during the 1997-98 Interim. The Subcommittee conducted public review of the progress and acceptance of the program. The EQC eventually proposed legislation to renew FWP's ability to lease water for 10 additional years, increase the cap on the number of FWP leases, increase the maximum period for certain leases, and allow for the leasing of 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 FWP's water leasing statutes" (EQC, 1998). The bill 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.

The reauthorized statute also requires FWP to prepare a final report that is to be adopted by the FWP Commission and the DNRC and submit the report to the EQC for completion by December 1, 2008.

## V. DESIGNATED STUDY STREAMS AND LEASES

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. No additions to the designated study streams were requested or made in 2006.

<b>Figure 1. Status of Designated Study Streams and Leasing</b>			
<b>Study Stream</b>	<b>Basin</b>	<b>Status of Request</b>	<b>Status of Leasing in Reach</b>
<b>1. Swamp Creek</b>	Big Hole River	Final approval 3/5/90	No lease; FWP has conducted previous unsuccessful negotiations.
<b>2. Big Creek</b>	Yellowstone River	Final approval 3/5/90	Two leases finalized in 1999
<b>3. Mill Creek</b>	Yellowstone River	Final approval 11/9/90	Three leases; all expired and not be renewed. Flushing flow tested and evaluated in 06.
<b>4. Cedar Creek</b>	Yellowstone River	Final approval 1/6/92	One lease in place; additional lease agreement finalized in 2003
<b>5. Blanchard Creek</b>	Blackfoot River	Final approval 9/25/92	Lease rescinded. Opportunities being explored with new owner.
<b>6. Hells Canyon Creek</b>	Jefferson River	Final approval 9/25/92	Lease
<b>7. Tin Cup Creek</b>	Bitterroot River	Final approval 10/30/92	2004 was last year of lease. Montana Water Trust now holds this lease.
<b>8. Rattlesnake Creek</b>	Clark Fork	Final approval 5/25/95	No lease; negotiations on hold
<b>9. Mol Heron Creek</b>	Yellowstone River	Final approval 11/28/95	Lease
<b>10. Rock Creek</b>	Blackfoot River	Final approval 11/28/95	TU lease negotiations on hold, past FWP negotiation information being used in efforts by Trout Unlimited
<b>11. Chamberlain Creek</b>	Blackfoot River	Final approval 1/3/96	Lease

<b>Figure 1. Status of Designated Study Streams and Leasing</b>			
<b>12. Pearson Creek</b>	Blackfoot River	Final approval 1/3/96	Lease
<b>13. Rock Creek, near Garrison</b>	Clark Fork River	Final approval 7/15/98	Lease
<b>14. Locke Creek</b>	Yellowstone River	Final approval 6/18/02	Lease
<b>15. Trail Creek</b>	Clearwater / Blackfoot River	Final approval 6/18/04	One lease agreement with two lessors. (See discussions above.)

Since its authorization FWP has developed 17 agreements to lease water for instream flow. Fifteen of these were authorized through the statutory instream flow leasing study provisions for FWP. One was converted to instream flow through the Upper Clark Fork Basin Instream Flow Pilot program. The Trail Creek project is being reexamined prior to submittal of a Change of Use application to DNRC. One lease on Tin Cup Creek could not be renewed as is now held by the Montana Water Trust. Three have been terminated. FWP's leasing history is provided in Figure 2.

## **VI FISH, WILDLIFE AND PARKS “WATER PROGRAM”**

FWP has developed a “water program” to, in part; implement the statutory provisions for water leasing. This program is administratively located in the Fishery Division’s Habitat Bureau. The program has two full time water positions - one located in Helena and a second in Lewistown Montana. Biologist and Fish Mangers located in the Regional offices provide additional program assistance. These two positions investigate leasing opportunities; monitor existing leases and broadly speaking, oversee the protection and management of agency water rights. More specific duties include but are not limited to:

- Participation in DNRC water right permitting process where new rights or water right changes may adversely affect FWP water rights;
- Participation in Montana’s general stream adjudication process;
- Participation in the Reserved Water Right Compact Commission deliberations;
- Management of instream flow derived from water storage contracts. e.g. Painted Rocks Reservoir water in the Bitterroot River drainage;
- Monitoring drought conditions and stream flows especially during water short years;
- Making calls on junior water users to protect instream flows during low flow periods;
- Protecting FWP water rights from illegal diversions or improper uses of water;
- Participating in local drought planning activities and in the Governor’s Drought Task Force.
- Conducting hydrologic analyses and stream flow monitoring on streams where FWP water rights or leases exist;
- Assisting fishery biologists and stream restoration specialists with water right related issues; and
- Negotiating, developing, implementing and monitoring water leases procured for instream flow.

**Figure 2. FWP Instream Flow Leasing History, as of December 2006**

SOURCE	LESSOR	LEASE TERM/EXP.	PRIORITY OF RIGHT	QUANTITY LEASED	PERIOD OF USE	COST
Mill Creek	Mill Creek Water and Sewer District	Terminated	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 <sup>1</sup>
Mill Creek	Individual	Terminated	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	Contract Rescinded 3/5/2004	May 11, 1913 (first right on stream)	3.0 cfs	April 15 -October 15	\$2,000 per year
Tin Cup Creek	Six individuals	Met statutory limit on renewal. 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 Lease Renewed Sep. 20, 2015	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 <sup>2</sup> 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 (1 <sup>st</sup> 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	Terminated	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 <sup>3</sup>	20 years Oct. 2016	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 <sup>4</sup>	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 2 (cont.). FWP Instream Flow Leasing History, as of December 2005**

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 (1 <sup>st</sup> 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 (4 <sup>th</sup> 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.

<sup>1</sup>Lessor pays for water commissioner and the installation of measuring devices on all on-farm turnouts from the pipeline.

<sup>2</sup>These rights are used to maintain a flow of 1.3 cfs at the mouth of Cedar Creek, eliminating effects on other water users.

<sup>3</sup>FWP converted its own water rights to instream flow under 85-2-439, MCA.

<sup>4</sup>Ranches transferred their rights to the Montana Land Reliance, who is the lessor.

## VII 2006 LEASING YEAR – INSTREAM FLOW ACTIVITIES

Drought conditions continued in most of Montana in 2006. While snow pack in much of the state was near or slightly below average. Abnormally high spring temperatures stimulated an early and rapid runoff. Further, much of the state did not receive significant precipitation throughout July and August. The National Weather Service, in their presentation to the Governor's Drought committee, identified the summer of 2006 as the 33<sup>rd</sup> driest of 112 years of record.

Once again, FWP water program staff spent much of their time responding to drought. As a result, FWP did not complete any new leases in 2006. Instead staff priorities were to:

- Monitor existing leases and stream flows where FWP hold water rights;
- Enforce instream water right priority against junior water users;
- Serve on the Governor's Drought Advisory Council;
- Taking part in the negotiations of federal reserved water rights between the State of Montana and United States Forest Service and other United States Department of Agriculture facilities;
- Participate in Montana's general stream adjudication process investigating claim examination issues and resolve accuracy issues that might adversely affect FWP water rights;
- Participate in a collaborative, interest group dialog, hosted by Montana Department of Natural Resources and Conservation (DNRC), related to surface water /ground water appropriation;
- Work with local watershed groups on stream flow measurement and potential restoration projects; and
- Protect FWP water rights as an objector in State's water right appropriation processes.

Water program and FWP fishery biologists devoted considerable time to the investigating three potential flow restoration opportunities. On Mill Creek, tributary of the Yellowstone River, a temporary diversion reduction agreement was tested to evaluate the benefits of a short-term flow enhancement to aid in the out-migration of Yellowstone cutthroat fry to the main stem. The Mill Creek investigation was an extension of work begun under a previous lease agreement that was allowed to expire. A temporary flow reduction agreement was also used on Hardy Creek, tributary to the Missouri River, to evaluate the potential for both flow and channel restoration. Additional flow monitoring and synoptic ditch measurements were conducted on Trail Creek in the Big Blackfoot Drainage. The potential for a Trail Creek lease was introduced in the 2005 annual report. A contract was developed between the parties but at this time, lease approval has not been requested or submitted to DNRC.

- **Trail Creek (Columbia Basin)**

In 2004, FWP signed a lease agreement with two water right holders on Trail Creek, a tributary to the Clearwater River, near Seeley Lake. One of the parties agreed to replace a leaky ditch with a pipe that was intended to reduce diversionary demand during periods of low flow. FWP was to then lease the saved water. A second party leased FWP all the water they once used for irrigation. In 2006, Water Program staff continued to monitor the water

flow in the diversion and in the creek below the diversion to determine if the project can be modified and still meet instream flow goals. At current diversion levels, it appears that conveyance and other losses are about .5 cfs. Over the winter, additional evaluation of field data will be conducted to determine if cost effective structural improvements might be made that will enhance stream flow.

- **Mill Creek (Yellowstone Basin)**

FWP contracted with the Mill Creek Water District to cease diversions from Mill Creek for approximately 60 hours in order to move or flush Yellowstone Cutthroat and Rainbow Trout fry and young fish into the Yellowstone River. The Water District agreed to cease diversion no later than 10 PM, August 19, 2006 with partial resumption of diversion beginning approximately 6 A.M., August 22, 2006 and full diversion resuming no sooner than 10 A.M. that same day.

