II. FINDINGS OF FACT

A. FINDINGS ON THE QUALIFICATION OF DEPARTMENT OF FISH, WILDLIFE AND PARKS TO RESERVE WATER (Mont. Code Ann. § 85-2-316(1)(1991); ARM 36.16.107B(1)(a).)

1. The Montana Department of Fish, Wildlife and Parks (DFWP) is an executive branch agency of the State of Montana established pursuant to Section 2-15-3401, MCA, and is qualified to reserve water pursuant to Section 85-2-316, MCA. (DFWP Exh. 10, Graham Dir., p. 2.)

2. DFWP is the executive branch agency mandated by statute to provide for the protection, preservation and propagation of all fish and wildlife and their habitat within the state. Therefore, DFWP has the responsibility and duty to represent the people of Montana in applying for instream flow reservations for fish, wildlife and their habitat in the Missouri River Basin above Fort Peck Dam.

B. FINDINGS ON THE PURPOSE OF THE WATER RESERVATION APPLIED FOR BY DFWP (Mont. Code Ann. § 85-2-316(4)(a)(1991); ARM 36.16.107B(1)(b).

3. DFWP submitted an application in June 1989 to reserve waters to maintain a minimum flow, level, or quality of water throughout the year or during described portions of the year on 281 stream reaches, one lake, and one swamp in the Missouri River Basin above Fort Peck Dam. (Bd. Exhs. 37-A.1, 37-A.2, and 37-A.3.) The waters applied for, including reach boundaries and amounts of water requested are shown in Table 1. (DFWP Exh. 17, Spence Dir., Appendix A.) By stipulation and agreement between parties, DFWP has agreed to modify the reach boundaries on Mussigbrod Creek, a tributary to the Big Hole River and Blacktail Deer Creek, a tributary to the Beaverhead River. The modified reaches are:

(1) Mussigbrod Creek - From Hellroaring Creek to Arrow Ranch's upper most existing diversion point in NWSENW Section 9,T1S,R16W M.P.M. (Stipulation and Agreement between DFWP and Arrow Ranch Company dated February 10, 1992);

(2) Blacktail Deer Creek - from Middle and West Forks to Zenchiku Land and Livestock's uppermost existing diversion point in SENENE Section 29,T8S,R8W P.M.M. (Stipulation and Agreement between DFWP and Zenchiku Land and Livestock, Inc. dated February 10, 1992.

Table 1

DFWP instream flow requests

HEADWATERS SUBBASIN

BIG HOLE RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af/yr)
American Creek	Headwaters to mouth	Jan 1 - Dec 31	2.8	2,027
Bear Creek	Headwaters to mouth	Jan 1 - Dec 31	2.8	2,027
Big Hole River #1	Warm Springs Creek to Pintlar Creek	Jan 1 - Dec 31	160	115,835
Big Hole River #2	Pintlar Creek to the old Divide Dam	Jan 1 - Dec 31	800	579,173
Big Hole River #3	Old Divide Dam to mouth	Jan 1 - Dec 31	650	470,578
Big Lake Creek	Twin Lakes outlet to mouth	Jan 1 - Dec 31	4.7	3,403
Birch Creek	Mule Creek to mouth	Jan 1 - Dec 31	10	7,240
Bryant Creek	Headwaters to mouth	Jan 1 - Dec 31	1.4	1,014
California Creek	Headwaters to mouth	Jan 1 - Dec 31	14	10,136
Camp Creek	Headwaters to mouth	Jan 1 - Dec 31	5	3,620
Canyon Creek	Canyon Lake to mouth	Jan 1 - Dec 31	5	3,620
Corral Creek	Headwaters to mouth	Jan 1 - Dec 31	1	724
Deep Creek	Sevenmile and Tenmile to mouth	Jan 1 - Dec 31	18	13,031
Delano Creek	Headwaters to mouth	Jan 1 - Dec 31	0.3	217
Divide Creek	North and East forks to mouth	Jan 1 - Dec 31	3	2,172
Fishtrap Creek	West and Middle forks to mouth	Jan 1 - Dec 31	10	7,240
Francis Creek	Sand Creek to mouth	Jan 1 - Dec 31	4	2,896
French Creek	Headwaters to mouth	Jan 1 - Dec 31	6	4,344
Governor Creek	Headwaters to mouth	Jan 1 - Dec 31	4	2,896
Jacobsen Creek	Tahepia Lake to mouth	Jan 1 - Dec 31	14	10,136
Jerry Creek	Headwaters to mouth	Jan 1 - Dec 31	7	5,068
Johnson Creek	Schultz Creek to Forest Service boundary	Jan 1 - Dec 31	13	9,412
Joseph Creek	Anderson Creek to mouth	Jan 1 - Dec 31	5	3,620
LaMarche Creek	West and Middle forks to mouth	Jan 1 - Dec 31	11	7,964
Miner Creek	Upper Miner Lakes to mouth	Jan 1 - Dec 31	9	6,516
Moose Creek	Headwaters to mouth	Jan 1 - Dec 31	9	6,516
Mussigbrod Creek	Hell Roaring Creek to uppermost existing diversion point in NWSENW Section 9 T1S R16W	Jan 1 - Dec 31	10	7,240
NF Big Hole River	Ruby and Trail creeks to mouth	Jan 1 - Dec 31	30	21,719
Oregon Creek	Headwaters to mouth	Jan 1 - Dec 31	0.3	217
Pattengail Creek	Sand Lake to mouth	Jan 1 - Dec 31	12	8,688
Pintlar Creek	Oreamnos Lake to mouth	Jan 1 - Dec 31	10	7,240
Rock Creek	Beaverhead National Forest boundary to mouth	Jan 1 - Dec 31	5	3,620
Ruby Creek	Pioneer and WF Ruby creeks to mouth	Jan 1 - Dec 31	4	2,896
Sevenmile Creek	Headwaters to mouth	Jan 1 - Dec 31	1.8	1,303
Seymour Creek	Upper Seymour Lake to mouth	Jan 1 - Dec 31	13	9,412
Sixmile Creek	Headwaters to mouth	Jan 1 - Dec 31	1.6	1,158
SF Big Hole River	Skinner Lake to mouth	Jan 1 - Dec 31	22	15,927
Steel Creek	Headwaters to mouth	Jan 1 - Dec 31	6	4,344
Sullivan Creek	Headwaters to mouth	Jan 1 - Dec 31	4	2,896
Swamp Creek	Yank Swamp to mouth	Jan 1 - Dec 31	8	5,792
Tenmile Creek	Tenmile Lakes to mouth	Jan 1 - Dec 31	3.8	2,751
Trail Creek	Headwaters to mouth	Jan 1 - Dec 31	14	10,136
Trapper Creek	Trapper Lake to mouth	Jan 1 - Dec 31	3.2	2,317
Twelvemile Creek	Headwaters to mouth	Jan 1 - Dec 31	1.2	869
Warm Springs Creek	West and East forks to mouth	Jan 1 - Dec 31	20	14,479
Willow Creek	Tendoy Lake to mouth	Jan 1 - Dec 31	16	11,583
Wise River	Mono and Jacobson creeks to mouth	Jan 1 - Dec 31	35	25,339
Wyman Creek	Headwaters to mouth	Jan 1 - Dec 31	7	5,068

Table 1 (cont.)

GALLATIN RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	AMOUNT REQUESTED (af/yr)
Baker Creek	Heeb Lane Bridge to mouth	Jan 1 - Dec 31	14	10,136
Ben Hart Creek	Headwaters to mouth	Jan 1 - Dec 31	29	20,995
Big Bear Creek	Headwaters to mouth	Jan 1 - Dec 31	2	448
Bridger Creek	Headwaters to mouth	Jan 1 - Dec 31	36.6	26,497
Cache Creek	Headwaters to mouth	Jan 1 - Dec 31	2.6	882
EF Hyalite Creek	Heather Lake to Hyalite Reservoir	Jan 1 - Dec 31	7	5,068
East Gallatin River #1	Rocky and Sourdough cks to Bozeman STP outlet	Jan 1 - Dec 31	121.3	87,817
East Gallatin River #2	Bozeman STP outlet to Thompson Spring Creek	Jan 1 - Dec 31	90	65,157
East Gallatin River #3	Thompson Spring Creek to mouth	Jan 1 - Dec 31	170	123,074
Gallatin River #1	Yellowstone NP boundary to WF Gallatin River	Jan 1 - Dec 31	170	123,074
Gallatin River #2	WF Gallatin River to East Gallatin River	Jan 1 - Dec 31	400	289,587
Gallatin River #3	East Gallatin River to mouth	Jan 1 - Dec 31	1,000	723,967
Hell Roaring Creek	NF Hell Roaring Creek to mouth	Jan 1 - Dec 31	16	11,583
Hyalite (Middle) Creek #1	Middle Creek Dam to Middle Creek Ditch intake	Jan 1 - Dec 31	28	20,271
Hyalite (Middle) Creek #2	I-90 bridge near Belgrade to mouth	Jan 1 - Dec 31	16	11,583
MF of the WF Gallatin R.	Headwaters to NF of the WF Gallatin River	Jan 1 - Dec 31	3	2,172
Porcupine Creek	NF Porcupine Creek to mouth	Jan 1 - Dec 31	4.5	3,258
Reese Creek	Bill Smith Creek to mouth	Jan 1 - Dec 31	5	3,620
Rocky Creek	Jackson Creek to Sourdough Creek	Jan 1 - Dec 31	51	36,922
Sourdough (Bozeman) Ck.	Mystic Reservoir to mouth	Jan 1 - Dec 31	35.9	25,990
South Cottonwood Creek	Jim Creek to Hart Ditch headgate	Jan 1 - Dec 31	14	10,136
SF Spanish Creek	Falls Creek to mouth	Jan 1 - Dec 31	15	10,859
SF of the WF Gallatin R.	Headwaters to mouth	Jan 1 - Dec 31	5	3,620
Spanish Creek	North and South forks to mouth	Jan 1 - Dec 31	70	50,678
Squaw Creek	Headwaters to mouth	Jan 1 - Dec 31	12	8,688
Taylor Fork	Tumbledown Creek to mouth	Jan 1 - Dec 31	36	26,063
Thompson Spring Creek	County road crossing in T1N R5E Sec 30 to mouth	Jan 1 - Dec 31	29	20,995
WF Gallatin River	Middle and North forks to mouth	Jan 1 - Dec 31	26	18,823
WF Hyalite Creek	Hyalite Lake to Hyalite Reservoir	Jan 1 - Dec 31	12	8,688

JEFFERSON AND BOULDER RIVER DRAINAGES

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	AMOUNT REQUESTED (af/yr)
Boulder River #1	West and South forks to High Ore Creek	Jan 1 - Dec 31	20	14,479
Boulder River #2	High Ore Creek to Cold Spring	Jan 1 - Dec 31	24	17,375
Boulder River #3	Cold Spring to mouth	Jan 1 - Dec 31	47	34,026
Halfway Creek	Headwaters to canyon	Jan 1 - Dec 31	1.9	1,376
Hells Canyon Creek	Headwaters to mouth	Jan 1 - Dec 31	3.6	2,606
Jefferson River	Headwaters to Madison River	Jan 1 - Dec 31	1,100	796,363
Little Boulder River	Moose Creek to mouth	Jan 1 - Dec 31	7	5,068
North Willow Creek	Hollow Top Lake to mouth	Jan 1 - Dec 31	7	5,068
South Boulder River	Curly Creek to mouth	Jan 1 - Dec 31	12	8,688
South Willow Creek	Granite Lake to mouth	Jan 1 - Dec 31	14	10,136
Whitetail Creek	Whitetail Reservoir to mouth	Jan 1 - Dec 31	3	2,172
Willow Creek	North and South Willow creeks to mouth	Jan 1 - Dec 31	14	10,136
Willow Spring Creek	Headwaters to mouth	Jan 1 - Dec 31	9.2	6,660

MADISON RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	AMOUNT REQUESTED (af/yr)
Antelope Creek	Headwaters to mouth	Jan 1 - Dec 31	14	10,136
Beaver Creek	Wyethia Creek to Earthquake Lake	Jan 1 - Dec 31	937	42,280
Black Sand Spring Creek	Black Sand Spring to SF Madison River	Jan 1 - Dec 31	18.7	13,538
Blaine Spring Creek	Ennis National Fish Hatchery to mouth	Jan 1 - Dec 31	23	16,651
Cabin Creek	Gully Creek to Madison River	Jan 1 - Dec 31	585	36,741
Cherry Creek	Headwaters to mouth	Jan 1 - Dec 31	15	10,859
Cougar Creek	Yellowstone NP boundary to mouth	Jan 1 - Dec 31	24	17,375

Table 1 (cont.)

MADISON RIVER DRAINAGE (continued)

Duck Creek	Yellowstone NP boundary to Hebgen Reservoir	Jan 1 - Dec 31	23	16,651
Elk River	Headwaters to mouth	Jan 1 - Dec 31	28	20,271
Grayling Creek	Yellowstone NP boundary to Hebgen Reservoir	Jan 1 - Dec 31	34	24,615
Hot Springs Creek	North and Middle forks to mouth	Jan 1 - Dec 31	5.5	3,982
Indian Creek	Raw Liver Creek to mouth	Jan 1 - Dec 31	48	34,750
Jack Creek	Lone Creek to mouth	Jan 1 - Dec 31	28	20,271
Madison River #1	Yellowstone NP boundary to Hebgen Reservoir	Jan 1 - Dec 31	500	361,983
Madison River #2	Hebgen Dam to West Fork	Jan 1 - Dec 31	800	579,173
Madison River #3	West Fork to Ennis Reservoir	Jan 1 - Dec 31	1,000	723,967
Madison River #4	Ennis Dam to mouth	Jan 1 - Dec 31	1,300	941,157
Moore Creek	Fletcher Creek to mouth	Jan 1 - Dec 31	1.4	1,014
North Meadow Creek	Headwaters to mouth	Jan 1 - Dec 31	18	13,031
O'Dell Creek	Headwaters to mouth	Jan 1 - Dec 31	98	70,949
Red Canyon Creek	Headwaters to Hebgen Reservoir	Jan 1 - Dec 31	2.9	2,100
Ruby Creek	Beartrap Canyon to mouth	Jan 1 - Dec 31	18	13,031
SF Madison River	Dry Canyon to Hebgen Reservoir	Jan 1 - Dec 31	92	66,605
Squaw Creek	North Fork to mouth	Jan 1 - Dec 31	14	10,136
Standard Creek	Headwaters to mouth	Jan 1 - Dec 31	10	7,240
Trapper Creek	Headwaters to Hebgen Reservoir	Jan 1 - Dec 31	3.2	2,317
Watkins Creek	Coffin Creek to Hebgen Reservoir	Jan 1 - Dec 31	5.5	3,982
WF Madison River	Fox Creek to mouth	Jan 1 - Dec 31	957	66,533

RED ROCK-BEAVERHEAD DRAINAGE

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af/yr)
Bear Creek	Headwaters to BLM boundary	Jan 1 - Dec 31	6.5	4,706
Beaverhead River #1	Clark Canyon to East Bench Div Dam at Barretts	Jan 1 - Dec 31	200	144,793
Beaverhead River #2	East Bench Diversion Dam at Barretts to mouth	Jan 1 - Dec 31	200	144,793
Big Sheep Creek	Cabin and Nicholia creeks to mouth	Jan 1 - Dec 31	48	34,750
Black Canyon Creek	Headwaters to mouth	Jan 1 - Dec 31	2.5	1,810
Blacktail Deer Creek	MF and WF to uppermost existing diversion point in SENENE Section 29 T8S R8W	Jan 1 - Dec 31	42	30,407
Bloody Dick Creek	Swift Lake outlet to mouth	Jan 1 - Dec 31	20	14,479
Browns Canyon Creek	Headwaters to mouth	Jan 1 - Dec 31	2.3	1,665
Cabin Creek	Headwaters to mouth	Jan 1 - Dec 31	0.4	290
Corral Creek	Headwaters to mouth	Jan 1 - Dec 31	6	4,344
Deadman Creek	Deadman Lake to mouth	Jan 1 - Dec 31	4.5	3,258
EF Blacktail Deer Creek	Headwaters to mouth	Jan 1 - Dec 31	18	13,031
EF Clover Creek	Headwaters to mouth	Jan 1 - Dec 31	4.4	3,185
EF Dyce Creek	Headwaters to mouth	Jan 1 - Dec 31	1.4	1,014
Frying Pan Creek	Headwaters to mouth	Jan 1 - Dec 31	1.6	1,158
Grasshopper Creek	Blue Creek to mouth	Jan 1 - Dec 31	30	21,719
Hell Roaring Creek	Headwaters to mouth	Jan 1 - Dec 31	15	10,859
Horse Prairie Creek	Headwaters to mouth	Jan 1 - Dec 31	36	26,063
Indian Creek	Headwaters to mouth	Jan 1 - Dec 31	0.2	145
Jones Creek	Headwaters to Lakeview Road crossing	Jan 1 - Dec 31	1.9	1,376
Long Creek	Jones Creek to mouth	Jan 1 - Dec 31	3.4	2,461
Medicine Lodge Creek	Bear Canyon to mouth	Jan 1 - Dec 31	10	7,240
Narrows Creek	Spring in T13S R1E Sec18A to Elk Lake	May 1 - July 15	1.2	869
		July 16 - April 30	0.5	362
Odell Creek	Headwaters to Lower Red Rock Lake	Jan 1 - Dec 31	11	7,964
Peet Creek	Headwaters to reservoir in T14S R4W Sec34A	Jan 1 - Dec 31	0.9	652
Poindexter Slough	Springs & canal T8S R9W Sec3,SW to Beaverhead	Jan 1 - Dec 31	57.9	41,918
Rape Creek	Headwaters to reservoir in T10S R13W Sec4	Jan 1 - Dec 31	0.4	290
Red Rock Creek	Headwaters to Upper Red Rock Lake	Jan 1 - Dec 31	15	10,859
Red Rock River #1	Dam at Lower Red Rock Lake to Lima Reservoir	Jan 1 - Dec 31	55	39,818
Red Rock River #2	Lima Dam to Clark Canyon Reservoir	Jan 1 - Dec 31	60	43,438
Reservoir Creek	Headwaters to mouth	Jan 1 - Dec 31	1.5	1,086
Shenon Creek	Headwaters to BLM boundary in T10S R14W Sec25	Jan 1 - Dec 31	0.4	290
Simpson Creek	Headwaters to mouth	Jan 1 - Dec 31	0.7	507
Tom Creek	Headwaters to Upper Red Rock Lake	Jan 1 - Dec 31	1.4	1,014
Trapper Creek	Headwaters to mouth	Jan 1 - Dec 31	0.7	507
WF Blacktail Deer Creek	Grays and South forks to mouth	Jan 1 - Dec 31	3	2,172
WF Dyce Creek	Headwaters to mouth	Jan 1 - Dec 31	0.7	507

RUBY RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af/yr)
Coal Creek	Headwaters to mouth	Jan 1 - Dec 31	3.6	2,606
Cottonwood Creek	Geyser Creek to mouth	Jan 1 - Dec 31	4	2,896
EF Ruby River	Headwaters to mouth	Jan 1 - Dec 31	3	2,172
MF Ruby River	Divide Creek to mouth	Jan 1 - Dec 31	5	3,620
Mill Creek	Outlet of Branham Lake to mouth	Jan 1 - Dec 31	10	7,240
NF Greenhorn Creek	Headwaters to mouth	Jan 1 - Dec 31	3.5	2,534
Ruby River #1	East, Middle, and West forks to Ruby Reservoir	Jan 1 - Dec 31	102	73,845
Ruby River #2	Ruby Dam to mouth	Jan 1 - Dec 31	40	28,959
Warm Springs Creek	Romy Lake outlet to mouth	Jan 1 - Dec 31	48.5	35,112
WF Ruby River	Headwaters to mouth	Jan 1 - Dec 31	3.0	2,172
Wisconsin Creek	Crystal Lake outlet to mouth	Jan 1 - Dec 31	12	8,688

UPPER MISSOURI SUBBASIN

UPPER MISSOURI RIVER AND TRIBUTARIES

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af)	(af/yr)
Avalanche Creek	Cooney Gulch to Canyon Ferry Reservoir	Jan 1 - Dec 31	5	3,620	
Beaver Creek	Headwaters in Elkhorn Mts to Canyon Ferry Reservoir	Jan 1 - Dec 31	2.8	2,027	
Beaver Creek	Headwaters in Big Belt Mts to mouth	Jan 1 - Dec 31	10.0	7,240	
Canyon Creek	Headwaters to mouth	Jan 1 - Dec 31	10.0	7,240	
Confederate Gulch	Debauch Gulch to mouth	Jan 1 - Dec 31	5	3,620	
Cottonwood Creek	Headwaters to mouth	Jan 1 - Dec 31	1.0	724	
Crow Creek	Tizer and Wilson Creeks to Williams Ditch intake	Jan 1 - Dec 31	11	7,964	
Deep Creek	Castle Fork to Missouri River	Jan 1 - Dec 31	9	6,516	
Dry Creek	Headwaters to Broadwater Missouri Canal	Jan 1 - Dec 31	1.8	1,303	
Duck Creek	Headwaters to Canyon Ferry Res.	Jan 1 - Dec 31	8	5,792	
Little Prickly Pear Ck. #1	Canyon Creek to Clark Creek	Jan 1 - Dec 31	22	15,927	15,927
Little Prickly Pear Ck. #2	Clark Creek to mouth	Jan 1 - Dec 31	70	50,678	50,678
Lyons Creek	Headwaters to mouth	Jan 1 - Dec 31	10.0	7,240	7,240
McGuire Creek	Headwaters to mouth	May 1 - Nov 30	8.3	3,523	
		Dec 1 - Apr 30	4.7	1,408	4,931
Missouri River #1	Jefferson and Madison rivers to Canyon Ferry Res.	Jan 1 - Dec 31	2,400	1,737,520	1,737,520
Missouri River #2	Hauser Dam to Holter Reservoir	Oct 15 - Dec 15	4,878	599,873	
		Dec 16 - Mar 15	3,000	535,537	
		Mar 16 - Apr 30	5,316	485,030	
		May 1 - June 30	7,890	954,624	
		July 1 - Oct 14	3,500	735,867	3,310,931
Missouri River #3	Holter Dam to Great Falls	May 19 - July 5	6,398	609,132	
		July 6 - May 18	4,100	2,577,916	3,187,048
Prickly Pear Creek #1	Rabbit Gulch to Hwy 12 bridge in East Helena	Jan 1 - Dec 31	22	15,927	15,927
Prickly Pear Creek #2	Hwy 12 bridge in East Helena to Lake Helena	Jan 1 - Dec 31	30	21,719	21,719
Sevenmile Creek	Greenhorn Creek and Skelly Gulch to mouth	Jan 1 - Dec 31	1.0	724	724
Sheep Creek	Headwaters to mouth	Jan 1 - Dec 31	35	25,339	25,339
Silver Creek	Helena Valley Irrigation Canal to mouth	May 1 - Nov 30	13.0	5,518	
		Dec 1 - Apr 30	5.4	1,617	7,135
Sixteenmile Creek	Billy Creek to mouth	Jan 1 - Dec 31	20	14,479	14,479
Spokane Creek	Helena Valley Irr. Canal to mouth	May 1 - Nov 30	4.0	1,698	
		Dec 1 - Apr 30	3.0	898	2,596
Stickney Creek	North and South forks to mouth	Apr 1 - Apr 30	7	417	
		May 1 - May 31	34	2,091	
		June 1 - June 30	35	2,083	
		July 1 - July 31	7	430	5,021
Tenmile Creek	Headwaters to mouth	Jan 1 - Dec 31	12.0	8,688	8,688
Trout Creek	Springs near Vigilante Campground to mouth	Jan 1 - Dec 31	15.0	10,860	10,860
Virginia Creek	Headwaters to mouth	Jan 1 - Dec 31	6.0	4,344	4,344
Wegner Creek	Headwaters to mouth	Apr 1 - Apr 30	8	476	
		May 1 - May 31	41	2,521	
		June 1 - June 30	38	2,261	
		July 1 - July 31	8	492	5,750
Willow Creek	Headwaters to mouth	Jan 1 - Dec 31	3.5	2,534	2,534
Wolf Creek	Headwaters to mouth	Jan 1 - Dec 31	7.0	5,068	5,068

Table 1 (cont.)

DEARBORN RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af)	(af/yr)
Dearborn River	Headwaters to mouth	Jan 1 - Dec 31	110	79,636	79,636
Flat Creek	Headwaters to mouth	Jan 1 - Dec 31	7.5	5,430	5,430
MF Dearborn River	Headwaters to mouth	Jan 1 - Dec 31	9.5	6,878	6,878
SF Dearborn River	Headwaters to mouth	Jan 1 - Dec 31	11.5	8,326	8,326

SMITH RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af)	(af/yr)
Big Birch Creek	Headwaters to mouth	Jan 1 - Dec 31	11	7,964	7,964
Eagle Creek	Headwaters to mouth	Jan 1 - Dec 31	2.5	1,810	1,810
Hound Creek	EF Hound Creek and Middle Creek to mouth	Jan 1 - Dec 31	35	25,339	25,339
Newlan Creek	Headwaters to mouth	Jan 1 - Dec 31	3.8	2,751	2,751
NF Deep Creek	Headwaters to rock cascades	Jan 1 - Dec 31	1.0	724	724
NF Smith River	Headwaters to mouth	Jan 1 - Dec 31	9	6,516	6,516
Rock Creek	Headwaters to mouth	Jan 1 - Dec 31	11	7,964	7,964
Sheep Creek	Headwaters of South Fork to mouth	Jan 1 - Dec 31	22	15,927	15,927
Smith River #1	North and South Forks Sheep Creek	Jan 1 - Dec 31	90	65,157	65,157
Smith River #2	Sheep Creek to Hound Creek	Jan 1 - Dec 31	150	108,595	108,595
Smith River #3	Hound Creek to mouth	Jan 1 - Dec 31	80	57,917	57,917
SF Smith River	Headwaters to mouth	Jan 1 - Dec 31	7	5,068	5,068
Tenderfoot Creek	Headwaters to mouth	Jan 1 - Dec 31	15	10,859	10,859

SUN RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af)	(af/yr)
Elk Creek	Headwaters to mouth	Jan 1 - Dec 31	16	11,583	11,583
Ford Creek	Headwaters to mouth	Jan 1 - Dec 31	12	8,688	8,688
NF Willow Creek	Headwaters to mouth	Jan 1 - Dec 31	3.0	2,172	2,172
Sun River #1	Diversion Dam to Elk Creek	Jan 1 - Dec 31	100	72,397	72,397
Sun River #2	Elk Creek to mouth	Jan 1 - Dec 31	130	94,116	94,116
Willow Creek	Headwaters to mouth	Jan 1 - Dec 31	3	2,172	2,172

BELT CREEK DRAINAGE

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af)	(af/yr)
Belt Creek #1	Headwaters to Big Otter Creek	Jan 1 - Dec 31	90	65,157	65,157
Belt Creek #2	Big Otter Creek to Missouri River	Jan 1 - Dec 31	35	25,339	25,339
Big Otter Creek	Whiskey Spring Coulee to Belt Creek	Jan 1 - Dec 31	5	3,620	3,620
Dry Fork Belt Creek	Galena and Oti Park Creek to Belt Creek	Jan 1 - Dec 31	7	5,068	5,068
Logging Creek	Headwaters to Belt Creek	Jan 1 - Dec 31	6	4,344	4,344
Pilgrim Creek	Headwaters to Belt Creek	Jan 1 - Dec 31	8	5,792	5,792
Tillinghast Creek	Headwaters to Belt Creek	Jan 1 - Dec 31	5.5	3,982	3,982

MIDDLE MISSOURI SUBBASIN

MIDDLE MISSOURI RIVER AND TRIBUTARIES

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af)	(af/yr)
Cow Creek	NF and SF to County bridge	Jan 1 - Dec 31	4.5	3,258	[illegible]
Highwood Creek	Headwaters to Hwy 228 Bridge at Highwood	Jan 1 - Dec 31	10	7,240	[illegible]
Missouri River #4	Great Falls to Maris River	Mar 15 - May 18	4,887	630,059	
		May 19 - July 5	11,284	1,074,311	
		July 6 - Aug 31	4,500	508,760	
		Sep 1 - Mar 14	3,700	1,431,075	3,64[illegible]
Missouri River #5	Marias River to Judith River	Mar 15 - May 18	5,571	718,244	
		May 19 - July 5	14,000	1,332,892	
		July 6 - Aug 31	5,400	610,512	
		Sep 1 - Mar 14	4,300	1,663,140	4,32[illegible]
Missouri River #6	Judith River to upper end of Fort Peck Reservoir	Mar 15 - May 18	7,100	915,371	
		May 19 - July 5	15,302	1,456,851	
		July 6 - Aug 31	5,800	655,735	
		Sep 1 - Mar 14	4,700	1,817,850	4,84[illegible]
Shonkin Creek	Forest boundary to town of Shonkin	Jan 1 - Dec 31	7	5,068	[illegible]

FORT PECK RESERVOIR TRIBUTARIES

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af)	(af/yr)
Big Dry Creek	Hwy 200 bridge to mouth	Mar 15 - Mar 31	300	9,521	
		Apr 1 - Apr 30	100	5,950	
		May 1 - May 31	35	2,152	
		June 1 - Oct 31	5.5	1,669	9 292
Little Dry Creek	Whiteside ranch house to Big Dry Creek	Mar 15 - Mar 31	110	3,491	
		Apr 1 - Apr 30	42	2,499	
		May 1 - May 31	17	1,045	
		June 1 - Oct 31	3.5	1,062	8 097

JUDITH RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af)	(af/yr)
Beaver Creek	West Fork to Cottonwood Creek	Jan 1 - Dec 31	5	3,620	3 620
Big Spring Creek #1	Fish hatchery to Cottonwood Creek	Jan 1 - Dec 31	110	79,636	9 636
Big Spring Creek #2	Cottonwood Creek to mouth	Jan 1 - Dec 31	100	72,397	2 397
Cottonwood Creek	Spring Branch of Cottonwood Ck. to Big Spring Ck.	Jan 1 - Dec 31	4.5	3,258	3 258
East Fork Big Spring Ck.	Headwaters to Big Spring Creek	Jan 1 - Dec 31	7.5	5,430	5 430
Judith River #1	SF and MF to Big Spring Creek	Jan 1 - Dec 31	25	18,099	8 099
Judith River #2	Big Spring Creek to Missouri River	Jan 1 - Dec 31	160	115,835	1 5 835
Lost Fork Judith River	SF and WF to MF Judith River	Jan 1 - Dec 31	14	10,136	0 136
Middle Fork Judith River	Headwaters to South Fork	Jan 1 - Dec 31	22	15,928	5 928
South Fork Judith River	Headwaters to Middle Fork	Jan 1 - Dec 31	3.5	2,534	2 534
Warm Spring Creek	Springs to Judith River	Jan 1 - Dec 31	110	79,636	9 636
Yogo Creek	Headwaters to MF Judith River	Jan 1 - Dec 31	3	2,172	2 172

Table 1 (cont.)

