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ANNUAL PROGRESS REPORT
WATER LEASING STUDY

1997

Submitted to:

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

Submitted by:

Montana Fish, Wildlife and Parks
Fisheries Division

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I. INTRODUCTION

This is the eighth annual report prepared by Montana Fish, Wildlife and Parks (FWP) in response to the reporting requirement under 85-2-436 (3) (a), MCA. A water lease agreement was completed on Mol Heron Creek in November, 1997. One additional lease on an approved study stream was actively pursued and 10 others were investigated for their feasibility. Nine previously approved leases and one water right conversion to instream flow were implemented during the report period.

II. SUMMARY

Water leasing activities and accomplishments that occurred during 1997 are the following:

1. Completed a water lease agreement on Mol Heron Creek, an important cutthroat spawning tributary to the upper Yellowstone River near Gardiner.

2. Completed the first year of implementing a water lease on Chamberlain Creek, an important cutthroat trout stream that is tributary to the Blackfoot River near Ovando.

3. Completed the first year of implementing a water lease on Pearson Creek, an important cutthroat trout stream tributary to Chamberlain Creek in the Blackfoot River basin near Ovando.

4. Completed the second year of implementing a water lease on Cedar Creek, a cutthroat spawning tributary to the upper Yellowstone River near Gardiner.

5. Completed the second year of implementing a water lease on Hells Canyon Creek, a rainbow and brown trout spawning tributary to the Jefferson River near Silver Star.

6. Completed the second year of implementing a water lease on Tin Cup Creek, a rainbow and cutthroat spawning tributary to the Bitterroot River near Darby.

7. Completed the fourth year of implementing a water lease on Blanchard Creek, a Blackfoot River spawning tributary near Ovando.

8. Completed the fifth year of implementing two water leases of existing water rights on Mill Creek, a Yellowstone River spawning tributary near Pray. Also, completed the second year of a third water lease on this stream.

9. Completed the first year of implementing a conversion of some of FWP's irrigation water rights to instream flow on Cottonwood Creek, a tributary to the Blackfoot River that flows through FWP's Blackfoot-Clearwater Wildlife Management Area (WMA) near Ovando.

10. Continued the process of investigating a new water lease on Rock Creek, a tributary to the North Fork of the Blackfoot River near Ovando.

11. Investigated 10 leasing inquiries that proved to be infeasible or are still being pursued to obtain initial information as to their suitability for leasing.

III. DESIGNATED STUDY STREAMS

When the water leasing study legislation was approved in 1989, FWP was required to receive approval of the Board of Natural Resources and Conservation (BNRC) to study a stream for leasing. As of July 1, 1995, the BNRC no longer exists and this duty is now the function of the Department of Natural Resources and Conservation (DNRC). The following is a list of the streams approved to date, the approving authority and date of approval. Current law allows no more than 20 streams to be approved for water leasing.

1. Swamp Creek (Big Hole R. drainage); BNRC; March 5, 1990

2. Big Creek (Yellowstone R. drainage); BNRC; March 5, 1990

3. Mill Creek (Yellowstone R. drainage); BNRC; November 9, 1990

4. Cedar Creek (Yellowstone R. Drainage; BNRC; January 6, 1992

5. Blanchard Creek (Blackfoot R. drainage); BNRC; September 25, 1992

6. Hells Canyon Creek (Jefferson R. drainage); BNRC; September 25, 1992

7. Tin Cup Creek (Bitterroot R. drainage); BNRC; October 30, 1992

8. Rattlesnake Creek (Clark Fork R. drainage); BNRC; May 25, 1995

9. Mol Heron Creek (Yellowstone R. drainage); DNRC; November 28, 1995

10. Rock Creek (Blackfoot R. drainage); DNRC; November 28, 1995

11. Chamberlain Creek (Blackfoot R. drainage); DNRC; January 3, 1996

12. Pearson Creek (Blackfoot R. drainage); DNRC; January 3, 1996

Leases have been given final DNRC approval on all but five (5) of the designated streams: Swamp Creek, Big Creek, Rattlesnake Creek, Mol Heron Creek and Rock Creek. FWP and the potential lessor on Swamp Creek could not reach agreement on a price for the lease. The Big Creek water users are still investigating the feasibility of converting from flood to sprinkler irrigation by installing a gravity pipeline. Discussions with the potential lessor on Rattlesnake Creek have not been fruitful. A lease agreement was completed on Mol Heron Creek in November, 1997 but additional work is needed before a lease can be approved by DNRC. Negotiations with the potential lessor on Rock Creek are still in progress.

IV. 1997 ACTIVITIES

Water Lease Agreement Completed

A water lease agreement was completed in November, 1997 with the Church Universal and Triumphant on Mol Heron Creek, a tributary to the upper Yellowstone River near Gardiner. Mol Heron Creek is an important Yellowstone cutthroat trout spawning tributary to the Yellowstone River. The lease is expected to improve instream flows in the lower half-mile of stream. The stream has chronic low flow problems in most years due to irrigation withdrawals by the Church.

FWP is investigating the lease of salvaged water in Mol Heron Creek. About ½ mile above the mouth, the Church has a large diversion dam used to divert irrigation water to their hay lands along the Yellowstone River. The diversion is sometimes a partial blockage to upstream migration of cutthroat trout and also captures young cutthroat migrating downstream to the Yellowstone River, reducing a source of recruitment to the river fishery. The Church will replace its existing flood irrigation system with a more efficient sprinkler irrigation system that will allow some water to be salvaged. The intent of the lease is to ensure that the salvaged water remains instream to the mouth of the creek to improve the reproductive capacity of the stream and enhance the important cutthroat fishery in the Yellowstone River.

In conjunction with water leasing, a new "fish friendly' diversion would be installed at the existing diversion to improve both upstream and downstream fish migration.

An Environmental Assessment has been written but must still be sent out for public comment. An "Application to Change Appropriation Water Right" must also be completed and submitted to DNRC to change the purpose and place of use of the water rights to instream flow. DNRC

must approve the application, send it out for public notice and, if objections are received to the lease, hold an administrative hearing before making a decision on the application.

