

ANNUAL FWP DROUGHT SUMMARY

2005

Prepared for:

Governor's Drought Advisory Committee

Submitted by:

Montana Fish, Wildlife & Parks

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I. INTRODUCTION

This report is provided in fulfillment of the annual reporting requirement of the 1995 Montana Drought Response Plan. The specifics of the annual reporting requirement can be found in Chapter IV (Drought Monitoring) of the Plan, on page 14. The entire Plan is available online at <http://nris.state.mt.us/drought/committee/DroughtP.pdf>. This report constitutes Montana Fish, Wildlife and Park's (FWP) "participating agency" annual report for 2005 to the Governor's Drought Advisory Committee.

This report is not intended to repeat any of the specific climatic data and reporting presented to the Committee in 2005 by other participating agencies. That information continues to be available on the Committee's website at <http://nris.state.mt.us/drought/committee/meeting.html>. This report focuses on FWP's analysis of local drought conditions and responses to those conditions.

II. FWP DROUGHT ASSESSMENT AND RESPONSE ACTIVITIES

FWP's drought response consists of ongoing activities performed on a regular basis, regardless of the existence or absence of drought conditions exist or not and specific activities undertaken in response to drought conditions. The following describes FWP's assessment and response activities in 2005.

Regular and Ongoing Assessment and Response Activities

FWP administrators and field staff regularly assess the relationships between climatic/hydrologic conditions and habitat, whether such conditions are overly dry, overly wet, or near normal. These assessments include the following activities:

- By monitoring snow pack and precipitation reports and forecasts FWP staff anticipate the needs and issues of the upcoming seasons, both for Montana's fish, wildlife and recreational resources, as well as to the local communities and businesses associated with those resources.
- FWP tracks stream flow and water temperature conditions in Montana's priority streams and tributaries to determine relative conditions for fish and wildlife, and recreational activities, dependent on certain flow minimums, maximums, pulses, or timing.
- FWP staff makes field observations and notes anecdotal information regarding actual species' response to changing moisture conditions. This includes activities such as noting location of bull trout relative to flows and/or water temperatures in a stream, reporting groundwater conditions (e.g., flows from springs and wells), logging comments from river recreationalists regarding conditions, or noting movement of deer and elk into or away from irrigated pastures.
- Through communication between agency divisions, with local communities, and with businesses FWP endeavors to respond appropriately to impacts of unusual moisture conditions in a consistent and science-based manner.
- FWP participates in and facilitates ongoing policy, planning, and informational efforts related to how the fish, wildlife, and recreational resources of Montana and the habitats critical to these resources are perceived, managed, and allocated, both now and in the future.

- FWP strives to increase the scientific understanding of the relationships between fish, wildlife, and recreation resources and climatic conditions, and works to make that information available and usable to decision-makers at various levels. Examples include the field determination of appropriate instream flows for various fish species, participating in development of water quality restoration or drought management plans at the local level and sponsoring research into specific factors such as whirling disease that may affect a species capability to withstand climate-related stresses.
- FWP funds (through grant programs or direct expenditures) and conducts specific long-term projects to increase Montana's capability to sustain dry climatic conditions while also maintaining habitat quality, resource productivity, and management flexibility. Examples include stream restoration grants, stream flow restoration through instream flow leasing, conservation easements to meet habitat and landowner objectives, native species conservation and restoration, as well as coordination with Montana Department of Natural Resources and Conservation on water allocation policy and issues.

Specific Fisheries Assessment and Response Activities in 2005

Under drought conditions and with limited resources, FWP's efforts in long-term drought susceptibility reduction shift to a more short-term assessment and response mode, based on the severity of the situation and the needs it creates. While Montana experienced some relief this past year, drought impacts to fisheries may not be evident until several years after the low flow events. Effects may include missing age/size classes, reduced growth rates, reduced fish densities, poor fish condition (e.g. parasitism), etc. A summary of FWP's specific assessment and response activities by Region for year 2005 follows. The monthly drought updates provided by FWP to the Committee that are the basis for this summary can be found at <http://fwp.state.mt.us/drought/default.asp> under the heading **Regional Drought Reports**.

FWP Regional Reports

Region 1 – Kalispell

By mid-March snow pack in northwest Montana was about 50% of normal or less. Most stream flows were also running 50% of normal or less. It was uncertain if major reservoirs would fill. The concern was so great, PPL Montana, which operates Kerr Dam on Flathead Lake, requested and was granted a waiver to start refilling Flathead lake when it was down only 5.6 feet as opposed to continuing to draft down to 10' below full pool before refilling. Many lakes in the Region were showing below normal water levels, light ice cover and snow pack served to limit winterkill damage in these lakes. Echo Lake was down nearly 10' and has shown poor northern pike spawning success for the last 5 years. Ashley Lake was in dire straights. The lake was down 2.7' or 7,550 acre-feet. The Hand Creek snow pillow in the Ashley Creek watershed was at 10% of average snow pack and runoff was predicted to be less than 1,600 acre-feet which would refill Ashley lake less than 0.6 feet.

Two slow-moving weather systems centered over Region 1 for the first two weeks of June, dropping from 3" to 8" of rain. These storms produced near record rain in some areas. Many streams came up to normal high flows but some streams like the Yaak, Fisher and Thompson Rivers and Prospect Creek remained at below normal flows. Reservoir managers had been managing outflows from Lake Koocanusa, Flathead Lake and Hungry Horse Reservoir conservatively to maximize chances for refill. The heavy rains forced greatly increased discharges downstream of these projects, resulting in high flows but no flooding. Flathead Lake and Hungry Horse Reservoir were being managed at just below full pool. Lake Koocanusa was

10' down and flows were being increased both for sturgeon flows and to avoid overfilling. NOAA Fisheries called for full sturgeon flows and drafting the upper 20' of Kooconusa. They proposed to release 17,000 cfs for the whole summer, then dropping to 4,000 cfs on September 1. FWP recommended a release of 12,000 cfs for the summer, then dropping to 9,000 cfs September 1 to smooth out impacts. Ashley Creek water right holders voted to manage Ashley Lake for minimal flows through June to maximize refill. Ashley Lake will still not refill but storage should be improved.

By early July, Flathead Lake and Hungry Horse Reservoir were full and increased discharges to avoid overfilling. Lake Kooconusa was near full despite the higher than normal releases for sturgeon. Ashley Lake came within 1.3' of full or about 70 % of full under conservative flow releases. High water temperatures and low stream flows prompted FWP to close northwestern Montana's Thompson River and its tributaries, including the West Fork Thompson River and Fishtrap Creek, to angling from noon to midnight daily until conditions improve. The order took effect Tuesday, July 26, 2005. The low stream flows and high temperatures threatened the river's popular wild rainbow trout and native westslope cutthroat trout fisheries and its federally protected native bull trout population. The Thompson River re-opened to fishing on September 5th. Angler compliance during the closure appeared to be good. Due to successive years of drought, overall trout numbers are down in the Thompson. Brown trout appear to be faring slightly better. These trends are typical of drought-impacted streams. Diminished fishing opportunity will continue for several years out as weak year classes recruit to the fishery.

The heavy June rains helped some groundwater-fed lakes such as Echo Lake near Bigfork recover water levels to some degree. Other lakes, such as Horseshoe Lake near Ferndale, have shown little recovery. Horseshoe is about 10' down and shows poor recruitment of smallmouth bass due to poor spawning conditions and partial winterkill.

Region 2 – Missoula

Despite improved conditions in the fall of 2004, drought impacted fish numbers throughout Region 2. It is likely that recent declines in numbers of west slope cutthroat trout and bull trout in sampling sections are related to decreased amount of habitat (water quantity) and likely increased temperatures (water quality). Reduced rainbow trout numbers is likely the effect of whirling disease that is made worse by drought. Drought reduces water quantity and increases concentration of spores that infect fish.

Blackfoot River Basin

The Blackfoot Challenge Emergency Drought Response was triggered on August 1st as flows in the Blackfoot River flows fell below the first trigger of 700 cubic feet per second (cfs). The Emergency Drought Response consists of a voluntary program where all water users are asked to reduce water use during low flow periods. When flows fall below 700 cfs, participating irrigators are asked to implement their individual drought management plans. As flows drop below 600 cfs, outfitters and anglers are asked to participate by limiting fishing to morning hours, quickly releasing fish, and avoiding bull trout streams. Low stream flows on the Blackfoot River prompted the Blackfoot Drought Response Committee and Montana Fish, Wildlife & Parks to request voluntary fishing restrictions on the river beginning Saturday, August 13th. Under the voluntary restrictions, anglers are asked to limit fishing on the main Blackfoot to morning only and to cease all fishing in important bull trout tributaries. Bull trout tributaries include Gold, Belmont, Cottonwood, Copper and Monture Creeks, and the

North Fork and Landers Fork of the Blackfoot. In the past, junior water right holders on the Blackfoot have been subject to call by FWP. Under this plan, participating “junior” water right holders are able to continue operations using individual water conservation plans. For outfitters and anglers the plan helps protect fisheries and provides an alternative to fishing closures.