MUSSELSHELL RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af)	(af/yr)
Alabaugh Creek	Headwaters to mouth	Jan 1 - Dec 31	12	8,688	8,688
American Fork Creek	South Fork to mouth	Jan 1 - Dec 31	5.5	3,982	3,982
Big Elk Creek	Origin at Lebo Fork to mouth	Jan 1 - Dec 31	9.5	6,878	6,878
Careless Creek	Headwaters to Roberts Creek	Jan 1 - Dec 31	2	1,448	1,448
Checkerboard Creek	East and West Forks to mouth	Jan 1 - Dec 31	6	4,344	4,344
Collar Gulch Creek	Headwaters to mouth	Jan 1 - Dec 31	0.6	434	434
Cottonwood Creek	WF, MF, and Loco Creek to mouth	Jan 1 - Dec 31	16	11,583	11,583
Flatwillow Creek	NF and SF to Petrolia Reservoir	Jan 1 - Dec 31	18	13,031	13,031
Musselshell River #1	NF and SF to Deadmans Basin Div	Jan 1 - Dec 31	80	57,917	57,917
Musselshell River #2	Deadmans Basin Div to Musselshell Div	Jan 1 - Dec 31	80	57,917	57,917
Musselshell River #3	Musselshell Diversion Dam at town of Musselshell to mouth	Jan 1 - Dec 31	70	50,678	50,678
NF Musselshell #1	Headwaters to Bair Reservoir	Jan 1 - Dec 31	3	2,172	2,172
NF Musselshell #2	Bair Reservoir to SF Musselshell R.	Jan 1 - Dec 31	16	11,583	11,583
SF Musselshell	Headwaters to North Fork	Jan 1 - Dec 31	30	21,719	21,719
Spring Creek	Headwaters to mouth	Jan 1 - Dec 31	8	5,792	5,792
Swimming Woman Ck.	Headwaters to Cty road crossing 8 linear miles upstream from mouth	Jan 1 - Dec 31	2.5	1,810	1,810

MARIAS/TETON SUBBASIN

MARIAS RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af)	(af/yr)
Badger Creek	N and S Badger creeks to Forest/ Blackfeet Reservation Boundary	Jan 1 - Dec 31	60	43,438	43,438
Birch Creek	Swift Reservoir to Hwy 358	Jan 1 - Dec 31	64	46,334	46,334
Cut Bank Creek	Blackfeet Reservation boundary to mouth	Jan 1 - Dec 31	75	54,297	54,297
Dupuyer Creek	Headwaters to mouth	Jan 1 - Dec 31	12	8,688	8,688
Marias River #1	Two Medicine River and Cut Bank Creek to head of Tiber Reservoir	Jan 1 - Dec 31	200	144,793	144,793
Marias River #2	Tiber Dam to Circle Bridge (Hwy 223)	Jan 1 - Dec 31	500	361,983	361,983
Marias River #3	Circle Bridge (Hwy 223) to mouth	Jan 1 - Dec 31	560	405,421	405,421
North Badger Creek	Headwaters to mouth	Jan 1 - Dec 31	14	10,136	10,136
NF Dupuyer Creek	Headwaters to mouth	Jan 1 - Dec 31	12	8,688	8,688
South Badger Creek	Headwaters to mouth	Jan 1 - Dec 31	40	28,959	28,959
SF Dupuyer Creek	Headwaters to mouth	Jan 1 - Dec 31	6	4,344	4,344
SF Two Medicine River	Headwaters to Forest/ Blackfeet Reservation Boundary	Jan 1 - Dec 31	16	11,583	11,583

TETON RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af)	(af/yr)
Deep Creek	Headwaters to mouth	Jan 1 - Dec 31	18	13,031	13,031
McDonald Creek	Headwaters to mouth	Jan 1 - Dec 31	10	7,240	7,240
NF Deep Creek	Headwaters to mouth	Jan 1 - Dec 31	7.2	5,212	5,212
SF Deep Creek	Headwaters to mouth	Jan 1 - Dec 31	6.9	4,995	4,995
Spring Creek	Headwaters to mouth	Jan 1 - Dec 31	4.5	3,258	3,258
Teton River	Headwaters to discharge from Priest Butte Lake	Jan 1 - Dec 31	35	25,339	25,339

LAKES AND SWAMPS

STREAM	REACH DESCRIPTION	DATES REQUESTED	AMOUNT REQUESTED (cfs)	(af)	(af/yr)
Bean Lake	Sec. 18C and 19B, T18N, R6W, Sec. 13D and 24A, T18N, R7W	Jan 1 - Dec 31	—	2,649	2,649
Antelope Butte Swamp	North 1/2 Sec. 28, T26N, R8W	Jan 1 - Dec 31	—	460	460

4. The instream reservations are for the benefit of the public for fish, wildlife and recreational uses. (Bd. Exh. 37-A.1, p. 1-5; DFWP Exh. 10, Graham Dir., p. 2; DFWP Exh. 17, Spence Dir., pp. 4 and 5.)

5. A purpose of the reservations is to preserve the riparian habitats of fish and wildlife populations at the present levels by protecting the quantity and quality of the water. (Bd. Exh. 37-A.1, pp. 1-2 and 1-5; DFWP Exh. 10, Graham Dir., pp. 2 and 3; DFWP Exh. 17, Spence Dir., pp. 4 thru 6.)

6. By preserving the fish and wildlife habitats, the instream reservations will protect the diversity of fish and wildlife species comprising the riparian natural resource in the Missouri River Basin above Fort Peck Dam. Fish and wildlife populations and their habitats are inseparable. (Bd. Exh. 37-A.1, pp. 1-2 and 1-5; DFWP Exh. 10, Graham Dir., p. 2; DFWP Exh. 17, Spence Dir., pp. 4 and 5.)

7. A purpose of the instream reservations is to contribute to, and maintain, a clean, healthful and desirable environment and to protect the environmental life support systems of the stream and river systems from degradation. (Bd. Exh. 37-A.1, pp. 1-2 thru 1-5; DFWP Exh. 10, Graham Dir., p. 2; DFWP Exh. 17, Spence Dir., pp. 4 thru 6.)

8. A purpose of the reservations is to help maintain water quality. (Bd. Exh. 37-A.1, pp. 1-3 and 1-5; DFWP Exh. 10, Graham Dir., pp. 7 and 8.)

9. A purpose of the reservations is to provide optimum opportunities for diverse outdoor recreation that are commensurate with the resource protection provided by instream reservations, including simply enjoying or knowing of the existence of a healthy ecosystem. (Bd. Exh. 37-A.1, pp. 1-3 thru 1-5; DFWP Exh. 17, Spence Dir., pp. 4 and 5.)

10. A purpose of the reservations is to help sustain adequate levels of water quality to protect fish and wildlife habitat. (Bd. 37-A.1, p. 1-5; DFWP Exh. 10, Graham Dir., pp. 2,3,7,and 11; DFWI Exh. 17, Spence Dir., pp. 5 and 6.)

C. <u>FINDINGS ON THE NEED FOR THE WATER RESERVATION APPLIED FOR B' DFWP (Mont. Code Ann. § 85-2-316(4)(a)(ii)(1991); ARI 36.16.107B(2).</u>

11. An instream flow for fish, wildlife, and recreationa purposes cannot be obtained through a water use permit. (Bd. Exh 40, p. 22; Bd. Exh. 37-A.1, p. 1-6; DFWP Exh. 17, Spence Dir., p 5.)

12. The temporary water leasing statutes (Sections 85-2-436 and 437, MCA) provide for the temporary leasing of consumptive water rights for instream purposes to supplement existing flows, but do not allocate unused water and do not provide an opportunity to preserve the status quo where fisheries values are significant, as reservations would. Water leases are applicable to specific problem areas where the considerable cost of leasing water is justified. (DFWP Exh. 10, Graham Dir., p. 4; DFWP Exh. 17, Spence Dir., p. 5.)

13. Based on past experience, stream flows will continue to be depleted, increasing the annual occurrence of critically low flows if minimum instream flows are not protected. (Bd. Exh. 40, Appendix A; Bd. Exh. 37-A.1, pp. 1-6; DFWP Exh. 10, Graham Dir., p. 11.)

14. Instream flows of water in the Missouri basin are needed to meet the basic life requirements of the fish, wildlife, and other living organisms that are dependent upon the flow of the Missouri River and its tributaries. (Bd. Exh. 37-A.1, p. 1-6; DFWP Exh. 10, Graham Dir., p. 10; DFWP Exh. 17, Spence Dir., pp. 4 and 5.)

15. Sufficient instream flows are essential for maintaining viable fish populations at levels commensurate with the stream's biological capabilities. Flow primarily regulates fish abundance through its impact on fish habitat. Fish inhabiting a stream occupy specific habitats which are comprised of many components, which are all created by sufficient stream flows. (Bd. Exh. 37-A.1, pp. 1-6 and 1-7; DFWP Exh. 17, Spence Dir., pp 5.)

16. Instream flows will help preserve the reproductive capacity of streams and rivers for fish. Stream riffles and side channels are typically the prime sites chosen for spawning and the rearing of young. These sites are also the stream habitats that are most sensitive to flow reductions. Consequently, the production of the young recruits that are needed to sustain stream fisheries is strongly tied to the magnitude of the flows necessary to maintain riffle and side channel habitat. (Bd. Exh. 37-A.1, pp. 1-7; DFWP Exh. 17, Spence Dir., p. 5.)

17. Instream flows are necessary to protect the food base for fish. All aquatic organisms, including game fish, depend on some lower form of plant or animal for food. These lower life forms have specific water requirements necessary to sustain their growth and reproduction. The primary food of Montana stream-dwelling gamefish is aquatic invertebrates which have their greatest production in stream riffles. Riffles are highly sensitive to stream flow reductions. Therefore, the health and well being of game fish populations and, in turn, the quality of the angling experience depend on the maintenance of sufficient riffle habitat

to protect the fishes food base. (Bd. Exh. 37-A.1, p. 1-7; DFWI Exh. 10, Graham Dir., p. 2; DFWP Exh. 17, Spence Dir., pp. 5 anc 6.)

18. Instream flows will help protect the quality of wate that is necessary to sustain aquatic organisms and will hel prevent the further deterioration of water quality during low flo periods. Possible consequences of further lowering streamflow during normal low flow periods are higher water temperatures increased amounts of dissolved solids, increased nutrien concentrations and lower dissolved oxygen levels, all of which ar potentially harmful to aquatic life. (Bd. Exh. 37-A.1, pp. 1-7 anc 1-8; DFWP Exh. 10, Graham Dir., pp. 2,7 and 8; DFWP Exh. 17 Spence, p. 6.)

19. Instream flows will help preserve the Missouri River an its tributaries as important fishing and recreational areas used b the people of Montana and other states. Approximately one-half o the fishing pressure which occurs in the entire state occurs in th Missouri River basin upstream from Fort Peck Dam. The area i popular for its recreational opportunities and portions of th basin's fisheries values are of outstanding quality. Recreationa use of the Missouri basin's water is important to the huma experience, providing both enjoyment and relief from day-to-da pressures. (Bd. Exh. 37-A.1, p. 1-8; DFWP Exh. 10, Graham Dir., p 10; DFWP Exh. 17, Spence Dir., p. 4; DFWP Exh. 37, Knudson Dir. pp. 3 - 8.)

20. Conservation of native fish species by sustaining thei habitat reduces the potential for the species to become listed a threatened and endangered. (DFWP Exh. 10, Graham Dir., p. 10.)

21. Instream flows will help preserve the Missouri basin' nationally acclaimed sport fisheries which provide a significan part of Montana's economy. In 1989, Montana ranked fifth in th nation in the number of nonresident fishing licenses sold. Trou anglers spent about $50 million in 1985 fishing the waters of th Missouri River Basin above Fort Peck Dam. The net economic valu of fishing alone in the basin was over $61.5 million in 1985. Th total economic value of streams in the basin would be significantly higher than the amount for fishing alone if other recreationa benefits were included, such as floating, camping, picnicking swimming, bird watching, sightseeing and hunting. These are al popular recreational activities conducted along the Missouri Rive and its tributaries. (Bd. Exh. 37-A.1, pp. I-9 and I-10; DFWP Exh 10, Graham Dir., pp. 10 and 11.)

22. The travel industry adds millions of dollars to th state's economy each year and provides jobs for thousands o Montanans. Without the quality fishing opportunities provided b the Missouri River basin, Montana's tourist industry, a majo contributor to the state's economy, would suffer. Angling-relate

revenues depend on the maintenance of sufficient flows to protect the abundant fish resources that characterize Montana. Continued flow depletions will degrade some of the very resources that draw tourists to Montana. (Bd. Exh. 37-A.1, pp. I-9 and I-10; DFWP Exh. 10, Graham Dir., p. 10.)

23. Instream flows are needed to preserve a flow for instream values by protecting the status quo of stream and river flows up to the minimum flows necessary to provide a healthy fishery.

24. On the following guaged streams DFWP applied for an instream reservation that exceeds one-half or 50% of the average annual flow. The one-half annual flow is applied to the following streams or reaches. (Bd. Exh. 40, DEIS, pp. 135-152 and Bd. Exh. 40, FEIS, p 58.)

Stream or Reach	50% Annual Flow (cfs)
Gallatin River Drainage	
Gallatin River #3	533.5
Madison River Drainage	
Jack Creek	24.0
Madison River #1	245.0
Madison River #2	502.5
Madison River #3	716.0
Madison River #4	825.0
Jefferson River Drainage	
Jefferson River	1,095.5
Big Hole River Drainage	
Big Hole River #3	573.0
Ruby River Drainage	
Ruby River #1	90.0
Red Rock-Beaverhead River Drainages	
Big Sheep Creek	32.5
Blacktail Deer Creek	27.0
Grasshopper Creek	25.8
Upper Missouri River Drainage	
Missouri River #2	2,881.0
Tenmile Creek	12.0
Middle Missouri River & Tributaries	
Missouri River #3	3,327.0
Smith River Drainage	
Smith River #1	78.5

Marias River Drainage	
Marias River #2	419.5
Marias River #3	488.5
Middle Missouri River & Tributaries	
Missouri River #4	3,876.0
Missouri River #5	4,280.0
Missouri River #6	4,652.0
Judith River Drainage	
Big Spring Creek #1	53.5
Flatwillow Creek	15.0

25. About 2,739 streams in the Missouri River Basin above Fort Peck Dam support a fishery or have the potential for a fishery. The streams in DFWP's application include those with the more significant fishery values in the basin. (DFWP Exh. 17, Spence Dir., p. 13; Nelson Cross, Tr. Day 4, pp. 37 and 38.)

26. The Gallatin River is nationally recognized for its outstanding wild trout fishery. In 1989, the river supported over 65,000 angler-days of use. (DFWP Exh. 22, Nelson Dir., p. 25.)

27. Reach #1 of the Gallatin River, from the Yellowstone National Park boundary to the confluence of the West Fork Gallatin River, supports an abundance of pan-sized rainbow trout in the 7-10 inch class and a few brown trout up to 18 inches. (Bd. Exh. 37-A.2, p. 2-481.)

28. Rainbow trout from 10-14 inches and brown trout in the 12-17 inch class are the mainstay of the fishery in Reach #2 of the Gallatin River (from the confluence of the West Fork Gallatin River to the confluence of the East Gallatin River). (Bd. Exh. 37-A.2, p. 2-484.)

29. Reach #3 of the Gallatin River, from the confluence of the East Gallatin River to the river's mouth, is noted for the presence of larger-size brown and rainbow trout, some reaching trophy proportions. (DFWP Exh. 22, Nelson Dir., pp. 25 and 26.)

30. Cache, Hell Roaring, Porcupine, S.F. Spanish, Spanish, and Squaw Creeks, the Taylor Fork, and the West Fork Gallatin River and its Middle and South forks drain the high peaks of the Gallatin National Forest and feed the canyon stretch of the Gallatin River. These are the most important stream fisheries in the Gallatin Canyon. Rainbow trout are the most abundant species in eight streams, brook trout dominate in one (S.F. Spanish Creek), while genetically impure cutthroat trout are most numerous in Cache Creek. (DFWP Exh. 22, Nelson Dir., p. 26.) As to the Middle Fork of the West Fork of the Gallatin River when compared with similar streams its trout population is only fair. (Bd. Exh. 37-A.2, p. 2-501.) As to the South Fork of the West Fork of the Gallatin River

electro-fishing results show fewer fish than other similar streams. (Bd. Exh. 37-A.2, p. 2-504.)

31. South Cottonwood and Big Bear creeks support rainbow, brook and a few cutthroat trout in their mountain headwaters in the Gallatin National Forest. Upper South Cottonwood Creek is one of the Gallatin's outstanding small stream fisheries. (DFWP Exh. 22, Nelson Dir., p. 26.) However, the fishery of Big Bear Creek is substantially lower than expected for a mountain stream of its size. (Bd. Exh. 37-A.2, p. 2-526 and Table 2-151.)

32. Baker Creek has spring creek-like qualities. High numbers of larger-size brown trout inhabit the lower creek. During the fall, brown trout from the Gallatin River enter the creek to spawn. (DFWP Exh. 22, Nelson Dir., p. 26.)

33. The East Gallatin River supports robust populations of rainbow and brown trout despite its proximity to the growing urban center of Bozeman. Recent upgrades in Bozeman's sewage treatment plant have allowed the East Gallatin fishery to improve. However, water quality problems persist. (DFWP Exh. 22, Nelson Dir., p. 26.)

34. Reach #1 of the East Gallatin River, from the convergence of Rocky and Sourdough creeks to the Bozeman Sewage Treatment Plant outlet, supports substantial numbers of rainbow trout, which occasionally reach weights of 3-5 pounds, and 1-2 pound brown trout, with an occasional trophy of up to 8-9 pounds. Fish populations are subject to periodic fluctuations, a probable consequence of water quality problems. (Bd. Exh. 37-A.2, pp. 2-570 through 2-572.)

35. Reach #2 of the East Gallatin River, from the Bozeman Sewage Treatment plant outlet to the confluence of Thompson Creek, presently supports substantial numbers of brown and rainbow trout for a river of its size. Rainbow trout as large as 5 pounds are present while brown trout typically reach weights of 2 pounds. Fish populations are subject to periodic fluctuations, a probable consequence of water quality problems. (Bd. Exh. 37-A.2, pp. 2-573 through 2-575.)

36. The trout fishery of Reach #3 of the East Gallatin River (from the confluence of Thompson Creek to the River's mouth), while not the caliber of that in Reaches #1 and #2, is popular with local anglers. Brown trout predominate, followed by rainbow trout and a few brook trout. (Bd. Exh. 37-A.2, p. 2-577.)

37. Sourdough (Bozeman), Rocky and Bridger creeks are, in their own right, notable stream trout fisheries. (Bd. Exh. 37-A.2, pp. 2-536 through 2-546; Nelson Cross, Tr. Day 1, pp. 155 and 156.)

38. The East and West forks of Hyalite Creek, both within the boundaries of the Gallatin National Forest, provide crucial spawning and rearing habitats for the cutthroat and arctic grayling populations in Hyalite Reservoir. (DFWP Exh. 22, Nelson Dir., p. 26.)

39. Ben Hart, Thompson and Reese creeks are spring-fed creeks that are highly valued for their outstanding fisheries for rainbow and brown trout. (DFWP Exh. 22, Nelson Dir., p. 26.)

40. Reach #1 of Hyalite Creek (from Middle Creek Dam to the Middle Creek Ditch intake) supports an abundance of small rainbow trout, making it one of the more valued tributaries in the Gallatin drainage. (Bd. Exh. 37-A.2, p. 2-555.)

41. Reach #2 of Hyalite Creek (from the I-90 bridge near Belgrade to the Creek's mouth) supports low numbers of rainbow, brown and brook trout. Environmental problems have limited the umber of fish in this stream and its fishery value is relatively low. (Bd. Exh. 37-A.2, p. 2-559, and Table 2-160.) All reaches of the Gallatin River and the East and West Forks of Hyalite Creek are noted for their outstanding recreational value. (Bd. Exh. 40, Table H-1.)

42. The Madison River is nationally recognized as a premier wild trout river, supporting over 113,000 angler-days of use annually. (DFWP Exh. 22, Nelson Dir., p. 28.)

43. Reach #1 of the Madison River, which extends from the Yellowstone National Park boundary to Hebgen Reservoir, is noted for its fall fishing, when brown trout leave Hebgen Reservoir for spawning sites in Yellowstone National Park. (DFWP Exh. 22, Nelson Dir., p. 28.)

44. Reach #2 of the Madison River, which extends from Hebgen Dam to the confluence of the West Fork Madison River, and Reach #3, from the West Fork Madison River to Ennis Reservoir, provide nationally acclaimed fishing for resident rainbow and brown trout. The downstream portion of Reach #3 also supports a remnant population of arctic grayling. (DFWP Exh. 22, Nelson Dir., pp. 28 and 29.)

45. Reach #4 of the Madison River, from Ennis Dam to the River's mouth, suffers in summer from solar heating of stored water in Ennis Reservoir. Summer heating affects the growth, survival and catchability of trout in Reach #4. Despite higher than preferred water temperatures, both rainbow and brown trout endure, occasionally reaching densities as high as 6,000 trout per mile in some stretches in some years. Added flow depletions will contribute to the further warming of Reach #4. Summer water temperature increases as little as one or two degrees could prove very detrimental to the fishery. (DFWP Exh. 22, Nelson Dir., p.

28; DFWP Exh. 3, Nelson Obj., pp. 2 through 5; and Bd. Exh. 37-A.2, p. 2-402.)

46. Black Sand Spring, Cougar, Duck, Grayling, Red Canyon, Trapper and Watkins creeks and the South Fork Madison River feed Hebgen Reservoir and provide crucial spawning and rearing habitats for the reservoir's self-sustaining trout populations. (DFWP Exh. 22, Nelson Dir., p. 29.)

47. Beaver and Cabin Creeks and the West Fork Madison River, which enter the upper Madison River, provide habitat for trout and provide spawning and nursery habitat for the rainbow, brown, and cutthroat populations of Earthquake Lake. (Bd. Exh. 37-A.2, pp. 2-431, 2-246 through 2-247.) (DFWP Exh. 22, Nelson Dir., p. 29.)

48. Antelope Creek, which feeds Cliff Lake in the Beaverhead National Forest, is a crucial spawning and rearing site for the lake's self-sustaining rainbow trout and the newly introduced Bear Lake strain of cutthroat trout. (DFWP Exh. 22, Nelson Dir., p. 29.)

49. Blaine Spring and O'Dell creeks are valley floor tributaries that, because of their spring creek nature, hold high numbers of brown and rainbow trout. (DFWP Exh. 22, Nelson Dir., p. 29.)

50. Moore Creek, another valley floor tributary, is a potential spawning stream for the remnant grayling population of Ennis Reservoir and the Madison River "channels". (Exh. 22, Nelson Dir., DFWP p. 29.)

51. Elk River, a tributary to the West Fork Madison River, flows entirely within the Beaverhead National Forest and provides a stream rainbow trout fishery in a wilderness setting. (DFWP Exh. 22, Nelson Dir., p. 29.)

52. Jack, Ruby, Indian, Standard, North Meadow and Squaw Creeks drain mountainous national forest lands surrounding the Madison Valley. All are excellent small stream fisheries. (DFWP Exh. 22, Nelson Dir., p. 30.) Standard Creek maintains a genecically pure poulation of westslope cutthroat trout and may support fluvial artic grayling. (Bd. Exh. 37-A.2, pp. 2-444 to 2-445.)

53. Cherry and Hot Springs Creeks harbor resident populations of rainbow, brown and some brook trout and support spawning runs of brown trout from the Madison River. (DFWP Exh. 22, Nelson Dir., p. 30.)

54. Reaches 2 and 3 of the Madison River are noted for their outstanding recreational value. (Bd. Exh. 40, Table H-1.)

55. Because of summer low water flows, trout densities in the Jefferson River are depressed compared to those in the neighboring Madison and Big Hole rivers. The River's brown trout, which commonly reach weights of 1½-2 pounds, support a spring and fall sport fishery that is locally popular with residents of the Butte-Whitehall area. The River's use amounted to 15,260 angler-days in 1989. (DFWP Exh. 22, Nelson Dir., p. 27 and Nelson Cross, Tr. Day 4, pp. 48, 51, 69, 81, 82 and 83.)

56. The largest and one of the relatively few tributaries contributing flows to the Jefferson River during the summer irrigation season is the Boulder River. (DFWP Exh. 22, Nelson Dir., p. 27.)

57. Reach #1 of the Boulder River (from the convergence of its West and East forks to the confluence of High Ore Creek) provides, the best fishing opportunities on the river. Here, rainbow and brook trout provide a locally important fishery in a small stream setting. (DFWP Exh. 22, Nelson Dir., p. 27.)

58. Populations of trout, now dominated by brown trout, are severely depressed in Reach #2 of the Boulder River (from the confluence of High Ore Creek to Cold Spring). The aquatic environment of Reach #2 of the Boulder River is severely degraded. (DFWP Exh. 22, Nelson Dir., p. 27; Nelson Redirect, Tr. Day 4, pp. 80 and 81; Bd. Exh. 37-A.2, pp. 2-362, 363, and 367.)

59. Spring inflows rejuvenate the lower river, allowing brown trout numbers in Reach #3 of the Boulder River (from the Cold Spring to the river's mouth) to recover to a higher density. A substantial run of brown trout from the Jefferson River enters Reach #3 each fall to spawn. (DFWP Exh. 22, Nelson Dir., p. 27.)

60. The Little Boulder River, a tributary to the Boulder River, supports good numbers of brown, rainbow and brook trout in its lower segment and provides small stream fishing opportunities of local importance. (DFWP Exh. 22, Nelson Dir., p. 27.)

61. North and South Willow creeks, which feed Willow Creek Reservoir, support notable fisheries for resident rainbow and brook trout and provide important spawning and rearing habitats for the self-sustaining rainbow trout population of the reservoir. (DFWP Exh. 22, Nelson Dir., pp. 27 and 28.)

62. Willow Creek, downstream from Willow Creek Reservoir, is a locally renowned rainbow and brown trout fishery. (DFWP Exh. 22, Nelson Dir., p. 28.)

63. The South Boulder River supports a substantial trout population, comprised of rainbow, brook and brown trout. (DFWP Exh. 22, Nelson Dir., p. 28.)

64. Whitetail Creek harbors high numbers of brown trout for a small stream. (DFWP Exh. 22, Nelson Dir., p. 28.)

65. Hells Canyon Creek is one of only two known spawning sites for the rainbow trout population of the Jefferson River. The Creek also supports fairly substantial numbers of resident rainbow trout and rainbow x cutthroat hybrids. (DFWP Exh. 22, Nelson Dir., p. 28.)

66. Willow Spring Creek, a short spring-fed creek on the valley floor, was rehabilitated and successfully developed as a spawning tributary for the Jefferson River's rainbow trout. (DFWP Exh. 22, Nelson Dir., p. 28.)

67. Halfway Creek is the only stream in the Jefferson River Sub-basin that is known to support a genetically pure population of westslope cutthroat trout. (Bd. Exh. 37-A.2, p. 2-354a.)

68. The Big Hole River is recognized as an outstanding wild trout fishery. In 1989, the river supported nearly 40,000 angler-days of use. (DFWP Exh. 22, Nelson Dir., p. 23.)

69. Reach #1 of the Big Hole River, from the convergence of Warm Springs Creek and the S.F. Big Hole River to the confluence of Pintlar Creek, is the habitat of the stream-dwelling or fluvial arctic grayling, a once-common species in Montana's upper Missouri River drainage that is now being considered for threatened or endangered status. (DFWP Exh. 22, Nelson Dir., pp. 23 and 24; MTU/AFS Exh. 10, Kaya Dir., p. 2.)

