



Big Hole Watershed Committee

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2005 Drought Newsletter June 1, 2005

The purpose of the Big Hole Watershed Committee is to seek understanding of the river and agreement among individuals and groups with diverse viewpoints on water use and management in the Big Hole watershed.

To All Members of the Big Hole Community:

The purpose of this newsletter is to provide you with an update of our Drought Management Plan. This plan was developed to protect and restore fluvial Arctic grayling. The Drought Management Plan has demonstrated improvements in maintaining stream flows since 1999. Our successes over the past years have been admirable and have truly made a difference.

Also in this newsletter, we present a synopsis of this year's snowpack, precipitation, stream flows, and a brief description of the status of the Candidate Conservation Agreements (CCAA) and the voluntary water management and habitat restoration efforts under way. This winter, our snowpack conditions were bleak and did not bode well for spring flows. We did not want to find ourselves reacting to an emergency situation as we did last year. With that in mind, the Big Hole Watershed Committee (BHWC) organized a meeting in the first week of March dedicated to working out a plan for maintaining flows despite the tough drought situation. As this newsletter describes, we have been successful.

That success would not be possible without the irrigators on the Big Hole who have made drastic changes in their irrigation practices and to the hard-working team that is helping facilitate communication and water management among irrigators and monitoring flows. That team includes FWP, DNRC personnel

and Jim Boetticher, whose valuable services as ditch rider we are fortunate to have. The BHWC wishes to acknowledge and thank all of you.

The BHWC is moving beyond year-to-year reaction to drought emergencies, toward a healthy system that supports the biological and ecological health of the watershed and the economic health of our community. We are achieving our goals through cooperative water management and on-the-ground habitat restoration projects –in addition to our Drought Management Plan. The BHWC urges all residents, water users, and anglers to be an active participant in the Drought Management Plan.

We also invite you to participate in our collaborative efforts. Our meetings are held the third Wednesday of each month. Please return the information card in this newsletter to be included on our mailing list, if you are not already receiving our newsletters and drought reports.

On behalf of the Big Hole Watershed Committee, I extend our gratitude for all your past cooperation and thank you for your continued support.

Sincerely,
Randy Smith
Chairman, BHWC

Snowpack Update

February snowpack in the Big Hole was grim. In early April, snowpack was just over 50% of normal. In mid-April, NRCS predictions for flows at Wisdom and Melrose were 21% and 33% of normal, respectively. However, after the driest February in 111 years, April and May were among the wettest months on record. Snowpack increased to 74% of normal overall and flow predictions have been upgraded to 56% at Wisdom and 69% at Melrose. While this is not a panacea, it is better than we anticipated. The outlook for June calls for above-normal precipitation.

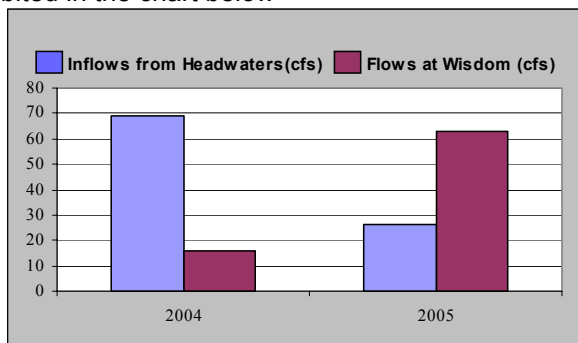
May 2004 vs May 2005 Snowpack Data

| | <u>2004 % of Avg</u> | <u>2005 % of Avg</u> |
|-----------------|----------------------|----------------------|
| Barker Lake | 54 | 136 |
| Basin Creek | 41 | 71 |
| Bloody Dick | 5 | 0 |
| Calvert Creek | 1 | (unavailable) |
| Darkhorse Lake | 56 | 78 |
| Moose Creek | 2 | 2 |
| Mule Creek | 53 | 93 |
| Saddle Mountain | 50 | 54 |

Spring 2005 Voluntary Water Management

In the first week of March 2005, a plan was crafted that is intended to maintain river flows to permit successful spawning and survival of grayling. The minimum flow goal was set at 60 cfs at Wisdom Bridge. Sixty cfs is the minimum flow necessary to achieve successful grayling spawning and rearing according to the wetted perimeter theory developed by fisheries biologists. Ideally, the flow goal should be at least 160 cfs during the early spring but with the dire snowpack and drought conditions, we chose a biologically sound goal that we felt was achievable.