Mill Creek responded quickly to changes in flow. It took only 4¾ hours for the increased flow to travel the 5 miles between the flow recording stations despite the last 0.7 miles of stream being dry. Upon completion of the test and resumption of the water diversion, stream flows decreased to pre-test conditions at the lower station in only 2½ hours. The estimated net loss of 30% between the recording stations is somewhat lower than expected, but should not be used as a standard applicable to different times of the year and different flow regimes without further study. Even with the stream being dry, the closing of the Water District Pipeline was clearly sufficient to generate a flow that reaches the Yellowstone River.

Fry trapping data suggest that some fry reached the Yellowstone River. However, the number of redds that were dewatered prior to the test greatly reduced survival of eggs and fry. If a base flow can be maintained during egg and fry incubation, the success of a flushing flow would be much greater. The investigation showed that a flushing flow without an accompanying base flow to protect redds does little to improve Yellowstone Cutthroat fry recruitment to the Yellowstone River.

- **Hardy Creek (Missouri Basin)**

The construction of a gravel pit on lower Hardy Creek has obliterated the natural stream channel. FWP is exploring the possibility of restoring the channel in the abandoned gravel pit. A restored channel would allow Hardy Creek to function as a spawning and rearing area for rainbow trout. However, it is not clear that Hardy Creek has sufficient stream flow to support its functioning as a spawning and rearing area due at least in part to dewatering caused by one major irrigation diversion. In 2006 FWP entered into a diversion reduction agreement with the largest water user on Hardy Creek. The reduction of water usage from this diversion allowed FWP to further evaluate the potential for leasing water rights to provide for adequate stream flow if the gravel pit section of Hardy Creek were restored. FWP had a similar agreement in 2005 and gathered stream flow data in 2005. Additional data gathered under a wider ranging climatic and hydrologic conditions is needed to more accurately assess the ability of Hardy Creek to support fish spawning and rearing if the channel restoration project is implemented.

- **Implementation Painted Rocks instream water contract.** FWP worked with DRNC and

the Painted Rock's water commissioner on the timing and release of water under the renewed water service contract. This contract provided 15,000 acre-feet of water from Painted Rocks Reservoir on the West Fork of the Bitterroot River. That water was delivered and policed through the upper and mid section of the watershed to maintain summer instream flow.

- **Supporting leasing/conversion by others.** FWP has assisted water right holders interested in leasing water 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 to document whether a conversion will benefit the fishery.
- **FWP leases and water reservations available on the Web.** The Montana Fisheries Information System (MFISH) allows users to access a variety of information for various streams and rivers, including the presence of instream water rights and 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 field staff, as well as the public.

## VIII. LEASING PROGRAM CHALLENGES

**The year in review and leasing challenges.** FWP did not complete any new leases in 2006. FWP is required by statute to provide compelling justification in this report for its failure to obtain a new lease. Three leasing opportunities were investigated and tested but no leases completed. (These are discussed in the previous section.)

Instream flow leases have clearly enhanced spawning, rearing and recruitment of fish in several important streams. These streams attract thousands of anglers every year and importantly contribute to local economies. Fisheries of the Blackfoot, Bitterroot, Jefferson, Clark Fork and Yellowstone have all benefited from the leasing program. Leasing is a valuable tool in selected locations. However, leasing is not an effective tool for re-watering entire stream systems. It is important to point out that good, strategic leases are difficult to find.

In 1998, FWP submitted a Water Leasing Study Final Report to the EQC, which EQC then considered in its Final Report to the 56<sup>th</sup> Legislature. EQC reiterated FWP's conclusion:

“The DFWP has been very careful in obtaining the leases it currently holds. Although many potential leases have been investigated, only a small number have been pursued to completion. Interest in leasing is more prevalent now than it was during the first few years of the study. Water leasing will not solve all of Montana's stream dewatering problems, because of; (1) the complexity of obtaining leases, (2) the small quantities of water that are usually involved, and (3) the potential effects on existing water users. However, because leasing is one tool that can help balance the competing uses of a finite water resource, leases should continue to be cautiously selected and pursued where they will benefit the fisheries resource without adverse effects on existing water users.”

There continue to be challenges and impediments to water leasing. Some of the more significant

operational and policy issues that limit the effectiveness of water leasing are described below.

**Adjudication of Water Rights** As discussed in the 2005 Annual Water Leasing Report, the slow pace of Montana's general water adjudication is resulting in the loss of potential leases. Inflated, unperfected and abandoned claims impede the process. The 2005 Legislature provided DNRC and the Montana Water Court considerable direction, funds, and staff to revitalize the state's general stream adjudication. It will be several years before these positive actions have a significant impact. Until things progress further, every water right investigated as a potential lease must be subjected to a significant "due diligence" review.

Since the initiation of the State's general stream adjudication there has been a generational shift in ownership of many properties. Additionally, along the Rocky Mountain spine, Montana is experiencing significant and rapid change in ownership and land use. These new owners are frequently unfamiliar with water law and their own water rights. An accurate, timely adjudication will help relieve this problem.

**Limitations on lease renewals** The water leasing study statute limits FWP to a single lease and one renewal [85-2-436 (2)(f) MCA 2005]. Except for projects that include considerable conservation infrastructure, the lease term is limited to 10 years with one 10-year renewal. FWP may again see this statutory restriction impede future opportunities. Fisheries in Montana would benefit if FWP were allowed the ability to renew leases for more than two terms. While some concerns linger over long-term consequences and impacts to other users, there are other statutory safeguards that protect senior water right holders. Further, since FWP is a governmental entity, there are opportunities for oversight by all three branches of state government.

**Authorization of a Permanent Leasing Program.** The leasing program was conceived as a study. Ten years into the program, the EQC published a final report on the leasing study. The EQC considered making the program permanent but recommended that the study be continued for another ten years citing the need to take a cautious approach with the legislature rather than risk losing the entire program to a sunset clause. FWP's current authority to lease water will expire in 2009. The 2005 legislature, in reviewing the two statutory private water leasing study programs, determined that those statutory provisions could 1) safely be combined into a single state wide program and 2) that the "private party" leasing program become permanent. Under the existing FWP water leasing study program, fisheries have benefited and controversy over specific projects has been limited.

**Permanent dedication of water to instream flow.** The leasing program is one valuable tool for the enhancement of fishery resources. However, the statutory limitations that regulate both the number of renewals and the duration of leases constrain long-term effectiveness of the instream flow leasing effort. Other western states, including Colorado and Oregon allow water to be permanently dedicated to instream flow. Montana does not. Moreover in Montana, a consumptive water right holder may change the use of that right to any beneficial use other than instream flow so long as certain statutory criteria are met – the most important of which is that the change does not adversely affect any other water user. Montana's past legislative debates have, to date, not extended the authority to permanently change a consumptive diversionary right to instream flow. The 2006 legislature will consider the draft compact between the State of

Montana and the United States Department of Agriculture. The USDA Forest Service (USFS) will propose, as part of that compact, that the USFS is given the ability to permanently convert acquired consumptive rights to instream flow. We recommend applying the same concept to properties and water rights held or acquired by FWP.

**Increased Transaction Costs for Water Leasing:** Because many of Montana's rivers and streams are over allocated and large basins are closed to new surface water appropriations, those seeking new uses of water are increasingly looking to purchase water rights. Ground water in these designated closed basins was generally viewed as "appropriable water", although there was often a "connected to surface water evaluation." In the summer of 2006, the Montana Supreme Court, in a decision referred to as DNRC vs. TU, reviewed DNRC's interpretation of "connected ground water" and suggested to the agency and the district court that a broader interpretation of was merited by the facts. The case was remanded back to district court. In response to that decision, proposed new users of ground water are purchasing existing surface water rights to mitigate for adverse effects that might result from their new appropriation. This mitigation concept is one of several "augmentation" alternatives.

The 2007 legislature will likely debate a bill request that would require "augmentation" as a mitigation requirement whenever a future, closed basin, ground water appropriation causes surface water depletion. This action is likely to stimulate a future market for water rights and will likely increase the value of those rights. Water is a limited resource and senior rights are even more limited. The cost to lease water will increase over time. At some point these increased costs will limit the agencies ability to participate in a leasing program. It follows that Montana should evaluate the need for a mechanism to permanently dedicate formerly consumptive water rights to instream flow.

The above concerns and others that may arise are likely to be re-examined during the 2009 legislative process if not before.

# FWP WATER LEASE MONITORING INFORMATION, 2006

## COLUMBIA RIVER BASIN

### Cottonwood Creek

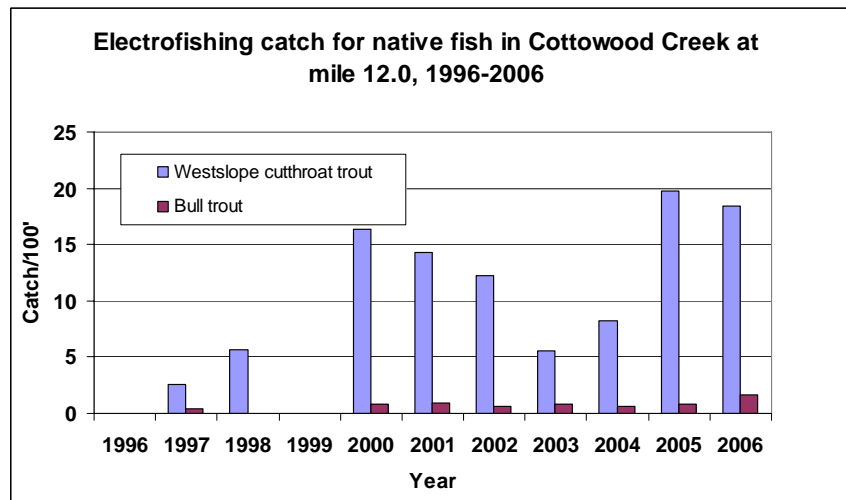
Restoration Objectives: Improve degraded habitat; eliminate fish losses to irrigation ditches; and restore migration corridors for native fish.