70. Reach #2 of the Big Hole River, from Pintlar Creek to the old Divide Dam, is noted for its rainbow trout fishery in its downstream canyon portion. Lesser numbers of brown trout, some trophy-size, also inhabit the canyon. Upstream from the canyon, all trout numbers decline markedly and brook trout become more prevalent. (DFWP Exh. 22, Nelson Dir., p. 23.)

71. Reach #3 of the Big Hole River, from the old Divide Dam to the river's mouth, supports robust populations of brown and rainbow trout throughout much of its length, making it the most popular of the three reaches for angling. (DFWP Exh. 22, Nelson Dir., p. 23.)

72. Arctic grayling are found in Francis, Governor, LaMarche, Miner, Mussigbrod, Pintlar, Rock, Steel, Swamp and Wyman creeks and N.F. Big Hole River. Big Lake, Governor, Rock, Steel and Swamp Creeks are spawning and rearing sites for river grayling, while Deep and LaMarche creeks are probable spawning sites. Deep Creek is also an important wintering area for river grayling. (DFWP Exh. 22, Nelson Dir., p. 24.)

73. Westslope cutthroat trout, a "Species of Special Concern" that currently occupies less than eight percent of its historic Montana range, reside in Camp, Delano, Jacobson, Jerry, Moose, Pattengail, Sixmile, and Wyman Creeks. Westslope cutthroat readily hybridize with rainbow and Yellowstone cutthroat trout, species introduced throughout western Montana. Only in one Big Hole tributary, Delano Creek, have pure westslope cutthroat trout been verified through genetic testing. (DFWP Exh. 22, Nelson Dir., p. 24.) Westslope cutthroat may occupy Trapper Creek and the Wise River. However, in Trapper Creek and Wise River there is no indication that cutthroat trout have been confirmed as westslope cutthroat. (Bd. Exh. 37-A.2, p. 2-328 through 2-330 and 2-311 through 2-313.) Jacobsen Creek has cutthroat that may be pure westslope. However, genetic analysis of cutthroat from Mono Creek, an adjacent drainage, showed them to be hybridized with rainbow trout. This suggests that Jacobsen Creek cutthroat may be hybridized as well. (Bd. Exh. 37-A.2, p. 2-304.)

74. Birch, Camp, Canyon, Divide, Jerry, Moose, Trapper and Willow creeks provide notable fishing for pan-sized trout. Brook trout predominate in Birch, Camp, Divide and Trapper Creeks, while rainbow and rainbow x cutthroat hybrid trout are most numerous in Canyon, Jerry, Moose and Willow Creeks. A few cutthroat trout and brown trout are also present in some of these streams. (DFWP Exh. 22, Nelson Dir., p. 24.)

75. American, California, Corral, Deep, French, Oregon, Sevenmile, Seymour, Sixmile, Sullivan, Tenmile and Twelvemile Creeks originate on, or flow through, the 56,138-acre Mt. Haggin Wildlife Management Area, owned by DFWP. All except California and French Creeks support high numbers of pan-sized trout. Brook trout are most abundant in the 12 streams. French and California Creeks have relatively low munbers of fish (Bd. Exh. 37-A.2, pp. 2-288, 2-291.) Nine streams also contain rainbow trout, four support rainbow x cutthroat hybrids, and one (Sixmile Creek) has cutthroat trout of unknown genetic purity. (DFWP Exh. 22, Nelson Dir., p. 24.)

76. Reservations are sought for the Wise River and three of its 50+ tributaries (Jacobson, Pattengail, and Wyman Creeks). Virtually all of the Wise River drainage is within the confines of the Beaverhead National Forest. Here, the brook trout is the most numerous trout species. Lesser numbers of rainbow, cutthroat and rainbow x cutthroat hybrid trout intermingle with the brook trout. The overall population of fish in the Wise River is extremely low. (Bd. Exh. 37-A.2, pp. 2-312-313.) Jacobson Creek is the only known Wise River tributary where cutthroat trout dominate the population. (DFWP Exh. 22, Nelson Dir., p. 25.)

77. Reservations are sought for the North Fork Big Hole River and five of its tributaries (Johnson, Joseph, Mussigbrod, Ruby and Trail Creeks). The U.S. Forest Service (USFS) is the major land

holder in the North Fork drainage, except for the North Fork itself which passes entirely through private lands. In Trail Creek the fish population is severely depressed. (Bd. Exh. 37-A.2, p. 2-230.) Brook trout are by far the most numerous trout species. A few of these streams also support low numbers of rainbow and rainbow x cutthroat hybrids. (DFWP Exh. 22, Nelson Dir., p. 25.)

78. Bear, Bryant, Fishtrap, LaMarche and Pintlar Creeks are locally noted for their brook trout fishing. These drainages are primarily within mountain forest lands controlled by the USFS. (DFWP Exh. 22, Nelson Dir., p. 25.)

79. Reaches #1 and #2 of the Big Hole River, Deep, LaMarche, Miner, Pattengail, and Wyman Creeks are noted for their outstanding recreational value. (Bd. Exh. 40, Table H-1.)

80. Big Lake, Francis, Governor, Miner, Rock, Steel, Swamp and Warm Springs Creeks and S.F. Big Hole River, all brook trout fisheries of local significance, feed the upper Big Hole River. (DFWP Exh. 22, Nelson Dir., p. 25.)

81. The Ruby River supported over 11,000 angler-days of use in 1989, despite limited public access to the river. (Exh. 22, Nelson Dir., DFWP p. 33.)

82. Reach #1 of the Ruby River, which extends from the convergence of its East, Middle and West forks to Ruby Reservoir, is, overall, not noted as an exceptional fishery. However, below the confluence of Warm Springs Creek, trout numbers are rated as good. Here, rainbow trout and lesser numbers of brown trout sustain a sport fishery of local importance. (DFWP Exh. 22, Nelson Dir., p. 33.)

83. Reach #2 of the Ruby River, from Ruby Dam to the River's mouth, provides a notable sport fishery. Brown trout in the 10-14 inch class are the mainstay of the fishery. In the fall, large numbers of brown trout from the Jefferson River enter the Ruby River to spawn. (DFWP Exh. 22, Nelson Dir., p. 33.)

84. The East, Middle and West forks of the Ruby River, all of which harbor rainbow trout, rainbow x cutthroat hybrids and a few cutthroats, support depressed trout populations, the consequence of a sedimentation problem. (DFWP Exh. 22, Nelson Dir., p. 33.)

85. Coal and N.F. Greenhorn Creeks are small, headwater, mountain tributaries in the Beaverhead Forest that harbor westslope cutthroat trout, a "Species of Special Concern" in Montana. (DFWP Exh. 22, Nelson Dir., p. 33.)

86. The importance of Warm Springs Creek rests with its flow contribution to the Ruby River. The warm, nutrient-laden water of Warm Springs Creek has a positive influence on the aquatic

productivity of the river, allowing a 4-7 fold increase in the river's game fish population immediately below the Creek's confluence. (DFWP Exh. 22, Nelson Dir., p. 33.)

87. Cottonwood Creek is, like the three forks of the Ruby, another major tributary impacted by siltation. Low numbers of rainbow and rainbow x cutthroat hybrid trout inhabit the creek. (DFWP Exh. 22, Nelson Dir., p. 33.)

88. Mill Creek provides a noteworthy small stream fisheries for pan-sized brook trout. (DFWP Exh. 22, Nelson Dir., p. 33.) While Wisconsin Creek is similar in some ways to Mill Creek it has been classified as a stream with limited fishery value. (Bd. Exh. 40, p. 6-7.)

89. The Red Rock River is one of southwest Montana's lesser known sport fisheries. While angler use is relatively light, the river fishery has regional significance. (DFWP Exh. 22, Nelson Dir., p. 30.)

90. Reach #1 of the Red Rock River, from Lower Red Rock Lake to Lima Reservoir, supports brook and cutthroat trout and a few arctic grayling. This reach produces some larger-size brook and cutthroat trout of 3-4 pounds. (DFWP Exh. 22, Nelson Dir., p. 30.)

91. Reach #2 of the Red Rock River, from Lima Dam to Clark Canyon Reservoir, supports respectable densities of brown and rainbow trout, particularly in its downstream segment, and provides important spawning and rearing habitats for the trout populations of Clark Canyon Reservoir. (DFWP Exh. 22, Nelson Dir., p. 30.)

92. Corral, Hell Roaring, Odell, Red Rock and Tom Creeks, which feed the waters of the Red Rock Lakes National Wildlife Refuge, are important spawning tributaries for the arctic grayling and cutthroat trout populations of the Red Rock Lakes. The streams also harbor good numbers of resident brook trout and some cutthroat trout. (DFWP Exh. 22, Nelson Dir., pp. 30 and 31.)

93. Narrows Creek, a tributary to Elk Lake in the Centennial Valley, is the sole spawning site for the lake's arctic grayling and provides important spawning habitat for lake-dwelling cutthroat trout. (DFWP Exh. 22, Nelson Dir., p. 31.)

94. Jones and Peet Creeks are populated exclusively with westslope cutthroat trout, a "Species of Special Concern" in Montana. (DFWP Exh. 22, Nelson Dir., p. 31.)

95. Long Creek holds good numbers of brook trout and hybridized cutthroat trout. (DFWP Exh. 22, Nelson Dir., p. 31.)

96. East Fork Clover Creek supports above-average numbers of brook trout and lesser numbers of genetically impure cutthroat

trout. (DFWP Exh. 22, Nelson Dir., p. 31.)

97. Bear, Browns Canyon, Cabin, Frying Pan, Indian, Rape, Shenon, Simpson and Trapper Creeks are small, extreme headwater tributaries that support westslope cutthroat trout and flow primarily through public lands controlled by the BLM and USFS. (DFWP Exh. 22, Nelson Dir., p. 31.) Bear Creek cutthroat in that drainage were not tested for determination of strain but due to their proximity to other streams with westslope cutthroat it is likely that a population is present. (Bd. Exh. 37-A.2, p. 2-85.)

98. Big Sheep Creek, a large spring-fed stream flowing into the Red Rock River, is well known for its brown and rainbow trout, which consistently reach lengths in excess of 20 inches. (DFWP Exh. 22, Nelson Dir., p. 31.)

99. Deadman Creek, a Big Sheep Creek tributary, is, considering its small size and high elevation, a productive fishery for pan-sized rainbow trout and rainbow x cutthroat hybrids. (DFWP Exh. 22, Nelson Dir., p. 31.)

100. Black Canyon Creek contains excellent numbers of brook trout, while Bloody Dick and Medicine Lodge Creeks, which hold both brook and rainbow trout, support some of the highest trout densities for streams in the Red Rock drainage. (DFWP Exh. 22, Nelson Dir., p. 31.)

101. Horse Prairie Creek, the second largest tributary to Clark Canyon Reservoir, is populated with brown, brook and rainbow trout. While not noted for an abundance of trout, the Creek's fish, particularly the brown trout, reach above-average sizes. (DFWP Exh. 22, Nelson Dir., p.31.) The natural channel and flow of this stream has been altered and electro-fishing indicates fairly low numbers of resident fish. (Bd. Exh. 37-A.2, p. 2-99 and Table 2-26.) However, the Creek also provides spawning habitat for rainbow and brown trout from Clark Canyon Reservoir. (DFWP Exh. 22, Nelson Dir., p. 31.)

102. The Beaverhead River supports substantial fishing pressure, which amounted to 22,700 angler-days in 1989. (DFWP Exh. 22, Nelson Dir., p. 31.)

103. Reach #1 of the Beaverhead River, which extends from Clark Canyon Dam to the East Bench Diversion Dam, supports a nationally acclaimed trophy trout fishery as well as high numbers of smaller brown and rainbow trout. (DFWP Exh. 22, Nelson Dir., p. 31.)

104. Reach #2 of the Beaverhead River, from the East Bench Diversion Dam to the river's mouth, supports lesser numbers of brown and rainbow trout. The fishery for 14-18 inch trout in the

Dillon area is good while the fishery progressively declines as the river approaches its mouth. (DFWP Exh. 22, Nelson Dir., p. 32.)

105. Brown, rainbow, brook and rainbow x cutthroat hybrid trout reside in lower Grasshopper Creek, where mine pollution and dewatering have damaged the fish community. Above Bannack, the source of the mine pollution, the Creek harbors excellent numbers of brook trout. (DFWP Exh. 22, Nelson Dir., p. 32.)

106. Blacktail Deer Creek holds less than expected trout numbers for a stream of its size. Brook and a few rainbow trout inhabit this stream. (DFWP Exh. 22, Nelson Dir., p. 32.)

107. The East Fork of Blacktail Deer Creek is a better fishery than the mainstem and, overall, provides fair to good fishing for pan-sized brook trout and a few rainbows. The East Fork drainage is entirely within the public domain, mainly the 18,000-acre Blacktail Wildlife Management Area owned by DFWP. (DFWP Exh. 22, Nelson Dir., p. 32.) The West Fork of Blacktail Creek Creek has only a fair fish population, probably due to sediment loads. (Bd. Exh. 37-A.2, p. 2-130.)

108. Three small tributaries in the Grasshopper Creek drainage have reservation requests. Reservoir Creek holds genetically pure westslope cutthroat trout. The East and West forks of Dyce Creek support relatively high numbers of brook and rainbow x cutthroat hybrid trout for streams of their size. (DFWP Exh. 22, Nelson Dir., p. 32; Bd. Exh. 37-A.2, p. 2-120.)

109. Poindexter Slough is one of Montana's most productive spring-fed Creeks, supporting high numbers of rainbow and brown trout. The lower three miles of stream flow through lands owned by DFWP. (DFWP Exh. 22, Nelson Dir., p. 32.)

110. Reach #1 and Reach #2 of the Beaverhead River, Grasshopper, and Deadman Creeks are noted for their outstanding recreational value. (Bd. Exh. 40, Table H-1.)

111. Spawning trout from Canyon Ferry Reservoir, which ascend Reach #1 (from the convergence of the Gallatin, Jefferson and Madison rivers to Canyon Ferry Reservoir) of the Missouri River, provide high quality fishing in the stretch of river below Tostor Dam. Brown trout, some in the 6-10 pound trophy class, ascend the river from late August through mid-December. In the spring, reservoir rainbow trout, averaging about 17 inches and two pounds, enter the river. About 10,700 angler-days of fishing pressure were expended on Reach #1 in 1989. (DFWP Exh. 22, Nelson Dir., p. 34.)

112. Sixteenmile Creek is regionally recognized for supporting exceptionally high numbers of rainbow and brown trout in its middle stream segment. (Bd. Exh. 37-A.2, pp. 2-587 and 2-588.)

113. Avalanche, Beaver, Confederate, Crow, Deep, Dry and Duck Creeks are stream fisheries of local importance. Rainbow and rainbow x cutthroat hybrid trout dominate in Avalanche, Crow, Deep, and Dry Creeks, while brook trout are most numerous in Beaver, Confederate and Duck Creeks. (DFWP Exh. 22, Nelson Dir., p. 34.)

114. Beaver, Confederate, Deep, Dry and Duck Creeks support, in addition to resident trout populations, spring spawning runs of rainbow trout from Canyon Ferry Reservoir. (DFWP Exh. 22, Nelson Dir., p. 34)

115. DFWP has requested instream flow reservations on five stream reaches between Canyon Ferry Dam and Fort Peck Reservoir. These are designated as Reaches 2, 3, 4, 5, and 6. (Bd. Exh. 37-A.3, pp. 3-6, 3-13, 3-22, 3-28, and 3-33.)

116. Reach #2 is a free-flowing 3.5 mile segment of the Missouri River between Hauser Dam and Holter Reservoir and is a very popular fishing water. It supports one of the highest densities of rainbow trout found in Montana waters. (Bd. Exh. 37-A.3, pp. 3-6 and 3-7.)

117. Reach #2 is one of the best trout fisheries in Montana during periods when spawning fish migrate from Holter Reservoir to spawn in the short reach of flowing river below Hauser Dam. (DFWP Exh. 30, Spoon Dir., p.3.)

118. Fish population estimates in Reach #2 show exceptional rainbow trout densities of 3,000 to 6,000 trout per mile have occurred in the last five years. The stream section is also particularly noted for producing trophy brown trout up to 12 pounds during the fall spawning period. (DFWP Exh. 30, Spoon Dir., p. 3.)

119. There is considerable fishing pressure in Reach #2. During October of 1982, 1983 and 1985, when brown trout spawners were concentrated below Hauser Dam, angler use estimates ranged from 810 to 1,049 angler days. During 1983, between March 1 and November 30, an estimated 8,719 angler days were expended on the river. A total of 3,662 actual interviews with anglers were made to derive these estimates. (DFWP Exh. 30, Spoon Dir., pp. 3 and 4.)

120. Reach #2 provides the primary spawning area for brown trout, rainbow trout and kokanee residing in Holter Reservoir. Juvenile fish produced in the River contribute to the fisheries of both the river and the reservoir. (DFWP Exh. 30, Spoon Dir., p. 4.)

121. Spawning habitat in Reach #2 is limited and is confined to four relatively small areas below the dam. The amount of spawning habitat is very much a function of the flow pattern of the River below the dam. The amount of available spawning habitat

changes as flows change, and once spawning has occurred, it is critical to maintain adequate flows to ensure that incubating eggs remain adequately covered with water. (DFWP Exh. 30 Spoon Dir., p. 5 and Attachment B.)

122. Kokanee that reside in Holter Reservoir are seasonably abundant in Reach #2 during the fall spawning period and this flowing segment of river is particularly important for meeting their spawning requirements. (Bd. Exh. 37-A.3, p. 3-7.)

123. Reach #3 of the Missouri River is a popular and heavily utilized recreation area between Holter Dam and Great Falls which supports an exceptional wild rainbow and brown trout fishery. From 80% to 90% of the existing recreational use is attributed to fishing. Public access is good. A frontage road, officially designated as a state recreation road, parallels much of the river reach downstream to Cascade. There are eight state recreation areas and one fishing access site. From Cascade to Great Falls, there are two additional fishing access sites and an additional state recreation area. (Bd. Exh. 37-A.3, p. 3-13; DFWP Exh. 29, Berg Dir., p. 2.) This reach is rated as having outstanding recreational value. (Bd. Exh. 40, Table H-1.)

124. Electrofishing estimates in Missouri River Reach #3 conducted by DFWP in 1988 near Craig showed 4,150 rainbow trout and 466 brown trout 10 inches and larger per mile of river. At Cascade, the population declines to 930 rainbow trout and 172 brown trout per mile. From Cascade to Great Falls, trout remain the dominant game fish along with some burbot and walleye. (Exh. 29, Berg Dir., DFWP p. 2.)

125. The upper 35 miles of Reach #3, from Holter Dam to Cascade, is designated a Class 1 sport fishery by DFWP and is considered one of Montana's premiere river trout fisheries. (DFWP Exh. 29, Berg Dir., p. 2.)

126. Angler use in Reach #3 is currently estimated at 88,400 angler days per year. From 60% to 70% of these anglers reside in Cascade and Lewis & Clark counties. Most of the angling is in the 35-mile segment from Holter Dam to Cascade where annual use is estimated at 74,000 angler days per year. Fishing use of this segment ranks second only to the Madison River statewide. An excellent overall catch rate of 0.40-0.50 rainbow trout per hour, second only to the Madison River, is maintained. (Bd. Exh. 37-A.3, p. 3-14.)

127. Side channels in Reach #3 are important for spawning and rearing of rainbow and brown trout. Side channels are preferred, particularly by brown trout, over the main channel for spawning because of more suitable depth, velocity, substrate and adjacent cover characteristics. (Bd. Exh. 37-A.3, p. 3-15.)

128. Brown trout in Reach #3 initiate spawning in mid-October and young fish emerge from the gravel in early May. Rainbow trout spawn in late March and early April and eggs incubate until mid-May. (Bd. Exh. 37-A.3, p. 3-15.)

129. Rearing of young rainbow and brown trout in Reach #3 occurs from mid-May through mid-October when large numbers of young fish move from side channels to the main river. (Bd. Exh. 37-41A, pp. 3-15 and 3-16.)

130. Canada geese nest on islands in Reach #3. The flow quantities around these islands determine whether the nests are protected from mammalian predators. Protective flows are a function of depth, width and velocity of water which inhibit or prevent mammalian predators from crossing onto the islands from the mainland. (Bd. Exh. 37-A.3, p. 3-16; DFWP Exh. 13, Hook Dir., p. 2.)

131. Reach #4, between Great Falls and the Marias River, supports a highly productive coolwater fishery, with sauger being the predominant game fish. Coldwater game fish species found in this reach include brown and rainbow trout and mountain whitefish. Other game species include burbot and shovelnose sturgeon. (DFWP Exh. 29, Berg Dir., p. 2.)

132. The upper 21 miles of the Missouri Wild and Scenic River (a national designation which begins at Fort Benton) is included in Reach #4. The Wild and Scenic River receives heavy recreational use in spite of the relative lack of access points. An average of 21,294 visitor days occurred annually between 1982 and 1986 within the Wild and Scenic corridor. About 30% of this use occurred in Reach #4. Nearly half of the use was in the form of recreational boating. (Bd. Exh. 37-A.3, p. 3-22.)

133. Angler use in Missouri River Reach #4 is currently estimated at 7,692 angler days per year. (DFWP Exh. 29, Berg Dir., p. 2.)

134. Reach #4 includes the transition zone between cold and warm water fisheries. Brown and rainbow trout and mountain whitefish (coldwater species) are common only in the upper 15 miles of this reach. Although sauger are by far the predominant game fish, walleye appear to be increasing in numbers over the past five years. The sizes of the warmwater game fish are better than the average for river populations within the state, probably due to the Missouri's productivity and the presence of suitable habitat conditions in this reach most of the time. (Bd. Exh. 37-A.3, p. 3-23.)

135. In addition to the game fish species, 22 non-game fish species have been identified in this reach. (Bd. Exh. 37-A.3, p. 3-23.)

136. Forage fish are small fish which are utilized as food for larger game and non-game species. Side channels are important habitat areas for forage species in Reach #4. They also provide important rearing habitat for sauger, smallmouth buffalo, bigmouth buffalo and goldeye. Small mouth and big mouth buffalo also utilize side channels for spawning. (Bd. Exh. 37-A.3, p. 3-25; Gardner Obj., DFWP Exh. 5, p. 2.)

137. Forage fish and young-of-the-year fish use side channel areas from early June through August 31. (Bd. Exh. 37-A.3, p. 3-25.)

138. Considerable Canada goose nesting occurs on islands in Reach #4. The flow quantities around these islands during the nesting period (March 15 - June 1) determine whether the nests are protected from mammalian predators. (Bd. Exh. 37-A.3, pp. 3-25 and 3-26.)

139. Reach #5, from the Marias River to the Judith River, supports an exceptional warmwater fishery for sauger and shovelnose sturgeon, as well as for burbot, channel catfish, and walleye. Shovelnose sturgeon in this reach attain the largest maximum size found anywhere in the United States. (DFWP Exh. 29, Berg Dir., p. 3.)

140. All 67 miles of Reach #5 are within the Upper Missouri National Wild and Scenic River corridor. About 85% of the 21,294 annual visitor days occurring in 1982-86 occurred in Reach #5. Nearly half of the use was recreational boating. (Bd. Exh. 37-A.3, p. 3-28.)

141. Paddlefish are found in Reach #5. The paddlefish is listed as a "Species of Special Concern -- Class A" in Montana. The Montana population is one of only six major self-sustaining populations of these ancient and unique fish that remain in the United States. Paddlefish are Montana's largest game fish, with female specimens often reaching five to six feet in length and weighing 75 to 125 pounds. Paddlefish have been significantly reduced over their worldwide range. (Bd. Exh. 37-A.1, p. 1-40; Bd. Exh. 37-A.3, p. 3-17.)

142. The Missouri River paddlefish population has growth rates that are superior to the other five remaining populations. This population is also older and more secure than those found anywhere else in North America, due largely to the free-flowing characteristics of this River Reach which provides essential and irreplaceable spawning areas for paddlefish. (Bd. Exh. 37-A.1, pp 1-40 and 1-41.)

143. Paddlefish occupy Reach #5 only during the spawning season. Most of their lives are spent in Fort Peck Reservoir Paddlefish leave the reservoir during high spring flows and migrate

upstream to spawn, frequently being observed as far upstream as the mouth of the Marias River. (Bd. Exh. 37-A.3, p. 3-29.)

144. Four paddlefish spawning areas have been identified in Reach #5 in the vicinities of Three islands, Virgelle Ferry, Little Sandy Creek and Deadmans Rapids. The spawning period is from May 19 through July 5. (Bd. Exh. 37-A.3, p. 3-29; DFWP Exh. 29, Berg Dir., p. 3.)

145. Although paddlefish receive light fishing pressure in Reach #5 because of limited access and low populations, critical paddlefish spawning areas in this reach help sustain the sport fishery for paddlefish on the Charles M. Russell Game Range within Reach #6. (DFWP Exh. 29, Berg Dir., p. 3.)

146. Two other ancient fish - the pallid and shovelnose sturgeons - also occur in Reach #5. Pallid sturgeon are very rare. They occur only as a relic population containing very few numbers in Montana and the species has recently been listed (October 1990) by the U.S. Fish and Wildlife Service as a federal endangered species. (DFWP Exh. 17, Spence Dir., p. 11; DFWP Exh. 29, Berg Dir., p. 3.)

147. The shovelnose sturgeon in the Missouri River are healthy and vigorous. Those residing above Fort Peck Reservoir are much larger than those found in other areas of the Missouri and Mississippi basins. The <u>average</u> size of shovelnose from the middle Missouri River equal or exceed the <u>maximum</u> size of those from the other rivers. (Bd. Exh. 37-A.1, p. 1-41.)

148. The paddlefish, pallid sturgeon and sturgeon chub are all fish species residing in Reach #5 which are considered "Species of Special Concern". Pallid sturgeon and sturgeon chub are considered rare throughout their entire geographic range. (DFWP Exh. 29, Berg. Dir., p. 3.)

149. Side channels are important fish habitats in Reach #5. A side channel is a channel diverging from the main channel and containing less than 20% of the river's flow. In reaches 4, 5 and 6, there are about 70 side channels ranging in length from 0.2 to 1.4 miles. (DFWP Exh. 5, Gardner Obj., p. 2.)

150. Side channels in Reach #5 provide important rearing habitat for sauger, bigmouth and smallmouth buffalo and goldeye as well as spawning areas for buffalo. Side channels are also important for production of forage fish. (DFWP Exh. 5, Gardner Obj., p. 2.)

151. Side channels become dewatered when water levels become too shallow to support fish or contain only pools which are disconnected from the main channel due to declining river flow. Sometimes only pools of standing water remain that can eventually

dry up or become unsuitable for fish life due to high water temperatures and low dissolved oxygen. The loss of side channel habitat means less food production for fish and fewer numbers of species that depend on the side channels for rearing of young fish, notably the sauger. (DFWP Exh. 5, Gardner Obj., p. 2.)

152. Riffle habitat is essential for forage food production which includes aquatic insects and small riffle fish such as sculpin, dace and stonecat. (DFWP Exh. 5, Gardner Obj., p. 2.)

153. Considerable Canada goose nesting occurs in Reach #5. An average of 38% of the total nests surveyed between Fort Benton and Fort Peck Reservoir were in Reach #5. Flow levels around goose-nesting islands determine whether the nests will have protection from mammalian predators. (Bd. Exh. 37-A.3, pp. 3-31 and 3-32.)

154. Missouri River Reach #6 extends from the Judith River to the upper end of Fort Peck Reservoir. An exceptional warmwater fishery is found in this reach. Paddlefish, sauger, shovelnose sturgeon and channel catfish are the predominant game fish species found throughout the Reach. Burbot also occur. (DFWP Exh. 29, Berg Dir., p. 4.)

155. Six paddlefish spawning areas have been identified in Reach #6 in the vicinities of Holmes Rapids, Dauphine Rapids, Bullwhacker Creek, Cow Island, Two Calf Islands, and Robinson Bridge. These spawning areas are critical for paddlefish recruitment into the sport fishery which occurs on the Charles M. Russell Game Range in the lower 20 miles of this Reach. (DFWP Exh. 29, Berg Dir., p. 4.)

156. There is a significant paddlefish sport fishery on the Charles M. Russell Game Range. Anglers come from a wide geographic area and the sport fishery is of statewide importance. (DFWP Exh. 29, Berg Dir., p. 4.)

157. Paddlefish are a "Species of Special Concern" in Montana due to their limited distribution and limited habitat available, but not because of low abundance. Paddlefish populations in Montana are not being adversely affected by angler harvest because overall angler success and the average size of paddlefish are not declining. (DFWP Exh. 29, Berg Dir., p. 4.)

158. Missouri River Reach #6 also contains three other "Species of Special Concern" - the pallid sturgeon, sicklefin chub, and sturgeon chub. All three are rare throughout their geographical range and the pallid sturgeon is a federally listed endangered species. (DFWP Exh. 29, Berg Dir., pp. 4-5.)

159. Twenty-three non-game species have been identified in Reach #6. Blue sucker, smallmouth buffalo, bigmouth buffalo, and fresh water drum are four non-game migratory species that are

dependent on high spring flows in the Missouri River for successful reproduction. (Bd. Exh. 37-A.3, p. 3-35.)

