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5449 Prospect Dr.
Missoula, MT 59808
October 25, 1999

Mr. Michael McLane
Water Resource Planner
Montana Department of Natural Resources and Conservation
PO Box 201601
Helena, MT 59620-1601

Dear Mike:

This letter is written to satisfy items 3 and 5 in our contract to refine the dewatered stream list. Our contract specifies that stream reaches on the list over 5 miles in length in the upper Clark Fork basin (UCFR) were to be addressed in this work. As I proceeded with the work, I decided to address all stream reaches on the list in the UCFR since the people I interviewed knew about most of the streams in their areas.

I suggest changing the way we address drought severity from "chronic" or "periodic" to a classification system based upon the likely effects of drought on fisheries. The next most significant change is in the boundaries of stream reaches. For most streams on the list, the degree of dewatering varied along the stream and the new reach designations reflect that variation.

The dewatering classification system, I recommend, categorizes the degree of dewatering into 5 categories. The frequency of a given dewatering condition is defined by designating the number of years out of five that the condition is likely to exist. I felt this was needed to help us understand the complexity of the problems with dewatering; every year is different and irrigation practices vary depending upon growing conditions and water availability. Without the time element you assume that a designated condition for a given reach exists every year and that may not be the case. It allows us to describe the range of conditions that exist on a given reach of stream over the years.

Classification System

Category 1. Stream reach is dewatered completely or so as to eliminate fish.

Category 2. Stream reach is dewatered to the point that fish can survive the irrigation season but movement up and downstream is cut off.

Category 3. Stream reach is dewatered but fish can survive, some movement is possible, habitat availability is limited.

Category 4. Stream reach flows year round but dewatering in summer limits fish production.

Category 5. Dewatering, if it occurs, is not a limiting factor to fish production.

A couple of examples might help you understand how the classification system looks. On the Clark Fork River the reaches were designated from the upper end to the lower end and on the tributaries reaches run from the lower end to the upper end.

Example 1:
Clark Fork River - Sager Lane to Little Blackfoot River 1 year out of 5 it is category 3 and 4 years out of 5 it is category 4.

Example 2:
Warm Springs Creek - mouth to Gardiner Ditch, 1 year out of 5 it is category 1, 2 years out of 5 it is category 2 and 2 year out of 5 it is category 3.
If you have any questions about the classification system please let me know.

Item 3 in the contract requires that I identify fish species and impacts on every reach of stream. We have agreed that this is not practical and that I should do this only on the stream reaches selected for detailed drought planning. The following is a list of stream reaches selected for detailed planning and a description of the expected effects of drought on fish.

REACHES SELECTED FOR DETAILED PLANNING

Reach 1:
Clark Fork River - Perkins Lane to Westside Ditch

Reach 2:
Clark Fork River - Westside ditch to Sager Lane. This is the most severely dewatered section on the entire upper Clark Fork River during dry years.

Reach 3:
Clark Fork River - Sager Lane to mouth of the Little Blackfoot River.

Brown trout are the fish species of primary concern in all three of the above reaches of river and the time period of impact would be from mid July through mid September. Drought conditions would effect juvenile and adult brown trout placing stress on them due to crowding, water warming and declining habitat quality as river flow declines. As the flow declines, it pulls away from undercut banks, log jams, debris piles and other features that provide protection for trout against various hazards. There probably is some direct mortality of both adult and juveniles due to dewatering. Survivors would probably experience poor growth and poorer condition going into winter possibly resulting in mortality directly related to dewatering. Dewatering for irrigation would probably not interfere with spawning runs but there could be some adverse effects on young trout migrating from tributaries to the main river because that typically occurs in early summer at about the time irrigation demands on the river are heavy. For fish in the UCFR, dewatering increases their vulnerability to the effects of toxic metals especially during summer thunder showers.

Reach 4:
Warm Springs Creek - mouth to Gardiner Ditch headgate

This reach is dewatered from mid July, through mid September. It is the primary spawning grounds for brown trout from the Clark Fork River. Dewatering has a severe effect on juvenile trout hatched at a time when the flow is greatly decreased. In dry years young fish may find it difficult to migrate to the main river, which is their natural tendency. If they stay in the stream with reduced flow, they would find habitat conditions less than optimal and their growth would probably be reduced subjecting them to higher mortality rates during stressful winter conditions. Adult trout of all species would be forced to leave the stream as flow decreased or face higher than normal mortality rates.

Reach 5:
Racetrack Creek - Interstate 90 to 0.5 miles above the Yellowstone Trail Road

This reach is so severely dewatered each year that fish are eliminated from it (category 1). All life stages and species are adversely affected. Most importantly, it eliminates this reach from producing young trout for recruitment to the main river fisheries.

My sources of information were the following people: Loren Luthje, Steve Gerdis, Jim Quigley, Len Walch, Wayne Hadley, Gordon Pierson, Eric Reiland, Adam McNevich and Cy Corlette. The streams each of these individuals provided information about is included in the field data forms which are included with the finished data tables. I conducted Interviews with these individuals, explained the classification system to them, and asked them to apply classifications to various reaches of stream that they were familiar with. No reference material was used. The data tables on which the information are presented are of my own making since the new data did not fit on the provided data forms.