Other Leases Actively Pursued on Approved Streams

Rock Creek

Rock Creek is a tributary to the North Fork of the Blackfoot River about five miles east of Ovando. Because of its importance as a potential spawning tributary for brown and bull trout, FWP and other interests completed a stream restoration project to improve the physical habitat for fish in a portion of the stream. As part of the restoration, about ½ mile of stream channel was reopened to water flow and the former irrigation system was improved to increase its efficiency. Some of the water previously used for irrigation has been salvaged and would be used to improve flows in about 3/4 mile of stream. FWP proposes to lease the salvaged water for fisheries. At the time this report was being completed, negotiations were still ongoing and a lease agreement had not been drafted.

V. REPORTING REQUIREMENTS FOR COMPLETED LEASES

Section 85-2-436 (3)(a) requires that an annual leasing progress report contain specific information on each pilot lease entered into during the report period. The following information, listed under 85-2-436 (1) (a) and (b), is provided below for the completed Mol Heron Creek lease agreement.

(1)(a) provide the following data for each designated stream reach and each pilot lease entered into under subsection (2):

- (I) the length of the stream reach and how it is determined;
- (ii) technical methods and data used to determine critical stream flow 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;

(1)(b) based on the data provided under subsection (1)(a), develops a complete model of a water lease and lease authorization that includes a step-by-step explanation of the process from initiation to completion.

(1) (a). Data

(I) **Length of stream reach**

The affected reach of Mol Heron Creek is from its mouth at the Yellowstone River upstream ½ mile to the Church's lower most irrigation diversion.

(ii) **Technical methods to determine critical streamflow**

The amount of flow to be leased is a minimum of 5 cfs. Part of this flow will be provided by the Church through converting from a flood irrigation system to a sprinkler system, which will use less water. The remainder will come from portions of other existing water rights. The salvaged quantity is determined by the difference between historical flood irrigation uses and the capacity of the sprinkler system. The 5 cfs is less than the desired flow needed to fully protect the stream resources but is deemed sufficient to have significant fishery benefits.

(iii) **Legal standards**

Information that will be used to determine the amount of water available for instream flows for the lease include:

1. The amounts of the rights claimed under SB76, or previously decreed;

2. An evaluation of historic irrigation practices on the creek and the use of the rights under investigation on the affected lands;

3. An analysis of irrigation return flows;

4. An evaluation of other water uses, including diversion locations and the amounts and priority dates of their claimed rights;

5. An evaluation of in-channel water losses; and

6. The capacity of the new sprinkler irrigation system.

This and other information will be discussed in FWP's "change" application for the lease.

(iv) **Steps to insure non-injury to other users**

Various steps incorporated in the leasing process ensure non-injury to other water users. These include:

1. Water users who could be potentially injured have the opportunity to voice their concerns when a lease agreement is brought before the Fish, Wildlife and Parks Commission for approval.

2. FWP, or its contractor, may conduct hydrologic analyses to determine the lease's possible effects on other water users.

3. The DNRC administrative "change" process provides an opportunity for individuals potentially injured by a proposed lease to object and resolve their concerns before a "change" is granted. However, the Church is the principal, and lowermost, water user in the drainage and other water users are not expected to be affected by the lease.

(v) **Means used to measure water**

The measuring plan for the lease, as required by 85-2-436 (2) (c), is presented in **Appendix A.**

(1) (b). Water leasing model

Negotiations with the Church began in June, 1995. Numerous meetings were held to determine which water rights were appropriate to lease, whether a new diversion structure was required for the Church to convert from flood to sprinkler irrigation and to resolve objections that FWP, the U.S. Forest Service and others had made to certain of the Church's water rights in the state's general adjudication, Water Court Case 43B-373. Over the period of many months, discussions with all the parties were held to determine how the objections could be resolved so the Church could proceed with leasing some of those rights for instream flow. These were complex negotiations between private, state and federal government agencies and involved many claimed water rights beyond just those to be leased. Finally, on February 26, 1997 a mutually beneficial stipulation was signed by all parties. On April 22, 1997, the Water Master's report to the Water Court adopted the stipulation and on July 31, 1997, the Water Court adopted the Water Master's report. The terms of the stipulation are referenced in the lease agreement and the implementation of the stipulation is contingent upon approval of a water lease with the Church.

During negotiations, FWP and the Church discussed replacing a poor diversion structure and deteriorating headgate on Mol Heron Creek to improve fish passage for cutthroat trout and alleviate the stream damaging practice of installing and removing the structure each year. The Church applied for a grant from FWP's Future Fisheries Improvement Program to replace the existing structure and, through a water lease, to help pay for the installation of a new sprinkler irrigation system to replace the current flood irrigation system. The grant was approved by the Future Fisheries Review Panel on February 29, 1996 and by the Fish, Wildlife and Parks Commission on March 28, 1996. At first, the installation of the new diversion was associated with approval of the lease agreement. However, it was later decided that structure replacement could proceed independently from the lease agreement. The new structure was being designed and preparations were being made for installation as this report was completed.

On November 7, 1997 the Fish, Wildlife and Parks Commission approved the water lease agreement and authorized FWP to sign the agreement. A "change" application was already being prepared in anticipation of lease agreement approval. The final application will now be submitted to DNRC for approval. A draft EA had been prepared and, once the agreement was approved, was sent out for public review and comment.

The following provides a chronological documentation of the principal events that led to the completion of the lease agreement.

Nov. 8, 1994 - Letter from Steve Brown (FWP's contract attorney) to Ed Francis (Church Vice President) stating that FWP is interested in water lease negotiations.

June 23, 1995 - Liter Spence (FWP) and Steve Brown meet with the Church and USFS about objections to Church water right claims and possibilities for water lease.

July, 1995 - Fred Nelson (FWP) and Steve Brown meet with Church and USFS about claims objections and further discuss the water lease.

July 6, 1995 - FWP letter to Church committing to further discussion about water lease.

July 25, 1995 - Liter Spence and Fred Nelson make field trip to Mol Heron Creek with USFS and Church personnel to view creek, diversions and irrigated lands.

August 4, 1995 - FWP Commission approves Mol Heron Creek for leasing study.

August 31, 1995 - Liter Spence and Steve Brown meet with Church to further discuss water lease.

Sept. 7, 1995 - Liter Spence and Steve Brown meet with Church to continue discussion of water lease.

Sept. 26, 1995 - Liter Spence and Steve Brown meet with USFS in Butte to discuss USFS objections to Church water right claims and possible resolution so water lease negotiations could proceed with the Church.

Oct. 6, 1995 - Liter Spence and Steve Brown meet again with the Church and USFS to discuss USFS objections to Church claims and their possible resolution.