That goal was achieved by asking water users to delay irrigation and to reduce the amount of water used when irrigation does occur. The success of these efforts is exhibited in the chart below

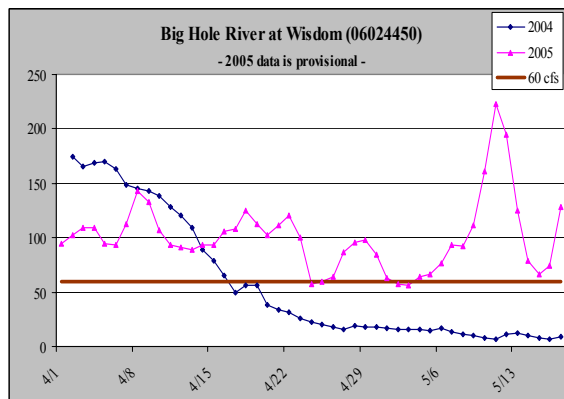


Although mainstem inflows are lower than last year at a comparable timeframe, we are maintaining significantly higher flows at Wisdom.

This improvement in flows is not accidental. Had it not been for the efforts of key water users and the support of

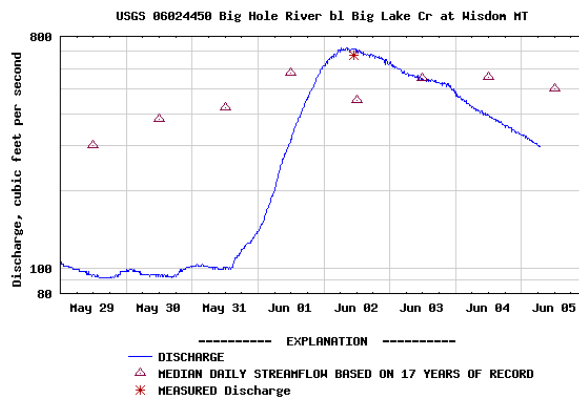
Jim Magee (FWP), Peter LaMothe (FWP), Jim Boetticher (ditch rider), Mike Roberts (DNRC), and others; combined with timely precipitation, we might have experienced worse flows at Wisdom Bridge than we had last year.

The following graph depicts flows at the Wisdom Bridge in 2004 compared to 2005 through mid-May.

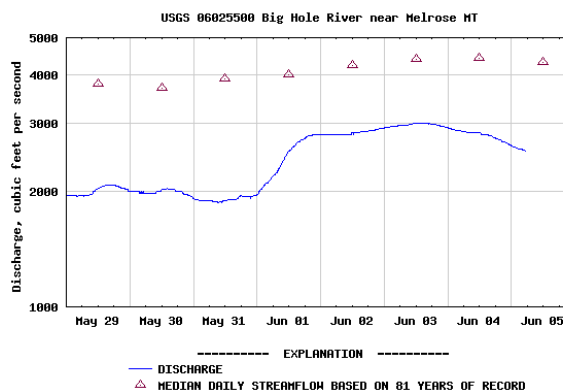


Stream Flows

As of June 1, 2005, we have again experienced cool weather and heavy precipitation. Flows at the Wisdom gauge on June 4 were 297 cfs. That flow is 59% of median flow – 500 cfs – based on 17 years of record.



Flows at the Melrose gauge were 2,540 cfs. The long-term median flow for this date is 4,330 cfs. Therefore, flows are 59% of the historic median flows at this site based on 81 years of record.



In this first week of June, flows at Wisdom exceeded median flows for a brief interval. Elevated springtime streamflows are an important and natural occurrence necessary in Montana rivers and streams from an ecological and geomorphologic standpoint. As the influential hydrologist, Luna Leopold, observed "The stream is the architect of its own channel. Spring runoff is a part of that "architecture". Maintaining adequate spring flows provides for many essential functions including: bedload transport and proper channel function; flushing of sediments which maintain clean spawning gravels; and scouring which promotes health and recruitment of riparian vegetation.

Status of Fluvial Arctic Grayling



Fluvial arctic grayling (*Thymallus arcticus*) once ranged throughout the upper Missouri River drainage as far as Great Falls. Now, the only self-sustaining native population is a remnant restricted to the upper Big Hole River, an area estimated to be less than 5 percent of the species' historical range.