Bitterroot River Basin

Noticeably poor snowpack and precipitation in the Bitterroot watershed led to below normal flow in the Bitterroot River. Fortunately, water purchased by FWP from DNRC’s West Fork Bitterroot Reservoir (Painted Rocks) was released to augment stream flows in the Bitterroot River. The last of the fisheries contract water was delivered to the Bitterroot River from DNRC’s West Fork Bitterroot Reservoir on September 28. This water has proven critical in maintaining stream flow during the later summer. Part IV of this report contains additional information regarding this stream augmentation program.

Region 3 – Bozeman

Big Hole River

Rainbow trout populations in the Big Hole River show somewhat of a decline through 2004. Brown trout populations show increasing rates of decline in a downstream direction. Numbers of age V and older browns are at or near all time modern lows. Preliminary brown trout electro-fishing results indicated some improvement in numbers of larger fish and the condition factor of the fish (probably associated with mild winter temperatures) but declining brown trout densities. Brown trout densities in the lower river (below Glen) appear to be extremely low. In May the upper Big Hole River near Wisdom was as low as 63 cfs. Without the cooperation of several irrigators the flows would have likely dropped below 20 cfs. Many water users reduced or ceased diverting water to help increase flows to benefit Grayling spawning.

Early August found flows in upper Big Hole River, above Wisdom, much improved over 2004 but still dropped to relatively low flow regimes during the normal grayling spawning period. As the flow in this reach declined below 40 cfs at the Wisdom USGS Gauge in accordance with the Big Hole Watershed Committee (BHWC) Drought Plan a phone tree was implemented to urge water users to conserve, use stock water wells, voluntarily cut back, etc. A voluntary PM fishing restriction was also implemented. The Middle and Lower Reaches of the Big Hole remain well above the Drought Plan second stage triggers and far above triggers that would result in angling closures. The closure trigger in the upper river occurs at 20 cfs at the Wisdom Gage. This closure occurred on August 26th, substantially later than the past four years. Strong flow regimes in lower reaches of the Big Hole River in the fall resulted in the best fall spawning conditions in many years.

Beaverhead River Basin

As of early March, Clark Canyon Reservoir conditions remained poor both in terms of fish numbers and storage of only about 55,000 acre feet. Rainbow trout numbers in Clark Canyon Reservoir are at all time modern low (since 1979) with 3rd consecutive fish plant survival failure. Brown trout numbers are also declining rapidly. Winter creel catch rates tied all time low for rainbow trout. Releases to the Beaverhead River were at the 25 cfs minimum. Into April inflows to Clark Canyon Reservoir continued to set all time monthly lows. Flows in the Red Rock River were virtually nil upstream from Big Sheep Creek in the Dell vicinity. Releases from Clark Canyon Reservoir remained near the absolute minimum of 25 cfs (minimum instream flow

reservation 200cfs) and did not increase until irrigation releases began well into May. Opening day of the fishing season occurred in the upper river (dam to Pipe Organ Bridge) with flow releases of only 25 cfs from the dam. The situation was mitigated by turbid inflows from Clark Canyon Creek and Grasshopper Creek and a strong enforcement presence. The turnout was lower than normal and the anglers on the scene generally did not keep many fish. The low flows precluded floating in boats and most people appeared to tire of the crowded conditions in the limited clear water reach rather quickly and moved on.

The snow pack in the Centennial Valley exceeded that of recent years resulting in most streams in the Red Rock River basin rising to near or above flood stage several times by mid-June. The Red Rock Lake grayling spawn appeared to be quite normal and 130,000 eggs were collected for a genetic infusion into the Roger's Lake brood with a minimum of effort. Lima Reservoir filled and spilled for the first time in many years. As a result, inflows into Clark canyon Reservoir **improved** to the 5th lowest on record for May. A fishing season occurred in the Red Rock for the first time in about 5 years. Flow regimes in the Red Rock River are very much improved over the situation that has marked the past 5 years. Spring base population densities of 576 brown trout and 76 rainbow trout per mile were established in the flow refuge reach near Dell. Population improvements are expected if flow regimes improve over the next several years. By fall, inflows from the Red Rock River into Clark Canyon Reservoir were maintaining at greater than 200 cfs. FWP did not impose a fall angling closure on the Red Rock for the 1st time in 6 years.

In the Upper Beaverhead (Clark Canyon Dam to Dillon) spring brown trout population estimates show numbers of fish continue to decline. Older fish (18 inch and larger) continue substantial declines dropping below 300 per mile (296) in uppermost tailwater area down to 10 per mile near Pipe Organ in mid- tailwater. Numbers of 18 inch plus fish declined to 38 per mile near Dillon. In July flows in the Lower Beaverhead (Dillon to mouth) declined below the 25 cfs minimum low flow level required in the system. During this period, water temperatures remained above 70 degrees for the vast majority of any given 24 hour period and maxed out in excess of 80 degrees on a daily basis. This is the 1st time in the experience of the long-time local FWP fisheries biologist that this absolute minimum was not achieved. Spring population estimates in two study sections revealed brown trout and mountain whitefish populations below 100 fish per mile. These were the lowest populations recorded in those study sections over our entire period of record.

By the last week in September, releases from Clark canyon decreased to slightly above the 25 cfs minimum to about 28 cfs. In response, FWP once again imposed a fall angling closure (October 3rd - November 30) from Clark Canyon Dam to Dillon, the 6th consecutive year of this closure. As opposed to the past 6 years, storage was improved in Clark Canyon Reservoir and rapidly approaching 50,000 acre feet with inflows in excess of 200 cfs. The water users provided water for irrigation through September 23rd. The policy of the past 6 years was to cut off all irrigation releases immediately after Labor Day. Much potential improvement in storage was sacrificed over that 19-day period.

Ruby River

March found minimum releases (25 cfs) from Ruby River Reservoir. Analysis of 2004 population data shows Brown trout populations in the Ruby River still declining through 2004. By April, stream flow below Ruby River Reservoir was very low at only about 33 cfs while flows

in the upper river approached the long-term median (150 cfs for April 19). Preliminary electro-fishing results for brown trout indicate continued low numbers of large fish and depressed standing crop in the tailwater each below Ruby River Reservoir and slightly depressed populations in the Ruby River near Sheridan. Conditions improved by the first week in May as the Ruby River Reservoir began spilling. Flow in the Ruby River remained near normal throughout the remainder of 2005.

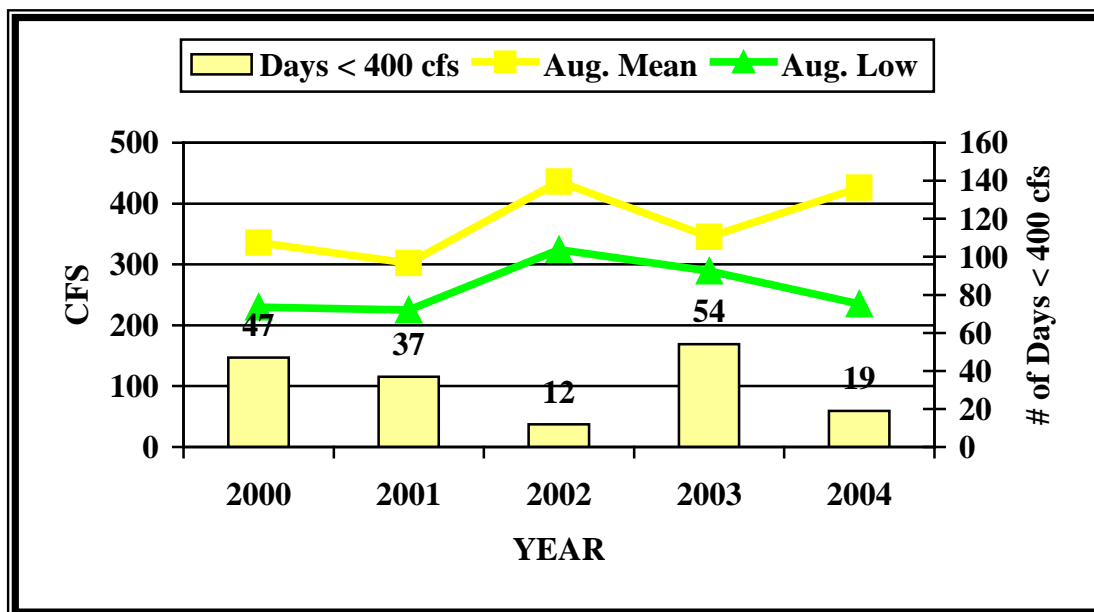
Jefferson River

Early in the spring critically low flows were again expected for the Jefferson River later in the summer. The joint project involving FWP, Jefferson Watershed Council, and Trout Unlimited anticipated implementing the drought plan, which involves monitoring trigger flows at the Twin Bridges gage. Under the plan, high water temperature (3 consecutive days over 73 F) results in afternoon fishing closures throughout the river. If flow drops below 280 cfs at Twin Bridges, a complete fishing closure is an option for the FWP Commission. Also at this trigger flow of 280 cfs, weekly meetings begin with water users to attempt to maintain a critical minimum flow of 50 cfs at Waterloo. Three primary canal systems (along with some smaller users) participate in this process.