Oct. 12, 1995 - FWP letter to Church summarizing verbal agreements to date on a potential water lease.

Oct. 13, 1995 - FWP requests DNRC to approve Mol Heron Creek for water leasing study.

Nov. 28, 1995 - FWP receives letter from DNRC approving Mol Heron Creek for water leasing study.

Dec. 11, 1995 - First draft of water lease agreement completed.

Dec. 16, 1995 - Liter Spence meets with Ed McKay, private engineer, and Jeffrey McNabb, Church engineer, at Mol Heron Creek to survey the lowermost diversion in order to develop conceptual design and cost estimates for new "fish friendly" diversion and fish screen.

Jan. 11, 1996 - Draft of Future Fisheries Improvement Program (FFIP) grant application completed and sent to Ed Francis for comment and approval.

Jan. 25, 1996 - Letter from Ed Francis forwarding Church engineer Jeff McNabb's comments on Ed McKay's conceptual design drawings.

Jan. 26, 1996 - Faxed McNabb's comments to Ed McKay for response.

Jan. 30, 1996 - Received FAX from Ed McKay responding to McNabb's comments.

Feb. 1, 1996 - Ed Francis meets with Liter Spence to complete, and submit to FWP, a FFIP grant application for new diversion and water lease.

Feb. 15, 1996 - Jeffrey McNabb, Ed McKay and Liter Spence meet in Helena to resolve diversion project design questions and cost estimates.

Feb. 29, 1996 - Future Fisheries Review Panel approves Mol Heron Creek project application in amount of $124,000.

March 28, 1996 - FWP Commission approves Mol Heron FFIP project for $124,000.

April 30, 1996 - Steve Brown sends letter to Dave Pengelly, attorney representing the Church, emphasizing the need to pursue the lease agreement more vigorously and to resolve the USFS objections to claims.

June 14, 1996 - Meeting with Ed Francis, Dave Pengelly, Steve Brown and Liter Spence to discuss another draft of water lease agreement.

Jan. 23, 1997 - Future Fisheries Review Panel approves an additional $21,000 for Mol Heron Creek diversion project to allow installation of an infiltration gallery instead of the previously designed concrete diversion with built-in fish ladder and fish screen in the irrigation canal.

Feb. 6, 1997 - FWP Commission approves the additional $21,000 for the infiltration gallery.

Feb. 6, 1997 - Steve Brown sends "final" draft of lease agreement to Dave Pengelly for signature by the Church. FWP wants to get FWP Commission approval at its March 14, 1997.

March 3, 1997 - No response from the Church on lease agreement. Date for commission approval changed to their April 4, 1997 meeting.

March 5, 1997 - Dave Pengelly sends revised draft lease agreement to FWP which contains substantial changes by the Church.

April 21, 1997 - Scheduled telephone conference call with Ed Francis, Dave Pengelly, Steve Brown and Liter Spence to discuss changes in draft lease agreement was canceled at last minute by Dave Pengelly.

April 29, 1997 - Conference call with above persons was held to resolve changes to draft lease agreement. Dave Pengelly will send revised agreement to Steve Brown.

May 14, 1997 - Dave Pengelly returns another draft of lease agreement to FWP for comment.

May 19, 1997 - FWP makes some clarifications to latest draft lease agreement and replies to Dave Pengelly.

June 6, 1997 - Dave Pengelly replies to clarifications.

June 6, 1997 - Environmental Assessment (EA) on new fish friendly diversion structure to be constructed under Future Fisheries Improvement Program completed and sent out for public comment. Copy to State Historic Preservation Office (SHPO). Comments are due by July 11, 1997.

June 12, 1997 - FWP receives letter from SHPO responding to EA. SHPO requests FWP to do cultural resources survey of Mol Heron Creek diversion site.

June 16, 1997 - Draft lease agreement sent to Bob Lane, FWP Chief Legal Counsel, for final review before sending it back to Dave Pengelly.

June 18, 1997 - FWP sends a second letter to SHPO, this time requesting their concurrence to implement water lease on Mol Heron Creek. A separate EA will be written on water lease.

June 23, 1997 - SHPO replies to FWP's June 18 letter and approves the leasing project.

July 2, 1997 - Liter Spence accompanies Dori Passman, NRCS Cultural Resources Specialist, on cultural survey of Mol Heron Creek diversion site in response to SHPO request of June 12.

July 10, 1997 -Bob Lane, after reviewing draft lease agreement, discusses some proposed language changes with Liter Spence.

July 11, 1997 - Liter Spence calls Steve Brown to discuss draft lease changes. Steve FAXes proposed changes to Dave Pengelly for his consideration.

July 12, 1997 - Diversion structure EA comment period passes with no comments received.

July 22, 1997 - Phone call to Liter Spence from Steve Brown concerning Ed Francis's concerns about FWP changes in Default paragraph.

Aug. 27, 1997 - Steve Brown notifies Liter Spence that he had talked to Dave Pengelly about Default language and Steve believes language has been worked out. Dave will be sending language revisions to Steve.

Sept. 5, 1997- Ed Francis called Liter Spence to inquire about the status of lease agreement. Dave Pengelly is supposed to get Default language to Steve Brown. Ed wants to expedite the process to be ready for 1998 irrigation season.

Sept. 5, 1997 - Dave Pengelly sends proposed Default language to Steve Brown. Steve forwards information to FWP for review.

Sept. 9, 1997 - FWP agrees to Default language with minor grammatical changes and notifies Dave Pengelly through Steve Brown.

Sept. 11, 1997 - Dave Pengelly forwards another draft of agreement to FWP. Steve Brown notifies Pengelly by phone that agreement is acceptable to FWP except for a minor formatting error.

Oct. 17, 1997 - FWP receives two copies of lease agreement signed by the Church. FWP Commission will be asked to approve agreement at their November 7, 1997 meeting.

Nov. 7, 1997 - FWP Commission approves lease agreement for signature by FWP director.

Nov. 12, 1997 - FWP director signs water lease agreement.

Nov. 24, 1997 - FWP sends water lease EA out for 30-day public comment.

VI. OTHER INVESTIGATIONS IN 1997

Ten (10) other leasing opportunities were investigated on the streams listed below, one of which (Mill Creek) is already approved for leasing. Some were not pursued further for reasons that are described below. Others are still being investigated as to their suitability for leasing.

