



Montana Fish, Wildlife & Parks

Memo To: Interested Parties
From: Andy Brummond
Date: October 22, 2009
Subject: 2009-Annual Drought Update

Note to the Reader: This document is largely distributed via electronic means. In order to reduce the size of the document many graphics are made available through links to the respective websites.

General/Statewide

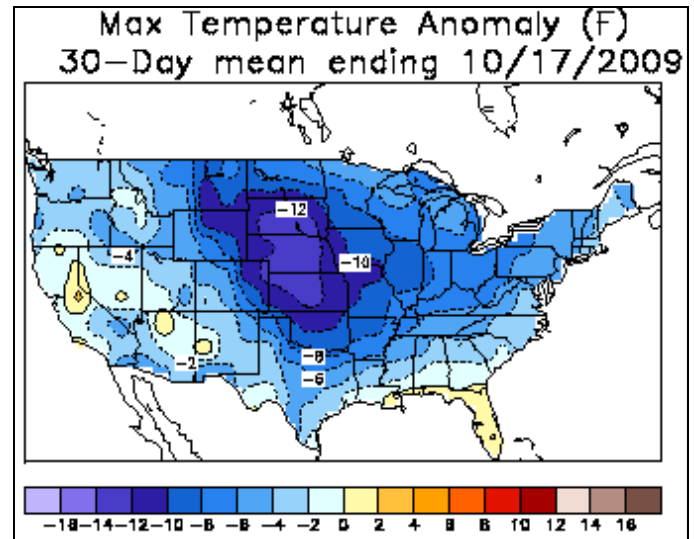
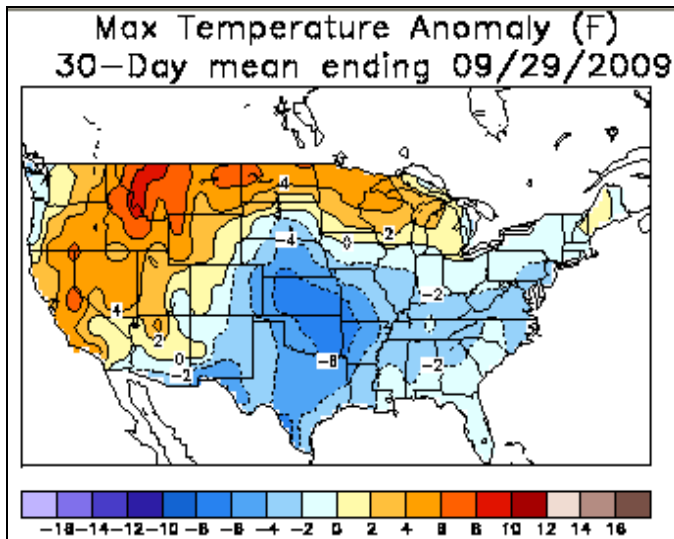
The winter outlook is tipping toward a warmer and drier than normal winter for Montana west of the divide. Warmer than normal temperatures are expected east of the divide with increased chances of drier than normal conditions extending east of the divide as well into north-central Montana. This forecast is based on a currently weak El Niño (a warming of surface water in the tropical central and eastern Pacific Ocean) that is expected to intensify over the winter. This bodes poorly especially for Northwestern Montana and the Rocky Mountain Front that already have experienced drought conditions in terms of below normal precipitation and streamflow this past year. These areas of the state have limited soil moisture and aquifer reserves to help carry it through another dry year. More information can be found at:

http://www.noanews.noaa.gov/stories2009/20091015_winteroutlook.html

Presently, the October 13th version of the U.S. Drought Monitor shows a slight decline in drought conditions in recent weeks due to record warm temperatures in September combined with generally limited precipitation during much of the month. Conditions had improved leading up to September due to cool temperatures and adequate to good precipitation in July and August. Throughout the last three months an area of moderate drought conditions has persisted in Glacier and Toole Counties while the remainder the state was classified either as not experiencing drought or as abnormally dry. The Monitor can be accessed at: <http://www.drought.unl.edu/dm/monitor.html>. The graphic is prepared using a variety of drought indices, and is updated approximately weekly. The October 15th U.S. *Seasonal Drought Outlook Through January 2010* predicts drought conditions will persist in the Glacier and Toole County areas with drought not expected to develop in the remainder of Montana. (see http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html).