The grayling has been a candidate for listing under the Endangered Species Act for the past 10 years. The United States Fish and Wildlife Service (USFWS) has resisted listing because of the efforts of the BHWC, through the drought management program, to maintain stream flows and temperatures adequate for grayling survival. Because these efforts have not been as successful as desired, the status of the grayling was upgraded to the highest level of priority in 2004. As streamflows fell to record lows in spring 2004, a lawsuit was brought against the USFWS to Emergency list the grayling. The federal judge reviewing this case declined to make a ruling last year based on the strenuous efforts to maintain conditions for the grayling. On June 29, 2005, the case will again be heard in Federal Court.

In fall of 2002, the remnant grayling population in the Big Hole River apparently had declined to such a low level that not enough fish were captured to estimate population density. The spring 2002 spawning surveys captured the lowest number of grayling in the past 14 years of sampling, and the spawning population was skewed toward older fish, indicating limited recruitment for the past 2 years. In 2003, abundant numbers of grayling were found in the lower reaches of tributaries with the coolest water temperatures. In 2004, peak spawning correlated with low flows in April-May. A healthy young-of-the-year class did not occur. Length frequency skewed towards age zeros, primarily in a few tributary streams. Beginning in 2005, survey methods will change from the mark-recapture to one-pass surveys. This is being done due to

access issues, to minimize handling, and to gain understanding on a broader scale on trends in grayling populations. The goals over the next few years will be to gain stability of age classes across the monitoring reaches.

Midstem tributaries are proving to be important for grayling due to healthy habitat and water temperatures remaining below 70° the entire summer. Nearly all other monitoring stations experience temperatures above 70°, which is stressful to grayling.

In 2004, the BHWC formed a habitat Restoration Working Group. The group is dedicated to determining restoration needs in the Big Hole Watershed based on requirements of grayling and prioritizing restoration projects based on those goals. Their recommendations will be brought before the BHWC, which has funding available for project implementation through a federal appropriation held in Cooperative Agreement with the USFWS.

Several habitat restoration projects have already been completed and others are approved by the BHWC and will be implemented in 2005. These include: removing barriers to fish passage by installing fish ladders, riparian vegetation restoration in Steel Creek, pool development in Fishtrap Creek, reconstruction of irrigation diversions for the benefit of fish on the Wise River and on the mainstem of the Big Hole above the Wisdom Bridge, purchase of numerous flow measuring devices, riparian fencing and pool development on LaMarche Creek, and replacing leaky headgates. All habitat restoration work funded by the BHWC will require monitoring to determine project effectiveness

The Montana FWP has also implemented a new monitoring plan on the Big Hole River for grayling populations. Their monitoring plan is as follows:

- Initiate trapping of Big Hole tributaries to better define the role of tributaries to the Big Hole Arctic grayling population.
- Pursue genetic analysis of mainstem Big Hole grayling and tributary grayling to better understand meta-population dynamics of the Big Hole River grayling population.
- Complete electrofishing surveys above and below installed fish ladders to assess efficiency of ladders for Arctic grayling and sympatric native and sportfish species.
- Complete summer snorkel surveys to document important summer habitats and flow and temperature refuge under drought and thermally stressful regimes.
- Complete fall population surveys in traditional sections.
- Complete surveys in reaches that will spatially assess population abundance and demographics in tributaries, side channels and mainstem reaches.

Candidate Conservation Agreements with Assurances

Another strategy that is being undertaken to remove threats to fluvial Arctic grayling in the upper Big Hole River is Candidate Conservation Agreements with Assurances (CCAA). CCAA's are voluntary agreements between private landowners and a regulatory agency to promote the conservation of an identified species on private lands. In the Big Hole Basin, landowners voluntarily enter into an agreement with Montana FWP to implement conservation measures that remove threats to the fluvial Arctic grayling. Site-specific plans under the CCAA program will improve streamflow dynamics, restore biological function of riparian areas, enhance grayling stream habitat and fish passage, and reduce the number of grayling in irrigation ditches. The conservation plans must meet rigorous scientific and legal standards. Upon agreeing to a plan, a landowner will be given assurances that no additional conservation measures will be required above and beyond what has already been agreed to in his or her site specific plan in the event grayling are listed under the Endangered Species Act.