1. Lolo Creek, a tributary to the Bitterroot River near Lolo
2. Cottonwood Creek, a tributary to the S. Fk. Musselshell River near Martinsdale
3. Spring Creek, a tributary to the N. Fk. Blackfoot River near Ovando
4. Mill Creek, a tributary to the Yellowstone River near Pray
5. Gallatin River near Bozeman
6. Poplar River near Wolf Point
7. Shanley Creek, a tributary to Cottonwood Creek, near Ovando
8. Skalkaho Creek, a tributary to the Bitterroot River, near Hamilton
9. Shroder Creek, a tributary to the Thompson River, near Thompson Falls
10. Clarks Fork Yellowstone River near Bridger

All the above opportunities except the Gallatin and Poplar rivers and Skalkaho Creek are still under consideration.

The 1996 progress report listed eight potential leasing opportunities under Part VI, Other Investigations. None of them were further pursued.

Some of the reasons leasing opportunities are not further pursued are:

1. The flow amount offered for leasing is too small to make a difference;
2. The water right has a poor priority date;
3. The water right is in the wrong location on the stream;
4. The validity of the water right is in question.
5. The stream does not have a dewatering problem;
6. The fishery benefits are judged too insignificant to justify a lease;
7. The stream is embroiled in a water right controversy that would greatly hamper lease implementation; and
8. The right holders withdrew their offer when made aware of the leasing process and its anticipated time frames.

A summary of the features and costs of the water leases that have been approved to date under the water leasing study is given in **Appendix B.**

NOTE: FWP's water rights conversion on Cottonwood Creek is also included in Appendix B.

VII. MONITORING

Flow Monitoring

Four of the nine water leases approved to date are on two streams which have water commissioners who administer water rights (Mill Creek and Tin Cup Creek). Both these streams have many other water users besides FWP. We have had some difficulty with commissioners understanding the concept of a water lease and how it should be administered. The concept of not diverting water at a former diversion site was a confusing point for one commissioner when he had to let water go past upstream diversions. He understood the concept of providing higher priority water if it was to be diverted downstream but was confused by how much water, if any, should be released for instream flow. He thought it was wasting water to pass it by an upstream diversion which was not getting all the water it needed anyway when there was no diversion of the water downstream, even though the downstream water right leased by FWP had a higher priority date.

We are educating the commissioners about how the instream flow water lease is supposed to work. Commissioners who have remained on the job for more than one year now have a better understanding of the concept of instream flow and have tried to do a good job of administering the water leases. However, as commissioners change, education will have to be a continuing job for FWP so the instream flows are properly maintained. In both 1996 and 1997, however, we had some difficulty getting the leased water from upstream users on Tin Cup Creek. Each summer the creek dropped to about half of the water lease flow. Part of the problem was getting a commissioner appointed on time to deal with low flows. Also, there was apparently a difficult relationship between the commissioner, the district judge and certain other water users as the commissioner was administering everyone's water rights.

Montana has not suffered a major drought since leases were approved. A drought, or a low flow year, will make lease administration even more difficult.

The remaining five leases are on streams with fewer or no other water users. Monitoring is done by FWP and there have been no major problems with lease implementation. Again, a drought or low flow year may alter this situation.

Biological Monitoring

The water leasing program is intended to improve a component of stream fish habitat (water quantity) that will result in more fish in the stream and, ultimately, greater angler opportunities. However, there are risks associated with leasing. Most fish populations are limited by some critical factor, usually an element of habitat, that is essential for the population to continue to thrive and expand. Examples of such factors are spawning habitat (or access to spawning habitat), rearing habitat, over-wintering habitat, security cover, food production, water quality

and water quantity (stream flow). If the habitat feature that is improved by a water lease is not the limiting factor, the lease may not improve fish numbers -- even if the habitat appears better.

Survey and inventory work conducted by biologists has greatly increased our understanding of factors limiting fish populations. However, our knowledge is far from complete. Consequently, it is possible that we will obtain some leases that will not provide the benefits hoped for. The intent of leasing is to improve flows in streams that suffer from various degrees of dewatering, a critical drawback to producing fish. However, leasing only provides better flows; it does not improve other habitat conditions that may be limiting fish populations. Appropriately, however, some leases have been obtained on streams that have also undergone other physical habitat improvements (Chamberlain and Pearson creeks) through FWP's river restoration programs. This combination of improved habitat elements should provide additional assurance that fish populations and angling opportunities are improved.

Finally, it has been shown that it often takes 3-5 years for fish populations to respond to habitat improvement. Thus, it is essential that monitoring of habitat be a long-term commitment. Such a commitment is particularly important when trying to establish or improve spawning runs of fish from larger rivers into tributary streams where leases are in place.

Biological monitoring is being done on all leases to determine their effectiveness in improving fisheries. Monitoring intensity varies and is currently done by FWP fisheries biologists and graduate students when they are available. FWP currently does not have sufficient staff for intensive monitoring of leases. Local biologists collect data when they can but have many other duties that often conflict with an adequate monitoring program.

The following is a summary of the monitoring conducted on each stream to date:

1. Blanchard Creek. This lease has been in effect since 1994. However, the water right holder began increasing instream flows in 1991. Fish population monitoring is done by the local fisheries biologists. Rainbow trout are the dominant fish in the stream reach affected by the water lease. With additional instream flows, the numbers of rainbow trout over 4 inches in length has improved significantly from 6/100 feet of stream in 1990 to 12-25/100 feet from 1992 to 1997 **(Appendix C).** The numbers of young-of-the-year rainbow trout have fluctuated over this same time period with no clear pattern developing. The diversity of species present, however, increased between 1990 and 1997. In 1990, there were only rainbow, brown and brook trout present. By 1997, cutthroat trout, longnose dace, sculpins, mountain whitefish, large scale suckers and northern squawfish were being collected in the stream reach.