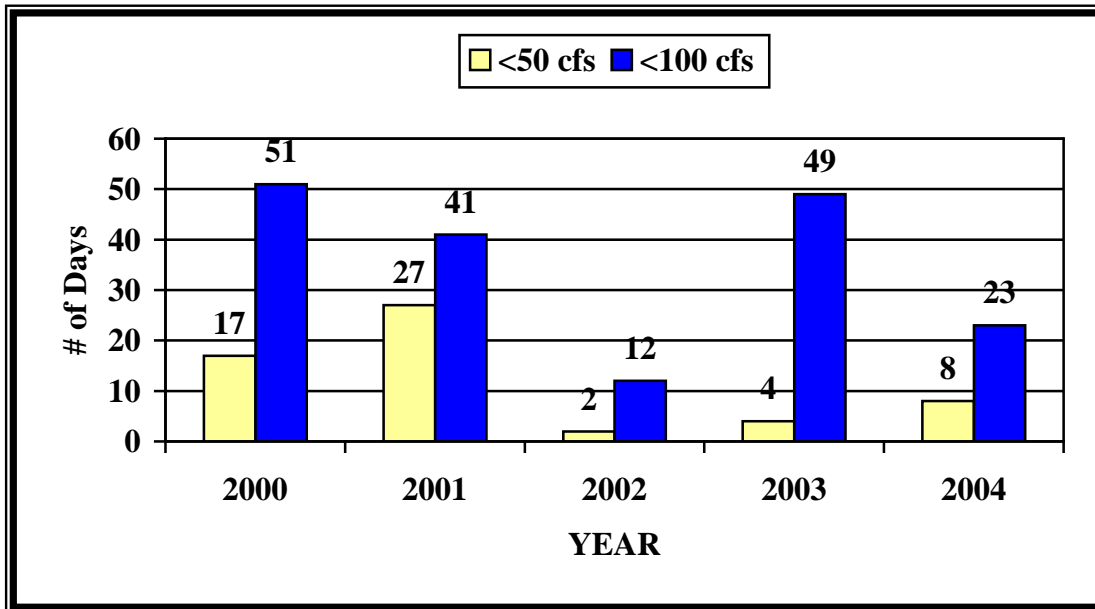
By July 22, flows in the Jefferson River had declined to 465 cubic feet per second (cfs) at the Twin Bridges USGS gauging station, triggering an alert to enlist voluntary contributions by water users and anglers to improve stream flow and reduce stress on the trout fishery. Water temperature at the gauging station had exceeded the 73° F threshold for three consecutive days requiring limitation of fishing to the cooler morning hours. Fishing along the entire length of the Jefferson River was prohibited between 12 noon and midnight daily beginning at 12 noon on Monday July 25, 2005. In the Jefferson River brown trout numbers declined from 2000 through 2005 (largely due to lack of water) but this decline has stabilized. Rainbow trout numbers are relatively stable and recruitment of juveniles from Hells Canyon Creek (FWP water lease) has been good.

The following charts relate the impacts of drought on the Jefferson River in from 2000 through 2004:

Jefferson River at Twin Bridges Flow During Severe Drought



**Jefferson River at Waterloo –
Days Below Target Flows (50 & 100 cfs) During Severe Drought Years**



The very latest data shows conditions for 2005 slightly better during 2005 with no days with flow less than 50 cfs and 13 days with flow less than 100 cfs. The following table shows the impact drought management plans have had in the Big Hole and Jefferson River basins:

Minimum Flow Comparisons Before & After Drought Management Plans

	<u>1988</u>	<u>2000</u>
Big Hole River near Melrose	53 cfs	126 cfs
Big Hole River below High Road	3.5 cfs	38 cfs
Jefferson River near Twin Bridges	79 cfs	230 cfs
Jefferson River below Waterloo Bridge	4.7 cfs	18 cfs

Clearly drought management plans have been successful in the Big Hole and Jefferson River basins.

Gallatin and Madison River Basins

April found water conditions in the Madison and Gallatin River drainages portending especially low flow conditions later in the summer. These rivers continued to support all fish in good condition, including fish just sampled. Significant changes in fish populations have not yet detected in the Madison and Gallatin drainages that can be attributed to drought effects alone. In some areas, portions of the East Gallatin River for example, population declines are occurring associated with an increasing *Myxobolus cerebralis* infection rate (whirling disease). Drought is likely exacerbating this disease problem by concentrating spores and otherwise reducing fish survivorship. But even in these areas, recruitment apparently is sufficient up to this point to maintain stable numbers of adult fish over time, despite several years of continuous drought.

By mid-May recent moisture provided welcome flow enhancements throughout the Madison and Gallatin River drainages. The effect was particularly noticeable in unregulated river sections, such as the Madison River near West Yellowstone and all of the Gallatin River. At this time the East Gallatin River was flowing at a rate nearly twice its long-term average. A mild winter and wet spring provide good conditions for fish. Continued cool temperatures and precipitation into early July moderated drought impacts in the Madison and Gallatin basin. Flows in the Gallatin dropped 100 cfs or more below the long-term medians in the later part of August and remained at this decreased level until early November. Moderating air temperatures prevented increases in water temperature as flows declined.

Upper Yellowstone River Basin

In March, the outlook for the upper Yellowstone River above Springdale and the Shields River Spring looked bleak due to persistent drought and poor snow pack. Significant dewatering (*FWP defines dewatering as a reduction in stream flow below the point where stream habitat is adequate for fish.*) was expected in tributaries and Yellowstone River itself. Spring fish sampling found fish captured both in the Yellowstone and Shields Rivers in good physical condition, likely due to the mild winter.

Precipitation in late April and early May coupled with some warmer weather brought flows in the Yellowstone River flows up to normal levels both at Livingston and Corwin Springs. The Shields did not respond equally as well as it remained below the 26-year long-term average. Into early June both the Yellowstone and Shields drainages received continued precipitation, but with relatively cool temperatures in the 30s and 40s along with snow in the Crazy and Absaroka Mountains caused stream flow to drop in both rivers despite the precipitation. Later June brought continued significant precipitation and high elevation snowmelt brought both the Yellowstone and Shields Rivers to near normal runoff levels. By the beginning of July little snow remained in the high mountains. Yellowstone cutthroat trout spawning in tributaries to the Yellowstone occurred between two and three weeks later than in recent years.

August and early September saw the flows in the Shields drop as low as 50 percent of the long-term median with a recovering to near normal flows in later September. The increase in flows will help improve spawning conditions for brown trout and provide more over winter habitat for all species of fish.

Region 4- Great Falls

Missouri River Basin

In March forecasted inflows to Canyon Ferry Reservoir were 51% of normal for the spring of 2005. Due to this forecast, releases to the Missouri River were reduced over the winter (downstream of Holter Dam) from 3,900 to 3,000 cfs. It was possible that release would be furthered decreased to 2,800 cfs if conditions worsened. These reductions in flow may have impacted brown trout redds, and potentially reduced this years brown trout recruitment in the Missouri River. Early spring flows in Little Prickly Pear Creek and the Dearborn River were well below the long-term medians.

June brought improved precipitation in southwest and north-central Montana. Despite the improved conditions, discharge from Holter dam remained at 3,260 cfs (42% of normal) in early June. The good news was Canyon Ferry Reservoir filled in late June. High flows occurred in the

major tributaries to the Missouri River, specifically Little Prickly Pear Creek, the Dearborn River, and Sheep Creek. These high flows likely aided emigrating juveniles in reaching the river. By mid-June the Missouri River downstream from Holter Dam was flowing at or above the recommended minimum flow of 4,100 cfs and remained near or above this level throughout 2005. Once high flows passed in the major tributaries to the Missouri River, specifically Little Prickly Pear Creek, the Dearborn River, and Sheep Creek, subsequent flows were generally below average levels well into the fall. Cool weather helped minimize stress of salmonids residing in these main tributary streams later in the summer.

Smith River Basin

Snow pack in the Smith River basin was 72% of normal in early March and the Smith River was flowing at 77% of the long-term average. Low flows in the coming summer were of great concern given the poor snow pack coupled with ground-water depletions (from 6 years of drought). FWP has documented that low flows during late summer have a direct impact on rainbow trout recruitment in the upper Smith River Basin. Flows and remaining snow pack improved slightly by April, however concerns for the summer remained. Precipitation and early runoff coupled to boost flows well above the long-term median by mid-May.

Substantial precipitation in latter May and in June increased flows well above the 8-year long-term median were they generally remained throughout the summer. Higher than normal reservoir releases from North Fork Smith Reservoir due to reservoir construction helped maintain flows at or above normal levels.

Sun River Basin

Snotel data for March 17th showed that the snow water equivalent in the Sun River drainage had increased to 46% of normal and total precipitation was about 60% of normal. Storage in Gibson Reservoir and other facilities were all above average coming at the expense of flows in the Sun River. The mid-March inflows into Gibson Reservoir were approximately 230% of the 30-year average inflows, 194% of the 10-year average inflows, and 158% of the mean inflows for March 16 for the last 5 years. Discharge from Gibson Dam was 44 cfs and at the Sun River Diversion Dam, it was 60 cfs on March 16. During drought years, 100 cfs is the absolute minimum flow recommended in this part of the Sun River to maintain fish and aquatic invertebrate populations. As of mid-April reservoir storage remained near or above normal still at the expense of stream flow with only 65 cfs flowing in the river at the Sun River Diversion Dam.

Population sampling on three sections of the Sun River was carried out from late March through mid-April. In the Simms area, the provisional population data for rainbow and brown trout eight inches and larger was the lowest ever observed in this section or any other reach of the Sun River. Low flows last summer contributed to the decline for trout, which were estimated at approximately 25 per mile.

By the middle of May rains and warm temperatures greatly increased runoff in the Sun River drainage. The main storage reservoirs in the basin were full and at the Sun River Diversion Dam, river flow was 2,014 cfs on May 16. The mean daily discharge of the Sun River at Simms was highly volatile in the spring with extremes of 41 cfs on April 28 and 3,030 cfs on May 17. Overly conservative spring reservoir operation left reservoirs full with no ability to store water during the peak flow periods.

Conditions deteriorated in the Sun River drainage by mid-August. Storage in Gibson Reservoir was nearly exhausted while Pishkun and Willow Creek Reservoirs were at below average storage. The computed mean daily discharge of the Sun River at Fort Shaw Diversion continued to be very low throughout July (15 cfs) and the first half of August (8 cfs). The recommended absolute minimum fishery flow for this reach during drought years is 130 cfs, with a recommended minimum flow of 220 cfs during non-drought years. During August, Muddy Creek, a lower tributary of the Sun River fed almost exclusively by irrigation wastewater and return flows maintained higher flows than any other measured reach of the Sun River downstream of Gibson Dam (Figure 1). This water discharging from Muddy Creek effectively bypassed an 80-mile reach of the Sun River.

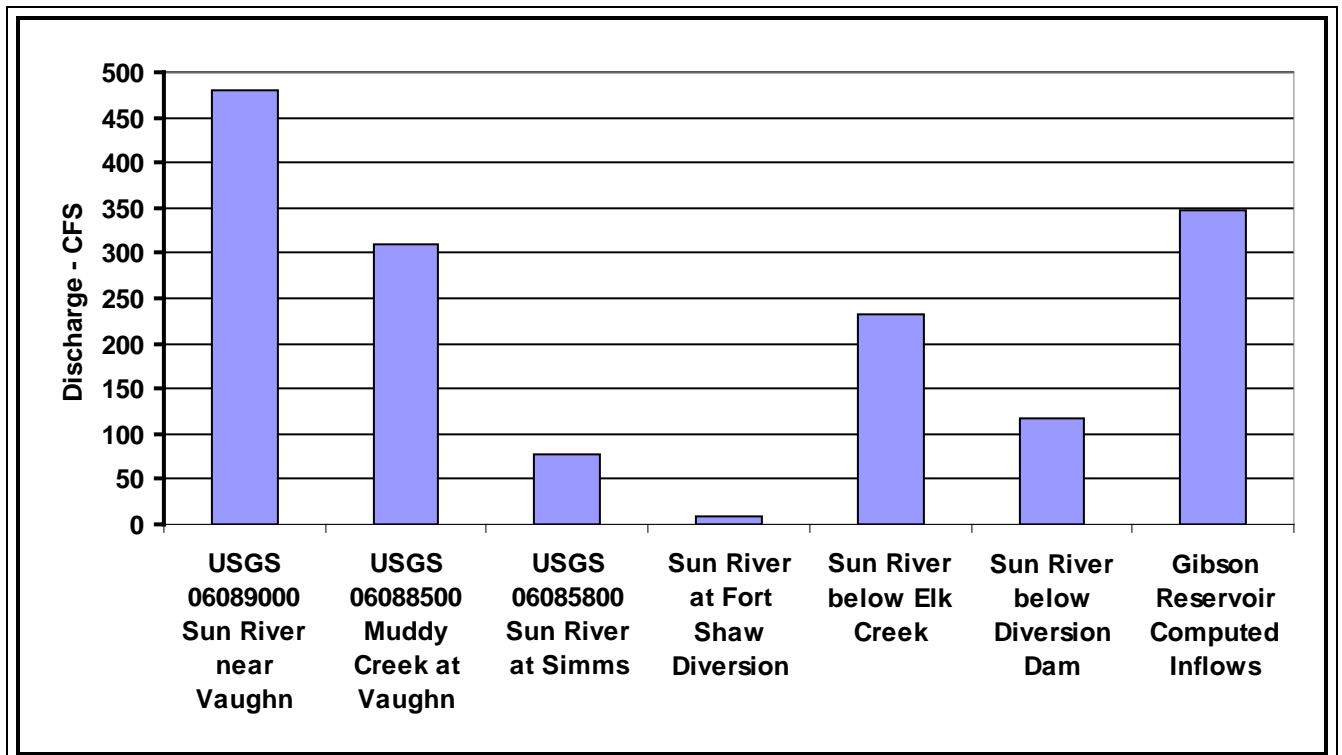


Figure 1. Mean daily discharge of the Sun River at locations throughout the drainage and Muddy Creek near its mouth from 1-15 August 2005.

Teton River Basin

In April flows in the upper Teton River were generally adequate, but were being diverted into Bynum and Farmers reservoirs. Additionally, some upper river irrigators were diverting water from the river. Through May, stream flows in the mid and lower portions of the Teton River at Dutton and Loma fell much lower than historic medians. Throughout the winter, the entire upper Teton River flow was diverted into Bynum and Eureka Reservoirs. Although Eureka Reservoir reached full pool prior to the irrigation season, Bynum Reservoir remained very low. Even in March it already seemed clear that Bynum, a once popular walleye and yellow perch fishery, would again be at dead storage following an abbreviated irrigation season.

By the middle of May, the Teton River above Choteau rose above the 10-year median flow of about 245 cfs. However, all of this water was diverted and the river channel remained dry above Choteau. Eureka Reservoir in the Teton drainage was at full pool, although water was being released for irrigation. Bynum Reservoir remained at approximately 15% of its storage capacity

and water users were anticipating a very abbreviated irrigation season. Bean Lake's elevation remained static at about eight feet down from full pool. The low water level in Bean Lake has resulted in very alkaline water conditions—too alkaline to sustain the lake's once popular trophy rainbow trout fishery.

The near-record June rains delivered a temporary reprieve to the ongoing drought in the Teton watershed. However, water demands did not lessen in the upper Teton River as irrigators continued to divert all of the river's flow, which peaked at 540 cfs in early June. All of the storage reservoirs in the upper Teton with the exception of Bynum Reservoir were topped off during June, but more summer-like weather caused stream flows and reservoir levels to begin dropping quickly by early July. However, 40 cfs was reaching the mouth of the river near Loma, which was considerably higher than the 5-year median of about 10 cfs.

Into August irrigation demands remained high in the Teton drainage as stream flow was just 16 cfs near Dutton (mid drainage), and the river was dry at the mouth of the 2,000-square mile drainage. As expected, Bynum Reservoir dropped to dead storage during July. Choteau's local fishing and recreation hotspot, Eureka Reservoir, rapidly approached dead storage due to irrigation withdrawals. Entrainment losses of stocked rainbow trout were expected to be high at Eureka as a result of the drawdown.

Marias River Basin

Tiber Reservoir on the Marias River began the spring down 15.5 feet from full pool. Based on Bureau of Reclamation projections, Tiber was expected to only gain about 5.5 feet of elevation from spring run-off. This proved true early on as by mid-May Marias River inflows to Tiber Reservoir were very low (1,400 cfs; one-half the 10-year median) and the reservoir had only gained about one-half foot elevation since April 1. Boating access was limited to just a few access points because of the low water conditions. Similarly, boat anglers are limited to one access on Lake Frances because of low reservoir elevation. Boating access at some facilities may become difficult in late summer and fall if these projections hold true. A recently completed low-water boat ramp at Lake Frances would help maintain boating access to this popular fishery

Flows in the upper Marias River near Shelby peaked at 5,190 cfs in early June. High river flows, concurrent with a decrease in the reservoir's discharge to 400 cfs, helped raise the elevation of Tiber Reservoir 5.5 ft. during June. The reservoir was still 7.5 ft. from full pool, but boaters were able to launch at all access points and the reservoir levels were expected remained adequate to maintain recreational access throughout the summer. The water level at Lake Frances was dropping quickly to meet irrigation demands and the City of Conrad's municipal needs. Boaters were forced to use the ramp on the east end of the reservoir for launching, as the ramp at Valier was not useable due to low water.

Flows in the upper Marias River near Shelby dipped below 100 cfs in late July and early August. Precipitation in mid-August boosted stream flow closer to median levels. In addition, cooler weather and shorter days likely minimize water temperature-induced effects on fisheries. Reduced outflows from Tiber helped maintain the Reservoir's elevation, which dropped about 1.4 ft of elevation since July 1st. As expected, recreational access remained adequate throughout the reservoir. The water level at Lake Frances continued to drop to meet irrigation demands and Conrad's municipal needs. Water storage in Lake Frances by mid-August weighed in at about one-third of capacity and the reservoir elevation was down about 16 ft from full pool. By this

point in the summer, a recently constructed low-water boat ramp on the former island out from the Valier city park was the only boater access to the water.

Judith River Basin / Central Montana

Flows in the Judith River generally exceed those recorded in recent years. At the USGS gauge near the mouth of the Judith River, through mid-July, flows were generally several cfs higher than the 4-year period of record. The FWP instream flow of 160 cfs was not met from July 21 – August 12. The lowest daily mean flow exceeded 100 cfs throughout the year. FWP has been monitoring flow for 3 years on the Judith River near Hobson. On August 3 the Judith River measured about 7 cfs at this site. The FWP instream flow reservation is 25 cfs. Flows exceeded 25 cfs from mid-May until about July 20, several weeks longer than observed during 2003 – 2004. Peak flows reach about 600 cfs in 2005, 200 – 300 cfs higher than June peaks during the last 2 years.

Big Spring Creek flows are monitored above and below Lewistown by FWP. In 2005 discharges were similar to 2004 at both stations and indicate that the 110 cfs Murphy Right is often not met on this stream. Prior to spring run-off, flows were typically less than 100 cfs. Below Lewistown, Big Spring Creek flows only exceeded the Murphy Right from mid April – mid May and from June 3 – July 10. Discharge was 61 cfs on August 3 below Lewistown. Above Lewistown, flows usually exceeded 110 cfs from April – mid July.

Warm Spring Creek flows were well below FWP instream flow of 110 cfs since early July. Warm Spring Creek flow has not been closely monitored for decades. During the past two years flows have been much lower than the base flows of 99 – 159 cfs measured from 1968 – 1971 by the USGS. On August 11 discharge was 46.6 cfs, which is the lowest recorded during flow monitoring in 2004 and 2005.

Most small reservoirs in Central Montana had adequate water for fish in 2005. Petrolia Reservoir is deeper than it has been in years. Yellow Water Reservoir did not receive much run-off this year despite late summer rains in Petroleum County and remains very low. Upper Carter pond, which partially drained in 2004 due to dam failure had summer kill in mid-August.

Region 5 – Billings

Bighorn River Basin

In March the Bureau of Reclamation anticipated significant water shortages in the Bighorn River basin that were even grimmer than 2004. Inflow to Bighorn Lake was anticipated to only allow Bighorn River flows to remain at 1,500 cfs through July, increase slightly in the late summer into the fall, ultimately reaching 2,500 cfs. Outfitters and anglers have asked for flushing flows to remove sediments that are changing the aquatic invertebrate faunal composition and hampering angler wading. The provision for flushing flows in the Bighorn River was not expected to be feasible without dropping the water elevation in Bighorn Lake to levels near the ends of the boat ramps. Fortunately, Bighorn River trout populations (which have declined from approximately 6,000 to 600 per mile) do not appear to be limited by lack of suitable spawning gravels, but by overall loss of habitat and by predation upon smaller trout crowded in with larger trout.

As of May 4, 2005, the Bureau of Reclamation predicted flows in the Bighorn River to remain at 1,500 cfs until December, when they would bump to 2,500 cfs. This forecast predated a May storm that caused inflows to exceed 13,000 cfs for one day. These spring storms brought flushing

flows to the Bighorn River that removed sediment and aquatic vegetation buildup. Inflows remained above 3,300 cfs, with outflows at 1,500 cfs, and irrigators were still not diverting from the system. As of mid-May, Bighorn Lake had risen 14 ft to 3,602 ft, or 22 ft above the ends of the boat ramps at Ok-a-Beh and Barrys Landing launch sites. The Bighorn flows were increased in early June and peaked at over 7,000 cfs in late June. Flows remained at or above the recommended 2500 cfs throughout 2005. Spring electro-fishing indicates the fishery on the Bighorn is in good shape and should be able to respond very favorably to the additional water.

On the Bighorn River, the Billings FWP Fisheries Crew marked trout at 3,000 cfs and attempted recaptures at over 6,000 cfs to estimate fish population size. The increased flow presented difficulty in finding previously marked fish as they dispersed over a greater area and into previously dewatered side channels. This dispersion was especially true of the smaller trout. They handled more 4 lb and heavier browns and rainbows than ever before, and fishing reports have been good.

In June a warden reported seeing large schools of emerald shiners in Bighorn Lake, which were the forage base that provided the last big boost in the lake fishery before the drought began. October found the water elevation in Bighorn Lake near normal. The shallow, vegetated areas of the lake had been flooded since spring, and emerald shiners are once again an abundant source of forage for walleyes and smallmouth bass.

Yellowstone River Basin

The Yellowstone River remained extremely low during the winter. Ice scour potentially impacted trout eggs and small fish, especially around Columbus and Reed Point. In April and early May, flows in the Yellowstone River near Big Timber were too low to allow the Columbus FWP Fisheries Crew to sample the fish population safely and efficiently. Anglers fishing Rock Creek reported that irrigators began diverting water on April 15, dewatering the creek for 10 miles from Roberts to Boyd, where Red Lodge Creek contributes flow.

The same May storm that swelled the Bighorn River also swelled rivers and streams draining the Beartooth Face. In the Rock Creek drainage, tributaries to Cooney Reservoir flooded causing operators to spill water into Red Lodge Creek. Some of the walleyes and rainbow trout marked by the Columbus FWP Fisheries Crew likely escaped during this extended spill. During this storm surge, the Yellowstone River grew to 27,800 cfs.

Early June found the Yellowstone River at Billings flowing only 14,000 cfs, which is about 52 % of normal, and most of the tributaries were also flowing well below normal. High-elevation snowmelt peaked the Yellowstone again, however, later in June. In July, flows in the Yellowstone River and its major tributaries receded. Spotty snow pack in the Absaroka-Beartooth Mountains left Boulder River flows lower than the median, while the Stillwater and Clarks Fork rivers were at or above median throughout the summer. Fortunately, water temperatures never rose high enough to require angling closures. FWP applied to the US Forest Service for an exemption for mountain lake sampling in anticipation of closures due to fire danger. No land closures were imposed, however, due to improved precipitation.

Musselshell River

Very little runoff was expected from the snow-depleted Crazy Mountains into the Musselshell River. Without sufficient flows to clean spawning gravels and scour sediment-laden pools, the brown trout population above Lavina were expected continue to decline. Prolonged low flows in the Musselshell River have encouraged beavers to build more dams. The Billings FWP Electro-fishing Crew must drag its boat over these obstructions to sample the remnant brown trout population upstream from Harlowton. This past spring's electro-fishing found several age classes of these trout, but too few to provide a reliable population estimate.

Late April and early May snow and rain events boosted Musselshell River flows above 600 cfs, which flushed some of the sediments accumulated for years. As of May 16th, flows remained at or above average, with the downstream-most gage at Mosby at 272 cfs, rather than the near-zero flows dominating recent years. Into June and throughout the summer, flows remained near the long-term medians throughout the river basin. In July a warden reported that anglers were keying in on sauger moving into the Musselshell from Fort Peck Reservoir. Anglers also reported good smallmouth bass fishing.

Most of the small ponds in South Central Montana once planted with bass by FWP remained dry. Even 7-acre Broadview Pond has remained essentially dry since fall 2001.

Region 6 – Glasgow

Milk River Basin

In March below normal flows in the Milk River and poor snow pack in the Milk and St. Mary drainages was cause for considerable concern. At the time the water elevation in Fresno Reservoir appeared to be increasing with the active conservation pool at nearly 42% full. Further downstream, the Nelson Reservoir conservation pool was near 69% full. Precipitation in the Havre area had brought most small streams and reservoirs to near normal flows and water levels. In the eastern portion of Region-Six small reservoirs and streams appeared to also be near normal levels. Despite a continued poor snow pack, April saw flows in the Milk River near the Canadian border increase to at or above median levels due to precipitation where they remained throughout the summer. The water elevation in Fresno Reservoir appears to be increasing with the active conservation pool at nearly 47% full with Nelson Reservoir at 75% full.

The Milk River at the Eastern River Boundary Crossing was flowing above normal flow and the conservation pool for Fresno Reservoir is nearly 95% full by early July. Nelson Reservoir conservation pool was nearly 75% full. Hopefully the flooding of shoreline vegetation in Milk River reservoirs improved spawning and rearing habitat for several fish species. The Milk River near its confluence with the Missouri River is at the median flow.

By mid-October stream flow in the Milk River near the Canadian border remained near the long-term median. The Fresno Reservoir pool elevation declined steadily since August and was about 50% of full conservation pool. Outflows at Fresno Reservoir had been significantly reduced and water elevations should remain steady going into the winter months. Nelson Reservoir water elevations increased slightly since August to 74% of full conservation pool, and are remaining stable throughout the winter.

Small Streams and Reservoirs

The spring precipitation in the Havre area brought most streams and small reservoirs up to near normal flows and water levels, which were sustained into October. In the eastern portion of Region-Six most small reservoirs and streams also appear to be near normal flows and water levels going into the winter. In early July the Poplar River and Big Muddy Creek in the eastern portion of the region were above median flow.

Missouri River

March found inflows to Ft. Peck Reservoir at 5,090cfs, well below the median flow of 7,855cfs for this time of year. At the time it seemed paddlefish would be unsuccessful at reproducing in late May and June due to low flows. Without a rising pool in Fort Peck Reservoir shoreline vegetation will not be inundated this spring, forage fish species are unlikely to successfully spawn or find adequate rearing cover. The Reservoir level near 2198' mean sea level was forecast to continue its decline through the summer. The discharge below the dam was forecast at a daily average of 5,000cfs through this spring, and if true resulting in poor reproduction of Missouri River native fish species is anticipated.

The Missouri River above Fort Peck Reservoir was flowing approximately 10,000cfs in early July, with discharges from the reservoir at 5,500cfs. As inflows continue to decline during summer and outflows increase to 7,500cfs on average by late July, the pool was expected to decline through the remainder of the summer. In early July the Corps of Engineers reported boat ramps at North Fork of Rock Creek, Spillway Bay, Ft. Peck Marina, Duck Creek, Pines, Hell Creek and Bone Trail would remain usable.

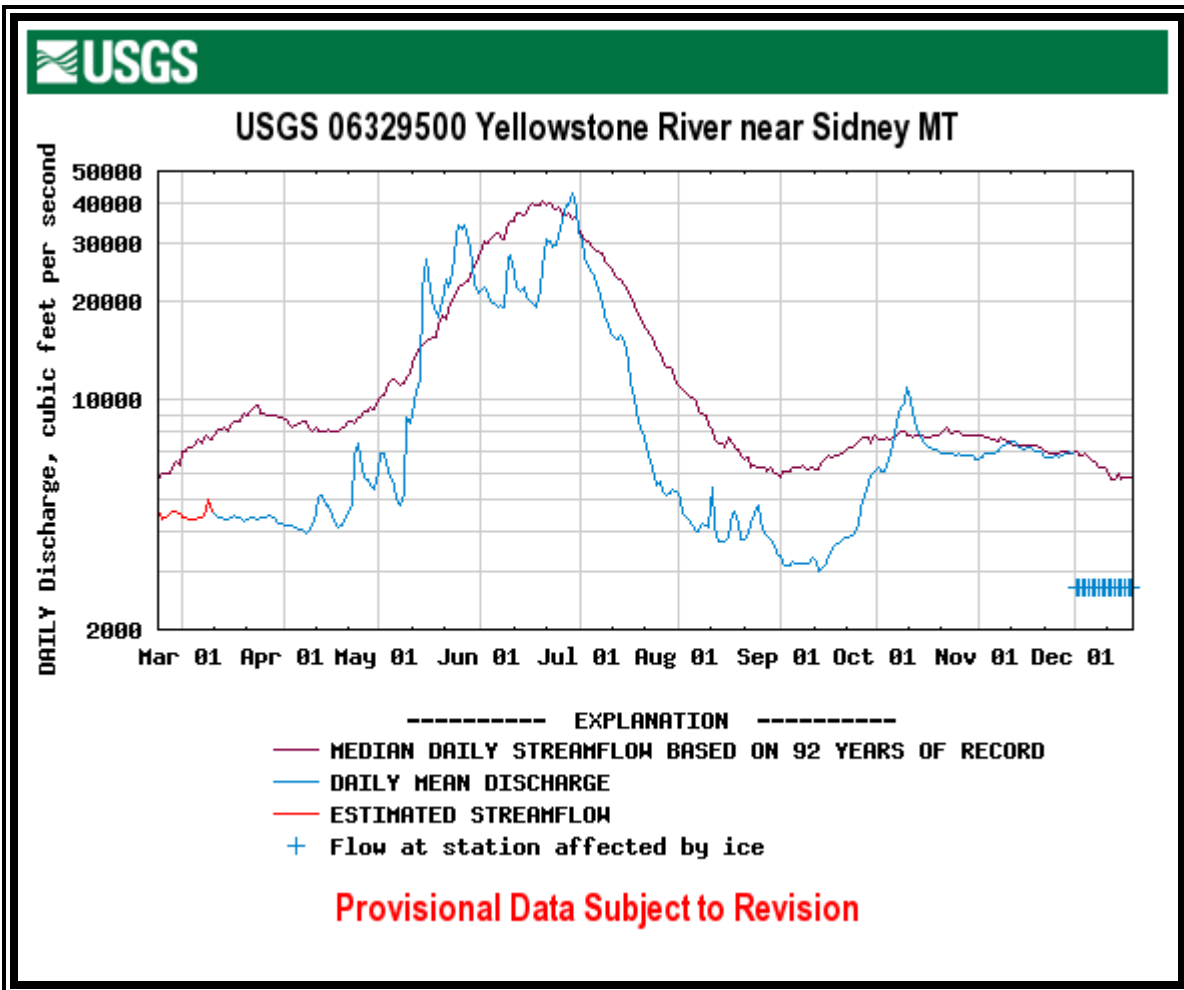
By mid-October discharge in the Missouri River above Fort Peck Reservoir was 5,400cfs, slightly below the mean. Discharge from Ft. Peck is scheduled to be 4,000cfs through December, while inflow is forecast to be similar to outflow, resulting in a near static pool during this period. Overall fishing for Chinook salmon in Fort Peck Lake has been poor during September and early October. Late summer/early fall beach seining surveys indicate better than anticipated production of some minnow species. Mid-October flows in the lower Missouri River near Culbertson are approximately 4,000cfs, which is half the median flow of 8,000cfs at this time of year.

Region 7 – Miles City

Yellowstone River

Low flows continue in the lower Yellowstone River in the spring forecasting a very difficult year for remaining fish stocks. Mountain snow pack held little potential to develop into a large discharge year, which would impact spawning runs for many Yellowstone Rive species. Paddlefish stocks were facing a 6th year of low recruitment due to low river flows and low reservoir elevations in Lake Sakakawea. Future management of this species is being scrutinized in light of the continual loss of spawning years and dismal recruitment. Water depletion in the Yellowstone River will be of great concern to fish survival this year.

Thanks to abundant spring and early summer precipitation, flows in the Yellowstone did peak at near normal levels. However as the following hydrograph shows both limbs were well below median flow level, reflecting the ongoing hydrologic droughts impact on base flow. The low flows in late summer served to increase fish entrainment in irrigation diversions.



Tongue River

As of March the forecast for spring run-off to re-charge the Tongue River Reservoir was dismal. Storage throughout the winter months resulted in 43,000 acre-feet of water storage (Full capacity is 80,000 ac-ft). Winter die-offs of small crappie have been documented. Population density related factors are suspected and may be related to low winter reservoir elevations. Continued storage during the winter resulted in extremely low discharges to the Tongue River during the winter. Near the beginning of 2005, the DNRC and the water users made the decision to reduce outflows in order to store additional water for irrigation and reduced discharges to 65 cfs. The amount of water in the river system currently is not enough to cover the riverbed. Fish populations have been impacted by the reduced habitat availability.

Irrigation from the Tongue River began about April 1st and an associated drop in flows was seen at Miles City. The same impacts facing spawning fish, reproduction and recruitment from in the Powder system are facing fish trying to use the Tongue system. Flow management combined with drought has had detrimental effects on Tongue and Yellowstone River fishes. The Tongue River Reservoir continued filling in April as spring precipitation events improved reservoir inflow. The ability to hold stable elevations through the month of June promotes good recruitment years for crappie, bass and pike in this system.

Preliminary results from fish sampling in the T&Y Irrigation Canal on the Tongue River suggests that fewer fish were entrained than in the previous year. This is likely the result of a better flow

year in the Tongue River drainage, which allowed water to pass over the diversion dam rather than all being diverted into the canal. By mid-October, Tongue River flows at the state line had dropped to below the long-term average. The Tongue River Reservoir storage was at 46,036 ac.ft., which is 58% full. This level if maintained through the winter should see reservoir fish come through the winter in good shape. The concern is whether the Tongue River flows below the reservoir can be maintained at adequate levels through the winter to provide for healthy fish and invertebrate populations.

Powder River

Prairie snow melt and the first spring rise came and went very quickly in the Powder River basin. Spring lowland melt usually occurs around March 15. This year this event occurred the first week of March and was minimal in magnitude. The average flow during this period should be near 1000 cfs compared to an early March flows of about 100 cfs. It was expected that this system would again lose connectivity to the Yellowstone River eliminating for another year the spawning runs of shovelnose sturgeon, sauger, and catfish and many other species greatly limiting recruitment of returning fry to the Yellowstone system.

Prairie Ponds and Streams

Minimal prairie snow pack left the prairie pond systems dry again in March. Most of these systems have been heavily impacted or lost due to drought induced winter or summer kill events. Prairie ponds can be restored to thriving fisheries if spring rain recharge occurs. By mid-April some prairie ponds had been stocked with rainbow trout fingerlings but many of the pond systems on stocking schedules were extremely low this spring due to a lack of snow cover this past winter. Many of the ponds scheduled for fish plants were postponed anticipating spring rain event recharge of these systems.

Prairie ponds recharged in some areas but not in others. Soil moisture was so low that, in many cases, surface runoff did not occur. Areas that have received enough moisture to recharge ground water supplies have filled prairie ponds. Those areas that are still lacking in soil moisture are not recharging ponds as quick. It is expected that fish stocked in newly recharged ponds will thrive this year and into next. Those ponds receiving adequate water that were restocked with fish and will be monitored for fish survival.

Many small ephemeral stream systems are used by prairie minnow species as spawning and nursery habitat during the spring months. Most of these small stream systems flow for only a few weeks but during that time cyprinid species move many miles up the streams in order to find appropriate spawning areas. The past few years of drought have had a large impact on minnow production, abundance and distribution. Fish production in small prairie streams provides forage for Yellowstone River sauger, catfish, sturgeon and bass. The impact of drought on these small stream systems is transferred to the larger river systems due to a loss of production.

Spring and early summer precipitation events were frequent in occurrence and of magnitude sufficient to keep Prairie stream systems flowing well beyond normal. Smaller tributaries fluctuated in flow in accordance to local rain events but remained relatively high throughout the spring. Spring spawning fish species have found the increased flows advantageous and have responded with large migrations of small mouth bass, shovelnose sturgeon and multiple sucker species up the tributary streams.

III. FWP DROUGHT MANAGEMENT OBJECTIVES

The Montana Drought Response Plan (1995) includes the following objectives for FWP drought response in general:

1. Protect FWP's existing instream rights.
2. Supplement stream flows through purchase of stored water, leasing of consumptive rights, and other innovative methods.
3. Obtain reservoir operations, which minimize impacts to fish, wildlife and recreation.
4. Monitor stream flow, fish populations and fishing use and harvest to ensure carry-over of wild stream fisheries while maintaining reasonable opportunity for harvest in all streams and lakes. Implement emergency regulations on streams and lakes as needed.
5. Develop and implement an Information and Education Program, which informs the public and maintains consistency in the Department's programs.
6. Coordinate an updated Department Drought Summary for presentation to the Governor's Drought Advisory Committee and the Fish, Wildlife and Parks Commission as required.
7. Develop and implement water conservation practices within the agency.

FWP continues working toward achieving these objectives, both in the short and long term, though several are difficult to attain under existing water allocation patterns and increasing competition for water in certain areas.

IV. FWP ACTIONS TAKEN TO MITIGATE DROUGHT IMPACTS

It should be noted that under existing law and water administration patterns, there is a fairly significant limit to the ability to mitigate impacts of low flows on Montana's fisheries. Despite the below-listed actions, many of Montana's fisheries have been impacted by the drought conditions. The extent of these impacts will continue to be determined over time, as additional fish population information is gathered in future years.

FWP Drought Mitigation Actions

- In June FWP sent letters to junior water users in several river basins informing them of the likelihood that FWP may be placing a call on them to cease diversions later in summer. Following lists the basins where the letters were sent:

Tobacco River	Young Creek
North and Middle Fork Flathead	Big Hole
Gallatin	Missouri (abv & blw Canyon Ferry)
Teton	Birch/Dupuyer Creeks
Marias (above and below Tiber)	Big Spring Creek
Missouri (above and below Ft. Peck)	Yellowstone (above Livingston)
Shields	Boulder (Yellowstone drainage)
Clarks Fork (Yellowstone drainage)	Yellowstone (above Bighorn)

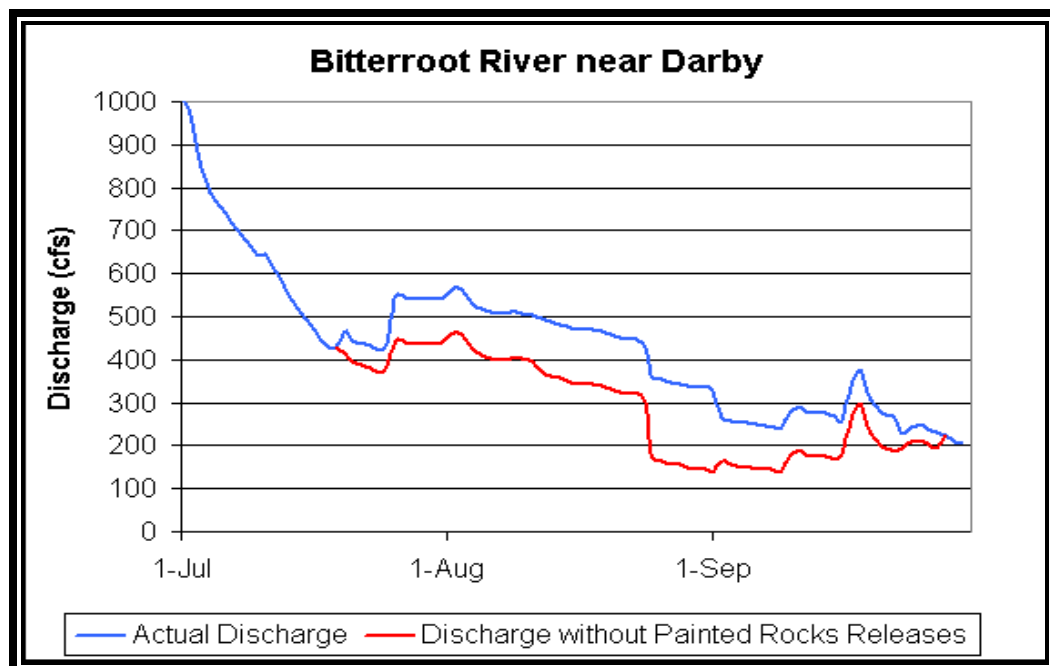
On August 4, FWP called junior water users to cease diverting on 10 streams and rivers in southwestern Montana. Letters were sent to 24 junior water users asking them to cease diversion immediately and until such time the flows recover above FWP's in-stream flow water rights. Following is a list of calls that were made:

Big Hole River including French Creek
East Gallatin River including Bridger and Rocky Creeks

Baker Creek tributary to Gallatin River
Shields River including Rock Creek
Missouri River between Canyon Ferry & Toston including Sixteenmile Creek

FWP staff continued to monitor flows in streams and rivers across Montana throughout the summer. With relatively cool temperatures and comparatively better stream flow, additional calls were deemed unnecessary. *(FWP Drought Management Objective 1)*

- FWP participated in the enforcement of water rights as a water user where Water Court decrees are enforced by water commissioners. *(FWP Drought Management Objective 1)*
- FWP employed a summer intern to analyze geospatial property ownership data in comparison to geospatial water right data to identify the current owner of water rights junior in priority to FWP instream rights on the Missouri River below Canyon Ferry Reservoir to Great Falls as well as above and including the Reservoir. The purpose was not only to correctly identify water right owners, but also to check compliance with the FWP call. This project anticipated a call on the Missouri River both above and below Canyon Ferry. Greater than forecasted inflows into Canyon Ferry and resulting releases above projections made a call below the reservoir unnecessary. Water rights in the upstream reach were called by FWP, however compliance was difficult to monitor given both the small size of some rights and the complexity of senior overlapping water rights. *(FWP Drought Management Objective 1)*
- FWP in cooperation with other governmental agencies and private parties continued to share with the U.S. Geological Survey in funding stream gauges and thermographs throughout Montana. For the 2005 water year this included 17 real-time stream gauges and 13 thermographs. Additional FWP staff measured stream flow throughout the state at ungauged locations and collected continuous stream flow information at several sites. *(FWP Drought Management Objectives 1 & 4)*
- FWP continued to purchase 15,000 acre-feet of water from DNRC's West Fork Bitterroot Project (Painted Rocks) DNRC releases the in-stream flow contract water which is protected from diversion by the Bitterroot water Commissioner. The flows vary as needed, with adjustments called for by the Bitterroot water commissioner and FWP local fisheries biologist, based upon flow and fishery conditions at Bell Crossing. The following hydrograph demonstrates the impact of this purchase water on the Bitterroot River during the critical low-flow part of the year: *(FWP Drought Management Objective 2)*



- Working with local communities to develop and implement emergency low flow/drought response plans (Big Hole, Jefferson, and Blackfoot). FWP staff are active members of the drought response committee efforts, coordinating with DNRC staff in their measurement of flows, monitoring fishery condition and water temperature, informing committees of problem areas, and generally encouraging collaborative and effective water conservation to address current and projected problem areas. The Blackfoot Drought Plan incorporates a creative alternative to FWP's traditional call for senior water, whereby senior water users contributed conserved water to conceptual "water bank", which juniors that are valid Plan participants can draw against in emergency conditions if certain conditions are met. This plan continues to work successfully without FWP needing to make call. *(FWP Drought Management Objective 2)*
- FWP continued to work with water users, communities, and other agencies to implement long-term flow and habitat protection and enhancement projects such as water right leasing for instream flow. FWP continues to maintain existing instream flow leases while searching for additional leasing opportunities. *(FWP Drought Management Objective 2)*
- FWP again offered a special opportunity to apply for Future Fisheries dollars for projects that will help maintain flows in streams and rivers and reduce the impact of the low water levels that were expected to occur in some parts of the state later in the summer. Applications were due by April 1st. *(FWP Drought Management Objective 2)*
- FWP provided comment and guidance regarding the operation of federally owned reservoirs aimed at mitigating the impacts of drought on the associated fisheries and recreation opportunities. It is notable that recommended fishery flows were achieved below Yellowtail Reservoir on the Bighorn River and on the Missouri River below Holter Dam. FWP also provided comment on operation of several state-owned reservoirs. *(FWP Drought Management Objective 3)*
- In light of the ongoing, long-term drought, FWP updated the Dewatered Stream List, which contains a list of streams that are either chronically or periodically dewatered. FWP defines dewatering as a reduction in stream flow below the point where stream habitat is adequate for fish. This information is available by stream on the Montana Fisheries Information System website at: <http://maps2.nris.state.mt.us/scripts/esrimap.dll?name=MFISH&Cmd=INST&WCmd=Stream> *(FWP Drought Management Objective 4)*
- In late July emergency fishing closures were instituted from noon to midnight on the Jefferson River and the Thompson River and its tributaries. In late August the upper Big Hole River was closed to fishing. These closures have since been lifted. Low flows and high water temperatures that make fish vulnerable to angling pressure and predators prompted the closures. In the case of the Jefferson and Big Hole Rivers, the closures were implemented as part of the local watershed drought plan. The Upper Beaverhead River, from Clark Canyon Dam to Selway Bridge at Dillon, was closed to angling beginning October 3 to protect brown trout populations. The closure expired November 30, 2005. Following the emergency closure period, the usual December 1 winter angling closure will go into effect on the Beaverhead from the Clark Canyon Dam to Pipe Organ. Voluntary closures were implemented on the Blackfoot River in August as part of the Emergency Drought Response Plan. *(FWP Drought Management Objective 4)*
- FWP collected information on known and suspected impacts of drought on specific fisheries, as reported by FWP fisheries field staff. *(FWP Drought Management Objective 4)*
- FWP provided drought updates, fishery condition information, and related angling restrictions to interested parties via the Internet and dissemination of regular FWP drought updates, prepared through the year. FWP also disseminates drought educational information. FWP continues to maintain a drought webpage at: <http://fwp.mt.gov/drought/default.html> *(FWP Drought Management Objectives 5 & 6)*

- FWP participates as a voting member of the Governor's Drought Advisory Committee and regularly reports to the Committee on drought impacts to the State's fish and wildlife.
(FWP Drought Management Objective 6)
- FWP works between its various divisions to ensure water conservation is considered and implemented. Water rights acquired with Wildlife Management Areas is reviewed both in terms of how benefits to wildlife can be maintained or enhanced while at the same time evaluating the possibility of improving stream flow by changing acquired water rights to instream flow.
(FWP Drought Management Objective 7)

V. SUCCESSES AND CHALLENGES

The following is an abbreviated list of successes and challenges noted by FWP staff in the Fisheries Division.

Successes

- The continued purchase and delivery of water from Painted Rocks Reservoir to the Bitterroot River was once again critical to this important fishery surviving drought conditions.
- Drought Plans in the Jefferson, Blackfoot and Big Hole River basins again helped successfully mitigate drought impacts.
- FWP is currently seeking approval for a Candidate Conservation Agreement with Assurances (CCAA) for the Big Hole watershed upstream of the Dickey Bridge. Big Hole grayling are classified as candidates for listing as threatened or endangered under the Endangered Species Act, and are currently the subject of litigation to list them. It appears that federal listing of grayling is imminent, and there is the possibility that they could be emergency listed at any time. If federally listed, then grayling would be subject to the regulatory requirements of the Endangered Species Act, as administered by the U.S. Fish and Wildlife Service. In the case of the Big Hole the Candidate Conservation Agreement with Assurances (CCAA) would be an agreement between the U.S. Fish and Wildlife Service (USFWS) and FWP. FWP would in turn enroll non-federal property owners who voluntarily agree to manage their lands or waters to remove threats to species at risk of becoming threatened or endangered. In exchange for proactive conservation activities benefiting the imperiled species, the USFWS will provide regulatory certainty and assurances to the participating property owners in case the covered species is subsequently listed under the Endangered Species Act (ESA). While not yet a success, hopefully the CCAA ultimately serves to protect both the arctic grayling as well as the agricultural production of the Big Hole Valley.
- The appointment of water commissioners to enforce all-encompassing Water Court decrees has greatly increased the efficiency of water deliveries, in some places benefiting stream flows as well. The largest water right enforcement project in Montana is on the Musselshell River where water commissioners administer water delivery on the main-stem Musselshell upstream of Mosby including the North and South Forks. In 2005 between April 22 and the end of October the water commissioners delivered 113,064.7 acre-feet of water including 6,195 acre-feet that flowed past Mosby and was billed as water delivered to FWP as instream flow. This compares to a total of 48,475.12 acre-feet delivered between April 23 and October 22, 2004. This enforcement project has resulted in considerably more water reaching downstream senior rights and benefits to the fishery at the same time.
- FWP instream leases continue overall to show very positive results. These leases effectively maintained and in some cases improved the fishery in previously de-watered streams.
- The passage of House Bill 22 by the 2005 Montana Legislature, which provides funding for an expedited water rights adjudication undoubtedly benefits FWP's drought mitigation efforts as the

extent of existing water rights will be determined in a more timely fashion. A side benefit of this legislation is the billing of all existing water rights, which requires that the rightful owners be identified. This will greatly assist FWP in easily identify the rightful owners of water rights junior in priority to instream flow rights. FWP has maintained an independent database of junior water right owners that was considerably more accurate and up to date than the DNRC records but required significant time and effort on the part of FWP staff. House Bill 782 that provides additional quality controls for the adjudication of water rights further benefits FWP's efforts to minimize the impacts of drought by more accurately adjudicating existing water rights.

Challenges

- In addition to providing ongoing input regarding the regular operation of Federal reservoirs, FWP provided comment on the renewal of long-term water contracts from Bureau of Reclamation's Clark Canyon Reservoir. The extended severe drought in southwest Montana coupled with corresponding reservoir operations along with the expansion of acres irrigated by the project has severely negatively impacted fishery in the Beaverhead River with impacts extending into the Jefferson River. Despite these severe impacts, the Bureau of Reclamation is not considering any contract renewal options that vary significantly from the status quo. Thus there is little chance that impacts to the Beaverhead of Jefferson Rivers will abate unless the Bureau of Reclamation considers further operational changes.
- While FWP continues to pursue instream flow leases, affordable and functional leases continue to be difficult to obtain. The slow pace and inaccuracies of the ongoing water rights adjudication present stumbling blocks to leasing that are difficult to overcome. Recent legislation previously identified hopefully will help remove these obstacles.
- The continuing multi-year drought although somewhat abated puts extreme pressure on voluntary water conservation measures. Voluntary water conservation measures may be compatible with water users needs for short periods of time, but may not be feasible over the long-term as the cumulative impacts of reduce water use continue to grow.
- There is a broad expectation that FWP staff and tools actually can solve low-flow impacts on fisheries, and that such impacts actually can be fully mitigated. Although Montana's fisheries received considerable assistance from other agencies and water users, there exist very few tools to deal with low-flow concerns on a broad scale in Montana.
- Long-term drought response continues to be difficult to obtain. Emergency, short-term responses maybe becoming more difficult to administer as the drought lingers. Most drought mitigation efforts are temporary and do not provide for long-term solutions that reduce drought susceptibility.
- Current statute provides for no permanent change to instream flow. Without this tool, a permanent reduction in the fishery drought susceptibility is nearly impossible to obtain in many streams and rivers.