There has been a great deal of support for the CCAA program. To date, 38 landowners with approximately 200,000 acres, upstream of Dickie Bridge have signed documents of intention to participate in the program once the CCAA has gone through the public comment process.

Big Hole River Drought Management Plan Adopted May 2000

The purpose of the drought management plan is to mitigate the effects of low stream flows and lethal water temperatures for fisheries (particularly fluvial Arctic grayling) through a voluntary effort among agriculture, municipalities, business, conservation groups, anglers, and affected government agencies.

Overview

The Big Hole Watershed Committee has agreed on this dry year plan to help mitigate damage to the fishery during dry years as indicated by flows and temperature. This plan has been designed to take into full account the interests of all affected parties including ranching, municipalities, anglers, and conservation groups.

The Big Hole Watershed Committee agrees that if this plan is to be successful in a dry year, it will need broad-based support and understanding. Big Hole Committee members are committed to helping secure the support of their constituencies for the successful implementation of this plan.

This initial plan is intended as a starting point from which modifications can be made based on the lessons learned from research projects, such as the Big Hole Watershed Committee's return flow study, increased information from new river gauges, and from the experiences gained by

implementing this plan. The plan will be reviewed by the Big Hole Watershed Committee every January for modifications.

Roles and Responsibilities

Big Hole Watershed Committee roles:

- Educate interested and affected parties;
- Develop, adopt, and modify annually the dry year plan;
- Receive, monitor, and act on information regarding stream conditions and snow pack levels throughout the year;
- Notify interested and affected parties of implementation and secure support; and
- Evaluate the environmental, social, and economic impact of the plan.

Montana Fish, Wildlife and Parks (FW&P), Montana Department of Natural Resources and Conservation (DNRC), and the United State Natural Resource Conservation Service (NRCS) roles;

- Provide accurate and timely information regarding stream conditions and snow pack levels throughout the year;
- Provide technical assistance in reviewing the plan and monitoring its implementation; and
- Ensure coordination of effort among all affected government agencies.
- Contacts and informs media of dry year plan implementation and stream flow and temperature status.

Definition of Dry Year Conditions and Recommended Actions

The Big Hole Watershed Committee will monitor snow pack levels and forecasted low stream level information provided by the United States Geological Survey (USGS) and Natural Resource Conservation Service (NRCS) throughout the year to prepare for potential water conservation measures. Stream flow information gathered from the USGS Wisdom and USGS Melrose gauging stations will be used to initiate specific voluntary actions to conserve water and mitigate the effects of dry year conditions on fisheries from May 1 through October 31.

The following flow targets take into consideration preparation time necessary to implement this voluntary plan. The annual evaluation of the effectiveness of the dry year plan will provide information to more intensively analyze the minimum in stream flows necessary to sustain adequate habitat quality and buffer water temperatures.

I. Upper River - Rock Creek Road to Mouth of the North Fork

Flows – Monitored at the USGS Wisdom Gauge.

| | |
|--------|---|
| 60 cfs | DNRC and FWP officials will meet with the Big Hole Watershed Committee to present data; formulate |
|--------|---|

water conditions and encourage conservation measures.

40 cfs Notice to outfitters and anglers requesting fishing be voluntarily limited to morning hours. Well use will be encouraged for stock watering. A phone tree will advise water users and outfitters of low water conditions and encourage conservation measures. The media will be contacted and news articles released to inform publics of low flow conditions.

20 cfs FWP will close the upper river to fishing, and will limit electrofishing sampling to core sections near Wisdom. Voluntary reduction of irrigation and public municipal water use is initiated, and continued well use for stock watering encouraged. The phone tree is again initiated to contact water users advising of extreme low water conditions and encourage conservation measures. The media is contacted and informed of fishing closures and encourages public conservation efforts. The river remains closed until flows exceed 40 cfs for seven consecutive days.

Temperature July 15-September 1:

Step 1 When temperatures exceed 70°F for over 8 hours per day for three consecutive days at the USGS Wisdom gauge and flows are above 30 cfs, a phone tree is used to contact outfitting businesses and a news release is issued advising publics and anglers of potential stressful conditions to the fishery and encouraging anglers to seek other destinations (mountain lakes and streams, spring creeks).