Project Summary: Cottonwood Creek is not a lease, but a conversion allowed under the statutorily developed Upper Clark Fork River Basin In-stream Flow Pilot Program (85-2-439 1997, repealed in [2005]). This lease/conversion is included in this report as an example of FWP's other instream flow-related activities. FWP acquired the water rights along with lands purchased for the Blackfoot Clearwater game range. The conversion was initiated in 1997. Prior to the conversion this "Dreyer Diversion" completely dewatered a portion of Cottonwood Creek during the late irrigation season

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, west slope cutthroat 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.

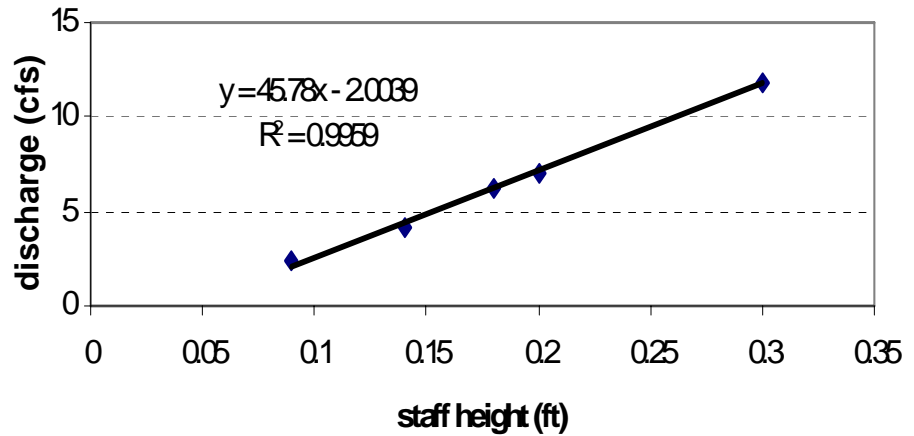
Biological Monitoring: In 2006, FWP continued to monitor fish populations in the upper Cottonwood Creek instream flow

conversion area, downstream of the Dreyer Diversion. Fish population monitoring in the conversion area (stream mile 12.0) shows increasing densities of WSCT following the 1997 increase in flows, and generally stable densities of WSCT between 2000-2006. Drought has influenced populations in recent years.



**Flow Monitoring:** Blackfoot Clearwater Game Range agriculture personnel administer water withdrawals at the Dreyer Diversion and monitor flows in Cottonwood Creek. In 2005, FW re-rated a staff gage to help monitor irrigation use at the Dryer Diversion. A comprehensive flow-monitoring program for Cottonwood Creek is not essential because there are no

diversions within the approximate 2-mile-long reach where FWP protects its salvaged water. Since only portions of the water rights were converted to instream flow, spot checks have revealed a proper balance of water has been found between diverted and instream water. In the unlikely event that new diversions are approved, FWP will then develop a more comprehensive flow monitoring plan for Cottonwood Creek.



**Figure X.** Stage discharge relationship for the Dreyer ditch on Cottonwood Creek, May 2005.

### 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.

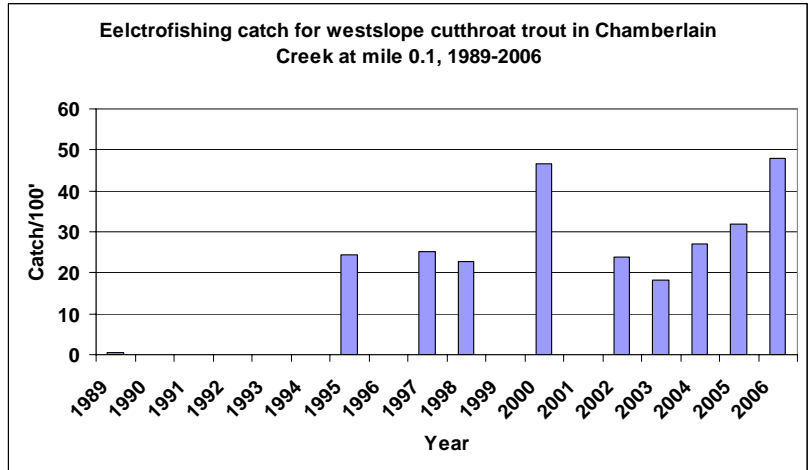
Since 1990, Chamberlain Creek has been the focus of a comprehensive fisheries restoration effort. Projects include road drainage repairs, riparian livestock management changes, fish habitat restoration, irrigation upgrades (consolidated ditches, water conservation, elimination of fish entrainment, and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



**Biological Monitoring:** Chamberlain Creek is dominated by WSCT stream over its entire length, with low densities of rainbow and brown trout in lower reaches.

Chamberlain Creek also 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 2006, 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 before the project. Recent density declines (2002-04) are likely related to continuing drought.



**Flow Monitoring:** Chamberlain Creek has only two water users. One user has leased all his water to FWP. The second diverts half the water into a pond, and then returns all but the evaporated water to Chamberlain Creek. FWP primarily relies on the lessor to monitor instream flows. FWP personnel periodically check the gauge and measure flows to ensure an even flow distribution between the two water users. In past years spot checks revealed an equal distribution of water diverted and left instream. This year, spot checks confirmed that flows are evenly divided between the users. Under an agreement with FWP the United States Geologic Survey (USGS), measured flows on four occasions during the irrigation season.

Date	Stage (feet)	Flow (cubic feet/second)
May 17, 2006	1.44	34.6
May 31, 2005	1.14	15
July 11, 2006	.84	3.46
August 23, 2006	.75	1.55

**Pearson Creek**

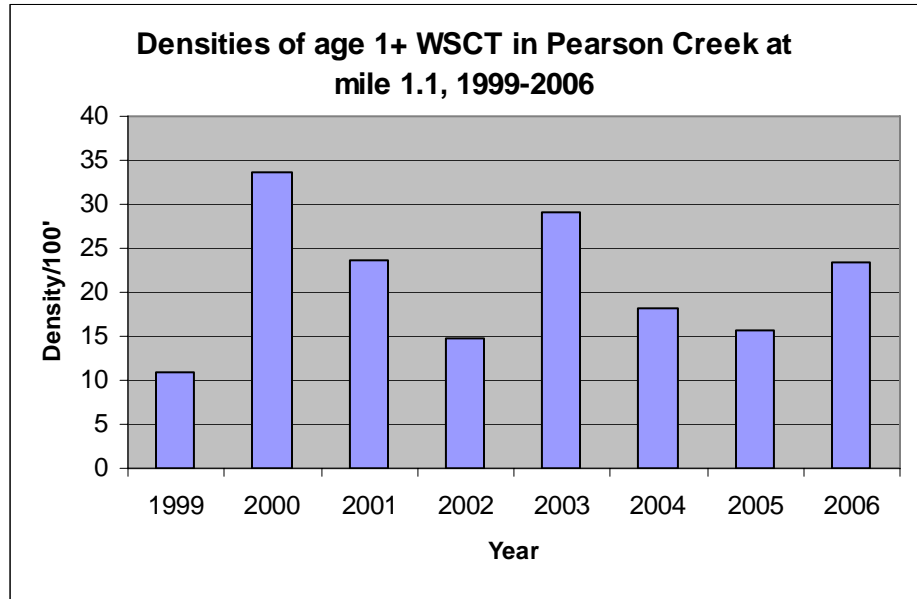
**Restoration Objectives:** Restore the stream to its original channel; improve stream flows through, condition of, and access to a historic fluvial WSCT spawning site.

**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 the lower two-miles of its channel. The Pearson Creek restoration effort includes conservation easements, water

leasing, channel reconstruction, riparian habitat restoration and improved riparian grazing management.

Biological

Monitoring: In 2006, FWP again sampled cutthroat trout in Lower Pearson Creek (mile 1.1) in a stream reach influenced by a water lease. Annual population surveys show large fluctuation in densities of young-of-the-year but generally stable densities of age 1+ cutthroat trout.



Flow Monitoring: Lessor was the only consumptive water user on Pearson Creek. FWP spot checks flow in Pearson Creek to ensure that all water remains in stream. In past years lessor has left all the water in Pearson Creek. In 2006 spot checks revealed that no water was diverted. The creek had all of its natural flow.

**Rock Creek**

Restoration Objectives: Improve fish and wildlife habitat through instream flow, nutrient and sediment reduction, habitat improvement, channel stabilization, and removal of fish passage barriers and assist with riparian management.

Project Summary: Rock Creek is a tributary to the Clark Fork River whose confluence is near Garrison, Montana. This stream was historically dewatered, over-grazed, 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 has improved fisheries and wildlife habitat in both Rock Creek and the Clark Fork River. It has 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 lower 2.5 miles of Rock Creek had been annually dewatered for 35 years. The project converted the ranch's flood irrigated pastures to sprinkler irrigation and dedicated

all salvaged water to instream flow (5-27 cfs). Since the lease took effect in 1999 instream flows have not dropped below 7 cfs, even in drought years. 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. 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.