Review of precipitation for the 12-month period through September 2009 shows most of the state at 90 to 110 percent of average precipitation with the only exceptions being the north central climate division at 70 to 90 percent of normal. A graphic of this period can be found at <http://www.wrcc.dri.edu/cgi-bin/spiFmap.pl?ave12>. Over the short-term conditions during September were much drier than normal ranging from 50-70% in the central and southwest down to 10-30% in the southeast and northwest part of the state. See <http://www.wrcc.dri.edu/cgi-bin/spiFmap.pl?ave01>

The following maps show the 30-day maximum temperature anomalies ending September 29th and October 18th respectively. Through areas or western Montana maximum temperatures were on average more than 10 degrees above normal for September while the first part of October saw a huge swing to well below normal temperatures.



Updated daily accumulated mountain precipitation and snow water equivalent information can be viewed in tabular form, by basin, and locations within these basins, by accessing: http://www.wcc.nrcs.usda.gov/cgibin/past_up.pl - choose "Montana", enter the month, date, and year, and it will generate the list. The following table contains a comparison of total mountain precipitation for the 2009 and 2008 water years. The water year runs from October of the preceding year through September of year listed.

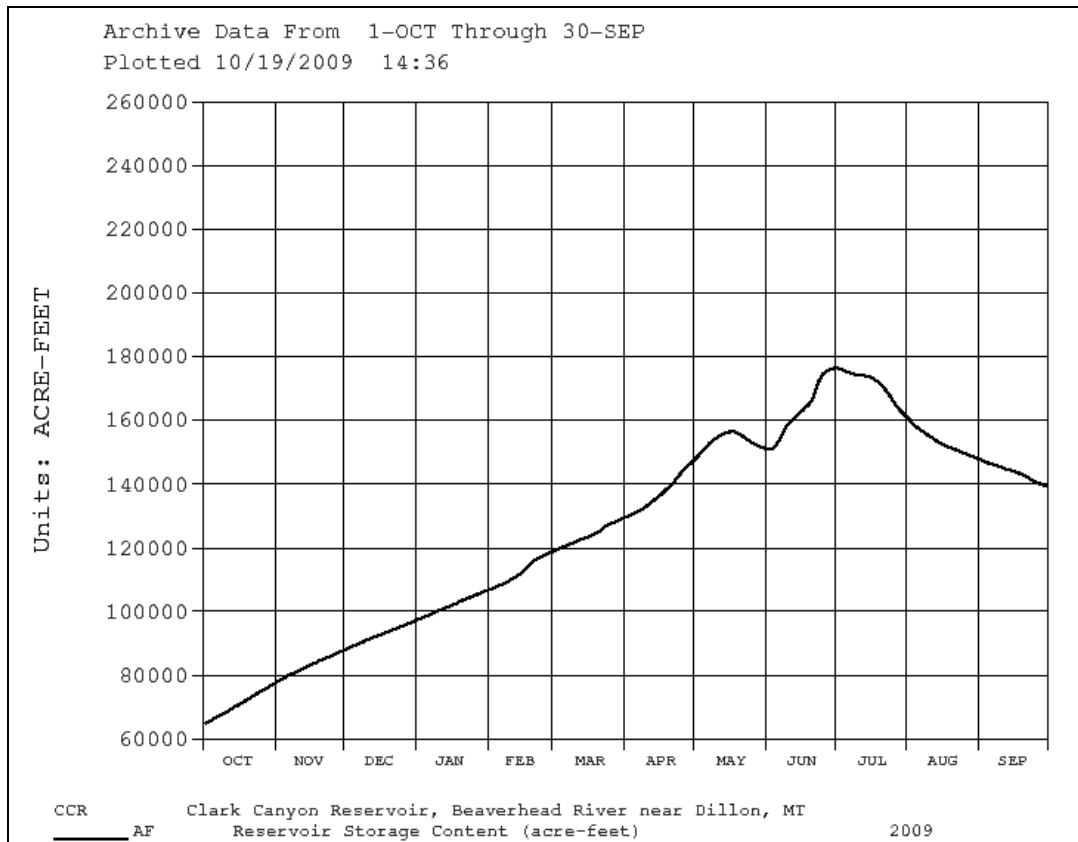
The percentages of total mountain precipitation for the 2009 water year ranged from 78 percent up to 103 percent of normal. Compared to 2008 mountain precipitation generally declined, particularly west of divide and along the Rocky Mountain Front. The upper Missouri and Yellowstone Basins were very near normal.