Step 2 When flows are 25-30 cfs at the USGS Wisdom gauge and temperatures exceed 70°F for more than 8 hours per day for three consecutive days, and evidence of thermally induced stress to the fishery occurs, FWP will close the upper river to fishing. News releases will be issued and a phone tree will again contact local outfitting businesses. The upper river will be closed until temperatures do not exceed 70°F for more than 8 hours per day for three consecutive days and flows are greater than 30 cfs for seven consecutive days.

Step 3 When flows are 25 cfs or less at the USGS Wisdom gauge and temperatures exceed 70°F for more than 8 hours per day, for

three consecutive days, FWP will close the upper river to fishing. News releases will be issued and a phone tree will again contact local outfitting businesses. The upper river will be closed until temperatures do not exceed 70°F for more than 8 hours per day for three consecutive days and flows are greater than 30 cfs for seven consecutive days.

The wetted stream perimeter (flow below which standing crops of fish decrease DNRC 1992) of the upper Big Hole River is 60 cfs. While this flow may be reasonable to maintain in ample moisture years and should be the goal for flow preservation efforts, in most years it is not a realistic quantity. Data from the USGS Wisdom gauge from 1988-1999 recorded flows below 60 cfs in each of the twelve years. Population and flow data indicate 40 cfs is feasible to maintain while still sufficient to protect the Arctic Grayling population. A minimum survival flow of 20 cfs will provide flows necessary to maintain a wetted channel and ensure survival of the grayling population during brief, critical periods.

Temperatures above 70°F are generally considered stressful to salmonids. Warm water temperatures typically occur between July 15 and September 1 in the Big Hole River. Although temperatures above 70°F can occur before and after this period, cooler night temperatures alleviate long periods of warm daytime temperatures. The upper incipient lethal temperature (e.g. that temperature that is survivable indefinitely for periods longer than one week by 50% of the population) for Arctic Grayling is 77°F (Loher et. al. 1997). Critical thermal maximum temperature is 85°F resulting in instantaneous death.

I. Middle River: Mouth of the North Fork to Dickie Bridge

Flows: Monitored at USGS Mudd Creek Gauge
Temperatures: Monitored at the Sportsman's Park Thermograph Site

100 cfs When flows decrease to 100 cfs or temperatures exceed 70°F for over 8 hours per day for three consecutive days. DNRC and FWP officials will meet with the Big Hole Watershed Committee to present data; formulate options including voluntary reduction of irrigation, stock water diversions, municipal water use, angling, and encourage the use of stock watering wells; and prepare to take action. A phone tree is initiated to advise water users, outfitters, and anglers of low water conditions and encourage conservation measures.

80 cfs When flows decrease to 80 cfs or temperatures exceed 70°F for over 8

hours per day for three consecutive days. Notice to outfitters and anglers requesting fishing be voluntarily limited to morning hours. Well use will be encouraged for stock watering. A phone tree will advise water users and outfitters of low water conditions and encourage conservation measures. The media will be contacted and news articles released to inform public of low flow conditions.

60 cfs

When flows decrease to 60 cfs or temperatures exceed 70°F for over 8 hours per day for three consecutive days. FWP will close the river to fishing and not conduct electrofishing surveys. Voluntary reduction of irrigation and water use is initiated. A phone tree and media releases inform water users, outfitters, angler, and public of water the continued decline of in stream flows and encourages water conservation. The river remains closed until flows exceed 80 cfs for seven consecutive days and temperatures do not exceed 70°F for more than 8 hours per day for three consecutive days.

Note:

In years with clear-cut drought conditions under which triggers in both the upper and middle reach are met, or about to be met, these two reaches could be treated as one unit (Rock Creek Road to Dickie Bridge).

The Mudd Creek gauge has limited data (1998-2003). Continued data on various flow scenarios will allow better analysis of wetted perimeter and in stream flow regimes. This plan should be fine tuned or modified as needed as additional data becomes available.

II. Lower River – Dickie Bridge to confluence with Jefferson

Monitored at USGS Melrose Gauge

250 cfs

DNRC and FWP officials meet with Big Hole Watershed Committee to present data; formulate options including the voluntary reduction of irrigation, municipal water use, and angling; and prepare to take action. A phone tree is initiated to advise irrigators and outfitters of stream flow conditions.