Biological Monitoring: Due to biologist position vacancies in the area, FWP did not monitor fish populations in Rock Creek in 2006. 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.

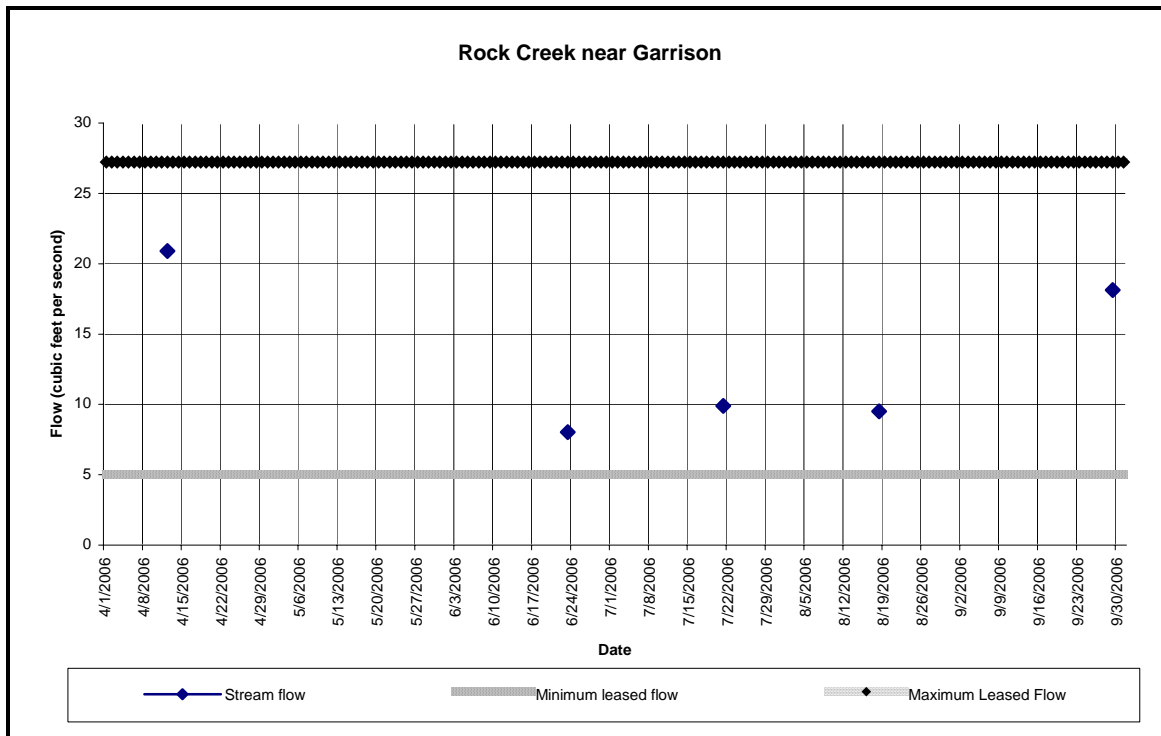
In fall of 2003 and 2004, brown trout redds were counted for the lower 2.5 miles of Rock Creek, but only once each year, during the first week of November. In 2003, the surveys found 4 definite redds, 9 probable redds and 4 test digs. In 2004, the number of redds increased to 5 definite and 4 probable. 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 previous 35 years. The redd counts and population estimates indicate that brown trout and westslope cutthroat trout are using the restored reaches of Rock Creek.

Flow Monitoring: FWP monitored stream flows in Rock Creek during the 2006 irrigation season. Instantaneous measurements were recorded on Rock Creek using a Marsh/Mcberny velocity meter and an Aquarod continuous stage recorder installed. Discharge was normally recorded below the return flow (fish bypass) pipe. However, if an irrigation pivot was in operation, then flow was recorded above the headgate also. The table below shows that the flow objective of a minimum of 5 cfs below the headgate was exceeded during the entire irrigation season. Measured flows reflect the unusually

dry period during July and August. By contrast fall precipitation was defined by frequent rain and rain-on-snow events.

### 2006 Rock Creek Flow Data

Dates 2006	Number of operating pivots	Discharge (cfs)	
		Above headgate	Below headgate
April 4	0	---	20.9
June 23	1	10.8	8.02
July 21	0	---	9.89
August 18	0	---	9.5
September 29		----	18.1



## YELLOWSTONE RIVER BASIN

### **Big Creek**

Background: Big Creek, a tributary to Yellowstone River near Emigrant, is used by native Yellowstone cutthroat trout from the Yellowstone River for spawning and rearing. Historically, irrigation diversion completely dewatered the lower 1.4 miles of Big Creek. Tributary dewatering is an important, if not the major factor regulating numbers of adult cutthroat trout in the Yellowstone River. Because of shrinking distribution and declining numbers, the Yellowstone cutthroat trout is classified as a “Fish of Special Concern” in Montana and had been petitioned for listing under the federal Endangered Species Act (ESA).

Restoration Objectives: Maintain stream flow in the lower 1.4 miles of Big Creek to improve Yellowstone cutthroat trout recruitment to the Yellowstone River. 11 cfs was determined to maintain 97% of the redds in lower Big Creek. (Byorth, 1989)

Project Summary: FWP finalized two leases on Big Creek in 1999. The first lease, DNRC Authorization to Change No. 43B 19526500, leases 10.0 cfs of the oldest 12.5 cfs water right on Big Creek from May 1 to November 1 of each year. This lease expires May 1, 2009. The installation of a sprinkler system paid for by the water right owner created the water savings to make the 10.0 cfs available for lease. The annual payment to the water right owner is \$8,000.

The second lease, DNRC Authorization to Change No. 43B 19062800, leases a total of 16.0 cfs under 5 water rights including the 4<sup>th</sup> most senior water right from Big Creek from April 15 to October 15 of each year. Of the 16.0 cfs leased, the lease warranties only 1.0 cfs that is enforced against other water users. This lease expires April 15, 2020. The installation of a gravity fed pipeline and sprinkler system funded through the Future Fisheries Improvement Program created the water savings to make the water available for lease. There is no annual payment associated with this lease.

Flow Monitoring: FWP monitors flows in Big Creek at the Kendall Bridge located about 0.2 miles downstream of the last major irrigation diversions. Again in 2006 FWP used an Aquarod® at this location to electronically and continuously record stream stage or elevation of the water in Big Creek. This stage information is used in conjunction with a mathematical stream rating function determined by actual stream flow measurements to calculate the instantaneous flow in Big Creek every 30 minutes. The Aquarod® was not installed until April 6<sup>th</sup> and removed on October 23<sup>rd</sup> to prevent possible damage from freezing.

Figure 1 shows the hydrograph for Big Creek at the Kendall Bridge below the main irrigation diversions as well as the leased flow rates. Figure 2 displays the same information, but focuses on the low-flow period of the irrigation season from July 15<sup>th</sup> through October 23<sup>rd</sup>.

Big Creek at Kendall Bridge 2006

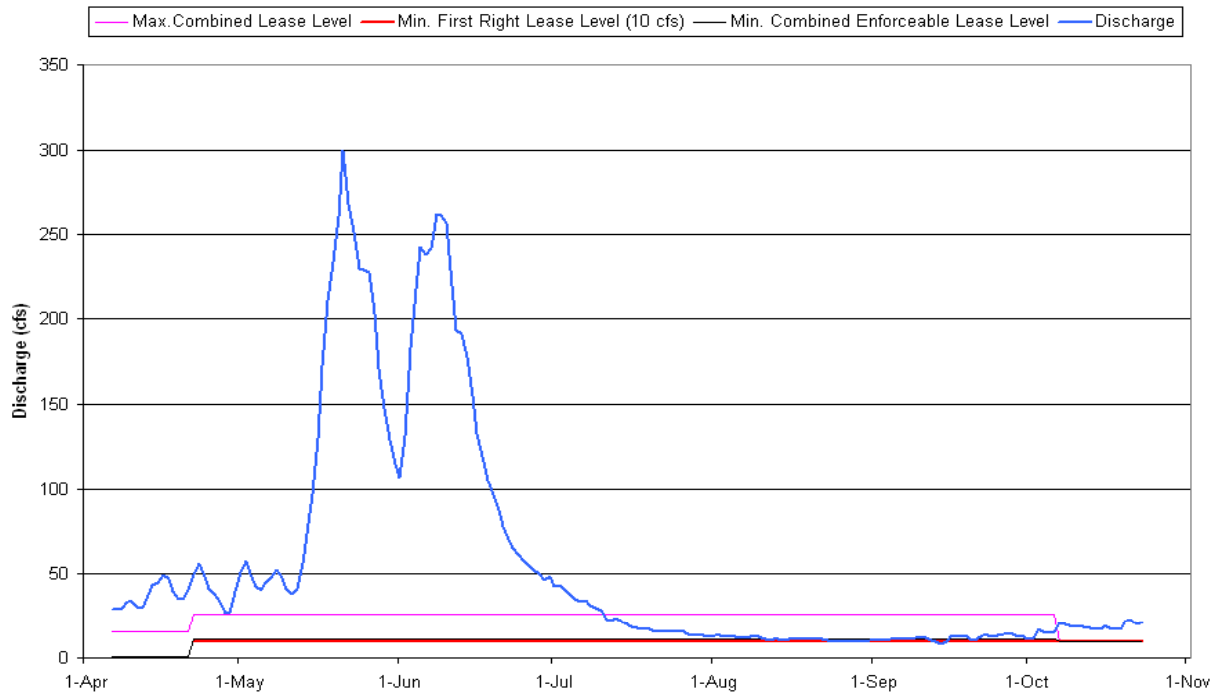


Figure 1. 2006 Big Creek discharge at Kendall Bridge in comparison to leased flow rates.

Big Creek at Kendall Bridge 2006

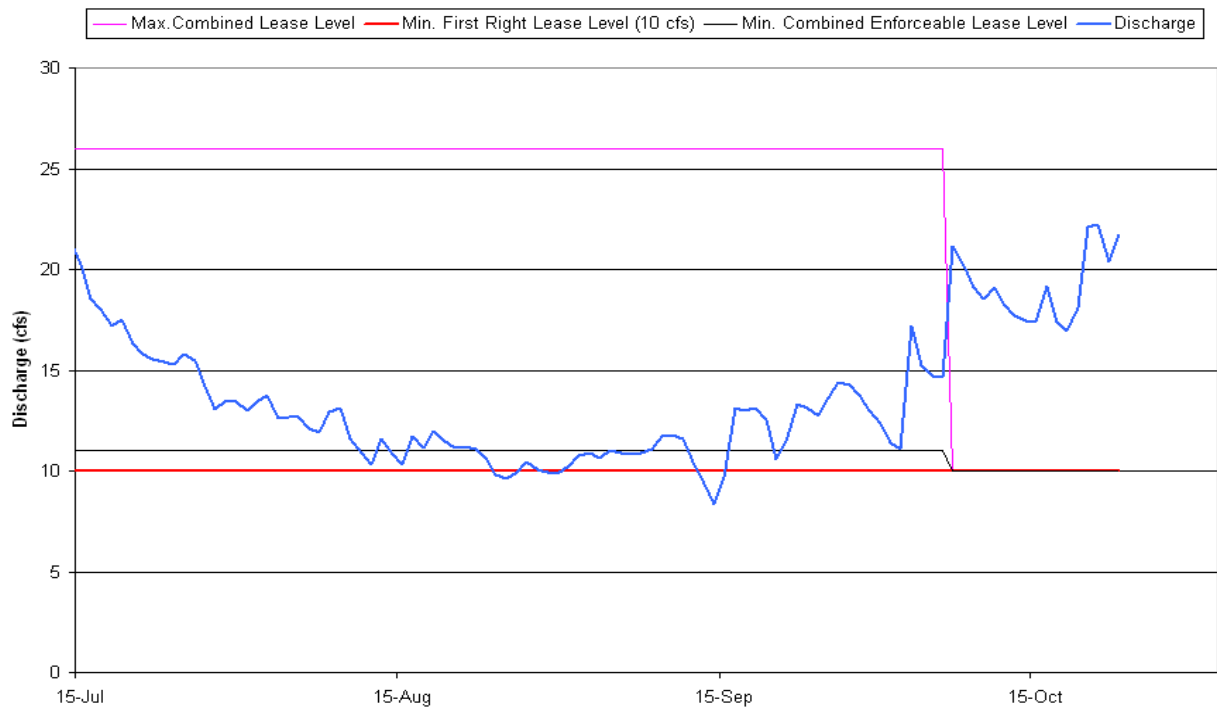


Figure 2. July 15<sup>th</sup> – October 23<sup>rd</sup>, 2006 Big Creek discharge at Kendall Bridge in comparison to leased flow rates.

In 2006 low flows were encountered about two weeks earlier than in 2005. However, peak flows were slightly higher and the overall water yield was similar if not higher during the period monitored when compared to 2005. The early rapid snowmelt in May 2006 contributed to high early flows and low late summer flows.

Without reductions in irrigation diversions, flows would have dropped much more significantly in August and September. The irrigators monitor the flow in Big Creek by reading the staff gauge attached to the Kendall Bridge. As the water is not completely still at this location, readings of the staff gauge are less than exact. For example, during low flows a difference of ½ inch in reading the staff gauge equates to a difference of about 1 cfs. This variability makes it difficult to exactly manage irrigation diversions to maintain the leased flow levels and contributes to the number of days when average flows are slightly below the leased levels. The hydrograph in Figure 2 indicates that the irrigators made adjustments in diversions to maintain the leased flow rates.

In recent years, an irrigation diversion below the Kendall Bridge resumed operation. This diversion diverts water under the first and second priority water rights. Observed flows from the lower diversion appear to be minimal and do not present a significant depletion to stream flow. In the future, a measuring device at this diversion would be helpful to ensure additional water is present at the Kendall Bridge to compensate for this lower diversion.

In 2006, the Big Creek leases continued to keep the lower 1.4 miles of Big Creek sufficiently watered to meet the objectives of the leases.

### **Cedar Creek**

Background: Cedar Creek, a tributary to Yellowstone River near Corwin Springs, historically has been an important spawning stream for Yellowstone cutthroat trout. However, during times of drought irrigation diversions dewatered the lower 2700 feet of the stream, limiting fry production and migration into the Yellowstone River.

Restoration Objectives: Maintain stream flow in the lower 2700 feet of Cedar Creek to improve Yellowstone cutthroat trout recruitment to the Yellowstone River. 3 cfs equals the inflection point derived using the wetted perimeter method and provides an indicator of the most desirable minimum flow. However, 1.3 cfs is sufficient to cover nearly all the redds in lower Cedar Creek and maintain connection with the Yellowstone River for fry migration.

Lease Summary: Two in-stream leases are currently in place on Cedar Creek. The first lease is with the U.S. Forest Service, DNRC Authorization to Change No. 43B 12253900, and was approved in 1995 and implemented in 1996. This agreement leases 7 irrigation water rights on Cedar Creek and its tributaries. The flow rates vary by month and water availability but in August they have a combined flow rate of up to 9.61 cfs. Leased rights including the 2<sup>nd</sup> oldest priority right in the Cedar Creek drainage. These water rights

were associated with the historic OTO Ranch, which the Forest Service gained title to provide for winter range for the Northern Yellowstone Elk Herd.

The lease protects a flow of 1.3 cfs in the lower 2700 feet of Cedar Creek from May 1 to October 15 of each year. One point three (1.3) cfs is the minimum flow necessary to prevent fry loss due to redd dewatering. This lease expired September 20, 2005 and was re-authorized by DNRC in 2006 for an additional 10 years. Under the renewal agreement, there is no monetary compensation to the U.S. Forest Service.

The second lease, DNRC Authorization to Change No. 43B 30005084, approved and implemented in 2004. This agreement includes the lease of 3 irrigation water rights on Cedar Creek with a combined flow rate of 7.01 cfs and includes the 3<sup>rd</sup> oldest priority right. The lease protects an additional flow of 1.7 cfs in the lower reach of Cedar Creek from April 1 to November 4 of each year. This second lease provides a total protected flow of 3.0 cfs.

Based on stream cross-sectional work by FWP, this flow is the minimum necessary to maximize spawning/incubation habitat. This second lease expires February 20, 2034. The installation of a reservoir with a gravity fed pipeline and sprinkler system in an adjacent drainage funded through the Future Fisheries Improvement Program made the water available for lease. There is no annual payment associated with this lease.

The water right with the oldest priority date in the Cedar Creek drainage is a historically decreed in District Court with a flow rate of 5.5 cfs. This right is now split between multiple owners. Under the current Temporary Preliminary Decree up to 5.14 cfs can be diverted without regard to the 3.0 cfs protected by the leases. (Nine irrigation timely filed claims with a combined flow rate of 5.14 cfs and two late filed claims, subordinate to timely filed claims, with a combined flow rate of 0.38 cfs, all based on the 5.5 cfs historically decreed first right currently are included in the current Temporary Preliminary Decree.)

However, the water distribution on Cedar Creek has typically been done in compliance with the historic District Court decree allowing up to 5.5 cfs diverted under the most senior water rights instead of the 5.14 cfs that makes up the timely file senior water right claims in the Temporary Preliminary Decree. This mode of operation is likely the best until such time the Temporary Preliminary Decree is deemed to be enforceable for Cedar Creek by the Water Court or a Final Decree is issued in for the Yellowstone River, above and including Bridger Creek.

Flow Monitoring: FWP monitors flow in Cedar Creek at three locations; one at stream mile 2.0 above the OTO Ranch buildings, a second above the lower diversions at stream mile 0.55 and a third location near the mouth below all the diversions. The lowermost monitoring location is the most important as it measures the stream flow in the reach historically dewatered. Again in 2006 FWP used an Aquarod® at the lower monitoring location to electronically and continuously record stream stage near the mouth of Cedar Creek. This stage information is used in conjunction with a mathematical stream rating



function determined by actual stream flow measurements to calculate the instantaneous flow in Cedar Creek every 30 minutes. Figure 3 shows the hydrograph for Cedar Creek near the mouth below the irrigation diversions as well as the leased flow rates. Data was not collected from July 6<sup>th</sup> until August 3<sup>rd</sup> because of technical difficulties. A single staff gauge reading indicating a flow of 2.6 cfs on July 27<sup>th</sup> indicates the lease functioning correctly during this time period. Figure 4 exhibits the same information, but focuses on the low-flow period of the irrigation season from the beginning of August through the end of October. The Aquarod® was not installed until April 6<sup>th</sup> and removed on October 23<sup>rd</sup> to prevent possible damage from freezing.