160. Side channels in Reach #6 are important for forage fish production and rearing areas for sauger, goldeye, smallmouth buffalo and bigmouth buffalo. Water level conditions in side channels are related to main river flow. (Bd. Exh. 37-A.3, p. 3-36.)

161. Paddlefish residing in Fort Peck Reservoir and the Missouri River require a very substantial flow (certainly greater than 4652 cfs) in Reach #6 to initiate their annual spring spawning migration from May 19 through July 5. (Bd. Exh. 37-A.3, p. 3-37; DFWP Exh. 29, Berg Dir., p. 6)

162. A fair amount of Canada goose nesting occurs on the Missouri River in Reach #6. An average of 13% of the total nests surveyed between Fort Benton and Fort Peck Reservoir are within this Reach. Flow levels around goose-nesting islands determine whether the nests will have protection against mammalian predators. The goose-nesting period is March 15 - June 1. (Bd. Exh. 37-A.3, pp. 3-36 and 3-37.)

163. DFWP has requested instream flow reservations on ten Missouri River Basin tributaries between Canyon Ferry and Holter dams. These streams are: Spokane Creek, McGuire Creek, Trout Creek, Prickly Pear Creek, Sevenmile Creek, Tenmile Creek, Silver Creek, Beaver Creek, Willow Creek, and Cottonwood Creek. (Bd. Exh. 37-A.3, pp. 3-39 to 3-81.)

164. Spokane Creek, McGuire Creek and Trout Creek are all spring-like streams that flow into Hauser Lake. Spokane Creek contains brown and rainbow trout, kokanee and mountain whitefish. Brown trout, kokanee and mountain whitefish migrate from Hauser Reservoir into Spokane Creek to spawn. McGuire Creek contains brown and rainbow trout and kokanee. This Creek also provides important spawning habitat for rainbow and brown trout and kokanee migrating from Hauser Reservoir. Trout Creek contains brown and rainbow trout, kokanee and mountain whitefish. The stream contains good populations of resident brown and rainbow trout. In addition, Trout Creek is a spawning and rearing tributary for brown and rainbow trout and kokanee migrating from Hauser Reservoir. (Bd. Exh. 37-A.3, pp. 3-41, 3-42, 3-44, 3-47 and 3-48; DFWP Exh. 14, Lere Dir., p. 4.)

165. Trout Creek is the most important tributary for spawning and rearing of kokanee, brown trout, mountain whitefish and rainbow trout that migrate from Hauser Reservoir. Spawning rainbow and brown trout up to 9 pounds have been collected. It is also an important rearing stream for juveniles of these salmonids. Trout Creek also contains a good resident fish population of rainbow and brown trout. Bald eagles concentrate at the mouth of Trout Creek

during the fall kokanee spawning season. Trout Creek is a designated public viewing area for the fall congregation of bald eagles. (DFWP Exh. 14, Lere Dir., pp. 5 and 6.)

166. Silver Creek is a spring-like stream entering Lake Helena. It contains brown, rainbow and brook trout and kokanee. It also provides spawning and rearing habitat for these species which migrate from Hauser Reservoir and Lake Helena. (Bd. Exh. 37-A.3, pp. 3-67 and 3-68.)

167. Prickly Pear Creek flows into Lake Helena. Sevenmile and Tenmile Creeks are tributaries to Prickly Pear Creek. Tenmile and Sevenmile Creeks provide fisheries for rainbow trout and brook trout. Brown trout are found in the lower portion of Tenmile Creek. Game fish populations in both streams are greater in upstream sections because of dewatering of the lower Reaches. (DFWP Exh. 14, Lere Dir., p. 8; Bd. Exh. 37-A.3, pp. 3-59 through 3-60 and 3-64 through 3-65.)

168. Prickly Pear Creek Reach #1 (Rabbit Gulch to East Helena) supports a relatively good resident trout population of rainbow and brown trout. The upper section of this Reach contains a good brook trout population. The Reach has important recreational values due to its close proximity to the Helena area. (DFWP Exh. 26, Frazer Dir., p. 21; Bd. Exh. 37-A.3, pp. 3-52 and 3-53.)

169. Prickly Pear Creek Reach #2 (East Helena to Lake Helena) supports a resident population of brown and rainbow trout. Brown and rainbow trout from the Lake Helena - Hauser Reservoir complex also migrate through this Reach to spawn. It has a high recreational value because of its close proximity to Helena. (DFWP Exh. 26, Frazer Dir., p. 22; Bd. Exh. 37-A.3, p. 3-56.)

170. Beaver Creek, Willow Creek and Cottonwood Creek are all tributaries to Holter Lake. Beaver Creek is the most important tributary for spawning and rearing of rainbow trout that migrate from Holter Reservoir as well as from the 3.5 mile section of Missouri River between Hauser Dam and Holter Reservoir. Extensive rainbow spawning occurs in Beaver Creek during the spring high flow period and they provide an excellent fishery at that time. Brown trout from the Missouri River occasionally use Beaver Creek for spawning in the fall. There are also resident populations of rainbow, brown and cutthroat trout which provide a good fishery in Beaver Creek. (DFWP Exh. 14, Lere Dir, p. 6; Bd. Exh. 37-A.3, pp. 3-70 and 3-71.)

171. Cottonwood and Willow Creeks contain rainbow, brown and brook trout that provide a moderate fishery. Migrant rainbow and brown trout and kokanee from Holter Reservoir sometimes use these two streams for spawning. (DFWP Exh. 14, Lere Dir., p. 7; Bd. Exh. 37-A.3, pp. 3-74, 3-75, 3-78 and 3-79.)

172. Reach #1 of Little Prickly Pear Creek (Canyon Creek to Clark Creek) supports a good resident trout population consisting of brown, rainbow and brook trout, and mountain whitefish. Brown trout are the dominant trout species. The lower end of Reach #1 also provides important spawning and rearing habitat for the extremely popular Blue Ribbon trout fishery in the Missouri River below Holter Dam. (DFWP Exh. 26, DFWP, Frazer Dir., p. 13.)

173. An estimated 15,000 rainbow trout spawn in Little Prickly Pear Creek. There is also a large, unquantified brown trout spawning run. (DFWP Exh. 20, Leathe Dir., p. 7; DFWP Exh. 26, Frazer Dir., p. 15.)

174. Reach #2 of Little Prickly Pear Creek (Clark Creek to mouth) supports a resident trout fishery dominated by rainbow trout, with lesser numbers of brown trout and brook trout. It is an important recreation area between Helena and Great Falls and supports heavy public use. (DFWP Exh. 26, Frazer Dir., p. 14.)

175. Reach #2 of Little Prickly Pear Creek also provides important spawning and rearing habitat for rainbow and brown trout that migrate out of the Missouri River. A majority of the spawning and rearing occurs in Reach #2. (DFWP Exh. 26, Frazer Dir., pp. 14 and 15.)

176. Virginia Creek, Canyon Creek, Lyons Creek and Wolf Creek are tributaries to Little Prickly Pear Creek. These four streams have resident fish populations consisting of rainbow, brown and brook trout. Lyons Creek and Wolf Creek also are important spawning streams for migratory rainbow and brown trout from the Missouri River and Little Prickly Pear Creek. Rearing of the young fish from these migratory spawners also occurs in these streams. (Bd. Exh. 37-A.3, pp. 3-101 through 3-107; DFWP Exh. 26, Frazer Dir., pp. 17, 28 and 39.)

177. Virginia and Canyon Creeks contain resident populations of brook, rainbow and brown trout. Brook trout comprise 76% of the population in Virginia Creek. Rainbow trout make up 49% of the population in Canyon Creek, with brook and brown trout equally providing the remaining 51%. These two streams provide moderate to good fisheries for these resident salmonids. The Canyon Creek fishery is very popular with local anglers. (DFWP Exh. 14, Lere Dir., p. 8; Bd. Exh. 37-A.3, pp. 3-93 through 3-98.)

178. The Dearborn River is a tributary to the Missouri River below Holter Dam and is one of the most important trout streams in Montana. It is known to have good fishing for resident trout (mostly rainbow) in the 8-12 inch range, particularly in its upper Reaches. Brown trout are found in the lower river and will average somewhat larger than the rainbow. Brook trout are present in the headwaters. The Dearborn provides up to 2,500 angler-days of

fishing annually. (Bd. Exh. 37-A.3, p. 3-118; DFWP Exh. 20, Leathe Dir., p. 5.)

179. In addition to its resident fishery, the Dearborn is an important spawning tributary for rainbow trout that reside in the Missouri River. The results of a spring 1988 spawning survey indicated that the Dearborn River is the most important spawning stream for rainbow trout which inhabit the Missouri River between Holter Dam and Cascade. (Bd. Exh. 37-A.3, p. 3-119; DFWP Exh. 20, Leathe Dir., pp. 5 through 7.)

180. Fish trapping and a helicopter survey of the Dearborn River in the spring of 1988 confirmed that large numbers of rainbow trout utilized the stream for spawning. Over 2,300 mature rainbow trout, averaging 14.9 inches in length, were captured and marked. It was estimated that approximately 20,000 rainbows use the Dearborn River for spawning. During the April helicopter survey of the lower 42 miles of the Dearborn, approximately 6,000 spawning nests (redds) were counted. Spawning rainbow trout were observed on many redds. Spawning areas were easily identified because of the abnormally low water and good visibility occurring under near-drought conditions. Most spawning was concentrated in the lower 30 miles of river. (DFWP Exh. 20, Leathe Dir., p. 6; Bd. Exh. 37-A.3, pp. 3-118 and 3-119.)

181. Tag returns by anglers fishing the Missouri River confirmed that the spawning rainbow trout in the Dearborn River were inhabitants of the Missouri River. (DFWP Exh. 20, Leathe Dir., p. 6.)

182. Spawning habitat in the Dearborn River is critical to the perpetuation of the Missouri River fishery. The Dearborn is one of only three tributaries to the Missouri River where Missouri River fish spawn. The other two streams are Sheep Creek and Little Prickly Pear Creek, but the Dearborn is the most heavily used spawning stream. (DFWP Exh. 20, Leathe Dir., p. 7.)

183. The Dearborn River is noted for its outstanding recreational value. (Bd. Exh. 40, Table H-1.)

184. Instream flow requests have been made for the Middle and South Forks of the Dearborn River and Flat Creek. The Middle and South Forks of the Dearborn both have very good rainbow trout populations. Numbers of rainbows longer than three inches range between 350 and 400 per thousand feet of stream. The Middle Fork contains rainbows up to 16 inches long. Rainbow trout from the Dearborn River also use the Middle and South Forks for spawning only in their lower reaches. Beaver dams apparently limit upstream fish migration of these 12-16 inch fish. (DFWP Exh. 20, Leathe Dir., p. 8.)

185. Flat Creek has relatively low trout populations but is the most heavily fished of the three tributary streams. Fishing pressure is approximately 340 angler-days per year. Flat Creek contains rainbow, brook and brown trout, and mountain whitefish. (Bd. Exh. 37-A.3, pp. 3-130 and 3-131.)

186. Wegner Creek and Stickney Creek are tributaries to the Missouri River near the town of Craig. The lower reaches of both streams are intermittent and flows only reach the Missouri River during spring runoff periods. Although both streams support resident rainbow trout populations in upstream sections, their principal value lies in their being spawning streams. During spring runoff, both streams are important spawning streams for Missouri River rainbow trout when flows are available. When natural spring flows occur during good water years, spawning rainbow trout are able to migrate through the normally dewatered sections and reach the perennial flowing sections upstream. (DFWP Exh. 26, Frazer Dir., pp. 26 and 27; Bd. Exh. 37-A.3, pp. 3-109, 3-110, 3-112 and 3-113.)

187. Sheep Creek flows directly into the Missouri River near Cascade 24 miles downstream from Holter Dam. It is a critically important spawning stream for rainbow trout that reside in the Missouri River. (DFWP Exh. 20, Leathe Dir., p. 9.)

188. Approximately 3,500 to 4,400 spawning rainbow trout, averaging about 16 inches long, migrate into Sheep Creek each year to spawn. Brown trout and mountain whitefish also migrate from the Missouri River to spawn in Sheep Creek. (DFWP Exh. 20, Leathe Dir., p. 9.)

189. Tag returns by anglers fishing the Missouri River show that spawning rainbow trout in Sheep Creek inhabit the Missouri River from four miles upstream to 15 miles downstream from the mouth of Sheep Creek. Sheep Creek is the most important spawning area for rainbow trout residing in this portion of the Missouri River. (DFWP Exh. 20, Leathe Dir., p. 10.)

190. Sheep Creek contains a resident population consisting of rainbow, brown and brook trout and provides up to 800 angler-days of use each year. However, its principal importance is as a spawning tributary for the Missouri River. (Bd. Exh. 37-A.3, pp. 3-134 and 3-135.)

191. The Smith River is one of the most popular trout fisheries in the state. An average of over 12,000 anglers per year fished the Smith River with about two-thirds of the use above the mouth of Hound Creek. The Smith River has been managed as a wild trout fishery since trout stocking was discontinued in 1974. (Bd. Exh. 37-A.3, pp. 3-142 and 3-143.)

192. Three stream reaches have been established by DFWP on the Smith River. All three reaches are noted for their outstanding recreational value. (Bd. Exh. 40, Table H-1.) Rainbow, brown, brook and cutthroat trout and mountain whitefish and burbot are present in all three reaches. Rainbow trout are the predominant species present in all three reaches, followed by brown trout and whitefish. (Bd. Exh. 37-A.3, pp. 3-143, 3-146 and 3-149.)

193. The most popular fishing on the Smith River is the 60-plus mile scenic floating section between Camp Baker (at the mouth of Sheep Creek) and Eden Bridge (below Hound Creek.) Fishing comprises one of the most important activities while floating this stretch of river. Access to this reach is gained almost exclusively by floating. Floating is currently limited to about mid-April through the first week in July in an average water year. (DFWP Exh. 4, Spence Obj., p. 6; DFWP Exh. 21, Wipperman Dir., p. 3; Bd. Exh. 37-A.3, p. 3-143.)

194. An instream flow in the Smith River will maintain the existing rainbow and brown trout populations in the river and maintain habitat for spawning and rearing of game fish and the production of aquatic food organisms used by rainbow and brown trout. Maintenance of existing habitat and trout populations will continue to provide a quality experience for outdoor recreation associated with the river. (DFWP Exh. 21, Wipperman Dir., p. 3.)

195. DFWP has filed instream flow requests on 10 tributaries to the Smith River. These are the South Fork Smith River, North Fork Smith River, Newlan Creek, Big Birch Creek, Sheep Creek, Eagle Creek, Rock Creek, Tenderfoot Creek, North Fork Deep Creek and Hound Creek. (Bd. Exh. 37-A.3, pp. 3-151 through 3-186.)

196. All of the 10 Smith River tributaries support significant trout populations and comprise an important fishery resource. Most of the streams provide a few hundred days of fishing recreation each year and a few sustain more than one thousand angler-days in some years. (DFWP Exh. 20, Leathe Dir., p. 3.)

197. Rainbow and brook trout tend to predominant in the Smith River tributaries, with the largest fish typically ranging from 11-14 inches long. Brook trout populations are especially high in the South Fork Smith River, Big Birch Creek and in Newlan Creek. Sheep Creek has an exceptional rainbow trout population above Moose Creek with more than 900 fish per 1,000 feet of stream. Rock Creek and Tenderfoot Creek also have outstanding rainbow and/or hybrid cutthroat trout populations. Eagle Creek supports populations of rainbow, cutthroat and brook trout. (DFWP Exh. 20, Leathe Dir., p. 3.)

198. The North Fork of Deep Creek contains a genetically pure westslope cutthroat trout population (a "Species of Special Concern" in Montana). This is the only species occupying the reach

of stream where instream flows have been requested. Rock outcrops form natural barriers that prevent the upstream migration of hybrid cutthroat trout from the South Fork into the North Fork of Deep Creek. (Bd. Exh. 37-A.3, p. 3-182.)

199. Sun River Reach #1 begins at Diversion Dam below Gibson Reservoir and flows for 32 miles downstream to the confluence of Elk Creek. The present trout fishery is rated as fair and there has been a considerable amount of angler use over the years. Rainbow and brown trout and mountain whitefish are the principal game fish species in Reach #1. Brown trout become more abundant in the lower portion of this Reach. Sizes of trout and whitefish are about average compared to other populations in the state. (DFWP Exh. 36, Gardner Dir., p. 3; Bd. Exh. 37-A.3, p. 3-192.)

200. Reach #1 of Sun River contains brown trout and whitefish which average about 11 inches in length, with some brown trout growning to 23 inches; rainbow trout average about 8 inches with some specimens reaching nearly 18 inches in length. Reach #1 of the Sun River experiences severe dewatering during the summer irrigation season. Inadequate streamflows and elevated water temperatures have suppressed the trout fishery in this Reach. (Bd. Exh. 37-A.3, pp. 3-192.)

201. Sun River Reach #2 extends from Elk Creek to the mouth. The present fishery is rated as fair for the majority of this section and there has been a considerable amount of angler-use over the years. Brown and rainbow trout, mountain whitefish, northern pike and burbot are found in this Reach. Brown trout are the most abundant game fish. Whitefish are fairly common in the upper half of the Reach, while rainbow trout are uncommon in the lower River. A small population of northern pike and burbot reside in the lower 25 miles of this Reach. The average sizes of brown and rainbow trout and whitefish are 14 inches, 12 inches and 10 inches, respectively, with some brown trout reaching 23 inches in length and some rainbow reaching 17 inches. The brown trout population is well represented by large-sized fish. Rainbow trout and whitefish sizes are about average compared to other populations in the state. (Bd. Exh. 37-A.3, p. 3-195; DFWP Exh. 36, Gardner Dir., p. 3.)

202. DFWP has requested instream flows on four tributaries to the Sun River. These are North Fork Willow Creek, Willow Creek, Ford Creek and Elk Creek. (Bd. Exh. 37-A.3, pp. 3-198 through 3-209.)

203. The principal fish species in these four tributaries are brook trout, followed by rainbow and brown trout. Brook trout comprise 100% of the game fish in North Fork Willow Creek and provide a good fishery for people in the local area. Brook trout range up to 12 inches in length. Willow Creek contains mostly brook trout with some rainbow trout also present. Brook trout can range up to 12 inches in length. A pure strain of westslope

cutthroat trout occurs in the upper reaches of Willow Creek. Ford Creek supports an excellent brook trout population and is an important fishery in the area. The fishery is approximately 90% brook trout and 10% rainbow and cutthroat trout. Brook trout up to 1.25 pounds have been recorded. Elk Creek has one of the most important trout fisheries in the Augusta area and includes rainbow, brown and brook trout. The brook trout are somewhat more abundant in the upper reaches. (DFWP Exh. 35, Hill Dir., pp. 4 and 5; Bd. Exh. 37-A.3, pp. 3-198 through 3-209.)

204. Belt Creek Reach #1 (headwaters to Big Otter Creek) has a very good trout fishery. The fishery is comprised of rainbow, brown, brook and cutthroat trout and mountain whitefish. Rainbow trout are the predominant fish throughout the reach, followed by whitefish and brown trout. Cutthroat and brook trout are not as common in the mainstem as they are in some of the tributary streams and headwater areas. Average size of rainbow and brown trout and whitefish is 7 inches, 10 inches and 13 inches, respectively. Belt Creek receives a substantial amount of fishing pressure due to its convenient access and close proximity to Great Falls. Approximately 8,000 angler-days of use has occurred annually in recent years. Approximately 3,000 catchable rainbow trout are stocked annually in the lower end of Reach #1 because an adequate self-sustaining trout population cannot be maintained. (DFWP Exh. 36, Gardner Dir., p. 3; Bd. Exh. 37-A.3, pp. 3-214 and 3-215.)

205. Belt Creek Reach #2 (Big Otter Creek to Missouri River) has a moderate cold water and warm water fishery. Fish species present include sauger, rainbow trout, brown trout and mountain whitefish. A marginal resident trout fishery exists in this reach because of low stream flows, high temperatures and siltation. Rainbow trout are the most common species found. Brown trout occur throughout the reach but in fewer numbers. Some spawning by rainbow and brown trout from the Missouri River occurs in Belt Creek during their spawning seasons. Mountain whitefish also migrate into Belt Creek from the Missouri River to spawn. Sauger migrate up Belt Creek from the Missouri River during the late spring and reside in the stream until fall as long as flow conditions are adequate. Sauger range from 12-16 inches in length. (DFWP Exh. 36, Gardner Dir., p. 3; Bd. Exh. 37-A.3, p. 3-217.)

206. DFWP has requested instream flows on five tributaries to Belt Creek. These are: Dry Fork Belt Creek, Tillinghast Creek, Pilgrim Creek, Logging Creek and Big Otter Creek. (Bd. Exh. 37-A.3, pp. 3-220 through 3-238.)

207. These five Belt Creek tributary streams contain various mixtures of rainbow, cutthroat, brown and brook trout. The maximum sizes range from about 9 inches for rainbow trout up to 19 inches for brown trout. Brook and cutthroat trout reach sizes of 13 inches and 10 inches, respectively. Dry Fork Belt Creek populations appear to be less abundant than those of nearby streams

due in part to the toxic affect of heavy metals pollution from old mines. However, good instream flows and habitat conditions occur and there is a good potential for trout fishery restoration when these abandoned mines are reclaimed. Tillinghast Creek has a very good trout fishery with a light amount of angler use because of its remote location and somewhat restricted access. Brook trout are the most abundant game fish. Pilgrim Creek is unique because the trout population is comprised entirely of cutthroat trout. Cutthroat numbers are very good and the fishery receives a moderate amount of angler use. Logging Creek has a very good trout fishery with a moderate amount of angler use. Brook trout are the most abundant game fish, followed by rainbow and brown trout. Total numbers of brook and rainbow trout were 1,183 trout per mile, an abundant fish population for small streams in this area. Fishing pressure is moderate, except where considerable use occurs at a Forest Service campground. Big Otter Creek has an uncommon spring-like aquatic system and a good trout fishery containing exceptionally large-sized brown trout for a creek of this size. Brown trout are the predominant fish found throughout Big Otter Creek, followed by brook and rainbow trout. The stream receives a considerable amount of angler use. (DFWP Exh. 36, Gardner Dir., pp. 3 and 4; Bd. Exh. 37-A.3, pp. 3-220 through 3-246.)

208. Highwood Creek is a tributary to the Missouri River. This creek has an excellent trout fishery and considerable fishing pressure. Brook, rainbow, cutthroat and brown trout occupy the stream, with brook trout being the predominant fish throughout the Reach. Rainbow trout are common but less numerous. Cutthroat trout are confined to the headwater areas and brown trout have been noted only in the lower portions of the reach. Brook and rainbow trout reach 11 and 12 inches in length, respectively. (DFWP Exh. 36, Gardner Dir., p. 4; Bd. Exh. 37-A.3, pp. 3-239 and 3-240.)

209. Shonkin Creek is a Missouri River tributary that has an excellent trout fishery consisting primarily of brook trout and a few rainbow trout. This productive creek is one of only two principal trout streams found in Chouteau County and receives a fair amount of angler use, mostly by local residents. There are an estimated 1,890 brook trout per mile of stream, an especially abundant fish population for streams in this area. (DFWP Exh. 36, Gardner Dir., p. 4; Bd. Exh. 37-A.3, p. 3-244.)

210. Reach #1 of the Marias River (above Tiber Reservoir) has a fair warmwater fishery and is an important spawning stream for walleye from Tiber Reservoir. Some coldwater species (rainbow trout and mountain whitefish) also inhabit this Reach, but are in lower numbers. Other species include burbot, northern pike and channel catfish. Walleye up to 28 inches in length, whitefish up to 17 inches, rainbow up to 22 inches, burbot up to 16 inches and northern pike up to 33 inches have been found in this reach. (DFWP Exh. 36, Gardner Dir., p. 6; Bd. Exh. 37-A.3, p. 3-253.)

211. The average walleye size in Marias River Reach #1 is fairly large for a river population. The river reach also provides rearing habitat for young walleye. Large rainbow trout (average of 2 pounds) occupy the river mainly in the spring and early summer, preferring Tiber Reservoir during the rest of the year. (Bd. Exh. 37-A.3, p. 3-253.)

212. Angler use of Marias River Reach #1 is moderate to light, most likely due to its remote and fairly inaccessible location. (DFWP Exh. 36, Gardner Dir., p. 6; Bd. Exh. 37-A.3, p. 3-254.)

213. Marias River Reach #2 from Tiber Dam to Circle Bridge on Highway 223 consists of a 21-mile cold water trout fishery that produces trophy-sized brown trout. Deep, cold water releases from Tiber Dam provide conditions that are favorable for rainbow and brown trout. Stream trout fisheries are uncommon in northcentral Montana and the Marias river is, therefore, of special value. This 21-mile tailwater fishery below Tiber Dam is the only trout stream within a 50-mile radius and receives a moderate amount of angler use. (Bd. Exh. 37-A.3, p. 3-258; DFWP Exh. 36, Gardner Dir., p. 6.)

214. Reach #2 of the Marias River contains mountain whitefish, rainbow trout, brown trout, sauger, walleye, northern pike, and burbot. Whitefish are the most abundant game fish in the reach and occur in high numbers. Rainbow and brown trout occur in fair numbers and attain exceptionally large sizes. The other species occur in lower numbers. (Bd. Exh. 37-A.3, p. 3-257.)

215. Marias River Reach #2 contains rainbow trout up to 22 inches, brown trout up to 32 inches, sauger up to 22 inches, walleye up to 23 inches, northern pike up to 47 inches and burbot up to 32 inches in length. The reach also contains 14 nongame fish species. (Bd. Exh. 37-A.3, pp. 3-257 and 3-258.)

216. Marias River Reach #3 extends from Circle Bridge to the mouth. This reach has an excellent resident and migratory warmwater fishery. Resident species include sauger, walleye, channel catfish and smallmouth bass. Migratory species from the Missouri River include shovelnose sturgeon, blue sucker, walleye, sauger and channel catfish. This reach contains sauger up to 22 inches, whitefish up to 17 inches, shovelnose sturgeon up to 43 inches, walleye up to 28 inches, channel catfish up to 31 inches, burbot up to 18 inches, and brown trout up to 16 inches in length. The maximum sizes of adult shovelnose sturgeon surpass most other known size data for the species and underscore the value of this high quality population. (Bd. Exh. 37-A.3, pp. 3-261 and 3-262.)

217. Blue sucker, smallmouth buffalo, bigmouth buffalo, and fresh water drum are the migratory species found in Reach #3 of the Marias River during their spawning seasons. They reside in the Missouri River during the rest of the year. There are also 16

nongame fish which are residents of Reach #3. (Bd. Exh. 37-A.3, p. 3-262.)

218. The central location of the warmwater fishery in Marias River Reach #3 makes it especially attractive for residents of the western part of the state, where trout fishing is the major activity. The lower six miles of this reach receive intensive angling pressure during the spring spawning season. Moderate angler use occurs during the rest of the year. (DFWP Exh. 36, Gardner Dir., p. 7; Bd. Exh. 37-A.3, p. 3-262.)

219. DFWP has requested instream flows on nine tributaries to the Marias River. These are: Birch Creek, South Fork Dupuyer Creek, North Fork Dupuyer Creek, Dupuyer Creek, South Badger Creek, North Badger Creek, Badger Creek, South Fork Two Medicine River and Cut Bank Creek. (Bd. Exh. 37-A.3, pp. 3-265 through 3-291.)

220. These nine Marias River tributary streams contain mixtures of brook, rainbow, westslope cutthroat trout and mountain whitefish. In addition to those species, Cut Bank Creek contains brown trout and burbot. (Bd. Exh. 37-A.3, pp. 3-265 through 3-291.)

221. South Fork Dupuyer, North Fork Dupuyer, South Badger, North Badger and Badger Creeks, and South Fork Two Medicine River all contain westslope cutthroat trout, a "Species of Special Concern" in Montana. Westslope cutthroat trout are found mostly in the headwaters of these tributary streams which arise on the east slope of the continental divide. Westslope cutthroat comprise 100% of the fish populations in these streams above natural barriers which prevent other species from mixing with these populations. (DFWP Exh. 35, Hill Dir., pp. 5 through 7; Bd. Exh. 37-A.3, pp. 3-267 through 3-288.)

222. Brook trout are the principal species in Birch Creek and Dupuyer Creek. Specimens up to one pound have been taken in Dupuyer Creek. These two streams also contain rainbow trout and whitefish. (DFWP Exh. 35, Hill Dir., pp. 5 and 6; Bd. Exh. 37-A.3, pp. 3-265, 3-266 and 3-275.)

223. Cut Bank Creek is an important fishery because it is the only trout stream readily available to persons in the Cut Bank area. Brown trout, introduced in 1965, have established a self-sustaining population. Catchable rainbow trout are stocked annually to supplement a few wild rainbow. (Bd. Exh. 37-A.3, p. 3-290.)

224. The Upper Teton River basin supports an abundance of fish and wildlife that provides good fishing and hunting. Native westslope cutthroat trout are found in headwater streams and rainbow, brook and brown trout occur in the middle to upper reaches of several streams. (Bd. Exh. 37-A.3, p. 3-294.)

225. DFWP has requested an instream flow in the Teton River only from its headwaters to the discharge from Priest Butte Lake near Choteau. Brook, brown and rainbow trout, and mountain whitefish are the principal game fish in this Reach, with the latter three providing a significant fishery in the lower portion of the reach. (DFWP Exh. 35, Hill Dir., p. 8; Bd. Exh. 37-A.3, p. 3-295.)

226. The Teton River provides a trout fishery for the people in the local area. Above Choteau, 90% of the fishery is small brook trout with fewer numbers of brown and rainbow trout and mountain whitefish. These are mostly pan-sized fish. (Bd. Exh. 37-A.3, p. 3-296.)

227. Below Choteau, the fishery is mostly brown trout, followed by whitefish and rainbow trout. Brown trout up to 22 inches, whitefish up to 21 inches and rainbow trout up to 18 inches in length have been taken in this Reach. (Bd. Exh. 37-A.3, pp. 3-296 and 3-297.)

228. DFWP has requested instream flows on five tributaries to the Teton River. These are: McDonald Creek, South Fork Deep Creek, North Fork Deep Creek, Deep Creek and Spring Creek. (Bd. Exh. 37-A.3, pp. 3-300 through 3-312.)

229. McDonald Creek provides a good fishery for small brook trout, the only game species present. South Fork Deep, North Fork Deep, Deep and Spring Creeks contain both brook and rainbow trout. Deep Creek also contains brown trout up to 14 inches in length, as well as whitefish. Westslope cutthroat trout are also found in South Fork Deep, North Fork Deep and Deep Creeks. (DFWP Exh. 35, Hill Dir., pp. 8 through 9; Bd. Exh. 37-A.3, pp. 3-300 through 3-312.)

230. Spring Creek is very important to the community of Choteau because it flows right through town. Annual plants of catchable rainbow trout are made within the town of Choteau for a children's fishing area. (DFWP Exh. 35, Hill Dir., p. 9.)

231. The Judith River is the third largest tributary to the Missouri River between Canyon Ferry Dam and Fort Peck Reservoir. It is a popular recreation area for fishing, hunting, picnicking, hiking and floating. (Bd. Exh. 37-A.3, pp. 3-315 and 3-316.)

232. Judith River Reach #1 (South and Middle Forks to Big Spring Creek) has a very good trout fishery that receives a considerable amount of angler use. Large brown trout are found in this Reach during the fall spawning season. Brown trout are the predominant game fish, followed by mountain whitefish and rainbow trout. An excellent population of brook trout exists in the upper portion of Reach #1. Low numbers of cutthroat trout also occur in

the upper portion of this Reach. (DFWP Exh. 36, Gardner Dir., p. 5; Bd. DFWP Exh. 37-A.3, p. 3-317.)

233. The upper portion of Judith River Reach #1 contains an estimated 1,420 trout per mile, which is an abundant fish population for streams typical of this area. Brook trout up to 13 inches, brown trout up to 20 inches, and rainbow trout up to 15 inches in length have been taken in this Reach. (Bd. Exh. 37-A.3, p. 3-317.)

234. Judith River Reach #2 (Big Spring Creek to its mouth) has a fair fishery for both warmwater and coldwater species. Present fish populations are not exceptionally high. (Bd. Exh. 37, A-3, p. 3-322.) It is an important spawning tributary for Missouri River channel catfish. Other game fish species present include sauger, mountain whitefish, brown trout, rainbow trout, smallmouth bass, walleye, cisco and burbot. (DFWP Exh. 36, Gardner Dir. p. 5; Bd. Exh. 37-A.3, p. 3-320.)

235. In Judith River Reach #2, sauger and channel catfish are the most abundant game fish. Sauger up to 24 inches and channel catfish up to 32 inches in length are present. Twelve nongame species also occur in this Reach. (Bd. Exh. 37-A.3, p. 3-320.)

236. The lower Judith River (Reach #2) has a diverse fishery which reflects the variety of habitat conditions present and the transition from a coldwater to a warmwater environment. This Reach receives only a light amount of fishing pressure, most likely due to its remote and fairly inaccessible location. (DFWP Exh. 36, Gardner Dir., p. 5; Bd. Exh. 37-A.3, p. 3-321.)

237. DFWP has requested instream flows on nine tributaries to the Judith River. These are: South Fork Judith River, Lost Fork Judith River, Middle Fork Judith River, Yogo Creek, Big Spring Creek, East Fork Big Spring Creek, Beaver Creek, Cottonwood Creek and Warm Spring Creek.

238. South Fork Judith, Lost Fork Judith, Middle Fork Judith and Yogo Creeks, all of which are headwater tributaries to the Judith River, contain very good to fair populations of pan-size rainbow, brook and cutthroat trout and mountain whitefish. Rainbow and brook trout are predominant. Middle Fork Judith River also contains a few brown trout. (DFWP Exh. 36, Gardner Dir., pp. 5 and 6; Bd. Exh. 37-A.3, pp. 3-324 through 3-338.)

239. South Fork Judith River receives a considerable amount of angler use, whereas Middle Fork, Lost Fork and Yogo Creeks receive moderate to light fishing pressure. (DFWP, Exh. 36, Gardner Dir., pp. 5 and 6; Bd. Exh. 37-A.3, pp. 3-324 through 3-338.)

240. Big Spring Creek is one of the largest spring-fed streams in the state. The majority of the flow originates from a large

spring located approximately nine miles southeast of Lewistown. The stream is high in dissolved solids, exceptionally productive and, for its size, rated as one of Montana's finest fishing waters. Local sportsmen and tourists consider the stream to be the most important trout stream in central Montana. (Bd. Exh. 37-A.3, pp. 3-341, 3-342 and 3-343.)

241. The productive nature of Big Spring Creek is due to stable year-round flows provided by the large spring; stable water temperatures in the mid-50's at the spring which provide optimum trout growth; productive water rich in dissolved solids from underground limestone formations which provide for good food production and fish growth; and the relatively stable banks, stream channel and well-developed riparian zone which provide trout habitat. (DFWP, Exh. 15, Poore Dir., p. 3.)

242. Big Spring Creek Reach #1 (from the state fish hatchery to Cottonwood Creek) contains primarily rainbow and brown trout with rainbow making up a majority of the population. A few brook trout and whitefish also occur. Up to 245 rainbow trout per mile 15 inches and longer, and up to 125 brown trout per mile 15 inches and longer, have been found in Big Spring Creek. Reach #1 has also produced many fish over 10 pounds and several between 18 and 20 pounds. (Bd. Exh. 37-A.3, pp. 3-343 and 3-344; DFWP Exh. 15, Poore Dir., p. 3.)

243. Big Spring Creek Reach #1 receives substantial angler use. Between 1982-86, an annual average of 11,000 angler-days of use occurred on this Reach. (Bd. Exh. 37-A.3, p. 3-344.)

244. Big Spring Creek Reach #2 (from Cottonwood Creek to the mouth) contains brown trout, rainbow trout, mountain whitefish and sauger. Whitefish are the most common salmonids, followed by rainbow and brown trout. Sauger are found in this Reach when they move in from the Judith River, probably to spawn. (Bd. Exh. 37-A.3, p. 3-347.)

245. Fishing pressure on Big Spring Creek Reach #2 is much less than Reach #1, but still substantial. An average annual use of 3,200 angler days occurred between 1982-86. (Bd. Exh. 37-A.3, p. 3-347.)

246. DFWP has requested instream flows on three tributaries to Big Spring Creek. These are: East Fork Big Spring Creek, Beaver Creek and Cottonwood Creek. (Bd. Exh. 37-A.3, pp. 3-350 through 3-360.)

247. These three Big Spring Creek tributaries contain pan-size rainbow, brook and brown trout. Rainbow are the predominant fish in the East Fork, brook trout in Beaver Creek and brown trout in Cottonwood Creek. Brown trout up to 17 inches and two pounds have been taken from Beaver Creek. All three streams have good to

moderate trout fisheries with moderate to light angler use. (DFWP Exh. 36, Gardner Dir., p. 5; Bd. Exh. 37-A.3, pp. 3-350 through 3-360.)

248. Warm Spring Creek flows directly into the Judith River. Because of its productivity and diversity of fish and invertebrate species, Warm Spring Creek is one of the most unique streams in the state. (DFWP Exh. 15, Poore Dir., p. 6.)

249. To some degree, the same factors which make Big Spring Creek so productive also apply to Warm Spring Creek: Stable stream flow, stable water temperatures, high dissolved solids and channel and bank stability. (DFWP Exh. 15, Poore Dir., pp. 6 and 7.)

250. Warm Spring Creek contains rainbow, brown and brook trout, smallmouth bass, sauger and channel catfish. Rainbow are the most abundant game fish. Brown trout are less abundant but Reach larger size (up to 20 inches and averaging 17 inches.) (Bd. Exh. 37-A.3, p. 3-363.)

251. Warm Spring Creek also contains smallmouth bass which are growing well and reproducing. Smallmouth bass were introduced because water temperatures are somewhat excessive for natural reproduction of rainbow and brown trout. The lower end of Warm Spring Creek also contains sauger and channel catfish which originate from the Judith River. (DFWP Exh. 15, Poore Dir., p. 6.)

252. Warm Spring Creek receives an average of 1,200 angler days per year. (Bd. Exh. 37-A.3, p. 3-364.)

253. Cow Creek is a northern tributary to the Missouri River. DFWP has requested flows on two miles of Cow Creek from the confluence of the North and South Forks to the county bridge near T.U. Reservoir. (Bd. Exh. 37-A.3, p. 3-367.)

254. Brook trout are the only game fish present in this Reach of Cow Creek. However, they occur in large numbers (4,187 fish per mile.) Brook trout are mostly pan-size but range up to 12 inches in length. (Bd. Exh. 37-A.3, pp. 3-367 and 3-368.)

255. This Reach of Cow Creek provides year-round habitat for brook trout as well as being the primary spawning areas for fish inhabiting downstream beaver ponds. Cow Creek has an excellent trout fishery and fishing pressure is light. (DFWP Exh. 36, Gardner Dir., p. 4; Bd. Exh. 37-A.3, p. 3-368.)

256. The Musselshell River is 364 miles long and is one of Montana's longest rivers. It is characterized by three fishery habitat types: 1) coldwater in the upper 55 miles; 2) coldwater/warmwater transitional zone for 146 miles; and 3) a classic warmwater prairie stream for 163 miles. Each Reach has

unique fishery qualities. (DFWP Exh. 27, Fredenberg Dir., pp. 2 and 3.)

257. Musselshell River Reach #1 (from the confluence of the North and South Forks to Deadmans Basin Diversion Dam) is a brown trout stream with abundant bank cover, deep pools and a dense riparian zone. Historically, when sufficient flows are present, Musselshell Reach #1 has provided large fish, with brown trout over five pounds not uncommon. Drought conditions between 1985 and 1988 produced a decline in the brown trout population. (DFWP Exh. 27, Fredenberg Dir., p. 3; Bd. Exh. 37-A.3, p. 3-376.)

258. Musselshell River Reach #2 (a 146-mile section from Deadmans Basin Diversion downstream to Musselshell Diversion) is a transitional zone between a coldwater and warmwater fishery. The trout fishery found in Reach #1 ends abruptly below Deadman's Diversion due to chronic dewatering and trout are, therefore, not a factor in the fishery of this Reach. (DFWP Exh. 27, Fredenberg Dir., p. 4.)

259. In Musselshell Reach #2, smallmouth bass are presently the most important game fish. A poor fishery exists throughout Reach #2 due to low water flows and poor water quality. (DFWP Exh. 27, Fredenberg Dir., p. 5; Bd. Exh. 37-A.3, p. 3-383.)

260. Musselshell Reach #2 contains a peculiar minnow, the northern redbelly dace x finescale dace hybrid, which is classified as a "Species of Special Concern" in Montana due to its limited numbers and habitat. This hybrid fish is a parthenogenetic species, which means that all of the individuals are female and they reproduce exact clones of the mother through development of an unfertilized egg. (DFWP Exh. 27, Fredenberg Dir., p. 5; Bd. Exh. 37-A.3, p. 3-383.)

261. Musselshell River Reach #3 extends for 163 miles from the Musselshell Diversion to its mouth at Fort Peck Reservoir. This Reach has significant fishery values and represents the free-flowing, warmwater portion of the Musselshell River. (DFWP Exh. 27, Fredenberg Dir., p. 5; Bd. Exh. 37-A.3, p. 3-386.)

262. Musselshell Reach #3 contains sauger, channel catfish, smallmouth bass, black bullhead, northern pike and walleye. This Reach is a very important spawning tributary for channel catfish, sauger and smallmouth bass from Fort Peck Reservoir because irrigation withdrawals are minimal and there are no barriers to upstream migration in this 163 miles of river. (DFWP Exh. 27, Fredenberg Dir., p. 6; Bd. Exh. 37-A.3, p. 3-387.)

263. Musselshell Reach #3, despite its remote location, had about 4,600 fisherman days of use in 1989. (DFWP Exh. 27, Fredenberg Dir., p. 6.)

264. DFWP requested instream flows on 11 tributaries to the Musselshell River. These are: South Fork Musselshell River, Alabaugh Creek, Cottonwood Creek, North Fork Musselshell River, Checkerboard Creek, Spring Creek, Big Elk Creek, American Fork Creek, Careless Creek, Swimming Woman Creek and Flatwillow Creek. (Bd. Exh. 37-A.3, pp. 3-390 through 3-436 and 3-440 through 3-443.)

265. All of the requested Musselshell River tributaries except Careless, Swimming Woman and Flatwillow Creeks are in Reach #1 of the Musselshell River. (Bd. Exh. 37-A.3, p. 3-372.)

266. South Fork Musselshell, Alabaugh Creek and Cottonwood Creek all contain rainbow, brook and brown trout. Brown trout are the dominant species in these three streams. All three streams provide good to excellent fisheries and produce some large fish. Brown trout up to 18 inches are present and specimens up to four pounds have been taken. (DFWP Exh. 26, Frazer Dir., pp. 4, 10 and 23; Bd. Exh. 37-A.3, pp. 3-390 through 3-402.)

267. North Fork Musselshell Reach #1 (above Bair Reservoir) contains an excellent pan-size brook trout population along with a few rainbow trout. Bair Reservoir is a barrier to all fish movement from downstream Reaches of the North Fork. (DFWP Exh. 26, Frazer Dir., p. 18; Bd. Exh. 37-A.3, pp. 3-406 through 3-412.)

268. Checkerboard Creek supports an excellent trout fishery comprised mostly of brook trout, with lesser numbers of rainbow and brown trout. Brook and rainbow trout over 12 inches long are present. Spring Creek is a good fishery for pan-sized brook and rainbow trout. Big Elk and American Fork Creeks provide good fisheries for brook and brown trout. Brook trout predominate in the upper reaches and brown trout in the lower reaches. Both streams contain brown trout up to 14 inches in length. Careless and Swimming Woman Creeks both contain brook trout and are important local fisheries. (DFWP Exh. 26, Frazer Dir., pp. 8 and 25; DFWP Exh. 27, Fredenberg Dir., pp. 7 and 8; Bd. Exh. 37-A.3, pp. 3-414, 3-418, 3-421 and 3-422, 3-425 and 3-426, 3-430, 3-433 and 3-434.)

269. Flatwillow Creek is the largest drainage emerging from the Snowy Mountains and, as such, is the best stream trout fishery in Petroleum County and surrounding locale. The stream contains brown, rainbow and brook trout. The mainstem of Flatwillow Creek above U.S. Highway 87 is a high quality trout stream that has regional importance. Brown trout are the predominant fish, followed by rainbow and brook trout. Brown trout up to 24 inches long have been taken from this stream Reach. (DFWP Exh. 27, Fredenberg Dir., p. 6; Bd. Exh. 37-A.3, pp. 3-441 and 3-442.)

270. Collar Gulch is a small tributary to Fords Creek which originates in the Judith Mountains about 12 miles northeast of Lewistown. This stream contains a small population of genetically

pure westslope cutthroat trout, a "Species of Special Concern" in Montana, which have survived in the isolated perennial headwaters of the stream for many years. Cutthroat up to 10 inches in length are present. (DFWP Exh. 15, Poore Dir., p. 8; Bd. Exh. 37-A.3, pp. 3-437 through 3-439.)

271. Big Dry and Little Dry Creeks are both low-gradient prairie streams. Little Dry Creek is a tributary to Big Dry Creek. Both streams contain channel catfish and walleye. Catfish are residents of the stream system and walleye are migratory species from Fort Peck Reservoir. Walleye are one of the most popular game fish in Fort Peck Reservoir. Walleye gather in the reservoir near the mouth of Big Dry Creek each spring and, if spring flows allow, they will migrate up Big Dry Creek 30 to 35 miles to spawn. They also migrate eight miles up Little Dry Creek to spawn. Walleye eggs, larvae and young-of-the-year fingerlings have all been collected in Big and Little Dry Creeks when high spring flows coincide with the normal walleye spawning period. Therefore, Big Dry and Little Dry Creeks are important spawning and rearing areas for walleye when flows are available. (DFWP Exh. 26, Frazer Dir., pp. 6, 7, 11 and 12; Bd. Exh. 37-A.3, pp. 3-445, 3-446, 3-448 and 3-449.)

272. Bean Lake is a natural lake located 15 miles southwest of Augusta in Lewis and Clark County. It is the only natural lake of any appreciable size in all of northcentral Montana. It is a popular recreation area and provides nearly 10,000 angler days of fishing per year. It is one of the few lakes and reservoirs which have public access and where the waters are not committed for other uses such as irrigation. Bean Lake has no surface water inflow; water supply is entirely from precipitation, ground water and seepage. It is an important rainbow trout fishery with a satisfactory catch rate and some older trout being taken in excess of four pounds. (DFWP Exh. 21, Wipperman Dir., pp. 5 and 6; Bd. Exh. 37-A.3, pp. 3-451 through 3-453.)

273. Antelope Butte Swamp is part of the Blackleaf Wildlife Management Area lying approximately 14 miles west of Bynum in Teton County. The swamp is a perennial wetland area of approximately 240 acres, which is fed by Noname Creek and a private diversion from Muddy Creek. The area is managed by DFWP as a winter range for migratory wildlife such as elk and mule deer. It has a diversity of plant communities which provide year-round and seasonal habitats for whitetail and mule deer, elk, black and grizzly bear, wolf, (both grizzly and wolf are federally protected threatened and endangered species), mountain lion, bobcat, lynx, beaver, mink, muskrat, sharptailed, ruffed, spruce and blue grouse, as well as numerous waterfowl species. Grizzly bears in particular are drawn to the area during the spring to feed on succulent plants that grow in the moist environment of the Swamp. As part of the Blackleaf Wildlife Management Area, the Swamp provides the needs for both game and nongame wildlife and a resource that is available for the

recreational enjoyment by the public. (DFWP Exh. 16, Olson Dir., pp. 2 and 3; Bd. Exh. 37-A.3, pp. 3-455 through 3-459.)

274. Fish "Species of Special Concern" which occur in Missouri basin streams above Fort Peck Dam include the following species:

Westslope cutthroat trout
Arctic grayling
Pallid sturgeon
Sturgeon chub
Paddlefish
Northern redbelly dace x finescale dace hybrid
Sickelfin chub
Blue sucker

275. "Species of Special Concern" is a DFWP and American Fisheries Society designation that reflects the limited numbers of these fish present in the state, their limited distribution or the limited amount of preferred habitat still available to them. These fish have been eliminated or severely reduced in numbers over much of their former range. (DFWP Exh. 17, Spence Dir., p. 11.)

276. The westslope cutthroat trout, a "Species of Special Concern", is native to Montana west of the Continental Divide and to the Missouri River and its tributaries in the mountains east of the Continental Divide. The Montana Natural Heritage Program (MNHP) lists genetically pure westslope cutthroat as rare in Montana. It is estimated that genetically pure westslope cutthroat occupy only 1.1% of their historical range in Montana streams. The decline of westslope cutthroat trout may be due to several factors, including hybridization with non-native rainbow trout, competition from introduced species, over-fishing and habitat alteration. (Bd. Exh. 40, p. 89; DFWP Exh. 35, Hill Dir., p. 4; Bd. Exh. 37-A.2, p. 2-10.)

277. The status of fluvial (permanently stream dwelling) arctic grayling, Thymallus arcticus, in Montana has been of increasing concern in recent years. Stream populations of this indigenous fish, which is an important component of the sport fishery of Montana, have declined severely. (MTU/AFS Exh. 10, Kaya Dir., p. 2.)

278. The U.S. Fish and Wildlife Service (USFWS) classifies fluvial Montana grayling as a category 1 species, the final category before listing as threatened or endangered. On October 3, 1991, USFWS received a petition from private foundations to list the stream-dwelling grayling as an endangered species throughout its known historical range in the lower 48 states. (MTU/AFS Exh. 10, Kaya Dir., p. 4; Bd. Exh. 41, p. 32.)

279. The arctic grayling was native to two areas in the lower 48 states: Michigan, where it is now extinct, and in the Missouri

River drainage above Great Falls, where it was once abundant. Once widely distributed in the Missouri River and its tributaries upstream from Great Falls, fluvial Montana grayling are now restricted to the upper reaches of a single tributary, the Big Hole River. This is the only confirmed fluvial grayling population still remaining south of Canada and Alaska. Lake dwelling grayling are abundant and secure in Montana in lakes in which they have been planted. (MTU/AFS Exh. 10, Kaya Dir., p. 2; Bd. Exh. 40, p. 89; Bd. Exh. 37-A.2, p. 2-10.)

280. There is some evidence that suggests that a grayling population that resides in Ennis Lake and moves back and forth between the Madison River channels and Ennis Lake may be another remnant of this same fluvial population. (Fredenberg Cross, Tr. Day 12, pp. 116, 117 and 122.)

281. Fluvial Montana grayling are reduced in distribution to only about 8% or less of their historical range. The Michigan grayling underwent a similar earlier decline and disappeared about 1936. Repeated attempts to establish or restore stream populations in Michigan and Montana have not succeeded. (MTU/AFS Exh. 10, Kaya Dir., p. 2.)

282. The total estimated size of the current fluvial grayling population in the 50 miles of the Big Hole River where they live is approximately 1,500 grayling one year old or older. (MTU/AFS Exh. 10, Kaya Dir., p. 4.)

283. Some Montana streams contain more than 1,500 age one or older trout per single mile. (MTU/AFS Exh. 10, Kaya Dir., p. 4.)

284. The cause of decline in stream-dwelling arctic grayling populations is not well understood but is believed to be identified with low stream flows, changes in land use, over-harvest and competition from introduced non-native species. (MTU/AFS Exh. 10, Kaya Dir., pp. 4 and 5; Bd. Exh. 40, p. 89; Bd. Exh. 37-A.2, p. 2-10; Kaya Cross, Tr. Day 13, p. 78.)

285. Degradation of fluvial grayling habitat in Montana appears most frequently to have been related directly or indirectly to agricultural irrigation. The most important disturbances have been reduction in streamflows through withdrawals of water for irrigation, blockage of streams by dams for reservoirs and diversions, and flooding of streams by reservoirs. (MTU/AFS Exh. 10, Kaya Dir., p. 5.)

286. One of the main requirements for a healthier and more productive grayling population in the Big Hole River drainage is adequate flow, ie., more water means more fish. (Kaya Cross, Tr. Day 13, p. 83.)

287. Among the factors most commonly cited as being detrimental to Big Hole River grayling is low streamflows. In addition to this reduction in habitat for grayling of all ages, other possible effects of low streamflows include interference with seasonal migrations, stranding of incubating eggs or young fish, increased predation on young fish through their being concentrated in remnant waters with adults and other fishes, reduced food availability through habitat reduction for aquatic invertebrates, and increased maximum daily temperatures. (MTU/AFS Exh. 10, Kaya Dir., pp. 6 and 7.)

288. Weak year classes of grayling are associated with lower flows and strong year classes with flows normal or slightly above average. During years of low flow, many adults move downstream after spawning instead of remaining in upstream areas through the summer, suggesting that low flows may be altering their migration patterns by making them leave their summer feeding areas. (MTU/AFS Exh. 10, Kaya Dir., p. 7.)

289. Grayling populations in the Big Hole River are higher during years when flows are higher and lower during low flow years. (Kaya Re-cross, Tr. Day 13, pp. 100 through 102.)

290. Water withdrawals from the Big Hole River may be contributing to elevated water temperatures during the summer through a relationship between reduced flows and increased stream temperatures. (MTU/AFS Exh. 10, Kaya Dir., pp. 7 and 8.)

291. Restrictive fishing regulations since 1984 have not improved the Big Hole River grayling population. (Kaya Cross, Tr. Day 13, p. 85.)

292. Since fishing harvest of grayling is now severely restricted by present catch and release fishing regulations, maintenance of adequate water flows may be the most critical requirement for the continued existence of the severely depressed population of fluvial grayling in the upper Big Hole River. (MTU/AFS Exh. 10, Kaya Dir., p. 8.)

293. The pallid sturgeon, Scaphirhynchus albus, is one of the two sturgeons in the genus Scaphirhynchus found in North America. The other species is the more common shovelnose sturgeon (S. platorynchus. Pallid sturgeon are one of the largest fish found in the Missouri River, with specimens approaching 6 feet and 85 pounds. (MTU/AFS Exh. 5, Dryer Dir., p. 1.)

294. The original distribution of the pallid sturgeon included the Mississippi River and large tributaries from Iowa to Louisiana, the Missouri River from Great Falls to the mouth, and the Yellowstone River below the mouth of the Tongue River. (Bd. Exh. 40, p. 88.)

295. Sturgeon are ancient fish which have survived and remained relatively unchanged for over 200 million years. The pallid sturgeon is now on the brink of extinction. Possible contributing factors to the decline of the species includes channelization and damming of rivers which has greatly reduced the migratory range of the fish, operation of the dams which alter water quality and flows, overfishing and environmental contaminants. (MTU/AFS Exh. 5, Dryer Dir., p. 3; Bd. Exh. 40, DEIS, p. 88.)

296. In October 1990, the pallid sturgeon was listed as an endangered species throughout its entire range. This designation means that the species is in danger of extinction throughout all or a significant portion of its range. (MTU/AFS Exh. 5, Dryer Dir., pp. 2 and 3.)

297. The pallid sturgeon's unique position in the Missouri River aquatic ecosystem has already been severely affected, especially as one moves further and further downstream of Montana. The Missouri River above Fort Peck Reservoir is the least altered of the entire 2,000+ mile Missouri and Mississippi River mainstem systems which encompass the range of the pallid sturgeon. Maintaining the natural Missouri River ecosystem in Montana in its current state is important to recovery of the pallid sturgeon. (MTU/AFS Exh. 5, Dryer Dir., p. 4.)

298. During the 1960's, 500 observations of pallid sturgeon were made over its entire range. By contrast, throughout the 1980's there were only 65 recorded observations of pallid sturgeon over its entire range. Since 1980, only seven pallid sturgeon have been recorded in the Missouri River above Fort Peck Reservoir in Montana. (MTU/AFS Exh. 5, Dryer Dir., p. 3.)

299. Pallid sturgeon are long-lived fish achieving ages of more than 40 years. The time required to reach sexual maturity for males is seven to nine years with a 2-3 year interval between spawning years. Females reach sexual maturity in 15-20 years with 3-10 year intervals between spawning. (MTU/AFS Exh. 5, Dryer Dir., p. 2.)

300. The sturgeon chub is a member of the minnow family and is not a game fish. This fish lives in medium to large rivers that are turbid and warm, in areas of strong current with a sand or gravel bottom. It grows to be about four inches long. The sturgeon chub is a candidate for listing as an endangered and threatened species. (Bd. Exh. 40, p. 89; MTU/AFS Exh. 5, Dryer Dir., p. 4.)

301. Paddlefish are Montana's largest game fish with female specimens often reaching five to six feet in length and weighing 75 to 125 pounds. Once abundant 150 million years ago, these primitive fish are presently found in only two river basins -- the

Yangtze in China and the Mississippi/Missouri. (Bd. Exh. 37-A.1, p. 1-40.)

302. The paddlefish is not listed as an endangered species but it is a "Species of Special Concern" in Montana. (DFWP Exh. 29, Berg Dir., p. 3.)

303. Stream channelization, dams, overharvesting and alteration of streamflows have reduced the range of paddlefish in the United States to only six isolated self-sustaining populations in the Mississippi/Missouri basins. The paddlefish population in Fort Peck Reservoir and the Missouri River above the reservoir is the oldest and most secure of all the North America populations. Growth rates of this population are also better than any of the other five populations. This is due largely to the unaltered free-flowing characteristics of this Reach of the river which provides essential and irreplaceable spawning areas for paddlefish. (Bd. Exh. 37-A.1, pp. 1-40 and 1-41.)

304. The northern redbelly dace x finescale dace is a hybrid fish which is produced when northern redbelly dace are crossed with finescale dace. The hybrid is a parthenogenetic species, which means that all of the individuals are female and they produce exact clones of the mother through development of an unfertilized egg. This peculiar minnow has been found in three locations in the Missouri River basin above Fort Peck Dam and in the Musselshell River. (Bd. Exh. 40, p. 89; DFWP Exh. 27, Fredenberg Dir., p. 5.)

305. The Montana Natural Heritage Program (MNHP) notes that the sickelfin chub is critically imperiled in Montana and rare throughout the rest of its range. The sickelfin chub is a member of the minnow family and may grow to 3.5 inches in length. It has been found along the lower portion of the Missouri River above Fort Peck Reservoir. The sickelfin chub is a candidate for listing as a federal endangered or threatened species. (Bd. Exh. 40, p. 89; MTU/AFS Exh. 5, Dryer Dir., p. 4.)

306. The blue sucker is rare in Montana. It has been found in the Missouri River below Fort Benton, Marias River, the lower Judith River and the lower portion of the Yellowstone River. The blue sucker is not a game fish in Montana. The state record weight for a blue sucker is 11.5 pounds. The blue sucker is a candidate for listing as a federal endangered or threatened species. (Bd. Exh. 41, p. 143; MTU/AFS Exh. 5, Dryer Dir., p. 4.)

307. Riparian communities are the plants and animals associated with stream courses and floodplains. From a wildlife standpoint, the habitat diversity provided by riparian vegetation is perhaps the greatest value provided by flowing water. (DFWP Exh. 28, Casey Dir., p. 2.)

308. Riparian soils are often geomorphically very young and coarse textured and, therefore, transmit water readily and have a low water retention capacity. Therefore, a dependable water supply is essential to assure that riparian soils will serve as growth media for woody vegetation. (DFWP Exh. 28, Casey Dir., p. 3.)

309. Decreased flow can result in decreased riparian cover because of induced soil moisture stress. Also, providing more consistent flows in intermittent or ephemeral streams has been shown to increase riparian vegetation. Light to moderate flooding also favors establishment and regeneration of riparian communities and some species such as willows and cottonwoods are dependent on seasonal flooding for perpetuation of multi-aged stands. (DFWP Exh. 28, Casey Dir., p. 3.)

310. The importance of riparian habitats to wildlife has been well documented in the scientific literature and their importance in the arid west is well accepted by the scientific community. (DFWP Exh. 28, Casey Dir., p. 3.)

311. Because of their biological importance and because of documented losses of riparian acreage through conversion to agriculture and other land uses, maintenance of riparian habitats is important wildlife across Montana and elsewhere in the west. (DFWP Exh. 28, Casey Dir., p. 3.)

312. Wooded riparian areas have been shown throughout the west to support higher densities of breeding birds than any other habitats. Breeding bird communities are frequently used as a "barometer" of habitat richness and health because they are relatively easy to measure and respond quickly and dramatically to environmental changes. (DFWP Exh. 28, Casey Dir., p. 3.)

313. The relationship between diversity of breeding birds and riparian habitats has been documented. Cottonwood communities in the Missouri River breaks supported more than 2-5 times as many breeding pairs and twice the species of birds as did the upland habitats investigated (upland habitats specifically were greasewood-sagebrush, sagebrush-grassland, and pine-juniper). (DFWP Exh. 28, Casey Dir., p. 4.)

314. Many big game species which feed in a variety of habitats, including agricultural lands, are dependent on wooded riparian habitat for security and thermal cover during critical times of the year. Many wildlife species are found almost exclusively in riparian habitats. These include numerous songbird species, waterfowl, ospreys and bald eagles, beavers, river otters, and mink. (DFWP Exh. 28, Casey Dir., p. 4.)

315. Mature stands of cottonwood and younger stands of willow/cottonwood on islands are two important nesting habitats for Canada geese. (DFWP Exh. 28, Casey Dir., p. 4.)

316. The importance of riparian habitat to specific wildlife species has been quantified. (DFWP Exh. 28, Casey Dir., p. 4.)

317. The biological abundance and diversity found within riparian areas attracts increasing numbers of persons who recreate along streams, including photographers, bird watchers, science students, hunters, berry pickers and naturalists. (Bd. Exh. 37-A.1, p. 1-45.)

318. Preserving instream flows will help maintain the health and vigor of riparian plant species through the protection of water (either surface or subsurface) during critical periods in their growth cycle.

319. Although the number of species varies from stream to stream, all of the streams where DFWP has requested flows for fishery purposes also harbor a wide diversity of wildlife species. (Bd. Exh. 37-A.2, pp. 2-8 through 2-615; Bd. Exh. 37-A.3, pp. 3-1 through 3-459.)

320. In addition to those numerous wildlife species occurring along the stream corridors, a number of threatened and endangered wildlife species occur in some stream reaches.

321. The bald eagle occurs year-round in the upper Missouri basin and is federally classified as an endangered species. From 30-50 eagles winter on area reservoirs and rivers. Winter densities are typically highest in the area of Ennis Reservoir on the Madison River and along the headwaters of the Missouri River near Three Forks, where 12-15 eagles may be present at each location. Bald eagles commonly pass through the upper basin during fall and spring migrations. The Missouri River basin between Canyon Ferry Dam and Fort Peck Reservoir also provides important habitat for bald eagles. Three active bald eagle nesting sites have been identified along the Missouri River corridor between Hauser Lake and Great Falls. (Bd. Exh. 37-A.2, p. 2-9; Bd. Exh. 37-A.3, p. 3-5.)

322. The peregrine falcon is an endangered species and occurs as a casual migrant in the upper Missouri River basin in spring and fall. Following recent efforts to reintroduce peregrines to their former breeding range in the upper basin, three breeding pairs are presently established and more are anticipated in the near future. The Missouri River basin between Canyon Ferry Dam and Fort Peck Reservoir also provides important habitat for peregrine falcons. Two active peregrine nesting sites have been identified along the River corridor between Hauser Lake and Great Falls and attempts are underway to reintroduce peregrine falcons along this stretch of the River. (Bd. Exh. 37-A.2, p. 2-9; Bd. Exh. 37-A.3, p. 3-5.)

323. The whooping crane is a federally designated endangered species and occurs primarily in the Redrock Lakes National Wildlife

Refuge in Montana. (Bd. Exh. 37-A.2, p. 2-9.)

324. Grizzly bears designated as threatened by the federal government use the mountain wildlands of the Madison, Gallatin and Ruby river drainages year long for winter denning, feeding and day-bedding and as a travel corridor. In the lower Missouri basin, grizzly bears also inhabit the headwater streams and foothills along the east slope of the Continental Divide, including streams in the Marias and Teton River sub-basins. The grizzly bear utilizes many of these areas during the spring, summer and fall. (Bd. Exh. 37-A.2, pp. 2-9 and 2-10; DFWP Exh. 35, Hill Dir., pp. 4 through 9.)

D. FINDINGS ON THE AMOUNT OF WATER NEEDED FOR THE WATER RESERVATION APPLIED FOR BY DFWP (Mont. Code Ann. § 85-2-316(4)(a)(iii)(1991); ARM 36.16.107B(3).)

325. The instream flows requested by DFWP are intended to maintain fishery values. Several methods were used to determine the requested amounts of water. (Bd. Exh. 37-A.1, p. 1-11.)

326. Positive relationships between fish abundance and the magnitude of a stream's annual low flows are well documented in the scientific literature. Higher flows generally lead to a greater abundance of fish. (DFWP Exh. 23, p. 7; MTU/AFS Exh. 9, White Dir., p.2.)

327. The best and most accurate means for deriving minimum flow requests to protect fishery values is to directly observe the response of the fish populations to flow variations over a period of many years. Because of the intensive data requirements and long-term commitment, this approach is impractical for a water reservation process, requiring the use of an array of less time-consuming and more practical alternatives. (DFWP Exh. 22, Nelson Dir., p. 4; MTU/AFS Exh. 8, Thomas Dir., p. 3.)

328. These alternative instream techniques are designed to determine how much water a stream needs to protect aquatic life, and are divided into three general groups of methods: 1) non-field, 2) incremental, and 3) habitat retention. (DFWP Exh. 22, Nelson Dir., p. 4; MTU/AFS Exh. 8, Thomas Dir., p. 3.)

329. Because non-field methods are usually performed in the office and are commonly based on a flow quantity derived from the historic flow record, they are normally confined to deriving preliminary recommendations. This limits their suitability for use in this process. (DFWP Exh. 22, Nelson Dir., p. 4; Nelson Cross, Tr. Day 8, p. 128.)

330. Incremental methods attempt to predict the actual amount of suitable fish habitat that is present as flow changes incrementally. They provide a means for measuring trade-offs as

opposed to providing minimum flow recommendations. This method is costly, complex and time-consuming and has limited application to a water reservation process. (DFWP Exh. 22, Nelson Dir., p. 5 and DFWP Exh. 44, Nelson Reb., pp. 2 through 4 and Attachment B, p. 180; Nelson Cross, Tr. Day 8, pp. 135, 136, 138, 139, 140, 141 and 232; MTU/AFS Exh. 8, Thomas Dir., p. 4.)

331. Habitat retention methods examine various components of a stream's hydraulic characteristics at various flows for the purpose of developing generalized habitat-flow relationships. The outcome is a minimum flow recommendation that is intended to fully protect some aspect of the stream resource. These methods, also termed standard-setting methods, are most appropriate for a water reservation process. (DFWP Exh. 22, Nelson Dir., p. 5; DFWP Exh. 44, Nelson Reb., p. 3 and Attachment B, p. 180; MTU/AFS Exh. 8, Thomas Dir., p. 4.)

332. At the present time no existing instream flow method can quantitatively predict the response of a stream's fish community to incremental changes in flow. These relationships are solely the product of stream-specific, long-term, biological studies. (DFWP Exh. 22, Nelson Dir., pp. 12 and 13.)

333. The Wetted Perimeter Method was chosen by DFWP to derive minimum instream flow requests for the majority of streams in DFWP's application. (Bd. Exh. 37-A.1, p. 1-18.)

334. The Wetted Perimeter Method originated in Washington and Idaho in the early-1970's. (DFWP Exh. 22, Nelson Dir., pp. 5 and 6 and DFWP Exh. 24, p. 4.)

335. Wetted perimeter is a well recognized and commonly used habitat retention minimum flow method, particularly in the Pacific Northwest and Rocky Mountain region of North America. (DFWP Exh. 44, Nelson Reb., pp. 1 and 2 and Attachment A, pp. 23 through 27; MTU/AFS Exh. 9, White Dir. p. 3; MTU/AFS Exh. 8, Thomas Dir., p. 3.)

336. Biological studies by DFWP and Montana State University support the validity of the minimum flow recommendations generated by the Wetted Perimeter Method. (Nelson Cross, Tr. Day 9, pp. 96 through 98; MTU/AFS Exh. 9, White Dir., p. 2.)

337. Wetted perimeter is the distance along the bottom and sides of a channel cross-section that is in contact with water when the stream is viewed in cross-section. (DFWP Exh. 22, Nelson Dir., p. 6 and Attachment B.)

338. The relationship between wetted perimeter and flow for stream riffles generally, but not always, shows two inflection points where the rate of increase of wetted perimeter changes. Below the lower inflection point, flow is spreading out

horizontally across the stream bottom, causing the wetted perimeter to increase rapidly for very small increases in flow. A point is eventually reached (at the lower inflection point) where the water starts to move up the sides of the active channel and the rate of increase of wetted perimeter begins to decline. At the upper inflection point, the stream is approaching its maximum width and begins to move up the banks as flow increases. Large increases in flow beyond the upper inflection point cause only small increases in wetted perimeter. (DFWP Exh. 22, Nelson Dir., p. 7 and Attachments C and D.)

339. The relationship between wetted perimeter and flow is derived for stream riffles. A riffle is a section of stream in which the water flow is rapid and shallower than the sections above and below. It has a substratum of gravel and rubble and is a very distinct habitat type that can be readily distinguished visually by an on-site inspection. Streams usually consist of a succession of pools and riffles. (DFWP Exh. 22, Nelson Dir., p. 6; Nelson Redirect, Tr. Day 9, p. 100.)

340. Riffles are the primary stream habitat where aquatic invertebrates, the main food of Montana's stream-dwelling game fish, are produced. (DFWP Exh. 22, Nelson Dir., pp. 6 and 7.)

341. Food supply is a major factor influencing the abundance of game fish in Montana's streams. (DFWP Exh. 22, Nelson Dir., p. 11 and DFWP Exh. 23, pp. 10 through 12.)

342. The underlying assumption of the wetted perimeter methodology is that food becomes limiting as flow associated reductions in wetted perimeter occur. This is a very reasonable assumption since many stream fish species rely on aquatic invertebrates as their primary food source and the primary food production area is in riffles. (MTU/AFS Exh. 9, White Dir., p. 3.)

343. As riffle areas are dewatered, food production is assumed to be reduced, resulting in a decrease in the carrying capacity of the stream. (MTU/AFS Exh. 9, White Dir., p. 3.)

344. Aquatic invertebrates - gill-breathing organisms that inhabit the small spaces within the riffle bottom - require a cover of flowing water to supply life-sustaining oxygen. (DFWP Exh. 22, Nelson Dir., p. 7.)

345. The Wetted Perimeter Method provides the minimum streamflow that will cover most of a stream's riffle area with water. This is the upper inflection point flow. (DFWP Exh. 22, Nelson Dir., pp. 6 and 7.)

346. Biological assumptions are a prominent component of all instream flow methods, including the Wetted Perimeter Method.

(DFWP Exh. 22, Nelson Dir., pp. 10 and 11; MTU/AFS Exh. 9, White Dir., p. 3.)

347. The upper inflection point flow is derived from the plot of the relationship between wetted perimeter and flow for the stream riffles of interest. These plots are generated using DFWP's wetted perimeter computer program, which is calibrated using surveyed channel measurements that are taken at different flows for each stream of interest. (DFWP Exh. 22, Nelson Dir., pp. 9 and 10.)

348. A number of checks were used by DFWP in developing and analyzing wetted perimeter information so that the results would be as reliable and accurate as possible. (Nelson Cross, Tr. Day 9, pp. 104, 105, 106, 107, 124 and 125.)

349. Wetted perimeter field data, used to calibrate the wetted perimeter computer program, were collected by a team of DFWP personnel, usually consisting of a team leader - typically a biologist - and two or more field workers. Approximately 12 teams collected the wetted perimeter data presented in DFWP's application. (DFWP Exh. 22, Nelson Dir., p. 10.)

350. DFWP personnel were trained in the use of the Wetted Perimeter Method at workshops conducted by DFWP, often in conjunction with the United States Geological Survey. Training included: theory of the Wetted Perimeter Method, surveying and field techniques, selection of study sites, data coding, flow measuring procedures, and field exercises. (DFWP Exh. 22, Nelson Dir., pp. 2 and 10; Nelson Cross, Tr. Day 12, p. 230; Frazer Cross, Tr. Day 9, pp. 156, 157, 168.)

351. Application of the Wetted Perimeter Method by DFWP's field personnel was governed by procedures and standards set forth in DFWP's 1980 publication titled "Guidelines for Using the Wetted Perimeter (WETP) Computer Program of the Montana Department of Fish, Wildlife and Parks", which was updated in 1985 and 1989. (DFWP Exh. 24, pp. 1 through 28 and A-1 through C-19; and DFWP Exh. 22, Nelson Dir., p. 2.)

352. In 1985, at the suggestion of the USFWS Instream Flow Service Group, the stage at zero flow was incorporated into DFWP's wetted perimeter computer program. This addition improved the accuracy of the wetted perimeter predictions for flows that are less than the lowest calibration flows measured in the field. The wetted perimeter information presented in DFWP's application reflects this 1985 modification. (DFWP Exh. 24, pp. 8 and 9; Nelson Cross, Tr. Day 9, p. 112; Nelson Cross, Tr. Day 8, pp. 119 and 120; Nelson Cross, Tr. Day 5, p. 82; Nelson Cross, Tr. Day 5, pp. 92 and 93.)

353. When using the Wetted Perimeter Method, there are no benefits from incorporating depth and velocity parameters. (Nelson Cross, Tr. Day 9, p. 99.)

354. There are no instream flow methods that establish confidence levels around the flow predictions. (Nelson Cross, Tr. Day 9, pp. 103 and 104.)

355. At the upper inflection point flow, a stream's food-producing potential is near maximum because most of the riffle habitat is covered with water. Maintaining near maximum food-producing potential will, in turn, benefit game fish populations. (DFWP Exh. 22, Nelson Dir., p. 12 and DFWP Exh. 23, pp. 11 and 12; MTU/AFS Exh. 9, White Dir., p. 3.)

356. Riffles are also used by many game fish species for spawning and for the rearing of their young. Flow requests that protect the food-producing capacity of riffles will also help to protect the fishes' spawning and rearing areas. (DFWP Exh. 23, p. 53.)

357. Riffles are areas of streams that are most sensitive to flow reductions. Therefore, a flow request that wets most of the riffle area will, at the same time, help to protect a stream's pools and runs - areas where adult fish normally reside. (DFWP Exh. 23, p. 53.)

358. Generally, the instream flows requested by DFWP are intended to maintain fishery values. (Nelson Cross, Tr. Day 13, p. 18.)

359. Flow requests based on the Wetted Perimeter Method apply to the non-winter period from approximately April through October. This is the period when fish grow and feed intensively and are being recruited into the population. Food supply appears to be a major limiting factor during this period. Fish food diversity and abundance are related to trout standing crops. Adequate summer flows are critical to preserving aquatic life. (DFWP Exh. 22, Nelson Dir., p. 15; Nelson Cross, Tr. Day 8, pp. 121, 122; MTU/AFS Exh. 8, Thomas Dir., p. 7.)

360. The limiting factor that regulates fish populations during the winter is fish habitat. The policy of DFWP when deriving flow requests for winter (approximately November through March) is to fully protect winter flows. This is based on the fact that winter is the most critical period influencing game fish densities in undepleted streams. Also, in winter, stream flows are typically at their annual lows in Montana's undepleted streams. (DFWP Exh. 22, Nelson Dir., pp. 15 and 16; DFWP Exh. 45, Nelson Reb., p. 7; Nelson Cross, Tr. Day 12, p. 195; Nelson Cross, Tr. Day 8, pp. 121, 122.)

361. Upper inflection point flow requests derived from the Wetted Perimeter Method typically exceed base winter flows. Winter flows would, therefore, be fully protected if upper inflection point requests were extended through the winter. In DFWP's application, requests based on the Wetted Perimeter Method were, for the majority of streams, extended through winter. (DFWP Exh. 23, pp. 59 and 60.)

362. Some inflection points can be poorly defined and difficult to identify. In Montana, the Wetted Perimeter Method has been primarily applied to fairly high gradient mountain streams that contain well-defined riffles having rectangular cross-sectional profiles. Due to this riffle configuration, inflection points, particularly upper ones, are readily discernible for the majority of streams. However, exceptions do occur and require some level of professional judgment in identifying inflection points. (DFWP Exh. 22, Nelson Dir., p. 13.)

363. Professional judgment, which plays a role in formulating flow recommendations with all instream flow methods, including the Wetted Perimeter Method, is an accepted and often desired component of instream flow methods. (DFWP Exh. 22, Nelson Dir., pp. 13 and 14; DFWP Exh. 44, Nelson Reb., Attachment A, p. 27; Nelson Cross, Tr. Day 9, p. 120; MTU/AFS Exh. 8, Thomas Dir., p. 5.)

364. Inflection point determinations were made by biologists who were instructed to use all the resources they had available in coming to that determination. These resources included their own visual observations of the stream, photographs they took of the stream and the knowledge they gained by being on the stream -- all used in conjunction with the graphical relationship of wetted perimeter and flow that was generated for each stream. (Nelson Cross, Tr. Day 12, p. 230.)

365. Flows at the upper inflection point are needed to provide minimum instream flow protection for those streams having the more significant fishery values. These include streams that have national, regional or local importance as sport fisheries; streams that support significant numbers of game fish for their stream type and size; streams that support "Species of Special Concern" (westslope cutthroat trout and arctic grayling, for example); and streams that provide crucial reproductive habitats for reservoir, lake or mainstem river populations of game fish. (DFWP Exh. 22, Nelson Dir., pp. 8 and 9 and DFWP Exh. 47, Hill Reb., p. 1.)

366. The purpose of a high inflection point flow recommendation is to provide a flow that would wet much of the riffle wetted perimeter. Flows which occur up to that point will be beneficial to the fish because of their impact on riffle food production. Flows above the upper inflection point will still be beneficial but will have less benefit than flows up to the high inflection point. (Nelson Cross, Tr. Day 13, pp. 7 and 8.)

367. The Wetted Perimeter Method does not incorporate existing water availability into the method. The method generates a minimum flow recommendation and that recommendation is not adjusted to reflect what the historic low flow event is. The instream flow recommendation is not downgraded to equal the historic low flow event. (Nelson Cross, Tr. Day 13, pp. 9 and 10.)

368. The U.S. Fish and Wildlife Service's Instream Flow Group has been involved for many years in the application and development of instream flow methods. Procedures such as the WETP method used by DFWP are appropriate for protecting the existing instream resource for purposes of state water plans and state water allocations such as permits or reservations, and for identifying target flows for use during project feasibility studies. (Bd. Exh. 41, p. C-10; Trihey and Stalnaker (1985), Bd. Exh. 41, p. R-9.)

369. More advanced incremental methods such as the instream flow group's Instream Flow Incremental Method (IFIM), are most appropriate for time series analysis to identify limiting flow conditions, fine tuning a resource maintenance objective (maximum utilization of available water), avoiding or minimizing flow-related impacts for specific projects and comparing mitigation alternatives. (Bd. Exh. 41, p. C-10.)

370. The upper inflection point flow requests, when averaged for all streams, equal about 40% of the average annual flow. (Bd. Exh. 41, p. 85; Bd. Exh. 37-A.1, p. 1-20; Nelson Cross, Tr. Day 12, p. 204.)

371. The fishery biologists who derived the instream flow requests using the Wetted Perimeter Method had the option of requesting a flow lower than the upper inflection point if, based on their professional evaluation of the stream resource, a lower flow request was sufficient to provide minimum instream flow protection. The lower inflection point flow was requested in the DFWP application to attain streams having the less significant fishery resource values. (DFWP Exh. 22, Nelson Dir., pp. 7 through 9.)

372. Instream flow requests at the lower inflection point or between the lower and upper inflection points were made for the following 24 stream Reaches. (Bd. Exh. 37-A.2, pp. 2-1 through 2-620 and Bd. Exh. 37-A.3, pp. 3-1 through 3-464):

<u>Red Rock-Beaverhead R. Sub-basin</u>
Blacktail Deer Creek

<u>Ruby River Sub-basin</u>
Ruby River (Reach #1)
Middle Fork Ruby River

<u>Little Prickly Pear Cr. Sub-basin</u>
Virginia Creek

<u>Dearborn River Sub-basin</u>
Flat Creek

East Fork Ruby River
West Fork Ruby River
Cottonwood Creek

Big Hole River Sub-basin
Pattengail Creek
Birch Creek

Jefferson River Sub-basin
Boulder River (Reach #3)

Gallatin River Sub-basin
Porcupine Creek
Middle Fork of the West Fork Gallatin River
South Fork of the West Fork Gallatin River
Big Bear Creek
Hyalite (Middle) Creek - Reach #2

Smith River Sub-basin
Smith River - Reach #3

Sun River Sub-basin
Sun River - Reach #1
Sun River - Reach #2

Belt Creek Sub-basin
Belt Creek - Reach #2

Judith River Sub-basin
Judith River - Reach #2
Cottonwood Creek

Musselshell River Sub-basin
Musselshell River - Reach #1
Musselshell River - Reach #2

373. In general the low inflection point was requested on streams where the fishery values were of lesser importance. (Bd. Exh. 37-A.2; Bd. Exh. 37- A.3.)

374. The low inflection point flow requests, when averaged, equal about 20% of the average annual flow. (Bd. Exh. 41, p. 85.)

375. For certain streams a high inflection point was requested, although the low inflection point provides sufficient flows due to the reduced fishery values. On the following streams, the need for a low inflection flow was shown but the need for a high inflection point flow was not shown.

	High Inflection (no need)	Low Inflection (need)
Big Hole Drainage		
California Creek	14	10
French Creek	6	3
Trail Creek	14	6
Trapper Creek	3.2	1.8
Warm Springs Creek	20	5
Wise River	35	20
Jefferson & Boulder Drainage		
Boulder River #2	24	8
Red Rock-Beaverhead Drainage		
Horse Prairie Creek	36	20
Ruby River Drainage		
Wisconsin Creek	12	6

376. The Wetted Perimeter Method is not applicable to braided stream segments because they are difficult to model hydraulically, making most computer models, including WETP, unworkable. Waters having little or no riffle development, such as cascading mountain streams that plunge from pool to pool and some low gradient, prairie streams, are another exception, as are spring Creeks. The seasonably stable flows that characterize spring Creeks prevent the collection of field data at a high, medium and low flow, which is information required to calibrate the wetted perimeter computer program. Other methods must be applied to these waters. (DFWP Exh. 22, Nelson Dir., p. 15; MTU/AFS Exh. 8, Thomas Dir., pp. 4-5.)

377. For 61 stream reaches in its application, DFWP relied upon four alternative approaches for deriving flow requests. (DFWP Exh. 22, Nelson Dir., p. 19.)

378. The first of the four alternate approaches, termed the Fixed Percentage Technique, was applied to 27 highly valued stream reaches, where time constraints, access limitations and other considerations prevented the use of the Wetted Perimeter Method. (DFWP Exh. 22, Nelson Dir., p. 19; Bd. Exh. 37-A.1, p. 1 through 19.) These are:

Beaverhead-Red Rock Sub-basin
Browns Canyon Creek
Red Rock River (Reach #1)
Reservoir Creek
West Fork Dyce Creek

Big Hole Sub-basin
Big Lake Creek
Delano Creek
Jacobson Creek
Rock Creek
Wyman Creek

Gallatin Sub-basin
Hell Roaring Creek

Jefferson Sub-basin
Halfway Creek

Madison Sub-basin
Cougar Creek
Duck Creek
Elk River
Moore Creek
Red Canyon Creek
Trapper Creek
Watkins Creek

Ruby Sub-basin
Coal Creek

Upper Missouri Sub-basin
Deep Creek

Smith Sub-basin
North Fork Deep Creek

Musselshell Sub-basin
Collar Gulch Creek

Marias Sub-basin
Badger Creek
Birch Creek
Cut Bank Creek
North Fork Deep Creek
South Fork Deep Creek

379. For the Fixed Percentage Technique, the high inflection point flows that were derived for those streams in which the Wetted Perimeter Method was applied, were expressed as percentages of the average annual flow for each stream. These percentages were then sorted by sub-basin and the individual percentages in each sub-basin were averaged to derive a sub-basin mean. The mean percentage for each sub-basin was then used to calculate flow requests for the tributary streams in that sub-basin (the above 27) for which flow requests from the Wetted Perimeter Method were not available. High inflection point flows, when averaged by sub-basin, ranged from 27-48% of the average annual flow. (DFWP Exh. 22, Nelson Dir., p. 19.)

380. The second of the four alternative instream flow approaches, termed the Base Flow Approach, was applied to 17 high quality spring-fed streams where seasonally stable flows prevented the required collection of wetted perimeter calibration data at a series of different flows. (DFWP Exh. 22, Nelson Dir., p. 21; MTU/AFS Exh. 8, Thomas Dir., p. 5.)

381. Spring-fed streams have the potential to grow and sustain trout at levels that far exceed the biological capability of most other streams, making them a highly valued fishery and recreational resource. (DFWP Exh. 22, Nelson Dir., p. 21; MTU/AFS Exh. 8, Thomas Dir., p. 5.)

382. The base flow - the lowest mean monthly flow for the year, which typically occurs in winter - is sufficient to protect fishery values on spring-fed streams. Base flow is the typical low flow event on undepleted streams. (DFWP Exh. 22, Nelson Dir., p. 21.)

383. DFWP requested the base flow for the following 17 waters (Bd. Exh. 37-A.1, pp. 1 through 24):

Beaverhead-Red Rock Sub-basin
Poindexter Slough

Gallatin Sub-basin
Ben Hart Spring Creek
Thompson Spring Creek

Jefferson Sub-basin
Willow Spring Creek

Madison Sub-basin
Antelope Creek
Black Sand Spring Creek
Blaine Spring Creek
O'Dell Spring Creek
S.F. of the Madison River

Ruby Sub-basin
Warm Springs Creek

Belt Creek Sub-basin
Big Otter Creek

Lake Helena-Hauser Reservoir
McGuire Creek
Spokane Creek
Silver Creek

Sun Sub-basin
North Fork Willow Creek

Teton Sub-basin
McDonald Creek
Spring Creek

384. Stickney and Wegner Creeks - tributaries to the Missouri River - had flow requests determined by a method similar to the Base Flow Approach. These streams, which are intermittent in their lower reaches, are important in the spring when runoff provides flows which allow rainbow trout to enter from the Missouri River to spawn and for young fish to migrate back to the Missouri River when flows are available. Requested flows were the mean monthly flows for the four months of the year when spawning/rearing occurs. (DFWP Exh. 22, Nelson Dir., pp. 21 and 22; Bd. Exh. 37-A.3, pp. 3-112 to 3-114.)

385. The third of the four alternative instream flow approaches is termed Water Quality and Flow Management Maintenance. For Beaver Creek, Cabin Creek and the West Fork Madison River in the upper Madison River Sub-basin, all remaining unappropriated water was requested instream to help insure that adequate fishery maintenance flows are provided to the upper Madison River when Hebgen Reservoir is filled each year and flow releases into the river are reduced. In addition the application of DFWP sets forth the high inflection points of these streams. (Bd. Exh. 37-A.2, pp. 2-429, 2-433 and 2-442.)

386. For Reach #1 of the East Gallatin River, Bridger Creek, Rocky Creek, and Sourdough Creek - headwaters in the East Gallatin River Sub-basin - all remaining unappropriated water was requested instream to provide the dilution flows that are needed to protect the water quality component of fish habitat in the East Gallatin River, a stream with a history of pollution problems. In addition the application of DFWP sets forth the high inflection points of

these streams. (Bd. Exh. 37-A.2, pp. 2-536 through 2-546 and 2-569 through 2-575.)

387. The fourth alternative method relies on Biological-Flow Relationships developed from long-term field studies. Streams in which flow requests are based, in whole or in part, on biological studies are: Gallatin River - Reach #2; Madison River - Reach #4; Narrows Creek; and Missouri River mainstem Reaches #2 through #6. (Bd. Exh. 37-A.2, pp. 2-31 through 2-32, 2-402 through 2-405, and 2-484 through 2-486; and Bd. Exh. 37-A.3, pp. 3-6 through 3-38.)

388. The instream flow methods used by DFWP to determine the amount of water needed for fishery resources are generally accurate and suitable and on most streams provide reasonable estimates of the amount of water needed to maintain instream benefits.

389. DFWP contracted with the Helena office of the U.S. Geological Survey (USGS) to obtain the physical availability of flows on the streams in its application. (Bd. Exh. 37-A.1, p. 1-29.)

390. The USGS completed Water-Resources Investigations Report 89-4082 entitled "Estimates of Monthly Streamflow Characteristics at Selected Sites in the Upper Missouri River Basin, Montana, Base Period Water Years 1937-86", containing streamflow estimates at 312 sites. Streamflow characteristics that were estimated were the monthly mean discharges that are exceeded 90, 80, 50 and 20 percent of the years of extended record (1937-86) and the mean monthly discharge for each month. (DFWP Exh. 12, p. 1; DFWP Exh. 11, Parrett Dir., p. 2.)

391. Of the 312 sites presented in Report 89-4082, 100 sites had gauged records, 139 had miscellaneous measurement records, and 73 had no streamflow records. (DFWP Exh. 12, p. 3.)

392. Of the 73 sites where no flow measurements were made, flows were estimated using basin characteristics for 52 sites, concurrent measurements for 14 sites and a drainage area ratio adjustment for 7 sites. No sites were estimated using only the channel width method. (DFWP Exh. 12, Table 1, pp. 21-27.)

393. Flow estimating sites for the water availability study were selected by the USGS so that they would be reflective of the flows available to the entire Reach even though the estimated flow at that site may not be the flow at other specific points on the stream. (Parrett Cross, Tr. Day 7, pp. 138 and 143.)

394. The 1937-86 base period of record was selected and the general study approach determined following consultation with the Department of Natural Resources and Conservation and the U.S. Geological Survey. (Parrett Cross, Tr. Day 7, pp. 102, 150 and 151.)

395. Estimates of monthly streamflow characteristics for sites with streamflow gauging stations are considered to be the most reliable. For those gauge sites where the period of actual streamflow record includes the 1937-86 base period, the estimates of monthly streamflow characteristics are based entirely on recorded streamflows and are considered to be perfectly reliable (zero error). (USGS Report 89-4082, DFWP Exh. 12, p. 14.)

396. For estimates of streamflow made at ungauged sites, weighted-average flow estimates based on three methods (basin characteristics, channel width, and concurrent measurement) are generally considered to be the most reliable. If only one estimation method is used, the concurrent measurement method generally provides more reliable estimates than any of the other individual estimating methods. (DFWP Exh. 12, p. 16.)

397. The mean annual flow for the base period 1937-86 is more reflective of the long term mean annual flows of streams in the Missouri River basin than is the 1930-90 period. (Parrett Cross, Tr. Day 7, p. 132; Holland-Grasshopper Exhs. 1 and 2 [graphs]).

398. Water year 1986 was selected as the ending date because it was the latest complete water year available when the study was begun. Water years 1987-89 were not included because these years were not concluded or even yet begun. Water year 1990 began October 1, 1989, three months after DFWP's application was submitted. (DFWP Exh. 46, Spence Reb., pp. 12 and 13.)

399. When considering the impact of a flood event on the mean annual flow of a stream, a flood discharge does not necessarily significantly affect the mean annual flow, the mean monthly flow or the long term mean annual flow. (Parrett Cross, Tr. Day 7, p. 112.)

400. The streamflow measurement techniques used by the USGS in the water availability study are generally accepted as being suitable techniques for estimating streamflows and have been generally accepted by the scientific community. Given the scope of the water availability project, no better techniques could have been used. (Parrett Cross, Tr. Day 7, p. 150.)

401. The 1969 Montana Legislature authorized DFWP to file for instream water rights to protect flows on Blue Ribbon trout streams for fish and wildlife habitat. These rights became known as Murphy Rights after the bill's sponsor. (Bd. Exh. 40, p. 61.)

402. DFWP filed for Murphy Rights on six streams in the Missouri basin. (Bd. Exh. 40, Table 4-13, p. 62; Bd. Exh. 41, Table 4-13, p. 141; DFWP Exh. 46, Spence Reb., Att. A.)

403. All of the Murphy Rights filed in the Missouri River basin have priority dates in December 1970. (DFWP Exh. 46, Spence Reb., Att. A.)

404. A comparison of the water right filings on the six Murphy Right streams and the instream reservations requested on those same streams is shown in Table 1A. Any instream reservations are not additive to the Murphy Rights if granted but are complementary with those Murphy Rights for a given time of year. To the extent they overlap, they would overlap at the same quantities for the periods in which they overlap. (DFWP Stipulation, Tr. Day 8, pp. 139 and 140; Nelson Cross, Tr. Day 4, pp. 31 and 32.)

E. FINDINGS THAT THE WATER RESERVATION APPLIED FOR BY DFWP IS IN THE PUBLIC INTEREST (Mont. Code Ann. § 85-2-316(4)(a)(iv)(1991); ARM 36.16.107B(4).)

405. The direct benefits of reserving the requested instream flows include the preservation of the fisheries resources in the basin, and continuation of fishing opportunities, recreational floating, and continued maintenance of existing riparian communities. (Bd. Exh. 37-A.1, DFWP App., Vol. 1, p. 1-33; DFWP Exh. 37, Knudson Dir., p. 5; DFWP Exh. 31, Duffield Dir., Attach. C, DFWP Exh. 28, Casey, p. 2.)

406. Significant fisheries resources would be protected by DFWP's reservations. DFWP has applied for instream reservations only on those streams with significant fishery resources. (Findings 25 to 273; DFWP Exh. 37, Knudson Dir., p. 3.)

407. Portions of the Madison, Big Hole, Gallatin, Beaverhead and Missouri Rivers are nationally known fishing streams. (DFWP Exh. 37, Knudson Dir., p. 3.)

408. The Ruby, East Gallatin, Jefferson, and Red Rock Rivers are also very important trout streams. (DFWP Exh. 37, Knudson Dir., p. 4.)

409. Tributaries to major rivers serve as vital spawning streams for the larger rivers, as well as habitat for resident fish. (DFWP Exh. 37, Knudson Dir., p. 4.)

410. Fish migrations from reservoirs and lakes throughout the basin provide important stream fishing opportunities. Tributaries to reservoirs and lakes that contain a trout fishery support spawning runs when adequate habitat, water quality and instream flows exist in these streams. (DFWP Exh. 37, Knudson Dir., p. 4.)

411. From Great Falls to Fort Peck Reservoir, the Missouri River and its tributaries support a warmwater fishery of significance. (DFWP Exh. 37, Knudson Dir., p. 5.)

Table 1A

Summary of DFWP "Murphy rights" and reservation requests on Murphy Right streams in the Missouri basin.

	MURPHY RIGHT			RESERVATION REQUEST	
STREAM	REACH	DATES	AMOUNT CFS	DATES	AMOUNT CFS
ıdison River	Hebgan Dam to Quake Lake	4/1-7/31 8/1-3/31	500 500	1/1-12/31	800
ıdison River	Quake Lake to mouth of West Fork	1/1-12/31	500	1/1-12/31	800
.dison River	Mouth of West Fork to Ennis Lake	1/1-5/31 6/1-7/15 7/16-12/31	900 1400 1050	1/1-12/31	1,000
.dison River	Ennis Lake to mouth	1/1-5/31 6/1-6/30 7/1-7/15 7/16-12/31	1200 1500 1423 1300	1/1-12/31	1,300
st Gallatin ver	Yellowstone Park to Shedd's Bridge	5/16-7/15 7/16-5/15	800 400	1/1-12/31	170/ 400
llatin River	Mouth to junction with East Gallatin River	5/1-5/15 5/16-5/31 6/1-6/15 6/16-6/30 7/1-8/31 9/1-4/30	947 1278 1500 1176 850 800	1/1-12/31	1,000
ssouri River	Toston Dam to Canyon Ferry Reservoir	1/1-1/31 2/1-5/15 5/16-6/30 7/1-7/15 7/16-9/14 9/15-12/31	2400 2400 4000 3816 2400 2400	1/1-12/31	2,400
ssouri River	Holter Dam to mouth of Smith River	1/1-12/31	3000	5/19-7/5 7/6-5/18	6,398 4,100
ith River	Fort Logan Bridge to confluence of Sheep Creek	5/1-6/30 7/1-4/30	150 90	1/1-12/31	90
ith River	Confluence of Sheep Creek to Cascade-Meagher county line	4/1-4/30 5/1-6/30 7/1-8/31 9/1-3/31	140 150 140 125	1/1-12/31	150
ith River	Cascade-Meagher county line to confluence of Hound Creek	5/1-5/15 5/16-6/15 6/16-6/30 7/1-4/30	372 400 398 150	1/1-12/31	150
ɟ Spring eek	State Fish Hatchery to mouth	1/1-12/31	110	1/1-12/31	110/ 100

i. Exh. 41 (FEIS) p. 141; Spence Reb. DFWP Exh. 46, Attachment A)

412. Paddlefish are Montana's largest gamefish and reside in this Reach of the Missouri River. (Finding 305 to 307.)

413. Pallid and shovelnose sturgeon also reside in this Reach of the Missouri. The pallid sturgeon is listed as an endangered species. (DFWP Exh. 37, Knudson Dir., p. 6.)

414. The middle Missouri is an under-utilized fishery resource, and opportunities for steady growth in the recreational use of the middle Missouri are very good. (DFWP Exh. 37, Knudson Dir., p. 6.)

415. The rivers and streams above Canyon Ferry Dam accounted for 375,239 of the total 1,193,000 days spent fishing in Montana during 1985. (DFWP Exh. 37, Knudson Dir., p. 3.)

416. Several Endangered Species and Species of Special Concern reside in streams in the Missouri River basin. (Findings 274 to 306.)

417. Preserving instream flows will directly benefit recreational floating by helping to maintain existing water depth and velocities on those streams large enough to accommodate canoes, rafts and other types of floating craft. Flows which are sufficient to enable these craft to operate will benefit recreational floaters as well as anglers who float to fish these streams. (DFWP Exh. 37, Knudson Dir., p. 7.)

418. The Missouri River and its tributaries are extensively used and are popular for floating. (DFWP Exh. 37, Knudson Dir., p. 7.)

419. The portion of the Missouri River from Fort Benton to Fort Peck Reservoir was designated as a National Wild and Scenic River in 1976. (DFWP Exh. 37, Knudson Dir., p. 7; Bd. Exh. 40, p. 65.)

420. Reservation for instream flows for Reaches 4, 5, and 6 of the Missouri River would help preserve the biological, recreational, scenic and historical values of this portion of the Missouri. (DFWP Exh. 37, Knudson Dir., p. 7; Bd. Exh. 37-A.1, p. 1-45.)

421. Instream flows enhance the attributes of river bottom lands by keeping riparian plant communities healthy and viable, and by providing habitat for wildlife and birds that people enjoy. (DFWP Exh. 28, Casey Dir., p. 2; DFWP Exh. 37, Knudson Dir., p. 7.)

422. Maintenance of existing riparian vegetation provides the benefit of dampening the effects of flooding through erosion control, and supplying organic material to the aquatic system, enhancing its productivity. (DFWP Exh. 28, Casey Dir., p. 5.)

423. Indirect benefits of reserving the requested instream flow include helping maintain water quality, helping maintain other uses, and supporting the State's recreation and tourist based economies.

424. Instream flow reservations will help maintain water quality by diluting carcinogenic substances, such as arsenic, and other toxic substances in the Missouri basin. (DFWP Exh. 39, Elliot Dir., p. 4.)

425. Streamflow dilution provided by instream flows would help maintain safe drinking water supplies for municipalities and individuals that take drinking water from the Missouri and Madison Rivers. (DFWP Exh. 39, Elliot Dir., p. 4.)

426. Maintaining instream flows through a reservation would help maintain existing water volumes to dilute wastewater discharges from municipalities and industrial sources, as well as return flows from irrigation. (DFWP Exh. 39, Elliot Dir., p. 4.)

427. Instream flow reservations would help maintain the electrical generating capacity of hydropower plants on the Missouri River. (DFWP Exh. 39, Elliot Dir., p. 3.)

428. Stream-based recreation has a significant economic impact in Montana, and tourism-related businesses constitute an expanding industry in Montana. DFWP's instream flow reservation would help protect the outstanding scenic and recreational values that attract tourists to Montana. (DFWP Exh. 37, Knudson Dir., p. 9.)

429. River-based outfitting businesses, as well as service sector businesses, including motels, campgrounds, restaurants and sporting good stores, benefit from maintenance of adequate fisheries and other amenities provided by adequate instream flows. (DFWP Exh. 37, Knudson Dir., p. 9.)

430. Recreational and aesthetic attributes of rivers and streams attract new businesses and economically independent residents to Montana. (DFWP Exh. 37, Knudson Dir., p. 10.)

431. Reserved instream flows will help maintain water levels at existing headgates for agricultural use of water. (DFWP Exh. 37, Knudson Dir., p. 11; DFWP Exh. 10, Graham Dir., p. 7.)

432. Direct costs to DFWP of an instream reservation include monitoring streamflows on certain stream reaches. DFWP may have to install some gauging stations and may have some administrative costs to implement its reservation program, but these costs will be minimal. (DFWP Exh. 37, Knudson Dir., p. 12; Bd. Exh. 37-A.1, p. 1-91.)

433. Indirect costs of reserving the requested instream flow include foregone development by consumptive users and economic opportunity costs to parties other than DFWP.

434. Reservations of instream flows in the Missouri River basin would have no indirect costs to existing industrial water users, but may affect future use of water by industries, primarily mining. (DFWP Exh. 39, Elliot Dir., p. 5; DFWP Exh. 37, Knudson Dir., p. 13.)

435. Water for industrial development could be supplied from other sources, such as groundwater, storage or purchase of existing water rights. (DFWP Exh. 39, Elliot Dir., p. 5; DFWP Exh. 37, Knudson Dir., p. 13.)

436. The possibility of indirect costs to industry is not significant, and has not been quantified. (Bd. Exh. 41, FEIS, p. S-8; DFWP Exh. 39, Elliot Dir., p. 5; DFWP Exh. 37, Knudson Dir., p. 13.)

437. Instream flow reservations would not unnecessarily preclude the use of groundwater or storage for the development of additional irrigation. (Bd. Exh. 41, pp. 55, 108; DFWP Exh. 37, Knudson Dir., p. 13, Bd. Exh. 40, pp 66, 237.)

438. Instream reservations are not inconsistent with the water storage section of the State's water plan. (Bd. Exh. 41, p. 71.)

439. Instream flow reservations will have an effect on the use of existing irrigation water rights if the reservants object to changes in existing rights. These are indirect costs to existing water right holders. All junior water right holders, including reservants, have the right to object to changes in senior water rights. (DFWP Exh. 11, Spence Dir., p. 7.) Such objections do impact existing water rights, by allowing the reservant to object to changes.

440. Reservant's objections, if any, may increase transaction costs for existing water right holders who wish to transfer or otherwise change water rights. (Duffield Cross, Tr. Day 10, p. 171.) An objection may, in some cases, prevent a change from occurring, but only if protected instream flows are measurably degraded as a result of the change. (Finding 471.)

441. DFWP's history of objections to changes in water rights with respect to its "Murphy" rights and Yellowstone basin reservation rights, shows that it objects infrequently to such changes. (DFWP Exh. 11, Spence Dir., p. 7.)

442. Objectors to instream reservations in this proceeding have not quantified any indirect costs to existing water right

holders, which would result from granting the instream reservations. (Duffield Cross, Tr. Day 10, pp. 67-171.)

443. There are indirect costs that result to existing water right holders by granting instream reservations. These costs have not been quantified by the applicant. (Duffield Cross, Tr. Day 10, p. 67, 171.)

444. The costs of applying for the reservations and of conducting the contested case hearing are not direct or indirect costs. (DFWP Exh. 31, Duffield Dir., Att. C; ARM 36.16.102(7).)

445. The direct and indirect costs of granting the instream reservation requests where there are no competing reservations applied for are negligible.

446. Although some potential new water uses with higher values have been identified in these reaches, the overall benefits of granting these requests substantially exceed the nominal direct and indirect costs. (Bd. Exh. 40, p. 255; DFWP Exh. 31, Duffield Dir., p. 18-19.)

447. For DFWP's instream reservations, the benefits and costs to be considered may be summarized as follows:

Direct Benefits	Fish, Wildlife and Recreation Fisheries Maintenance, Fishing Opportunities, Riparian Protection
Indirect Benefits	Hydropower Water Quality
Direct Costs	DFWP Fishery/Recreation Enforcement
Indirect Costs	Foregone Water Consumption for Irrigation or Other Uses Economic opportunity costs to parties other than the reservant

(DFWP Exh. 31, Duffield Dir., Attach. C; Findings 425-470.)

448. A no-action alternative to granting instream flow reservations could result in costs to recreation, fish and wildlife, aesthetic qualities and other economics. In some cases, further consumptive appropriations will result in detrimental affects to aquatic life, wildlife and recreation. (DFWP Exh. 38, p. 75; Bd. Exh. 40, p. 237.)

449. Other alternative actions could be taken to improve or protect instream flows, such as intensification of water conservation measures, leasing of water rights, constructing offstream storage facilities, conditioning water permits, closing basins and applying the public trust doctrine. (DFWP Exh. 38, pp. 75-84.)

450. These alternatives are either more costly, limited in applicability, legally untested or logistically infeasible for basin-wide utilization. (DFWP Exh. 37, Knudson Dir., p. 15.)

451. There are no other reasonable alternatives with greater net benefits. (Bd. Exh. 41, pp. S-8, 34; ARM 36.16.107B(4)(c).)

452. Depending on the location, timing, and amount of water diverted, new water use permits could cause an irretrievable loss of water quality, fisheries, and opportunities for recreation. (Bd. Exh. 40, p. 244; ARM 36.16.107B(4)(d).)

453. Incremental streamflow depletions will continue to reduce critical components of the natural environment, including fishery resources, wildlife riparian areas and water quality. (DFWP Exh. 38, p. 73.)

454. Reservations for instream flow are the only way to protect streamflow for water quality, fisheries and recreation on nearly all streams where such reservations are requested. (Bd. Exh. 40, p. 244.)

455. DFWP's instream flow reservation would not have adverse impacts to public health, safety and welfare. (Bd. Exh. 40, pp. 243-244; DFWP Exh. 38, p. 42; ARM 36.16.107B(4)(e).)

456. In general, the impacts to public health, safety and welfare from instream flow reservations are positive and beneficial. (Bd. Exh. 40, pp. 243-244; DFWP Exh. 38, pp. 41-42.)

457. The instream flows requested by DFWP as modified by Findings of Fact 325 through 404 by the Board are necessary to maintain the existing resident fish populations, to provide passage for migratory fish species in certain streams, to protect spawning and rearing habitats of both resident and migratory species, to protect the habitats of game fish "Species of Special Concern" such as the westslope cutthroat trout, arctic grayling, pallid sturgeon and paddlefish, as well as nongame species such as sturgeon chub, sickelfin chub and the northern redbelly dace x finescale dace hybrid. The flows are also necessary to help protect the habitat for those wildlife species which depend on the streams and their riparian zones for food, water and shelter, including the bald eagle, peregrine falcon, whooping crane and grizzly bear, all of which are threatened or endangered species. (Bd. Exh. 37-A.2 and 37-A.3, inclusive; ARM 36.16.107B(4)(f).)

F. OTHER FINDINGS RELATING TO BOARD DECISION (Mont. Code Ann. § 85-2-316(3)(B), (4)(a)(iv)(b), (5), (6), and (9)(e)(1991); ARM 36.16.107B(5) through (8).)

458. The water reservation by DFWP will be used wholly within the state and only within the Missouri River basin. (Bd. Exh. 37-A.1; ARM 36.16.107B(5) and (6).)

459. DFWP has a management plan for measuring, protecting, and reporting on instream reservations. (Bd. Exh. 37-A.1, pp. 1-90 through 1-95 and 1-106 (Appendix B); DFWP Exh. 10, Graham Dir., pp. 5 and 6; DFWP Exh. 17, Spence Dir., pp. 7 through 10.)

460. The management plan is based upon the process DFWP has followed for its Yellowstone reservations. (Bd. Exh. 37-A.1, pp. 1-91 through 1-93; DFWP Exh. 10, Graham Dir., p. 5.)

461. DFWP intends to notify new junior water use permit holders when an instream water reservation exists in the source of supply, or the exercise of the junior right could affect the reservation either through a letter or by the permit process. DFWP would object and request denial of permits only when the use of the water would routinely adversely effect an instream reservation. Otherwise, in its objections to new permits, DFWP will request that the permit be specifically conditioned to the senior instream flow reservation. (Bd. Exh. 37-A.1, p. 1-92; DFWP Exh. 10, Graham Dir., p. 5.)

462. When low flow or drought years threaten instream reservations, DFWP intends to initially advise junior users by letter of potential low flow conditions and, when flows deteriorate below instream reservations, junior water users will be requested by mail to cease their diversions until flows again rise above the reservation amount. (Bd. Exh. 37-A.1, pp. 1-92 and 1-93; DFWP Exh. 10, Graham Dir., pp. 5 and 6; DFWP Exh. 19, Chronology of Enforcement Actions; Tr.-Day 8, Spence, p. 76.)

463. Implementation of an instream flow reservation management plan for monitoring and protection of instream reservations would be an evolutionary process. The timing and degree of the monitoring of individual streams will depend on the extent of junior water use in and above any particular stream reach. (Bd. Exh. 37-A.1, pp. 1-90 and 1-91; DFWP Exh. 10, Graham Dir., p. 5.)

464. As circumstances require, DFWP may need to request DNRC to exercise its authority to enforce compliance by junior permit holders, or may need to use water commissioners, if legally available for reservations, to distribute water according to priority dates, or may need to use any other enforcement remedies available to a water right holder. (Bd. Exh. 37-A.1, p. 1-93; DFWP Exh. 10, Graham Dir., p. 6.)

465. Enforcement of instream reservations can restrict only junior consumptive users or those diverting water without a right, such as the expansion of a senior right beyond the quantity of water the senior is entitled to use. (Bd. Exh. 37-A.1, pp. 1-90; DFWP Exh. 10, Graham Dir., pp. 6 and 7.)

466. Instream reservations should be monitored and measured using a "reach concept." DFWP has applied for instream reservations on designated stream or river segments or reaches. Each instream flow reservation request was derived at a point on the reach, generally near the downstream end of the reach. The instream reservation will be measured and monitored at these points on the reach or downstream from these points. (Bd. Exh. 37-A.1, pp. 1-90 and 1-91; DFWP Exh. 17, Spence Dir., pp. 9 and 10.)

467. The stream or river reaches are the lengths of streams or rivers where fisheries, wildlife and recreational values warrant protection (see application descriptions in Bd. Exh. 37-A.2 and Bd. Exh. 37-A.3; and, resource value descriptions for each stream in the prefiled direct testimony of DFWP witnesses).

468. When instream flows fall below the reservation flows at the monitoring points, all junior users above these monitoring sites will be subject to restrictions whether they are on the reach mainstem or its tributaries. (Bd. Exh. 37-A.1, pp. 1-90 and 1-91; DFWP Exh. 17, Spence Dir., pp. 9 and 10.)

469. The stream reach does not represent a stream segment that has the same flow regime and instream flow requirement throughout its length. The values of the stream reach will be protected by monitoring the flows at or below the point where the minimum flow needs were determined. (Bd. Exh. 37-A.1, p. 1-90; DFWP Exh. 17, Spence Dir., pp. 9 and 10.)

470. The monitoring of instream flows at a downstream point in the reach is a practical approach to protecting fisheries, wildlife and recreational values within the reach. (Nelson Redirect, Tr. Day 9, pp. 107, 108.)

471. The effect of monitoring at a point in each reach will be that the instream reservation could be adversely affected and DFWP could, therefore, object to any new proposed junior users or to changes in use above the monitoring point when the new uses or change would result in the consumption of additional water affecting the flows at the monitoring point or adversely affect flows in the reach. (Bd. Exh. 37-A.1, pp. 1-90 through 1-92; DFWP Exh. 17, Spence Dir., pp. 9 and 10.)

472. A change occurring within a reach or a change that affects a reach could adversely affect instream flows within the reach.

473. Further information concerning streamflows above the monitoring point will be needed before the instream flow reservation can be adequately monitored and enforced.

474. DFWP is capable of exercising reasonable diligence towards measuring, quantifying, protecting, and reporting its instream water reservation in accordance with the management plan. (ARM 36.16.107B(7).)

475. The instream reservations applied for by DFWP would not remove or consume any water in a source of supply for an existing water right use. (DFWP 72155-41a, Bd. Exhs. 37-A.1, 37-A.2 and 37-A.3.)

476. The instream reservation requests of DFWP are intended to preserve the present status quo against future additional consumptive uses of water that would erode or further erode the minimum instream flows needed for healthy fisheries. (DFWP 72155-41a, Bd. Exh. 37-A.1, p. 1-90; DFWP Exh. 10, Graham Dir., p. 5 ; DFWP Exh. 17, Spence Dir., p. 10; DFWP Exh. 46, Spence Reb., pp. 2 & 16.)

477. In those streams and stream reaches where DFWP's instream flow reservations overlap with DHES' and BLM's instream requests, all such reservations should be concurrent, rather than cumulative. (Bd. Exh. 40, p. 11; Bd. Exh. 41, p. 68.)

478. In those streams and stream reaches where DFWP already has instream flow rights, the amount of water reserved should be concurrent with such prior right, rather than cumulative. (Finding 404.)

479. The public interest in protecting domestic and stockwater rights with a priority date on or after July 1, 1985 and perfected prior to the final date of this order and the public interest in protecting municipal reservations with a July 1, 1985 priority date outweigh the values protected by the DFWP reservation.

480. The water reservation as conditioned would not adversely affect any water right with a priority date before July 1, 1985. (Mont. Code Ann. § 85-2-316(9)(e); ARM 36.16.107B(8).)

III. CONCLUSIONS OF LAW

1. DFWP is a qualified applicant for a water reservation. (Mont. Code Ann. § 85-2-316(1)(1991).

2. The purpose of the DFWP application is a beneficial use. (Mont. Code Ann. § 85-2-316(4)(a)(i)(1991); ARM 36.16.107B(1)(b).)

3. The need for the DFWP application has been established. (Mont. Code Ann. § 85-2-316(4)(ii)(1991); ARM 36.16.107B(2).) Specifically, DFWP has demonstrated that there is a reasonable likelihood that future in-state competing water uses would consume, degrade and otherwise affect the water available for the purpose of DHES' reservation and DHES has demonstrated the water resource values warrant reserving water for the requested purpose.

4. The methodologies used by DFWP are generally accurate and suitable. (ARM 36.16.107B(3)(a).) DFWP has established the amount of water needed to fulfill its reservation as set forth in Table 2. (Mont. Code Ann. § 85-2-316(4)(a)(iii)(1991); ARM 36.16.107B(4).)

5. The benefits of granting these instream flows requested as modified and conditioned herein exceed the direct and indirect costs. Upon a weighing and balancing of the evidence, it has been established to the satisfaction of the Board that the water reservation requested by DFWP as modified and conditioned herein is in the public interest. (Mont. Code Ann. § 85-2-316(4)(a)(iv)(1991); ARM 36.16.107B(4).)

6. Upper Missouri River water reservations approved by the Board shall have a priority date of July 1, 1985. (Mont. Code Ann. § 85-2-331(4).) The Board may determine the relative priorities of all reservations. (Mont. Code Ann. § 85-2-316(a)(e).)

7. The Board may grant, deny, modify, or condition any reservation applied for. In no case may the Board make a reservation for more than the amount applied for. (Mont. Code Ann. s 85-2-316.)

8. The Board has no authority under the reservation statutes or any other statutes to determine, or alter, any water right that is not a reservation. (Mont. Code Ann. § 85-2-316(14).)

9. This reservation does not guarantee minimum flows.

IV. ORDER

1. Subject to all applicable conditions, and limitations (including but not limited to the conditions applied to instream reservations in Exhibits A and C attached to this Order) the application of DFWP is granted as set forth in Table 2.

2. DFWP shall within two years of the date of the Final Order submit to the Board a list of monitoring sites and a method of determining the extent of the instream flow along the reach proportional to the monitoring sites. Until approval of this monitoring report the DFWP may not object to any changes of use by other users within a reach.

3. Relative to other reservations the priority date of the DFWP shall be subordinate to the consumptive use reservations granted to all municipalities and the instream flow rights granted to the Montana Department of Health and Environmental Sciences. It shall be prior to the United States Department of Interior (Bureau of Land Management), other reservations granted to Conservation Districts and the reservation granted to the United States Bureau of Reclamation.

4. Any and all liability arising from the reservation or the use of the reservation is the sole responsibility of the applicant. By granting such reservations, the Board on behalf of itself and the Department of Natural Resources and Conservation assumes no liability.

5. The DFWP instream flow reservation shall run concurrently with any other non-consumptive water rights including but not limited to all hydropower rights and other instream flow reservations.

6. The DFWP reservation shall have no force and effect in any basin, subbasin, drainage, subdrainage, stream, or single source of supply for the period of time and for any class of uses for which permit applications are precluded.

Table 2

DFWP Instream flow amounts allowed

HEADWATERS SUBBASIN

BIG HOLE RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
American Creek	Headwaters to mouth	Jan 1 - Dec 31	2.8
Bear Creek	Headwaters to mouth	Jan 1 - Dec 31	2.8
Big Hole River #1	Warm Springs Creek to Pintlar Creek	Jan 1 - Dec 31	160
Big Hole River #2	Pintlar Creek to the old Divide Dam	Jan 1 - Dec 31	800
Big Hole River #3	Old Divide Dam to mouth	Jan 1 - Dec 31	573
Big Lake Creek	Twin Lakes outlet to mouth	Jan 1 - Dec 31	4.7
Birch Creek	Mule Creek to mouth	Jan 1 - Dec 31	10
Bryant Creek	Headwaters to mouth	Jan 1 - Dec 31	1.4
California Creek	Headwaters to mouth	Jan 1 - Dec 31	10
Camp Creek	Headwaters to mouth	Jan 1 - Dec 31	5
Canyon Creek	Canyon Lake to mouth	Jan 1 - Dec 31	5
Corral Creek	Headwaters to mouth	Jan 1 - Dec 31	1
Deep Creek	Sevenmile and Tenmile to mouth	Jan 1 - Dec 31	18
Delano Creek	Headwaters to mouth	Jan 1 - Dec 31	0.3
Divide Creek	North and East forks to mouth	Jan 1 - Dec 31	3
Fishtrap Creek	West and Middle forks to mouth	Jan 1 - Dec 31	10
Francis Creek	Sand Creek to mouth	Jan 1 - Dec 31	4
French Creek	Headwaters to mouth	Jan 1 - Dec 31	3
Governor Creek	Headwaters to mouth	Jan 1 - Dec 31	4
Jacobsen Creek	Tahepia Lake to mouth	Jan 1 - Dec 31	14
Jerry Creek	Headwaters to mouth	Jan 1 - Dec 31	7
Johnson Creek	Schultz Creek to Forest Service boundary	Jan 1 - Dec 31	13
Joseph Creek	Anderson Creek to mouth	Jan 1 - Dec 31	5
LaMarche Creek	West and Middle forks to mouth	Jan 1 - Dec 31	11
Miner Creek	Upper Miner Lakes to mouth	Jan 1 - Dec 31	9
Moose Creek	Headwaters to mouth	Jan 1 - Dec 31	9
Mussigbrod Creek	Hell Roaring Creek to uppermost existing diversion point in NWSENW Section 9 T1S R16W	Jan 1 - Dec 31	10
NF Big Hole River	Ruby and Trail creeks to mouth	Jan 1 - Dec 31	30
Oregon Creek	Headwaters to mouth	Jan 1 - Dec 31	0.3
Pattengail Creek	Sand Lake to mouth	Jan 1 - Dec 31	12
Pintlar Creek	Oreamnos Lake to mouth	Jan 1 - Dec 31	10
Rock Creek	Beaverhead National Forest boundary to mouth	Jan 1 - Dec 31	5
Ruby Creek	Pioneer and WF Ruby creeks to mouth	Jan 1 - Dec 31	4
Sevenmile Creek	Headwaters to mouth	Jan 1 - Dec 31	1.8
Seymour Creek	Upper Seymour Lake to mouth	Jan 1 - Dec 31	13
Sixmile Creek	Headwaters to mouth	Jan 1 - Dec 31	1.6
SF Big Hole River	Skinner Lake to mouth	Jan 1 - Dec 31	22
Steel Creek	Headwaters to mouth	Jan 1 - Dec 31	6
Sullivan Creek	Headwaters to mouth	Jan 1 - Dec 31	4
Swamp Creek	Yank Swamp to mouth	Jan 1 - Dec 31	8
Tenmile Creek	Tenmile Lakes to mouth	Jan 1 - Dec 31	3.8
Trail Creek	Headwaters to mouth	Jan 1 - Dec 31	6
Trapper Creek	Trapper Lake to mouth	Jan 1 - Dec 31	1.8
Twelvemile Creek	Headwaters to mouth	Jan 1 - Dec 31	1.2
Warm Springs Creek	West and East forks to mouth	Jan 1 - Dec 31	5
Willow Creek	Tendoy Lake to mouth	Jan 1 - Dec 31	16
Wise River	Mono and Jacobson creeks to mouth	Jan 1 - Dec 31	20
Wyman Creek	Headwaters to mouth	Jan 1 - Dec 31	7

Table 2 (cont.)

GALLATIN RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Baker Creek	Heeb Lane Bridge to mouth	Jan 1 - Dec 31	14
Ben Hart Creek	Headwaters to mouth	Jan 1 - Dec 31	29
Big Bear Creek	Headwaters to mouth	Jan 1 - Dec 31	2
Bridger Creek	Headwaters to mouth	Jan 1 - Dec 31	14
Cache Creek	Headwaters to mouth	Jan 1 - Dec 31	2.6
EF Hyalite Creek	Heather Lake to Hyalite Reservoir	Jan 1 - Dec 31	7
East Gallatin River #1	Rocky and Sourdough cks to Bozeman STP outlet	Jan 1 - Dec 31	42.4
East Gallatin River #2	Bozeman STP outlet to Thompson Spring Creek	Jan 1 - Dec 31	90
East Gallatin River #3	Thompson Spring Creek to mouth	Jan 1 - Dec 31	170
Gallatin River #1	Yellowstone NP boundary to WF Gallatin River	Jan 1 - Dec 31	170
Gallatin River #2	WF Gallatin River to East Gallatin River	Jan 1 - Dec 31	400
Gallatin River #3	East Gallatin River to mouth	Jan 1 - Dec 31	533.5
Hell Roaring Creek	NF Hell Roaring Creek to mouth	Jan 1 - Dec 31	16
Hyalite (Middle) Creek #1	Middle Creek Dam to Middle Creek Ditch intake	Jan 1 - Dec 31	28
Hyalite (Middle) Creek #2	I-90 bridge near Belgrade to mouth	Jan 1 - Dec 31	16
MF of the WF Gallatin R.	Headwaters to NF of the WF Gallatin River	Jan 1 - Dec 31	3
Porcupine Creek	NF Porcupine Creek to mouth	Jan 1 - Dec 31	4.5
Reese Creek	Bill Smith Creek to mouth	Jan 1 - Dec 31	5
Rocky Creek	Jackson Creek to Sourdough Creek	Jan 1 - Dec 31	18
Sourdough (Bozeman) Ck.	Mystic Reservoir to mouth	Jan 1 - Dec 31	11
South Cottonwood Creek	Jim Creek to Hart Ditch headgate	Jan 1 - Dec 31	14
SF Spanish Creek	Falls Creek to mouth	Jan 1 - Dec 31	15
SF of the WF Gallatin R.	Headwaters to mouth	Jan 1 - Dec 31	5
Spanish Creek	North and South forks to mouth	Jan 1 - Dec 31	70
Squaw Creek	Headwaters to mouth	Jan 1 - Dec 31	12
Taylor Fork	Tumbledown Creek to mouth	Jan 1 - Dec 31	36
Thompson Spring Creek	County road crossing in T1N R5E Sec 30 to mouth	Jan 1 - Dec 31	29
WF Gallatin River	Middle and North forks to mouth	Jan 1 - Dec 31	26
WF Hyalite Creek	Hyalite Lake to Hyalite Reservoir	Jan 1 - Dec 31	12

JEFFERSON AND BOULDER RIVER DRAINAGES

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Boulder River #1	West and South forks to High Ore Creek	Jan 1 - Dec 31	20
Boulder River #2	High Ore Creek to Cold Spring	Jan 1 - Dec 31	8
Boulder River #3	Cold Spring to mouth	Jan 1 - Dec 31	47
Halfway Creek	Headwaters to canyon	Jan 1 - Dec 31	1.9
Hells Canyon Creek	Headwaters to mouth	Jan 1 - Dec 31	3.6
Jefferson River	Headwaters to Madison River	Jan 1 - Dec 31	1,095.5
Little Boulder River	Moose Creek to mouth	Jan 1 - Dec 31	7
North Willow Creek	Hollow Top Lake to mouth	Jan 1 - Dec 31	7
South Boulder River	Curly Creek to mouth	Jan 1 - Dec 31	12
South Willow Creek	Granite Lake to mouth	Jan 1 - Dec 31	14
Whitetail Creek	Whitetail Reservoir to mouth	Jan 1 - Dec 31	3
Willow Creek	North and South Willow creeks to mouth	Jan 1 - Dec 31	14
Willow Spring Creek	Headwaters to mouth	Jan 1 - Dec 31	9.2

Table 2 (cont.)

MADISON RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Antelope Creek	Headwaters to mouth	Jan 1 - Dec 31	14
Beaver Creek	Wyethia Creek to Earthquake Lake	Jan 1 - Dec 31	22
Black Sand Spring Creek	Black Sand Spring to SF Madison River	Jan 1 - Dec 31	18.7
Blaine Spring Creek	Ennis National Fish Hatchery to mouth	Jan 1 - Dec 31	23
Cabin Creek	Gully Creek to Madison River	Jan 1 - Dec 31	22
Cherry Creek	Headwaters to mouth	Jan 1 - Dec 31	15
Cougar Creek	Yellowstone NP boundary to mouth	Jan 1 - Dec 31	24
Duck Creek	Yellowstone NP boundary to Hebgen Reservoir	Jan 1 - Dec 31	23
Elk River	Headwaters to mouth	Jan 1 - Dec 31	28
Grayling Creek	Yellowstone NP boundary to Hebgen Reservoir	Jan 1 - Dec 31	34
Hot Springs Creek	North and Middle forks to mouth	Jan 1 - Dec 31	5.5
Indian Creek	Raw Liver Creek to mouth	Jan 1 - Dec 31	48
Jack Creek	Lone Creek to mouth	Jan 1 - Dec 31	24
Madison River #1	Yellowstone NP boundary to Hebgen Reservoir	Jan 1 - Dec 31	245
Madison River #2	Hebgen Dam to West Fork	Jan 1 - Dec 31	502.5
Madison River #3	West Fork to Ennis Reservoir	Jan 1 - Dec 31	716
Madison River #4	Ennis Dam to mouth	Jan 1 - Dec 31	825
Moore Creek	Fletcher Creek to mouth	Jan 1 - Dec 31	1.4
North Meadow Creek	Headwaters to mouth	Jan 1 - Dec 31	18
O'Dell Creek	Headwaters to mouth	Jan 1 - Dec 31	98
Red Canyon Creek	Headwaters to Hebgen Reservoir	Jan 1 - Dec 31	2.9
Ruby Creek	Beartrap Canyon to mouth	Jan 1 - Dec 31	18
SF Madison River	Dry Canyon to Hebgen Reservoir	Jan 1 - Dec 31	92
Squaw Creek	North Fork to mouth	Jan 1 - Dec 31	14
Standard Creek	Headwaters to mouth	Jan 1 - Dec 31	10
Trapper Creek	Headwaters to Hebgen Reservoir	Jan 1 - Dec 31	3.2
Watkins Creek	Coffin Creek to Hebgen Reservoir	Jan 1 - Dec 31	5.5
WF Madison River	Fox Creek to mouth	Jan 1 - Dec 31	42

RED ROCK-BEAVERHEAD DRAINAGE

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Bear Creek	Headwaters to BLM boundary	Jan 1 - Dec 31	6.5
Beaverhead River #1	Clark Canyon to East Bench Div Dam at Barretts	Jan 1 - Dec 31	200
Beaverhead River #2	East Bench Diversion Dam at Barretts to mouth	Jan 1 - Dec 31	200
Big Sheep Creek	Cabin and Nicholia creeks to mouth	Jan 1 - Dec 31	33
Black Canyon Creek	Headwaters to mouth	Jan 1 - Dec 31	2.5
Blacktail Deer Creek	MF and WF to uppermost existing diversion point in SENENE Section 29 T8S R8W	Jan 1 - Dec 31	27
Bloody Dick Creek	Swift Lake outlet to mouth	Jan 1 - Dec 31	20
Browns Canyon Creek	Headwaters to mouth	Jan 1 - Dec 31	2.3
Cabin Creek	Headwaters to mouth	Jan 1 - Dec 31	0.4
Corral Creek	Headwaters to mouth	Jan 1 - Dec 31	6
Deadman Creek	Deadman Lake to mouth	Jan 1 - Dec 31	4.5
EF Blacktail Deer Creek	Headwaters to mouth	Jan 1 - Dec 31	18
EF Clover Creek	Headwaters to mouth	Jan 1 - Dec 31	4.4
EF Dyce Creek	Headwaters to mouth	Jan 1 - Dec 31	1.4
Frying Pan Creek	Headwaters to mouth	Jan 1 - Dec 31	1.6
Grasshopper Creek	Blue Creek to mouth	Jan 1 - Dec 31	25.8
Hell Roaring Creek	Headwaters to mouth	Jan 1 - Dec 31	15
Horse Prairie Creek	Headwaters to mouth	Jan 1 - Dec 31	20
Indian Creek	Headwaters to mouth	Jan 1 - Dec 31	0.2
Jones Creek	Headwaters to Lakeview Road crossing	Jan 1 - Dec 31	1.9
Long Creek	Jones Creek to mouth	Jan 1 - Dec 31	3.4

Table 2 (cont.)

RED ROCK-BEAVERHEAD DRAINAGE (continued)

Medicine Lodge Creek	Bear Canyon to mouth	Jan 1 - Dec 31	10
Narrows Creek	Spring in T13S R1E Sec18A to Elk Lake	May 1 - July 15	1.2
		July 16 - Apr 30	0.5
Odell Creek	Headwaters to Lower Red Rock Lake	Jan 1 - Dec 31	11
Peet Creek	Headwaters to reservoir in T14S R4W Sec34A	Jan 1 - Dec 31	0.9
Poindexter Slough	Springs & canal T8S R9W Sec3,SW to Beaverhead	Jan 1 - Dec 31	57.9
Rape Creek	Headwaters to reservoir in T10S R13W Sec4	Jan 1 - Dec 31	0.4
Red Rock Creek	Headwaters to Upper Red Rock Lake	Jan 1 - Dec 31	15
Red Rock River #1	Dam at Lower Red Rock Lake to Lima Reservoir	Jan 1 - Dec 31	55
Red Rock River #2	Lima Dam to Clark Canyon Reservoir	Jan 1 - Dec 31	60
Reservoir Creek	Headwaters to mouth	Jan 1 - Dec 31	1.5
Shenon Creek	Headwaters to BLM boundary in T10S R14W Sec25	Jan 1 - Dec 31	0.4
Simpson Creek	Headwaters to mouth	Jan 1 - Dec 31	0.7
Tom Creek	Headwaters to Upper Red Rock Lake	Jan 1 - Dec 31	1.4
Trapper Creek	Headwaters to mouth	Jan 1 - Dec 31	0.7
WF Blacktail Deer Creek	Grays and South forks to mouth	Jan 1 - Dec 31	3
WF Dyce Creek	Headwaters to mouth	Jan 1 - Dec 31	0.7

RUBY RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Coal Creek	Headwaters to mouth	Jan 1 - Dec 31	3.6
Cottonwood Creek	Geyser Creek to mouth	Jan 1 - Dec 31	4
EF Ruby River	Headwaters to mouth	Jan 1 - Dec 31	3
MF Ruby River	Divide Creek to mouth	Jan 1 - Dec 31	5
Mill Creek	Outlet of Branham Lake to mouth	Jan 1 - Dec 31	10
NF Greenhorn Creek	Headwaters to mouth	Jan 1 - Dec 31	3.5
Ruby River #1	East, Middle, and West forks to Ruby Reservoir	Jan 1 - Dec 31	90
Ruby River #2	Ruby Dam to mouth	Jan 1 - Dec 31	40
Warm Springs Creek	Romy Lake outlet to mouth	Jan 1 - Dec 31	48.5
WF Ruby River	Headwaters to mouth	Jan 1 - Dec 31	3.0
Wisconsin Creek	Crystal Lake outlet to mouth	Jan 1 - Dec 31	6

UPPER MISSOURI SUBBASIN

UPPER MISSOURI RIVER AND TRIBUTARIES

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Avalanche Creek	Cooney Gulch to Canyon Ferry Reservoir	Jan 1 - Dec 31	5
Beaver Creek	Headwaters in Elkhorn Mts to Canyon Ferry Reservoir	Jan 1 - Dec 31	2.8
Beaver Creek	Headwaters in Big Belt Mts to mouth	Jan 1 - Dec 31	10.0
Canyon Creek	Headwaters to mouth	Jan 1 - Dec 31	10.0
Confederate Gulch	Debauch Gulch to mouth	Jan 1 - Dec 31	5
Cottonwood Creek	Headwaters to mouth	Jan 1 - Dec 31	1.0
Crow Creek	Tizer and Wilson Creeks to Williams Ditch intake	Jan 1 - Dec 31	11
Deep Creek	Castle Fork to Missouri River	Jan 1 - Dec 31	9
Dry Creek	Headwaters to Broadwater Missouri Canal	Jan 1 - Dec 31	1.8
Duck Creek	Headwaters to Canyon Ferry Res.	Jan 1 - Dec 31	8
Little Prickly Pear Ck. #1	Canyon Creek to Clark Creek	Jan 1 - Dec 31	22
Little Prickly Pear Ck. #2	Clark Creek to mouth	Jan 1 - Dec 31	70
Lyons Creek	Headwaters to mouth	Jan 1 - Dec 31	10.0
McGuire Creek	Headwaters to mouth	May 1 - Nov 30	8.3
		Dec 1 - Apr 30	4.7
Missouri River #1	Jefferson and Madison rivers to Canyon Ferry Res.	Jan 1 - Dec 31	2,400
Missouri River #2	Hauser Dam to Holter Reservoir	Jan 1 - Dec 31	2,881

Table 2 (cont.)

UPPER MISSOURI RIVER AND TRIBUTARIES (continued)

Missouri River #3	Holter Dam to Great Falls	Jan 1 - Dec 31	3,32
Prickly Pear Creek #1	Rabbit Gulch to Hwy 12 bridge in East Helena	Jan 1 - Dec 31	2
Prickly Pear Creek #2	Hwy 12 bridge in East Helena to Lake Helena	Jan 1 - Dec 31	3
Sevenmile Creek	Greenhorn Creek and Skelly Gulch to mouth	Jan 1 - Dec 31	
Sheep Creek	Headwaters to mouth	Jan 1 - Dec 31	3
Sheep Creek	Headwaters of South Fork to mouth	Jan 1 - Dec 31	2
Silver Creek	Helena Valley Irrigation Canal to mouth	May 1 - Nov 30	1
		Dec 1 - Apr 30	5
Sixteenmile Creek	Billy Creek to mouth	Jan 1 - Dec 31	2
Spokane Creek	Helena Valley Irr. Canal to mouth	May 1 - Nov 30	4
		Dec 1 - Apr 30	3
Stickney Creek	North and South forks to mouth	Apr 1 - Apr 30	7
		May 1 - May 31	34
		June 1 - June 30	35
		July 1 - July 31	7
Tenmile Creek	Headwaters to mouth	Jan 1 - Dec 31	12
Trout Creek	Springs near Vigilante Campground to mouth	Jan 1 - Dec 31	15
Virginia Creek	Headwaters to mouth	Jan 1 - Dec 31	6
Wegner Creek	Headwaters to mouth	Apr 1 - Apr 30	8
		May 1 - May 31	47
		June 1 - June 30	38
		July 1 - July 31	8
Willow Creek	Headwaters to mouth	Jan 1 - Dec 31	3 5
Wolf Creek	Headwaters to mouth	Jan 1 - Dec 31	7

DEARBORN RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Dearborn River	Headwaters to mouth	Jan 1 - Dec 31	110
Flat Creek	Headwaters to mouth	Jan 1 - Dec 31	7 5
MF Dearborn River	Headwaters to mouth	Jan 1 - Dec 31	9 5
SF Dearborn River	Headwaters to mouth	Jan 1 - Dec 31	11 5

SMITH RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Big Birch Creek	Headwaters to mouth	Jan 1 - Dec 31	11
Eagle Creek	Headwaters to mouth	Jan 1 - Dec 31	2 5
Hound Creek	EF Hound Creek and Middle Creek to mouth	Jan 1 - Dec 31	35
Newlan Creek	Headwaters to mouth	Jan 1 - Dec 31	3 8
NF Deep Creek	Headwaters to rock cascades	Jan 1 - Dec 31	1
NF Smith River	Headwaters to mouth	Jan 1 - Dec 31	9
Rock Creek	Headwaters to mouth	Jan 1 - Dec 31	11
Smith River #1	North and South Forks Sheep Creek	Jan 1 - Dec 31	78 5
Smith River #2	Sheep Creek to Hound Creek	Jan 1 - Dec 31	150
Smith River #3	Hound Creek to mouth	Jan 1 - Dec 31	80
SF Smith River	Headwaters to mouth	Jan 1 - Dec 31	7
Tenderfoot Creek	Headwaters to mouth	Jan 1 - Dec 31	15

Table 2 (cont.)

SUN RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Elk Creek	Headwaters to mouth	Jan 1 - Dec 31	16
Ford Creek	Headwaters to mouth	Jan 1 - Dec 31	12
NF Willow Creek	Headwaters to mouth	Jan 1 - Dec 31	3.0
Sun River #1	Diversion Dam to Elk Creek	Jan 1 - Dec 31	100
Sun River #2	Elk Creek to mouth	Jan 1 - Dec 31	130
Willow Creek	Headwaters to mouth	Jan 1 - Dec 31	3

BELT CREEK DRAINAGE

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Belt Creek #1	Headwaters to Big Otter Creek	Jan 1 - Dec 31	90
Belt Creek #2	Big Otter Creek to Missouri River	Jan 1 - Dec 31	35
Big Otter Creek	Whiskey Spring Coulee to Belt Creek	Jan 1 - Dec 31	5
Dry Fork Belt Creek	Galena and Oti Park Creek to Belt Creek	Jan 1 - Dec 31	7
Logging Creek	Headwaters to Belt Creek	Jan 1 - Dec 31	6
Pilgrim Creek	Headwaters to Belt Creek	Jan 1 - Dec 31	8
Tillinghast Creek	Headwaters to Belt Creek	Jan 1 - Dec 31	5.5

MIDDLE MISSOURI SUBBASIN

MIDDLE MISSOURI RIVER AND TRIBUTARIES

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Cow Creek	NF and SF to County bridge	Jan 1 - Dec 31	4.5
Highwood Creek	Headwaters to Hwy 228 Bridge at Highwood	Jan 1 - Dec 31	10
Missouri River #4	Great Falls to Maris River	Jan 1 - Dec 31	3,876
Missouri River #5	Marias River to Judith River	Jan 1 - Dec 31	4,280
Missouri River #6	Judith River to upper end of Fort Peck Reservoir	Jan 1 - Dec 31	4,652
Shonkin Creek	Forest boundary to town of Shonkin	Jan 1 - Dec 31	7

FORT PECK RESERVOIR TRIBUTARIES

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Big Dry Creek	Hwy 200 bridge to mouth	Mar 15 - Mar 31	300
		Apr 1 - Apr 30	100
		May 1 - May 31	35
		June 1 - Oct 31	5.5
Little Dry Creek	Whiteside ranch house to Big Dry Creek	Mar 15 - Mar 31	110
		Apr 1 - Apr 30	42
		May 1 - May 31	17
		June 1 - Oct 31	3.5

Table 2 (cont.)

JUDITH RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Beaver Creek	West Fork to Cottonwood Creek	Jan 1 - Dec 31	
Big Spring Creek #1	Fish hatchery to Cottonwood Creek	Jan 1 - Dec 31	5
Big Spring Creek #2	Cottonwood Creek to mouth	Jan 1 - Dec 31	10
Cottonwood Creek	Spring Branch of Cottonwood Ck. to Big Spring Ck.	Jan 1 - Dec 31	
East Fork Big Spring Ck.	Headwaters to Big Spring Creek	Jan 1 - Dec 31	
Judith River #1	SF and MF to Big Spring Creek	Jan 1 - Dec 31	2
Judith River #2	Big Spring Creek to Missouri River	Jan 1 - Dec 31	16
Lost Fork Judith River	SF and WF to MF Judith River	Jan 1 - Dec 31	1
Middle Fork Judith River	Headwaters to South Fork	Jan 1 - Dec 31	2
South Fork Judith River	Headwaters to Middle Fork	Jan 1 - Dec 31	
Warm Spring Creek	Springs to Judith River	Jan 1 - Dec 31	11
Yogo Creek	Headwaters to MF Judith River	Jan 1 - Dec 31	

MUSSELSHELL RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Alabaugh Creek	Headwaters to mouth	Jan 1 - Dec 31	1
American Fork Creek	South Fork to mouth	Jan 1 - Dec 31	[illegible]
Big Elk Creek	Origin at Lebo Fork to mouth	Jan 1 - Dec 31	[illegible]
Careless Creek	Headwaters to Roberts Creek	Jan 1 - Dec 31	[illegible]
Checkerboard Creek	East and West Forks to mouth	Jan 1 - Dec 31	[illegible]
Collar Gulch Creek	Headwaters to mouth	Jan 1 - Dec 31	[illegible]
Cottonwood Creek	WF, MF, and Loco Creek to mouth	Jan 1 - Dec 31	1[illegible]
Flatwillow Creek	NF and SF to Petrolia Reservoir	Jan 1 - Dec 31	1[illegible]
Musselshell River #1	NF and SF to Deadmans Basin Div	Jan 1 - Dec 31	8[illegible]
Musselshell River #2	Deadmans Basin Div to Musselshell Div	Jan 1 - Dec 31	8[illegible]
Musselshell River #3	Musselshell Diversion Dam at town of Musselshell to mouth	Jan 1 - Dec 31	7[illegible]
NF Musselshell #1	Headwaters to Bair Reservoir	Jan 1 - Dec 31	[illegible]
NF Musselshell #2	Bair Reservoir to SF Musselshell R.	Jan 1 - Dec 31	1[illegible]
SF Musselshell	Headwaters to North Fork	Jan 1 - Dec 31	3[illegible]
Spring Creek	Headwaters to mouth	Jan 1 - Dec 31	8
Swimming Woman Ck.	Headwaters to Cty road crossing 8 linear miles upstream from mouth	Jan 1 - Dec 31	2.5

MARIAS/TETON SUBBASIN

MARIAS RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Badger Creek	N and S Badger creeks to Forest/ Blackfeet Reservation Boundary	Jan 1 - Dec 31	6[illegible]
Birch Creek	Swift Reservoir to Hwy 358	Jan 1 - Dec 31	6[illegible]
Cut Bank Creek	Blackfeet Reservation boundary to mouth	Jan 1 - Dec 31	7[illegible]
Dupuyer Creek	Headwaters to mouth	Jan 1 - Dec 31	1[illegible]
Marias River #1	Two Medicine River and Cut Bank Creek to head of Tiber Reservoir	Jan 1 - Dec 31	20[illegible]
Marias River #2	Tiber Dam to Circle Bridge (Hwy 223)	Jan 1 - Dec 31	41[illegible]
Marias River #3	Circle Bridge (Hwy 223) to mouth	Jan 1 - Dec 31	48[illegible]
North Badger Creek	Headwaters to mouth	Jan 1 - Dec 31	1[illegible]
NF Dupuyer Creek	Headwaters to mouth	Jan 1 - Dec 31	1[illegible]
South Badger Creek	Headwaters to mouth	Jan 1 - Dec 31	4[illegible]
SF Dupuyer Creek	Headwaters to mouth	Jan 1 - Dec 31	[illegible]
SF Two Medicine River	Headwaters to Forest/Blackfeet Reservation Boundary	Jan 1 - Dec 31	1[illegible]

Table 2 (cont.)

TETON RIVER DRAINAGE

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (cfs)
Deep Creek	Headwaters to mouth	Jan 1 - Dec 31	18
McDonald Creek	Headwaters to mouth	Jan 1 - Dec 31	10
NF Deep Creek	Headwaters to mouth	Jan 1 - Dec 31	7.2
SF Deep Creek	Headwaters to mouth	Jan 1 - Dec 31	6.9
Spring Creek	Headwaters to mouth	Jan 1 - Dec 31	4.5
Teton River	Headwaters to discharge from Priest Butte Lake	Jan 1 - Dec 31	35

LAKES AND SWAMPS

STREAM	REACH DESCRIPTION	DATES GRANTED	AMOUNT ALLOWED (af/yr)
Bean Lake	Sec. 18C and 19B, T18N, R6W, Sec. 13D and 24A, T18N, R7W	Jan 1 - Dec 31	2,649
Antelope Butte Swamp	North 1/2 Sec. 28, T26N, R8W	Jan 1 - Dec 31	460