200 cfs

Notice to outfitters and anglers requesting fishing be voluntarily limited to morning hours. The phone tree will inform local water users, anglers and outfitters of stream flow conditions. The media will be contacted and news articles released to inform public of low flow conditions.

150 cfs

FWP will close the river to fishing and not conduct electrofishing surveys. Voluntary reduction of irrigation and water use is initiated. A phone tree and media releases inform water users, outfitters, anglers, and public of the continued decline of in stream flows and encourages water conservation. The river will remain closed until flows exceed 200 cfs for seven consecutive days.

Temperature triggers are the same as the middle reach.

Notification and Monitoring Process

Montana, Fish, Wildlife and Parks, Montana Department of Natural Resources and Conservation Service will keep the Big Hole Watershed Committee fully informed throughout the year regarding stream flows, water temperature, and snow pack data. This will allow for timely information to help in encouraging appropriate courses of action.

Stream conditions, water temperature, and snow pack levels will be a standing agenda item at each Big Hole Watershed Committee meeting. Based on the year-long monitoring of weather conditions that may influence flow, the Big Hole Watershed Committee will publish a notification of impending dry year conditions. Notifications will be sent to the press, ranchers, municipalities, outfitters, conservation and sportsmen groups, and posted on the “world wide web”.

While most attention is on late summer conditions, it is crucial to certain species, including Fluvial Arctic Grayling that springs flows are closely monitored.

The Montana Fish, Wildlife and Parks will offer assistance to irrigators who are willing to cut back on water diversions. The BHWC will hold an open public meeting to present the information and conduct discussions with all parties concerning proposed actions.

Each caucus within the BHWC will communicate with their respective groups concerning implementation of the plan and secure support.

Public Education

The BHWC will develop and distribute educational material with agency assistance, describing the need for a drought management plan, its provisions, and anticipated benefits.

Information will be provided on the possible actions people can take to mitigate damage from dry years including but not limited to:

- Voluntary reductions of irrigation and diverted stock water during critical times;
- Increase flood irrigation during spring runoff to augment return flows;
- Water conservation policies by municipalities and industries during sensitive times;

- Emergency water reduction policies by municipalities and industries during critical times;
- Reduced recreation uses during sensitive times; and
- Elimination of fall recreation uses at critical times.

Addendum 2002 – Definition

Flow trigger levels will be based on the Average Daily Flow measured in cubic feet per second (cfs). Therefore, flows will be reviewed the following day to determine trigger levels and fishing closures.

Addendum 2002 – Publicity

It is recognized that flow levels, forecasting and angling closures affect local businesses and residents. Whenever possible, maps and specific locations will be included in press releases and other communications (MT FW&P website).

Addendum 2004 – Publicity and Outreach

The BHWC will issue weekly updates to irrigators during drought periods. Weekly updates will be provided in hard copy, electronic mailings and on the BHWC web site. In non-drought periods the BHWC will issue regular updates as needed.

The BHWC will work with M+FWP on press releases and other public outreach efforts. The BHWC will work with local newspapers and television stations to secure flow updates in these communication mediums.

The BHWC will issue an annual update in the form of a mailing (hard copy and electronic) which will include: a copy of the most recent Drought Management Plan, flow forecasting, updates on water conservation programs and assistance, and other related news items.

Addendum 2004 - May 15-June 30 Wisdom Reach

Flow Levels (J. Magee MFWP) Upper Reach: 160 cfs May 15 – June 30. When flows decrease below 160 cfs a phone tree will be used to contact water users advising of flow conditions and encouraging conservation measures.

20 cfs FWP will close the upper river to fishing, and will not conduct electrofishing surveys. (Subject to approval or change by the Fluvial Grayling Workgroup)

1) The upper and lower wetted perimeter inflection points for the upper Big Hole River are 160 and 60 cfs respectively (MFWP 1989). The upper inflection point is the flow required to maximize standing crop. While this flow may not be realistic in most years it should be the target goal for conservation measures. Maintaining this flow during grayling spawning and emergence in May and June will enhance survival and recruitment. Reduction of wetted perimeter is accelerated below the lower inflection point of 60 cfs. The flow goal for late summer and fall should be to maintain flows at 60 cfs or greater to avoid accelerated losses in standing crop. A minimum survival flow of 20 cfs will provide flows necessary to maintain a wetted channel, allow for migration into flow and

temperature refugia and allow survival of some portion of the population during brief, critical periods.