The final order of the DNRC for Authorization to Change No. 43B 12253900 required the two upstream monitoring sites. The objective of this additional monitoring is to determine the amount of water the stream gained between the points of diversion for the Forest Service rights being leased and the lower diversion points, a distance of about 1.5 miles. FWP measured the flow differences in this reach once on August 8, 2005. Flow of 9.55 cfs was measured above the OTO Ranch buildings with a flow of 8.91 cfs measured above the lower diversions for a loss of 0.64 cfs or 6.7%. The fact that Cedar Creek lost water instead of gained is likely due to the Forest Service not irrigating with its remaining water rights during June and early July, 2005. As Cedar Creek seems to lose water as opposed to gaining and the Forest Service did not irrigate again in 2006 no measurement comparisons between the two upper monitoring sites were made in 2006. Fire danger on the OTO Ranch made unnecessary trips into this restricted access area undesirable.

Comparison of flows at the monitoring gauge upstream of the lower diversions and the gauge near the mouth were made again in 2006 to assess how much water was being diverted water users with the senior water right. As in previous years, the water users made appropriate adjustments to their diversion as streamflow decreased.

The lowest average daily flow of 1.2 cfs was recorded on several days in the first part of September. When irrigation diversions were discontinued about October 8<sup>th</sup>, the increase in streamflow from about 1.5 cfs to about 6 cfs shows that the water users were voluntarily limiting the diversion under the 5.5 cfs oldest right to help maintain streamflow at or near the desired 1.3 cfs minimum level.

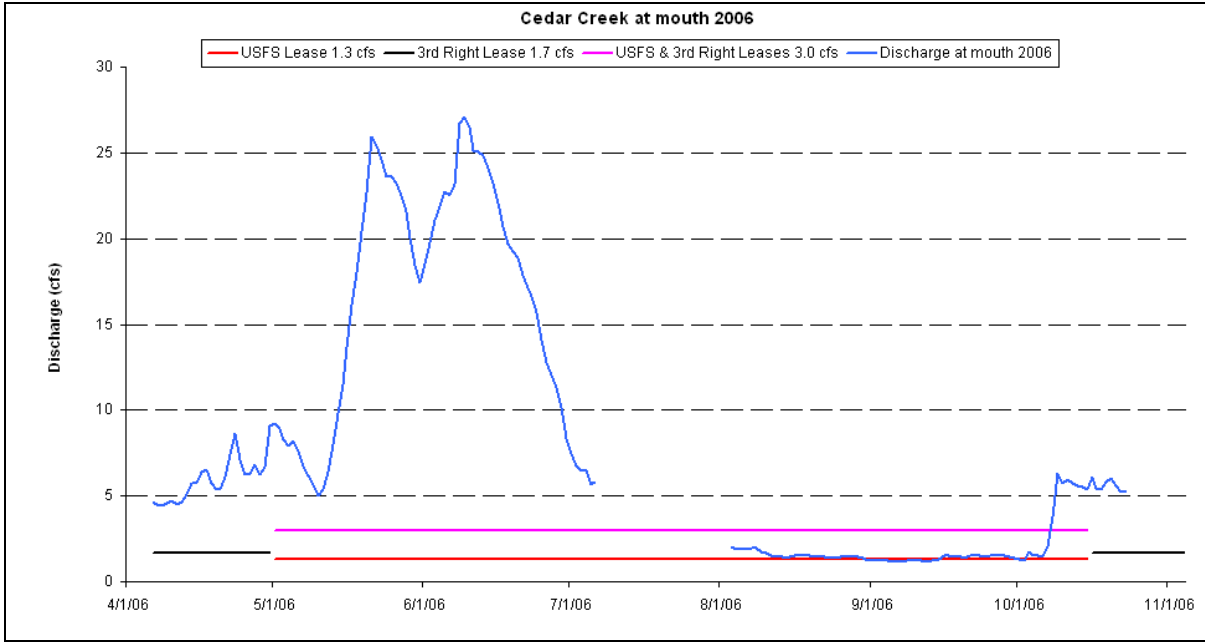


Figure 3. 2006 Cedar Creek discharge near mouth in comparison to leased flow rates.

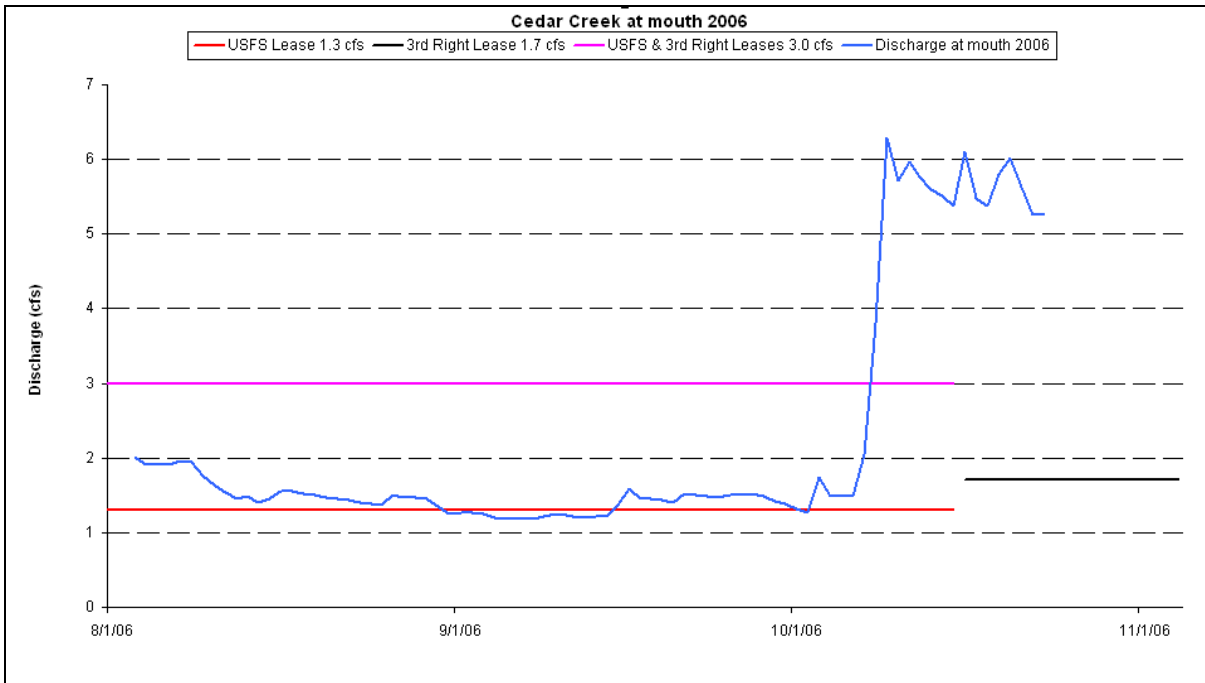


Figure 4. August 1 – October 23, 2006 Cedar Creek discharge near mouth in comparison to leased flow rates.

### Mol Heron Creek

Background: Mol Heron Creek, a tributary to the Yellowstone River near Corwin Springs, historically has been an important spawning stream for Yellowstone cutthroat trout. However, during times of low stream flow irrigation diversions dewatered the

lower 0.5 miles of the stream, limiting fry production and migration into the Yellowstone River.

Restoration Objective: Maintain stream flow in the lower 0.5 miles of Mol Heron Creek to improve Yellowstone cutthroat trout recruitment to the Yellowstone River. Wetted perimeter data indicates that 6 cfs would be the minimum desirable flow in lower Mol Heron Creek. However the leased flow 5 cfs was a negotiated value and still provided some level of protection for redds and adequately maintains connection with the Yellowstone River to provide for fry migration.

Lease Summary: One lease is currently in place on Mol Heron Creek. The lease, DNRC Authorization to Change No. 43B 18577200, approved and implemented in 1998, leases 27.0 cfs under 8 Mol Heron Creek water rights from April 15 to October 19 of each year. Of the 27.0 cfs leased, the lease 5.0 cfs to be left instream below the lowest diversion on Mol Heron Creek at all times. This lease expires December 31, 2018. The Future Fisheries Improvement Program funded the lease. The installation of sprinkler irrigation system created the water savings to make the water available for lease. There is no annual payment associated with this lease.

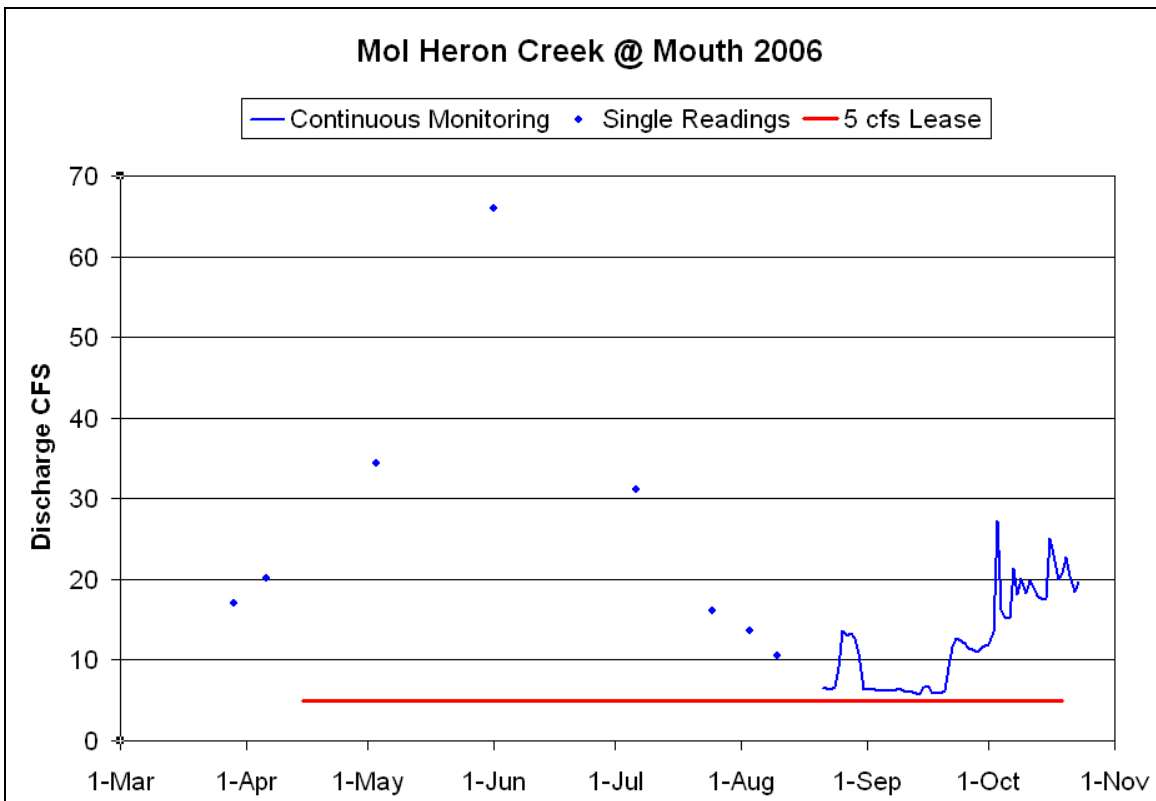


Figure 5. 2006 Mol Heron Creek discharge near mouth.

Flow Monitoring: The flow monitoring for the Mol Heron Creek lease occurs approximately 200 ft. upstream of the confluence with the Yellowstone River. On August 21, 2006 FWP installed an Aquarod® at the monitoring location to electronically

and continuously record stream stage or elevation. This stage information is used in conjunction with a mathematical stream rating function determined by actual stream flow measurements to calculate the instantaneous flow in Mol Heron Creek every 30 minutes. Prior to August 21<sup>st</sup>, the stage was periodically observed and recorded on various dates. Figure 5 shows the hydrograph for Mol Heron Creek at the Kendall Bridge below the main irrigation diversions as well as the leased flow rates.

Stream flow in Mol Heron Creek held up relatively well during 2006. The lowest observed or recorded flow of 5.8 cfs (ave. daily flow) occurring on September 14<sup>th</sup> and 19<sup>th</sup> remained above the 5.0 cfs lease minimum. In 2006, the Mol Heron Creek lease continued to successfully keep the lower 0.5 miles of Mol Heron Creek sufficiently watered to meet the objective of the lease.

**Biological Monitoring:** Four students from Montana State University, Jesse Patton, Andy Solcz, Joel Cahoon, Tom McMahon, Matt Blank, completed the final season of field work for a study assessing Yellowstone cutthroat trout passage through five culverts on Mol Heron Creek. The extent to which culverts affect fish mobility in streams is an increasing concern in Montana. Some studies have been performed on fish passage, but there is still much to be learned about the ability of trout to successfully swim through culverts. This study puts a technology called passive integrated transponder (PIT) tagging to a relatively new use. (PIT tags are small capsule-shaped electronic devices that are implanted under the skin of the fish. Then, when a tagged fish passes through a looped antenna, the date, time, and pit tag code are recorded.)

In this study, ten antennas were installed to monitor all the major culverts in a drainage basin that provides spawning habitat for trout that are resident in the Yellowstone River. Antennas are placed at both the upstream and downstream end of each of five culverts. With this arrangement, the number of attempts and successful passes made by each tagged fish is recorded electronically. Ultimately, the study will correlate the passage data with hydraulic and habitat conditions.

### **Locke Creek**

**Background:** Locke Creek, a tributary to the Yellowstone River near Springdale, historically has been an important spawning stream for Yellowstone cutthroat trout. However, during times of low stream flow irrigation diversions dewatered the lower 0.15 miles of the stream, limiting fry production and migration into the Yellowstone River. This diversion also limited access to approximately 0.35 miles of potential spawning and rearing habitat.

**Restoration Objectives:** To maintain stream flow in the lower 0.15 miles of Locke Creek and provide access to an additional 0.35 miles to improve Yellowstone cutthroat trout recruitment to the Yellowstone River.

**Lease Summary:** One lease with the sole irrigation diverter on Locke Creek is currently in place. The lease, DNRC Authorization to Change No. 43B 30001336, approved and implemented in 2004 leases one irrigation water right with a flow rate of 7.5 cfs from

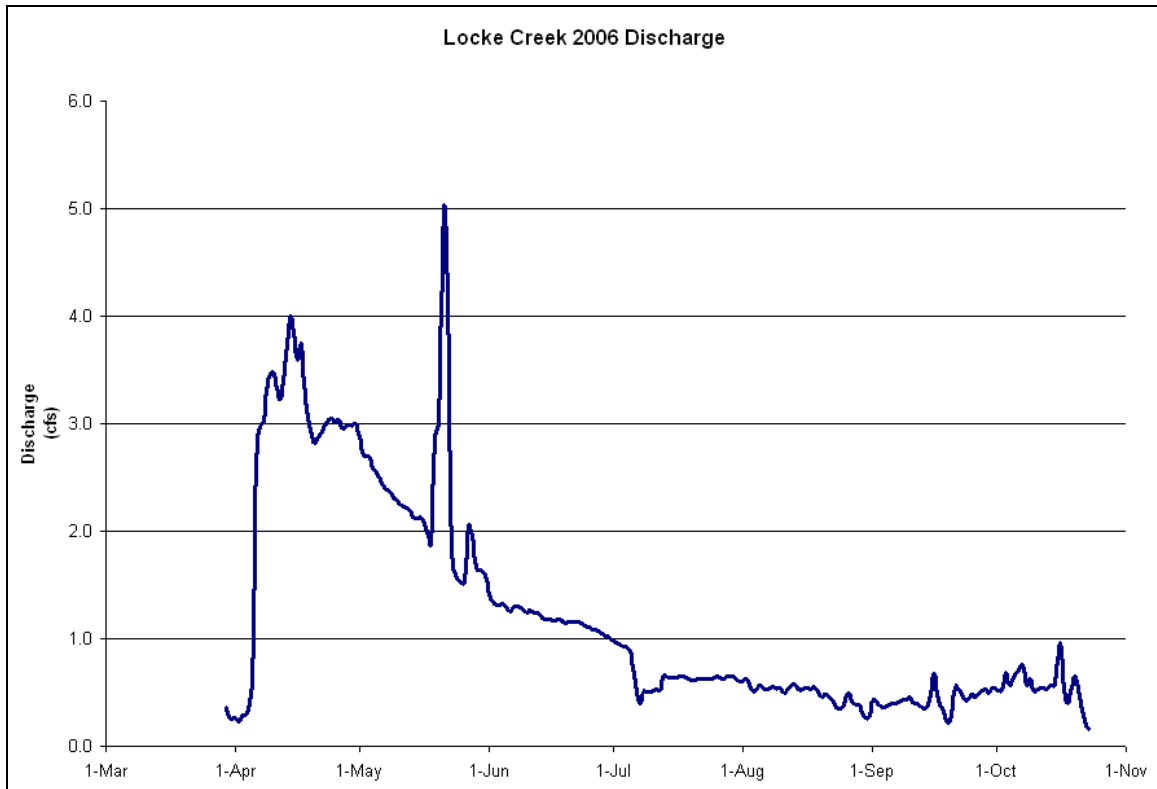
April 20 to October 24 of each year. A second irrigation right has not been changed to instream flow. However, under the terms of the lease agreement the lessor cannot use this water right during the lease period. This lease expires June 4, 2032. From about 1975 on the irrigation right was exercised via diversion and pump diverting about 1.5 cfs located at stream mile 0.15 supplying a sprinkler system. The water right owner replaced the Locke Creek diversion with a well that is not hydrologically connected to Locke Creek. This change from surface to ground water created the water savings leased by FWP. FWP made a one-time payment to the lessor from the Future Fisheries Improvement Program. There is no annual payment associated with this lease.



*Figure 6. Locke Creek near mouth. October 28, 2005. The Aquarod® is housed in the metal pipe driven into the streambed.*

Flow Monitoring: FWP monitors the flow in Locke Creek just above the creek's mouth. An Aquarod® (Figure 6) located at the monitoring location electronically and continuously recorded stream stage in Locke Creek. This stage information is used in conjunction with a mathematical stream rating function determined by actual stream flow measurements to calculate the instantaneous flow in Locke Creek every 30 minutes.

Figure 7 displays the hydrograph for Locke Creek near the mouth. The Aquarod® was installed on March 29<sup>th</sup> and removed on October 23<sup>rd</sup> to prevent possible damage from freezing. Average daily flows peaked in mid-April and again in mid May. The highest flow of about 5 cfs was approximately 3.5 cfs lower than the highest flow recorded in 2005. Without the lease the historic diversion of up to 1.5 cfs would have completely dewatered the stream beginning on about June 1<sup>st</sup>, as compared to about July 10<sup>th</sup> in 2005.