Basin	Total Precipitation (% of avg.), 2009 WY	Total Precipitation (% of avg.), 2008 WY
Kootenai	84	101
Flathead	83	101
Upper Clark Fork	95	99
Bitterroot	96	107
Lower Clark Fork	88	94
Jefferson	103	99
Madison	97	100
Gallatin	99	97
Missouri	100	93
Headwaters		

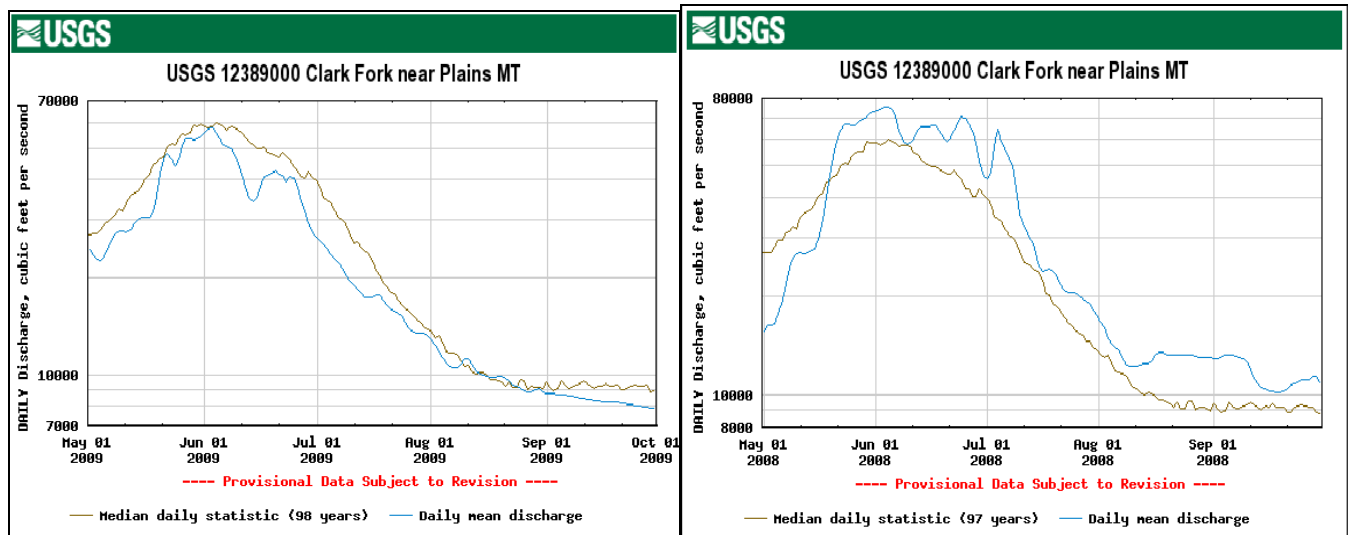
Hdw. Missouri Mainstem	97	96
Smith, Judith, Musselshell	93	114
Sun, Teton, Marias	84	102
Missouri Mainstem	91	98
St. Mary, Milk	78	102
Upper Yellowstone	101	98
Wind (WY)	102	102
Shoshone (WY)	103	104
Bighorn (WY)	101	106
Tongue (WY)	102	115
Powder (WY)	100	111
Lower Yellowstone	101	106

The statewide graphic showing stream flow conditions compared to long-term averages is located at <http://mt.waterdata.usgs.gov/nwis/rt>. As of October 21, 2009 the vast majority of stations are reporting stream flows in normal or above ranges. A notable exception is the Kootenai River below Libby Dam which failed to fill this year. Snowpack in the Kootenai Drainage above Libby Dam was dismal. However, early season snowpack and forecasts led reservoir operators to fully draft the reservoir by early January in anticipation of a normal runoff that did not materialize. This below normal flow may also relate to changes in reservoir operation that benefit the river fishery. Data for specific USGS gauges is available at: <http://mt.waterdata.usgs.gov/nwis/current?type=flow>.

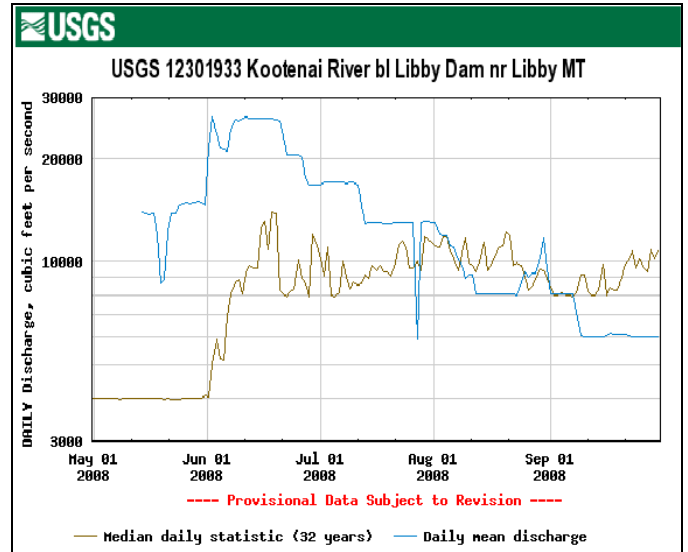
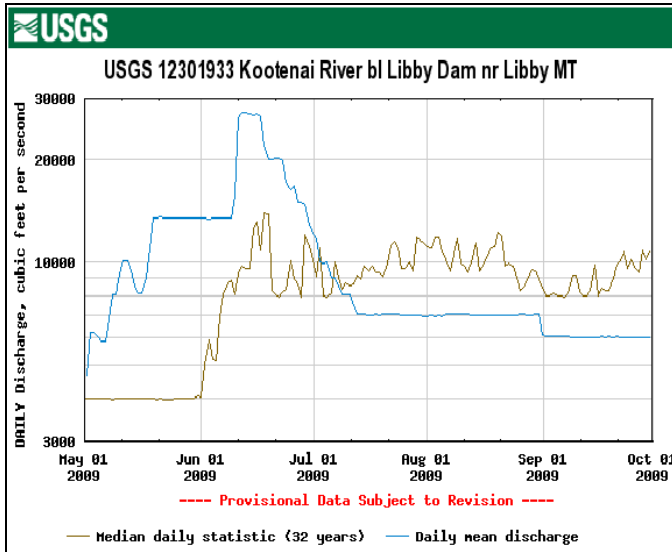
On the bright side Clark Canyon Reservoir saw better reservoir levels than have been experienced in years. The graph below shows reservoir storage through the end of September. The reservoir ended the irrigation season with over twice as much water in storage than at the end of the 2008 irrigation season. Presently the reservoir is filling slowly and is only about 35,000 acre-feet from full.



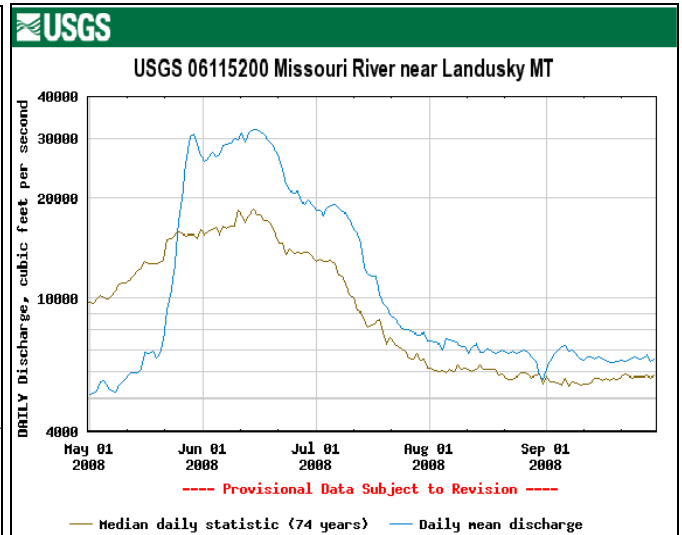
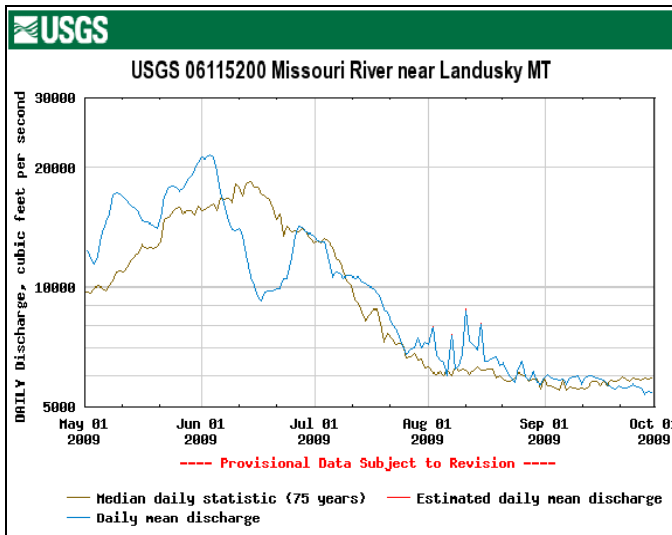
The following pairs of charts provide comparisons of stream flow for Montana's major river basins between 2009 (left) and 2008 (right).



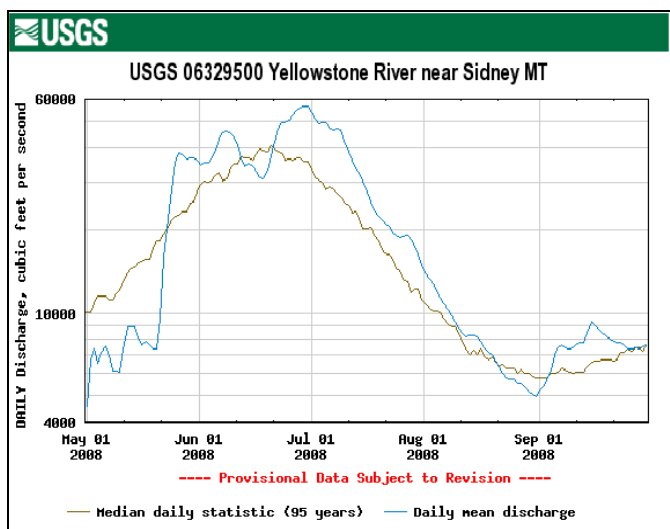
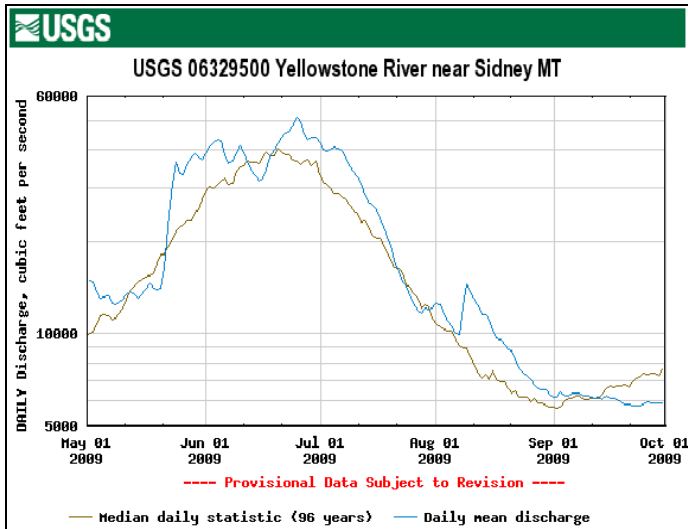
In the Columbia River basin for Montana west of the Divide, stream flow in the Clark Fork River near Plains remained near or below normal from for the entire May through September period. Cool temperatures helped preserve the less than normal snowpack to provide for a peak runoff with normal timing and flows. Water supply conditions were considerably below those seen in 2008.



Compared to 2008, the Kootenai River below Libby Dam saw flows dropped much sooner to accommodate well below normal reservoir storage. Despite the low reservoir levels, recommended streamflows for white sturgeon were maintained.



In the Missouri River basin stream flow peaked early and then tailed off considerably. Rains beginning in late June and lasting into August help streamflow to recover to near or above normal conditions. Flow dropped off in September reflecting the record high temperatures and lack of precipitation.



Stream flow in the Yellowstone River basin overall saw a similar year to 2008. Flows in early May were higher but were slightly lower in latter September. Irrigation demand was quite high in September due to warm temperatures and lack of precipitation causing flow to tail off in 2009.

The Surface Water Supply Index map considers soil moisture, precipitation, snow pack, and reservoir storage, according to seasonal relevance. The October 2009 map is shown at: <http://nris.state.mt.us/wis/SWSInteractive/SWSI-App.asp?month=10&year=2009> SWSI indices have declined over the past few months and in September in particular. 13 basins are showing wet or surplus water conditions. Dry conditions are shown in 20 basins with 12 of these being west of the continental divide including the Tobacco, Yaak and Swan basins in the extremely dry category. This compares to only 3 basin showing slightly dry conditions in April 2009 and the remainder near normal or with wet conditions. The SWSI values can be found by clicking on **REPORT** at the bottom center of the map.

The Montana Drought Monitoring website is located at <http://nris.state.mt.us/drought/>. Committee members and website administrators welcome suggestions for postings and site organization. Montana's Official Drought Website is at <http://drought.mt.gov/>

FWP Drought Response

Based on May snowpack and forecasted streamflow conditions FWP determined that no water right call warning letters would be sent water users with junior priority water rights. While in some isolated instances stream flow did ultimately drop below FWP instream water right levels, by and large stream flow did remain above FWP instream water right levels.

No drought fishing restrictions and closures were imposed in 2009. There are presently no fire-related closures on FWP administered lands. The only restriction involves Yellowstone River State Park where open fires are not allowed. Fire restrictions and other drought and fire related information can be found on FWP's drought website at: <http://fwp.mt.gov/news/drought/default.html>

FWP Regional Reports

In the past FWP has reported largely on drought impacts related only to fisheries. Beginning in 2008 FWP began a more comprehensive drought reporting procedure where each of the seven FWP Regions is now being asked to supply information with regard to how drought is impacting wildlife and recreation as

well as the fish. The following questions, categorized by division, were asked of each FWP Region. Some questions are seasonal in nature and are not relevant at this time.

Wildlife

Where are drought conditions affecting wildlife populations? (For example, note mild or harsh winters' impact on populations, or weather-related disease issues.)

Where are drought conditions causing wildlife to move from normal range to agricultural lands or urban areas?

Where are game damage hunts in place or planned to mitigate impacts to agriculture due to wildlife being displaced by drought conditions?

Where are changes in place, or being considered to grazing, recreation, hunting or other activities on WMAs in response to drought/fire conditions?

Parks

Where are drought/fire conditions causing state parks and fishing access sites to be closed or use restricted?

Where are low lake or water levels hindering or preventing recreational activities at state parks or fishing access sites?

Where are low stream flows not allowing or restricting recreational use of rivers?

Fisheries

Where are fish winterkills being reported in lakes or ponds due to low water levels or other drought conditions?

Where are fish summerkills been reported in lakes or ponds due to low water levels, high water temperatures or other drought conditions?

Where are streams or rivers closed to angling or have fishing restrictions due to low stream flows and /or high water temperature?

Where are drought conditions affecting fish populations? (For example, note where population trends can be explained by drought-impacted flow and temperature conditions.)

Where have low reservoir levels impacted fish populations in important flat-water fisheries? (For example, note where fishing regulation will be lifted to increase the harvest of stocked fish populations in waters impacted by low water levels and rising temperatures.)

Where are low reservoir levels impacting angling opportunities?

Enforcement

Where are drought/fire conditions causing landowners to close land to hunting and fishing?

Where are fire restrictions causing changes in the number of hunters in the field?

In general streamflows held up well across most of Montana despite periods of below normal precipitation (May, June, September) and above normal temperatures (September). Good snow pack, below normal spring temperatures and timely precipitation during July, August and October moderated conditions. Very few drought-related impacts affected fish, wildlife and recreational resources across Montana. It is not surprising that the following drought impacts listed by region are quite brief. In particular those regions across the southern half of Montana saw very little if any in the way of drought impacts.

Region 1 – Kalispell

Low groundwater levels over the winter led to fish kills in Lost and Timber Lakes. In general precipitation in northwest Montana in 2009 was characterized by brief high moisture periods followed by long dry periods. Rainfall by early August was 2 inches below normal, several days of rain mid-August brought yearly totals back to normal. Little precipitation in September led to annual totals again falling 2 inches below normal. Many streams fell to 50-70% of median flows. Snow and rain in early October have improved conditions. While there were some periods of very warm temperatures summer during 2009 improved stream flows held off any seasonal fishing closures. There were no reports of summer fish kills or other drought related problems. Presently Hungry Horse and Libby reservoirs and Flathead Lake are now going into fall drafting.

Region 2 – Missoula

The only reported impacts that could be stretched to be drought related both involve Painted Rocks Reservoir (a.k.a. West Fork Bitterroot Reservoir). FWP contracts with DNRC for 15,000 acre-feet of stored water to supplement flows in the Bitterroot River during latter summer. Because flows in the Bitterroot held up quite well, releases of contract water were not needed as early and to same extent as normal causing some complaints about low flows in the West Fork Bitterroot River below the reservoir. Ultimately the stored water was released, but as the reservoir was drafted it caused difficulty in using the boat ramp at the reservoir. Water management can be difficult even under good water supply conditions.

Region 3 – Bozeman

No Region Three Parks or Fishing Access Sites had any fire or drought related closures in 2009. Low water situations were rare in 2009. The boat ramp at Harrison Lake was extended last year so this ramp was in the water all year in 2009. Water levels were good in all other reservoirs where FWP Fishing Access Sites are located. Stream flows were robust throughout the summer and in no instances did low flows restrict or prevent recreational activities on Region 3 rivers or streams in 2009. No known drought related impacts to wildlife occurred. Hunting impacts have not been observed.

Region 4 – Great Falls

One notable drought related impact was a September fire along Holter Lake that prompted the closure of the Beartooth Wildlife Management Area until such time that the fire no longer threatened the access road. Inflows into Tiber Reservoir were well below normal, but were sufficient when combined with carry-over storage to provide for good reservoir levels and river flows below the reservoir.

Region 5 – Billings

The major streamflow issue in the Billings area involved not a lack of available water but the management of the more than adequate available water supply. Releases from Yellowtail Reservoir were suppressed during the spring to raise reservoir levels to provide for an earlier recreation season on the lake. This led to inadequate storage capacity to deal with runoff that led to very high releases of water into the Bighorn River. This change in reservoir operations will likely continue to cause very high releases in June that may well further degrade the main river channel. This further lowering of the main

river channel will increase the frequency of dewatering of side channels that are critical for the rearing of young fish.

Region 6 – Glasgow

By the end of September only stock ponds and temporary wetlands had dried up. This may impact distribution of upland game birds and waterfowl. Some wetlands seem to have dried up more than usual. Wildlife is beginning to move into agricultural areas, but this movement is typical as vegetation dries up. Drought or fire conditions have not restricted hunter access in the region.

The continuous low water levels of Fort Peck Lake left the boat ramp for Rock Creek Fishing Access Site out-of-the-water. An Army Corp Engineers “low-water boat ramp” next to this site provided decent access. The boat ramp at Duck Creek was useable again for the first time since 2002. Overall low reservoir levels at Fort Peck have reduced some of the angling opportunities by limiting the number of usable boat ramps available to anglers. Currently, there are 9 of 11 boat ramps available for use. There have been no adverse affects on the fish populations of Fort Peck Reservoir due to drought conditions caused by low water levels and/or rising water temperatures. Dry Fork Reservoir north of Chinook in the Battle Creek watershed remains too low to sustain a healthy fish population. The northern tributaries of the Milk River such as Battle Creek and Lodgepole Creek saw very low flows during much of the summer due to a lack of precipitation in the area.

Region 7 – Miles City

Stream flow generally hovered near or above normal in southeastern Montana. Significant spring snow in areas of the region filled small reservoirs and ponds. Tongue River Reservoir at its lowest this year dropped to only about 50,000 acre-feet or 2/3 of capacity. Presently it is at just over 50,000 acre-feet, which provides sufficient carry-over to help ensure that the reservoir will fill next year while at the same time providing adequate releases to the Tongue River below the reservoir over the winter.