2. Hells Canyon Creek. The lease has been in effect since 1996. Monitoring of adult rainbow and brown trout migrating upstream and young fish migrating downstream to the Jefferson River is done by the local fisheries biologist, whose monitoring report is presented in **Appendix D.**

3. Chamberlain Creek. This lease was first implemented in 1997. Monitoring is done by the local fishery biologists. The creek has an excellent westslope cutthroat trout population at stream mile 3.9. However, immediately below this point, barriers to fish migration and poor habitat and streamflow problems severely limited fish production and the stream's contribution to the Blackfoot River. Fish populations were inventoried in 1990 prior to completion of a river restoration project to improve physical habitat elements in the lower reach of stream. The stream was surveyed again in 1995 (two years prior to implementing the water lease) and fish populations improved in the altered reach. However, the water rights obtained in the lease had not been used for irrigation during this period, indicating that the poor physical habitat was a major reason for poor fish production. In 1997, a survey at stream mile 0.5, which is below an irrigation diversion in the dewatered section of stream affected by the water lease, found two juvenile bull trout. Bull trout had not been recorded in this reach since 1982. The irrigation diversion, formed by hay bales, was a seasonal barrier to fish movement and is now replaced with a concrete structure and fish ladder that will improve water management and fish passage. Additional monitoring will be necessary to determine if the long-term improvement in flows will further improve the fisheries.

4. Pearson Creek. This lease was first implemented in 1997. Monitoring is done by the local biologists. Pearson Creek was historically entirely diverted for irrigation. The lower section of stream channel was nearly obliterated from non-use. It was reconnected to Chamberlain Creek in 1994 through a stream restoration project which reestablished the physical features of the channel. Fish populations were inventoried in 1991 prior to completion of the restoration project. The water lease affects the lower mile of stream, which is in a newly reconstructed and naturally intermittent channel. The primary value of Pearson Creek is to provide a migratory corridor for fish from the Blackfoot River to migrate into the upper reaches of Pearson Creek to spawn. Out-migrant fish have been observed in the stream section since its reconstruction and good numbers of multiple age classes of cutthroat trout have been sampled. Also, brook trout have been collected in a section of the reconstructed channel. Additional monitoring will be needed to determine the long-term effectiveness of the water lease.

5. Mill Creek. Two of the leases have been in effect since 1993 and one of them since 1995. One of the leases, with the Mill Creek Water and Sewer District, provides a 48-hour flushing flow at the time cutthroat trout fry are migrating from the creek back to the Yellowstone River. The other two leases with private individuals provide a base flow throughout the irrigation season to help ensure some flow at the mouth of the creek, which has historically gone dry in most years due to upstream irrigation..

Monitoring has been done by the local biologists and a fisheries graduate student at Montana State University, who is assisted by FWP in setting up and conducting the monitoring program. The most intensive monitoring has been done in 1996 and 1997 by the graduate student. Her 1997 report on the success of trapping cutthroat fry as they migrate to the Yellowstone River is shown in **Appendix E**.

It is encouraging to note the larger number of fry out migrating in 1997 than in 1996. These small fish will be the basis for an adult population that will migrate back into Mill Creek to spawn in 3-4 years, repeating the cycle and, hopefully, eventually reestablishing a suitable spawning run of fish into Mill Creek. In the past, there have been inadequate flows at the mouth of the creek to allow fry to reach the Yellowstone River. It should be noted, however, that higher flows have occurred naturally in Mill Creek in the last 2-3 years, which contributes substantially to the success of spawning and out migration. The higher numbers of fry cannot be attributed just to the water leases.

6. Cedar Creek. The lease was first implemented in 1996. Monitoring has been done by both FWP and the same graduate student working on Mill Creek.

The Monitoring Plan for Cedar Creek requires three gages be installed to monitor flows. All three gages were installed by the USGS prior to the 1996 irrigation season when the lease took effect. The extremely high flows of spring runoff in 1996 damaged the gages and they had to be reset and recalibrated after runoff was over. The monitoring effort was hindered by the high flows but some data were obtained. There were some lapses in the 1.3 cfs minimum flow in the water lease during the course of the irrigation season. However, 1996 served as a pilot monitoring effort that was expected to be improved in 1997.

Cedar Creek experienced a large out migration of cutthroat fry in 1997. In the past, spawning redds have been dewatered when flows dropped after spawning occurred. No redds were dewatered in 1997. A total of 25,781 fry were caught in traps as they were out migrating to the Yellowstone River in 1997, compared to 13, 251 fry caught in 1996. Again, the high numbers of fry cannot be entirely attributed to the water lease but it is, nevertheless, encouraging to see improving spawning success. The graduate student's report on fry trapping in 1997 is shown in **Appendix F**.

7. Tin Cup Creek. The lease was first implemented in 1996. Monitoring is done by the local fisheries biologist. Data on rainbow trout spawning and reproduction was collected in 1992, 1993 and 1994, prior to implementing the lease. One year of data has been collected since the lease (1997). The 1997 data show the number of rainbow fry leaving the creek is not an improvement over pre-lease years. However, sampling rainbow fry is difficult since they leave the creek before high flows are completed. Sampling efficiency is variable depending on flow conditions and the intensity of sampling has an effect on estimating numbers of fry. Further monitoring will be needed before firm conclusions can be made about the benefits of the lease to rainbow trout.

Cutthroat trout may also migrate into Tin Cup Creek to spawn, but we have no data either previous to or since the lease to compare, largely because cutthroat spawn during higher flows and the spawning redds are difficult to detect. Cutthroat trout are becoming more abundant in the upper Bitterroot River due, perhaps, to more restrictive fishing regulations and Tin Cup

Creek may become more important for cutthroat spawning in the future. More information is needed to reach conclusions on the value of this lease to cutthroat trout.

8. Cottonwood Creek. The water rights conversion on this stream was first implemented in 1997. Monitoring is done by the local fisheries biologists. Salvaged water obtained by ditch lining on the Blackfoot-Clearwater Wildlife Management Area is left in the stream to improve flows below a major irrigation diversion on the creek. Seasonal dewatering downstream of the diversion had occurred for decades from water users taking the entire stream flow for late season irrigation. Historically, no fish would have existed there at this time of year. Since water has been left instream, bull trout, cutthroat trout and brook trout have been found in the previously dewatered reach.

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VIII. APPENDICES

APPENDIX A

FLOW MEASURING PLAN -- MOL HERON CREEK

Two components comprise the instream flow measuring plan for Mol Heron Creek: (1) stream gages to monitor flow and, (2) an administration program to ensure that the leased water is maintained.

(1) Stream Gages

Two staff gages will be installed, one above the point of diversion to measure the amount of water available for the Church to divert and the other below the diversion to measure the leased water. Installation of the gages and the development of rating curves could be contracted to the USGS depending on availability of funding and availability of USGS personnel to maintain the rating in a timely manner for FWP to monitor the lease. If funds or personnel are not available, FWP will install and rate the gages.

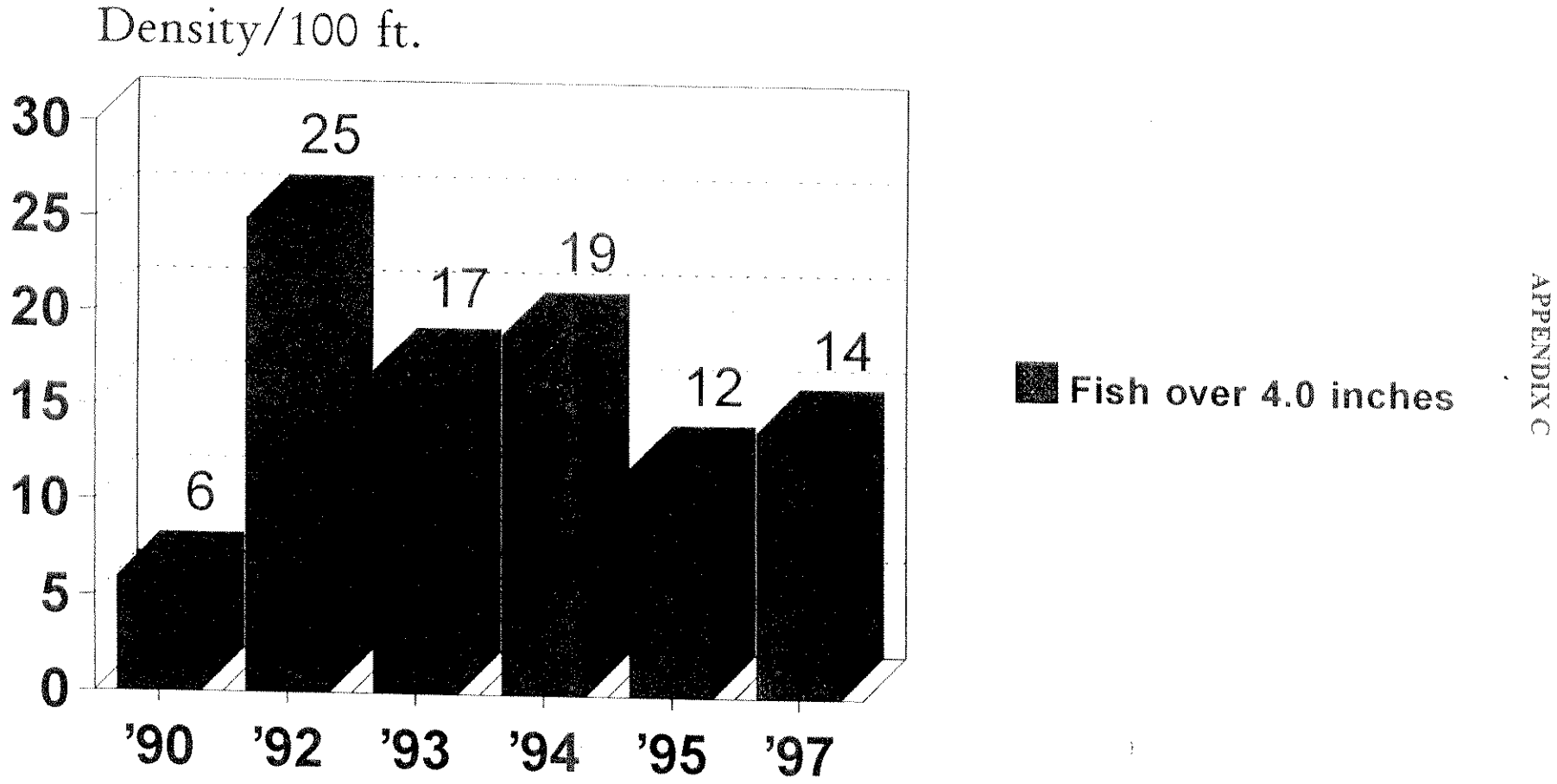
(2) FWP will primarily rely on Church personnel involved in irrigating to monitor flows and water use to ensure 5 cfs is bypassed the diversion point. FWP personnel will periodically check the gage and measure flows to ensure compliance with the terms of the lease.

APPENDIX B
Features and Costs of Approved Water Leases

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	95 right with various priorities	Up to 65 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	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	5 years June 20,1999	May 11, 1913 (first right on stream)	3.0 cfs	April 15 -October 15	Up to $2,000 per year
Tin Cup Creek	Six Individuals	5 years Nov. 4, 2000	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 1.8 cfs October 20-November 4	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 (first right on stream), August 23, 1889, August 29, 1912	1.12 cfs (salvaged water)	April 1- November 4	$25,000 - 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

[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.

Estimated Rainbow Trout Densities for lower Blanchard Creek, 1990 to 1997 Stream mile 0.1



Instream Flows in effect since 1991

APPENDIX D

Hell's Canyon Creek Water Lease, Fish Screen, and Gravity Pipeline Project:
Comparison of stream flow and fish loss to the irrigation system
in 1992 (pre-project) and 1997 (post-project).

Monitoring of stream flow of Hell's Canyon Creek and rainbow trout fry production was conducted in 1992 to document the importance of the stream for providing recruitment of juvenile trout to the Jefferson River and to evaluate the need for improving stream flow and rearing conditions in the creek. The Hell's Canyon Creek Project was implemented prior to the 1996 irrigation season, and post-project monitoring of stream flow and trout fry production was repeated in 1997 to evaluate effectiveness of the project.

PRE-PROJECT SAMPLING (1992)

Drought conditions in 1992 resulted in very low flow conditions throughout the Jefferson basin. Discharge of Hell's Canyon Creek was measured near the mouth of the creek, and stream flow ranged from 4.6 cfs on 15 July to 0.8 cfs on 19 August 1992. During much of August and early September, discharge was less that 1.6 cfs at the mouth of Hell's Canyon Creek. Two measurements were made at the Carroll Ditch during 1992. The canal contained 2.4 cfs on 15 July, and only 1.5 cfs on 19 August when stream flow above the canal was 2.3 cfs..

Traps were placed near the mouth of Hell's Canyon Creek to monitor trout fry migration to the Jefferson River and in the Carroll Ditch to monitor fry loss to the irrigation system. From 12 June through 19 August, an estimated 16,913 rainbow trout fry migrated to the Jefferson River. During the same period, 9,579 rainbow trout were lost to the Carroll Ditch. This loss to the irrigation system was estimated to be 36% of the total fry production at Hell's Canyon Creek.

POST-PROJECT SAMPLING (1997)

In contrast to 1992, the irrigation season of 1997 was wet and stream flow was above average throughout the upper Jefferson basin. Consequently, improved flow conditions were expected at Hell's Canyon Creek. Daily visits at a staff gage installed and monitored by U.S.G.S. document significantly higher stream flow downstream of the pipeline withdrawal. Discharge ranged from 3.8 cfs to 16.4 cfs between 15 July and 30 September. The average discharge for the month of August was 8.3 cfs. Daily flow records were also obtained from the gravity pipeline. Withdrawal typically averaged 350 gpm throughout the irrigation season. Flow ranged from 0 gpm to a maximum of 650 gpm.

Fry production was lower in 1997 compared to 1992. High flow conditions and flooding during rainbow trout spawning and egg incubation in May and June likely resulted in scouring of spawning gravel and may have contributed to relatively low spawning success. High flow conditions also contributed to difficulties in trapping juvenile trout during peak movement periods in July. An estimated 2,500 rainbow trout fry emigrated from Hell's Canyon Creek from 11 July through 1 October 1997. This should not be considered an estimate of total fry production because high flow prevented trapping during late June/early July when significant numbers of fry typically migrate from the creek. Monitoring of fish movement at the fish screen bypass indicated that no fish were lost to the irrigation system, and approximately 1,000 trout were effectively screened from entering the pipeline system. Comparisons of fry captured at the fish screen bypass and in Hell's Canyon Creek immediately below the irrigation withdrawal documented that about 40% of the fry would have entered the irrigation system had the fish screen not been present in 1997.

Although there is no estimate of trout fry numbers rearing in the stream downstream of the pipeline withdrawal, rearing conditions for small trout were significantly improved in 1997 compared to 1992 because of improved stream flow. This improved rearing environment is expected to provide increased survival of juvenile trout that would otherwise be forced to rear in the Jefferson River.

APPENDIX E

Mill Creek Summary 1997: Fry Trapping and Flushing Flow results

Leanne Hennessey

October 10, 1997

The streambed of Mill Creek splits into two branches approximately 330 yards (300 m) from its confluence with the Yellowstone River. In 1996, almost all of the water flowed into the more northern branch, leaving the southern branch dry soon after the spring floods subsided. After the 1997 floods, the creek's morphology changed to direct most of the water into the southern branch of the creek. The northern branch maintained a minimal flow throughout the summer, and Mill Creek now has two points of confluence. In 1997, fry traps were placed in each branch throughout the trapping season. Both traps were set approximately 65-85 yards (60m -80 m) upstream from the mouth.

The Mill Creek flushing flow took place between 6 a.m. on August 25 and 6 a.m. on August 27. The gauge mounted on the East River Road bridge was used to plot the hydrograph for the flush. The flow increased from 40.1 cfs on August 24 to 63.9 cfs during the flush. Minimum flows of 16.6 cfs occurred from August 31 to September 2. A heavy storm moved through the area on September 12 and raised the flow to its summer peak of 93.9 cfs. The average flow for 1997 was 37 cfs.

As of September 23, 1997, a total of 2316 Yellowstone Cutthroat fry had been caught in Mill Creek since July 31, 1997. Fry were caught on 36 of the 46 trapping days. The peak of the outmigration occurred on August 19 when 412 fry were trapped. In comparison, a total of 41 fry were caught on 7 of 31 trapping days in 1996.

Incidental mortalities from both sampling years were sent to the University of Montana in Missoula for electrophoresis testing. Several mountain whitefish fry and sculpin adults and fry were caught throughout August and September 1997.

The traps used for 1997 were identical to the ones used in 1996. Because of higher flows in 1997, I built velocity barriers to create slower pools for the tails of the traps to reduce mortalities. All traps have an opening that measures 1.5 feet by 2.3 feet. The opening tapers down to a 4-inch PVC coupling that connects the tail end to the front of the trap. All traps were made from 1/16" mesh netting. The total length of the front portion of the trap is 4.5 feet. The tails vary in length, but average 3 to 4 feet.

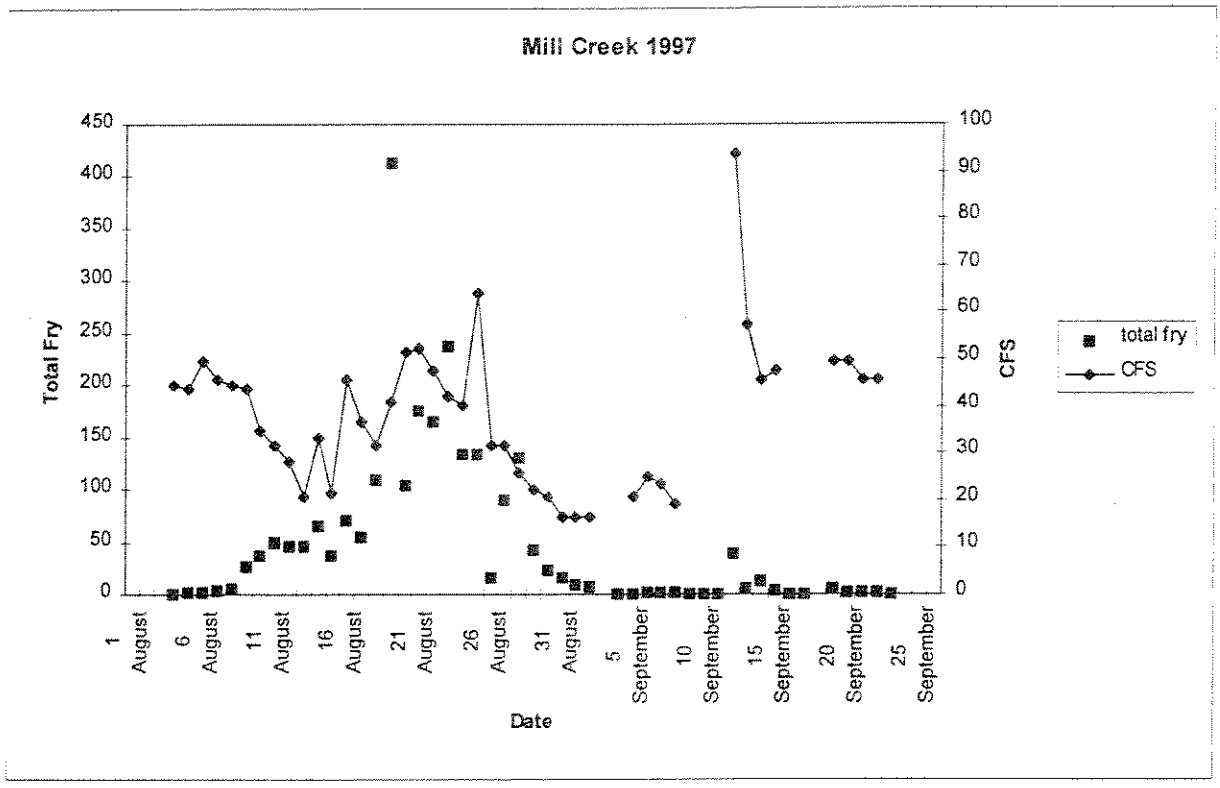


Figure 1: Total number of Yellowstone Cutthroat Trout fry caught in both branches of Mill Creek and the corresponding flows in 1997.

APPENDIX F

Cedar Creek Summary 1997: Fry Trapping Results

Leanne Hennessey

October 28, 1997

Cedar Creek experienced a large outmigration of fry in 1997. Flows in the creek remained within a narrow range throughout the trapping period. Assuming that 1997 spawning sites were similar to those used in 1996, there were no days when redds were dewatered this year. In 1997, the fry trap in Cedar Creek was placed just downstream of the 1996 trap site because a downed tree had covered the old site. The trap was set approximately 52-65 yards (50m -60m) upstream from the mouth.

The gauge mounted below the highway 89 bridge was used to plot the hydrograph for the flows. Minimum flows of 1.94 cfs occurred from mid to late September. Maximum flows during the trapping season occured early in August and reached 3.82 cfs. As mentioned in the Mill Creek Summary for 1997, a major storm moved through Paradise Valley on September 12. The hydrograph shows its effect as a spike in the flows.

In general the flows in Cedar Creek declined slowly over the entire trapping season. The average flow for 1997 was 2.6 cfs. Because the hydrograph is currently not well defined for gauge readings below 0.60 or for flows of approximately 2.80 cfs or less, several of the cfs points on the graph should be viewed as estimates.

As of September 23, 1997, a total of 25781 Yellowstone Cutthroat fry had been caught in Cedar Creek since August 7, 1997. Fry were caught on 34 of the 38 trapping days. The peak of the outmigration occurred on August 28 when 2956 fry were trapped. For comparison, a total of 13251 fry were caught on 20 of 24 trapping days in 1996.

Incidental mortalities from both sampling years were sent to the University of Montana in Missoula for electrophoresis testing. Many sculpin adults were caught throughout August and September 1997.

The traps used for 1997 were identical to the ones used in 1996. All traps have an opening that measures 1.5 feet by 2.3 feet. The opening tapers down to a 4-inch PVC coupling that connects the tail end to the front of the trap. All traps were made from 1/16" mesh netting. The total length of the front portion of the trap is 4.5 feet. The tails vary in length, but average 3 to 4 feet.

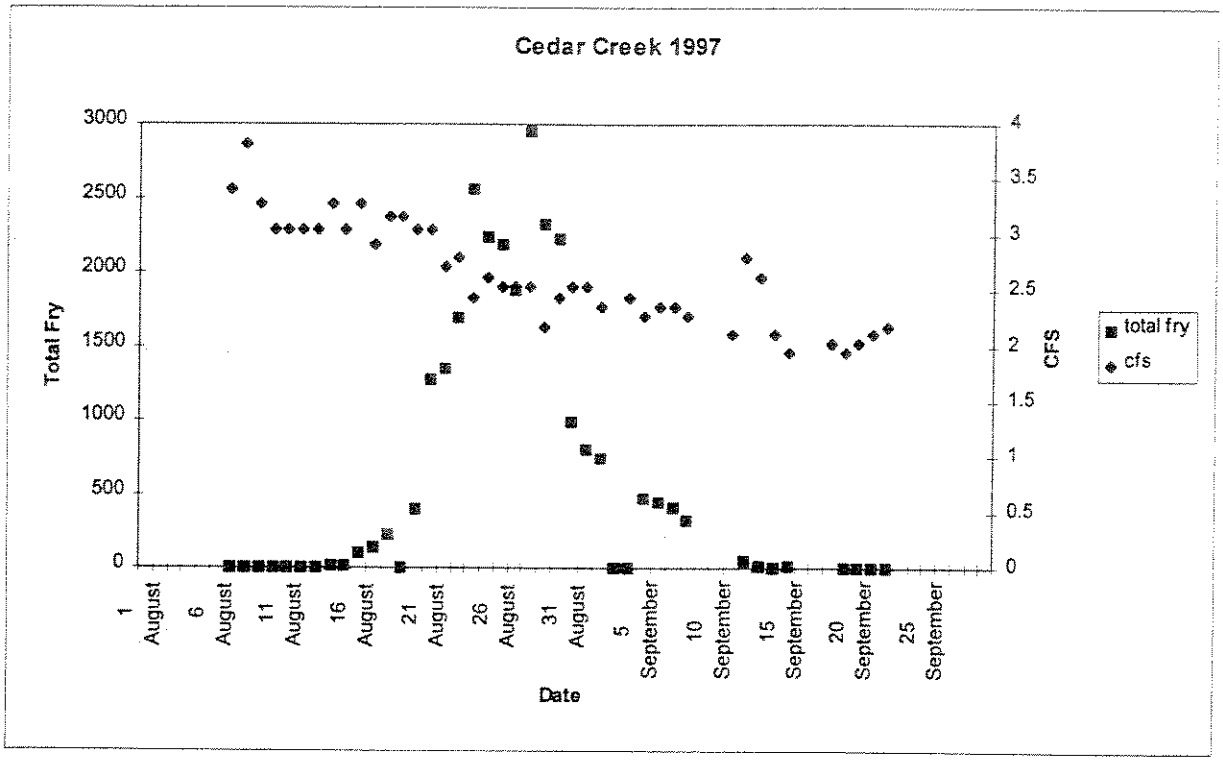


Figure 1: Total number of Yellowstone Cutthroat Trout fry caught in Cedar Creek and the corresponding flows in 1997.