**Figure 7. 2006 Locke Creek discharge near mouth.**

In 2006, the Locke Creek lease continued to successfully keep the lower 0.15 miles of the creek sufficiently watered to meet the objective of the lease.

### Biological Monitoring

FWP operated an adult fish trap to capture spawning fish from the Yellowstone River from April 28 to June 14, 2006. Trapping generally occurred only on weekdays due to a lack of fish entering Locke Creek from the Yellowstone. On May 1<sup>st</sup> one yearling Yellowstone Cutthroat Trout and one fingerling brown were captured in the trap. On May 18th, a 12.5-inch rainbow trout was captured. FWP intermittently operated fry traps near the mouth of Locke Creek from July 12 to August 15, 2006. Fry tapping for a total of 17 days during this time frame captured no trout fry exiting Locke Creek to the Yellowstone River. This indicates very little or no production of trout fry in lower Locke Creek due to an apparent lack of a spawning run by adult fish.

Channel Access Issues: During the recent years of extend drought there has been concern as to whether or not the spawning run of Yellowstone cutthroat trout from the Yellowstone River into Locke Creek has endured. The connection between Locke Creek and the Yellowstone River is somewhat tenuous. Locke Creek flows into a side channel of the Yellowstone River. Figure 8 is an aerial of the photo of this area. The aerial photo indicates a good connection between the side channel and the main channel. The extreme 1996 and 1997 flood events likely changed this situation. Now except during quite high water the side channel is perched well above the main channel. Figure 9 shows the side channel looking downstream from the mouth of Locke Creek. Figure 10 is a view of the

confluence of the side channel with the main channel of the Yellowstone River. This situation may be limiting the use of Locke Creek for Spawning.



**Figure 8. Aerial photograph of area near mouth of Locke Creek.**



**Figure 9. Side channel looking downstream from the mouth of Locke Creek. The Yellowstone River main channel can be seen in the distance.**



*Figure 10. Side channel at confluence with the Yellowstone River main channel.*

Fish passage impairments through the box culvert under the railroad at the mouth of Locke Creek (see figure 8) may also be limiting fish access to Locke Creek. The shallow flow may be too difficult for most fish to move through into Locke Creek. FWP intends to improve fish passage in the railroad culvert this spring by placing small barriers in the bottom of the culvert that break up flow and provide slack water areas for fish to rest as they move through the culvert. FWP also plans adult fish trapping to evaluate the effectiveness of the improved fish passage.

Access from the side channel of the Yellowstone River where Locke Creek enters may be limited by the water elevation in the side channel not being sufficient to allow access into the box culvert. FWP plans to install a stage-measuring device in the side channel to further evaluate whether or not its water level influences fish access into Locke Creek. During the same time the spawning run will be monitored in nearby Peterson Creek to determine the natural timing of the run. This information is expected to help determine which factors are influencing the spawning run or lack thereof in Locke Creek. Once impediments to spawning access in lower Locke Creek are identified and corrected, a spawning run may need to be re-established through the reintroduction of Yellowstone cutthroat trout in lower Locke Creek.

Beaver dams in the lower reach of Locke Creek are an annual maintenance issue. The beaver dams can prevent spawning migration. The water right lessor has been very gracious in removing these dams as necessary.



## UPPER MISSOSURI RIVER BASIN

### Hells Canyon Creek

Restoration Objectives: Improve fish and wildlife habitat through instream flow enhancement; eliminate entrainment of fish through installation of a fish screen.

Project Summary: Prior to the project, the lessor diverted water from Hells Canyon Creek into a highly inefficient ditch system. In 1996, FWP funded the installation of a pipeline that would convey water more efficiently, and leased the salvaged water for instream flow. The guaranteed minimum flows for Hell's Canyon Creek established in the lease agreement were:

<u>TIME PERIOD</u>	<u>MINIMUM FLOW (CFS)</u>	<u>PURPOSE</u>
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

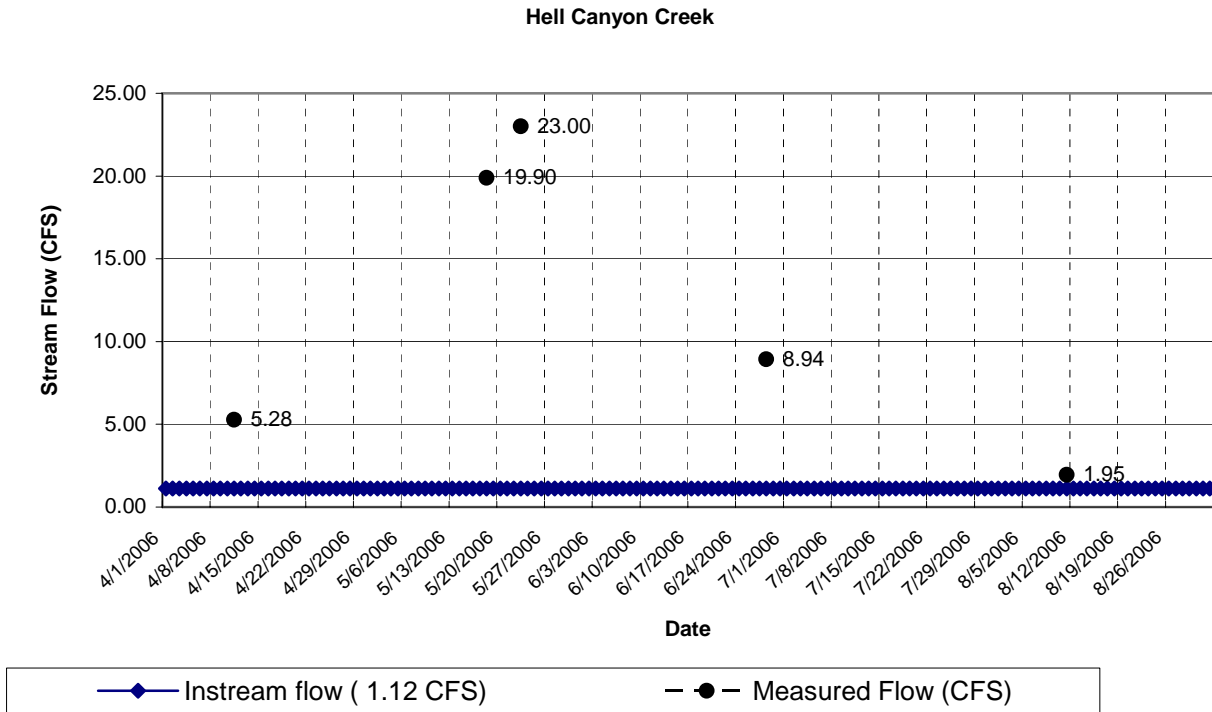
Flow Monitoring: The Hell's Canyon Creek water lease was monitored during 2006 to determine effectiveness and compliance of the lease agreement with landowners operating the Hell's Canyon Creek Gravity Pipeline. The pipeline was installed and the water lease implemented in 1996. Monitoring of pipeline withdrawal and stream flow from 1996 through 2005 did not identify 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. Stream flow monitoring was less intensive in 2006 and five flow measurements were provided by USGS from 11 April through 11 August. Additional gage height readings were observed during late August and September and flow was never observed below the 1.95 cfs measured on August 11, 2006.

<u>DATE</u>	<u>FLOW MEASURED BY USGS</u>
4/11/06	5.28 cfs
5/18/06	19.9 cfs
5/22/06	23.0 cfs
6/28/06	8.94 cfs
8/11/06	1.95 cfs (GH=1.78)

During the extremely dry conditions experienced during August and September from 2000 to 2006, the stream flow of Hell's Canyon Creek was low throughout the summer irrigation season. Although the terms of the water lease were met during each of these years, the low flows resulted in marginal conditions in the lower 2 miles of stream below the pipeline system.

As in previous years, discharge of Hell's Canyon Creek during 2006 was well over the minimum flow value of 1.60 cfs prior to 15 July. The lowest flow measured during this time period was 8.94 cfs on June 28, 2006. Flow in Hell's Canyon Creek was

frequently less than 3 cfs during August and September, but based on occasional staff gage readings, flow did not appear to drop below 1.95 cfs during the period. Although flow was not monitored on a daily basis, it is very unlikely that flow dropped below 0.25 cfs during 2006.



**Biological Monitoring:** Trout fry were not sampled at the fish screen bypass in 2006. This sampling is done once every two or three years to determine the effectiveness of the fish screen placed at the intake of the gravity pipeline system. Typically, this sampling estimates that several thousand trout fry are screened from the irrigation system during the July and August period of fry migration to the Jefferson River.

An electrofishing survey of juvenile trout was conducted near the mouth of Hell’s Canyon Creek during 2006 using similar methods employed at this stream beginning in 1992. In 2006, we captured 2.4 brown trout fry per 100 seconds of sampling, which was slightly more abundant than the long term average of 1.4 brown trout captured per 100 seconds of electrofishing from 1992 to 2005. We captured 3.0 rainbow trout fry per 100 seconds of sampling in 2006, which is slightly less than the long term average of 4.2 per 100 seconds. This sampling is conducted during November and it confirms that adequate flow is available for trout fry to survive and rear in lower Hell’s Canyon Creek throughout the summer and fall.