Please let me know if there are any problems or questions with the information I have provided. It has been a pleasure working with you on this project.

Best regards,

Dennis L. Workman

Table 1. Stream name, reach number, reach boundaries, degree of dewatering, fish species to be added or subtracted from the data base and special notes are included in this table.

KEY

COLUMN 4

Number of years out of 5 that the condition indicated by category in column 5 exists on the specified stream reach.

COLUMN 5

Category 1 stream reach is dewatered completely or so as to eliminate fish.

Category 2 stream reach is dewatered to the point that fish can survive the irrigation season but movement is cut off

Category 3 stream reach is dewatered but fish can survive, some movement is possible, habitat availability is limited

Category 4 stream reach flows year round but dewatering in summer limits fish production.

Category 5 dewatering, if it occurs, is not a limiting factor to fish.

Stream name & river reach #	upper reach boundary	lower reach Boundary	X out of 5 years	Category	Fish species & notes
CFR –	Warm Springs Cr.	Perkins Lane	5	5	
CFR	Perkins Lane	Westside Ditch	1 4	3 4	
CFR	Westside Ditch	Sager Lane	1 4	2 3	
CFR	Sager Lane	Little Blackfoot River	1 4	3 4	
CFR	Little Blackfoot River	Rock Creek	1 4	5 4	
CFR	Rock Creek	Milltown Res.	5	5	
Stream name & river reach #	lower reach Boundary	upper reach boundary	X out of 5 years	Category	Fish species & notes
GOLD CR – 0150000	MOUTH	PIKES PEAK CR	2 3	4 5	
0160000	PIKES PEAK CR	Headwaters	2 3	5 4	
ROCK CR – 0210000	MOUTH	2.5 MILES UPSTR	5	1	Project to lease water in the works
	2.5 MILES UPSTR	ROCK CR LAKE	1 4	4 5	
TINCUP CR – 0280000	MOUTH	Prison Road Crossing	5	1	Prison Ranch Controls all the water in Tin cup
	Prison road crossing	Mud Lake	5	2	
	Mud Lake	Headwaters	5	5	
POWELL CR – 0310000	MOUTH	Prison Ranch	5	1	
	Prison Ranch	Headwaters	5	5	
DEMPSEY CR 0330000	MOUTH	WESTSIDE DITCH	5	3	

Stream name & river reach #	lower reach boundary	upper reach Boundary	X out of 5	Category	Fish species & notes
	WESTSIDE DITCH	ROAD ABOVE MORRISON DIT.	5	2	
	ROAD ABOVE MORRISON DIT.	FORKS	5	4	
RACETRACK CR – 0360000	MOUTH	I-90	3 2	4 5	
	I-90	0.5 MILE ABOVE YELLOWSTONE TRAIL RD.	5	1	
	YELLOWSTONE TRAIL RD.	MORRISON DITCH	5	4	
	MORRISON DITCH	HEADWATERS	5	5	
LOST CR - 0430000	MOUTH	1 MILE UPSTR	5	1	Broken headgate diverts creek to ditch year round
	1 MILE UPSTR	SW ¼ SECTION 1	5	4	
	SW ¼ SEC 1	FIFER/CUMMOCK DITCH	3 2	4 5	
	F/C DITCH	ANTELOPE CR	5	5	
0430000	ANTELOPE CR	HEADWATERS	5	5	
WARM SPRINGS 0450000	MOUTH	GARDINER DITCH	1 2 2	1 2 3	
	GARDINER DITCH	MEYERS DAM	1 3 1	5 4 3	
	MEYERS DAM	HEADWATERS	5	5	
STORM LAKE CR 0460000	MOUTH	CABLE CR			Totally dewatered by the diversion into Silver Lake when
STORM LAKE CR 0460100	CABLE CR	CANAL			Filling the lake. Water controlled by ARCO and Uelands.
TWIN LAKES CR 0490000	MOUTH	HEADWATERS			Same as above
MILL CR – 0510000	MOUTH	WILLOW CR / BIG HOLE ROAD			
MILL CR – 0150100	WILLOW CR BIG HOLE ROAD	SOUTH FORK MILL CR.			

Stream name & river reach #	lower reach boundary	upper reach Boundary	X out of 5	Category	Fish species & notes
WILLOW CR – 0530000	MOUTH	1 MILE UPSTREAM	5	5	
WILLOW CR 0530000	1 MILE UPSTREAM	2 MILES UPSTREAM	2 3	3 5	
WILLOW CR – 0530000	2 MILES UPSTR	HEADWATERS	5	5	
PETERSON CR 0690000	MOUTH	I-90	1 2 2	1 2 3	
	I-90	Spring creek	1 2 2	1 2 3	
COTTONWOOD 0700000	MOUTH	I-90	3 1 1	3 2 4	
0700100	I-90	Baggs Cr.	1 3 1	1 2 3	
	Baggs	Headwaters	5	5	
LITTLE BLACKFOOT – 0720000	MOUTH	HIGHWAY 12 CROSSING ABOVE ELLISTON	3 2	4 3	
	HIWAY 12 ABOVE ELLISTON	HEADWATERS	5	5	
SPOTTED DOG 0740000	MOUTH	RESERVOIR	5	4	
	RESERVOIR	HEADWATERS	5	5	
DOG CR – 0850000	MOUTH	MACDONALD CR	5	4	-brook trout
DOG CR – 0850100	MACDONALD	HEADWATERS	5	5	
CARPENTER CR 0890000	MOUTH	OPHIR CR			Note:just a trickle barely stock water
CARPENTER CR 0890100	OPHIR	HEADWATERS			shouldn't be on this list. All messed up from mining and diversions
SNOWSHOE CR 0900000	MOUTH	UPSTREAM 1 MI.	5	3	
	UPSTREAM 1 MI.	LOIS LAKE	5	4	
	LOIS LAKE	HEADWATERS	5	5	

Stream name & river reach #	lower reach boundary	upper reach Boundary	X out of 5	Category	Fish species & notes
SIXMILE CR 0920000	MOUTH	THREEMILE CR			Note: very small spr cr is dewatered but prob.
SIXMILE CR - 0920100	THREEMILE CR	GIMLET CR			Flows because of irri. Return. No trout Delist
THREEMILE CR 0930000	MOUTH	Helmville Highway	5	5	+brook trout
THREEMILE CR 0930100	Helmville Highway	To first headgate upstream(200yds	5	1	
	1st headgate	Headwaters	1 4	2 3	
SIXMILE CR 0940000	GIMLET	HEADWATERS			Note: may not be perennial. Delist
WARM SPRING 0950000	MOUTH	2 MILES UPSTR	1 4	1 3	
	2 MILES UPSTR	BEAR GULCH	5	5	
WARM SPRING 0950100	BEAR GULCH	HEADWATERS	5	5	
HOOVER CR 0970000	MOUTH	I-90	1 4	1 3	Runs thru feed lot just above the river. Long culver under I-90
	I-90	Miller Lake	3 2	2 3	Serious habitat problems
	Miller Lake	Headwaters	5	5	
OPHIR CR – 1070000	MOUTH	Warm Springs Cr.	5	5	+brown trout
	Warm Springs Cr	Blackfoot City	1 4	2 4	
GIMLET CR 1380000	MOUTH	HEADWATERS			Note: just a trickle snow melt fills Parker Res. Delist
CREVICE CR 1420000	MOUTH	HEADWATERS			
ROSS FORK ROCK CR 190000	MOUTH	MOOSE MEADOWS CR	5	5	Dewatering if any is short term, short section probably not every year
UPPER WILLOW 0300000	MOUTH	SCOTCHMAN CR	5	5	

Stream name & river reach #	lower reach boundary	upper reach Boundary	X out of 5	Category	Fish species & notes
UPPER WILLOW 0300013	SCOTCHMAN CR	COWAN GUL.	5	5	Dewatering is short term, short sections, not every year, habitat loss from livestock is larger problem
	COWAN GUL.	HEADWATERS	5	5	Same comment as above
RANCH CR – 0310000	MOUTH	HEADWATERS	5	5	
FLINT CR 0320000	MOUTH	ALLENDALE DIVERSION	5	4	
LOWER WILLOW 0330000	MOUTH	RESERVOIR	2 1 2	3 2 5	+brown trout +brook trout
	RESERVOIR	HEADWATERS	5	5	
FLINT CR – 0360000	LOWER WILLOW	DOUGLAS	5	4	
FLINT CR – 0360100	DOUGLAS	ALLENDALE DIV. DOWNSTR OF SMART CR	5	4	
FLINT CR 0360200	ALLENDALE DIV\ SMART CR	BOULDER CR	5	5	
FLINT CR 0370000	BOULDER	MARSHALL CR	5	5	
FLINT CR 0370100	MARSHALL CR	DOUGLAS CR	5	5	
FLINT CR 0370200	DOUGLAS	FRED BURR CR	5	5	
FLINT CR 0380000	FRED BURR CR	SPRING CR	5	5	
FLINT CR 0380100	SPRING CR	TROUT CR	5	5	
FLINT CR 0400000	TROUT CR	GEORGETOWN LAKE	5	5	
BREWSTER CR 0660000	MOUITH	HEADWATERS	5	5	Water rights haven't been used for many years.
MARSHALL CR 0810000	MOUTH	HEADWATERS			
DOUGLAS CR - 0830000	MOUTH	HEADWATERS	5	5	

Stream name & river reach #	lower reach boundary	upper reach Boundary	X out of 5	Category	Fish species & notes
BEAR CR 1500000	MOUTH	FIRST CHANCE GULCH	5	1	
HARVEY CR 1560000	MOUTH	EIGHTMILE CR	5	5	
SCHWARTZ CR 1630000	MOUTH	WEST FORK	5	3	
SCHWARTZ CR.	WEST FORK	HEADWATERS	5	5	