2) Montana Fish Wildlife and Parks will not conduct electrofishing survey in the Wisdom West reach (Wisdom bridge downstream approximately 5 miles) if flows are less than 20 cfs and maximum daily temperatures are greater than 64°F.

Addendum 2004 - Thermal Series for the Middle Reach (R. Oswald, MFWP)

Rational: Last summer (2003), we encountered extremely high water temperatures at the Sportsman's Park Thermograph (FWP) in the Middle Reach. These temperatures often exceeded our Upper Reach Drought Plan standard of 70° F for more than 8 hours per day for 3 consecutive days. When we consulted the Drought Plan, we found a somewhat contradictory set of standards at the 3 triggers. That is, each flow trigger (100, 80, and 60 cfs) contained the same default thermal statement, i.e., "*or temperatures exceed 70° F for over 8 hours per day for 3 consecutive days.*" This left us with a situation in which the river would have closed to angling at any time we encountered the temperature standard at 100 cfs or less. Moreover, the only standard for reopening the river following closure was linked to seven consecutive days of flows greater than 80 cfs. Thus, thermal closure at flows less than 80 cfs would have required the same reopening criteria as flows below 60 cfs. The alternative of changing "*or*" to "*and*" in the thermal series also didn't work because that would have rendered any temperature considerations redundant, as the drought response actions would have defaulted to the flow triggers. In order to cope with the problem, we (FWP) merely monitored key segments of the reach for biological indicators of thermal stress.

In order to eliminate this problem in the future, I have drafted the following proposed Thermal set of Triggers for the Middle Reach. The set of Triggers parallels the series currently applied to the Upper Reach.

Temperature (July 15 – September 1)

Step 1: When Temperatures exceed 70° F. for more than 8 hours per day for 3 consecutive days at the FWP Sportsman's Park Thermograph and flows exceed 90 cfs at the USGS Mudd Creek Gauge, a phone/Email tree is used to contact outfitting businesses and a news release is issued advising publics and anglers of potential stressful conditions to the fishery and encouraging anglers to seek other destinations (reservoirs, mountain lakes and streams, spring creeks, etc.).

Step 2: When flows are 70 – 90 cfs at the USGS Mudd Creek Gauge and temperatures exceed 70° F. for more than 8 hours per day for 3 consecutive days and evidence of thermally induced stress to the fishery occurs*, FWP will close the Middle Reach to fishing. News releases will be issued and a phone/Email tree will again contact local outfitting businesses. The Middle Reach will remain closed to fishing until temperatures do not exceed 70° F. for more

than 8 hours per day for 3 consecutive days and flows are greater than 80 cfs for 7 consecutive days.

* Thermally induced stress as observed by trained, experienced observers may include any of the following: Observed mortality in significant numbers of Age I and older mountain whitefish and other salmonid species in lieu of other logical sources of mortality; Outbreaks of stress related piscid diseases such as Bacterial Furunculosis; Extraordinary concentrations of fish in thalweg or riffle tailout habitats; Hyperactivity to include gasping, rolling, jumping, etc., of large, concentrated numbers of fish; and Frenzied feeding activity at inappropriate times and under inappropriate conditions.

Step 3: When flows are 70 cfs or less at the USGS Mudd Creek Gauge and temperatures exceed 70° F. for more than 8 hours per day for 3 consecutive days, FWP will close the Middle Reach to fishing. News releases will be issued and a phone/Email tree will again contact outfitting businesses. The Middle Reach will remain closed until temperatures do not exceed 70° F. for more than 8 hours per day for 3 consecutive days and flows are greater than 80 cfs for 7 consecutive days.

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Dillon office – 406-683-9310

U.S. Fish and Wildlife Service,
Dillon office – 406-683-3893

Montana Drought Monitoring
406-444-5354

Internet Resources

Drought Report

<http://www.nris.state.mt.us/drought>

USGS Real Time Flow Data

<http://waterdata.usgs.gov/mt/nwis/current?type=flow>

NRCS Snowpack Monitoring

<http://www.wcc.nrcs.usda.gov/snow/>

Montana Fish, Wildlife & Parks Closure Policy

<http://www.fwp.state.mt.us/drought/closurepolicy.asp>

<http://www.fwp.state.mt.us/drought/default.asp>

Look for us on the web at www.bhwc.org or for more information contact: