FISHERIES MANAGEMENT PLAN

for

Mountain Lakes in the Boulder River Drainage

Montana

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Introduction

Absaroka-Beartooth Wilderness Lakes

The Absaroka-Beartooth Wilderness Area (A-B) established in 1978 encompasses 930,584 acres and contains more area over 10,000 feet in elevation than any other area in the U.S. It rates as one of the top four or five wilderness areas in the country, receiving about 320,000 visitor-days of use each year. For comparison, the Bob Marshall Wilderness area receives about 150,000 visitor-days use yearly. The Absarokee Beartooth Wilderness Area and lands immediately adjacent contain 948 high mountain lakes, 318 of which contain fish and 630 that are barren. Approximately 204 of these lakes have self-sustaining fisheries and 114 are stocked. Stocking schedules vary from early in some of the more heavily used areas to once every six to ten years in the lakes managed for trophy fisheries.

Pat Marcuson, during the time he worked for the Montana Department of Fish, Wildlife and Parks (MDFWP) out of Red Lodge, gathered a tremendous amount of information on the A-B lakes and created a massive data base. In 1980 he developed fisheries management plans for each major drainage. Since that time, a computer data base containing the latest information on the lakes with fisheries has also been developed. This data base is located at the MDFWP Regional Headquarters in Billings. Additional information about individual lakes can be obtained from that office.

The purpose of this document is to update the 1980 lake management plan with the latest fisheries information available for the mountain lakes in the Boulder River Drainage.

Methods

Mountain lake information is collected primarily by a lake survey team consisting of two temporary employees who spend about eight weeks backpacking into the remote lakes of the A-B mountains. Lakes scheduled for sampling are selected based on length of time since last survey, questions about the status of fish introductions, impending scheduled fish plants, and angler reports. Fish populations are monitored with lightweight experimental nylon gill nets, hook and line, and visual surveys. Additional information gathered includes lake access, pH, air and surface water temperatures, availability of firewood and campsites, and extent of recreation use. Observations are also made of aquatic invertebrates, cruising and rising fish, fish fry, and suitability of substrate for spawning. Inlet and outlet streams are visually surveyed for fish and spawning activity or potential.

Fish collected are weighted and measured, and scales are taken for later age determination. Live fish are released, dead fish are dissected to check for parasites and general health and condition; stomachs are examined for food organisms.

Spot creel checks are conducted by enforcement and fisheries personnel to determine catch rates and angler satisfaction with regulations. Additional angler use information was gathered during 1988 and 1989 with a voluntary trailhead creel information survey implemented at the major access points to the A-B wilderness area. The purpose of this survey was to address a proposed new three-fish limit, estimate harvest and catch rates, solicit public comments, and gather additional fisheries information. Supplemental fisheries information is also obtained from guides and outfitters, Wilderness Rangers and other Forest Service personnel, as well as reports from other Wilderness users.

Information gathered from all sources is summarized and analyzed to make fish management decisions for the mountain lakes. Regulations are adjusted as necessary to help achieve desired fish population levels. Stocking rates and individual lake management strategies are adjusted as necessary to maintain desired angler catch rates, fish growth rates, and species distribution. Summarized information is used to update the computer data base for each mountain lake sampled.

DESCRIPTION

Location and number of lakes

The Boulder River drains 424.7 square miles of Gallatin National Forest and 131 square miles of lands in private ownership. The forest area is administered by the Big Timer Ranger District. The drainage (Figure 1) includes the towns of McLeod and Big Timber. Waters generating to the west of the drainage flow directly into the Yellowstone River and partly to the Stillwater River on the east. A large majority of the drainage within the Forest is in Absaroka-Beartooth Wilderness Area.

There are 103 mountain lakes in the drainage, 57 in Park County and 46 in Sweet Grass County. Sixteen of the 103 lakes are on private property. The Boulder River Canyon splits the Absaroka Mountain Range on the west and south from the Beartooth Mountain Range to the east. Three plateaus - East Boulder Plateau, West Boulder Plateau and Lake Plateau - are within the drainage. Moccasin and Camp lakes and two different beaver ponds are the only lotic environments within the Forest that are outside the Absaroka-Beartooth Wilderness Area.

Lake areas and depths

The 103 lakes in the drainage cover 585.9 surface acres; 558.6 acres (87 lakes) are on Gallatin Forest lands. The lakes range from 0.2 to 39.7 acres with a mean of 5.7 acres. (Table 1) Kaufman (Falls Creek) Lake is the largest lake in the drainage. Lake areas cover .22% of the entire Forest land area. Mirror Lake is the deepest lake at 80 feet, followed by Weasel Creek Lake #48 at 75 feet, Bramble creek Lake #41 and Kaufman #76 at 70 feet each. The lakes range from 2 to 80 feet in depth. The majority, 68 lakes, are less than 15 feet deep (Marcuson, 1970, 1973, 1974).

Lake elevations

Ball Noah Lake on private land is the lowest lake in the drainage at an altitude of 5,315 feet. The lake at the highest altitude is unnamed #13 near Mirror Lake at 10,070 feet. The majority of the lakes (65%) are located in the 9,000 to 10,000-foot range.

Accessibility

A total of 23 lakes in this drainage can be reached by four-wheel drive vehicle, another 54 are accessible by horse travel and 26 are restricted to foot traffic only. Most of those lakes accessible by vehicles are near the Main Boulder River and are on private land. Approximately 62 of the 103 lakes are accessible via trail to the lake or are reasonably close to a trail. Numerous trails serve the drainage.

Water chemistry

Chemical attributes (Table 2) were collected during the 1970's on thirty-three lakes. The mean pH was 6.4, conductivities averaged 19 mhos, mean alkalinities were 24 ppm, total hardness averaged 11 ppm and silica averaged 1.7 ppm.

Thermal

Water temperatures peaked the third week of August. The majority of the lakes above 9,000 feet had a maximum surface temperature of 54° F. Lakes below 8,000 feet reached highs of 68° F. The ice-free period ranged from 92 to 204 days. Lakes in the alpine zone averaged 106 ice-free days while sub-alpine lakes averaged 125. Lakes in the Canadian zone averaged 153, and those in the transition zone averaged 201 ice-free days. Ponds along the Main Boulder River started losing ice cover in late April. The majority, however, began breaking up in July. The last waters to be clear of ice were those lakes located between Hicks Peak and Lake Mountain. Ice started forming between October and November.

Water clarity

The lakes in the Boulder River drainage were mostly clear with only little influence from glacial silts. Bridge and Elk lakes had poorest visibility at 16 feet. The average visible range of the secchi disk was 28 feet for all lakes sampled. Lakes were clear during high water stages.

Plankton

Plankton samples were collected from 28 of the 103 lakes during the 1970's (Table 3). Twelve lakes contained the large copepod (*Diaptomus shoshone*), four harbored *Daphnia middendorffiana* and two had *Daphnia pulex*. The numbers of zooplankton had little correlation with the presence or absence of fish; however, preliminary analysis of the data suggests that population density of large zooplankton are influenced by fish density. Considerably more work is needed on zooplankton distribution in this drainage.

Fisheries

Thirty-six of the 103 lakes supported a fishery at the time this report was written. Twelve of the 36 appear to have self-sustaining fisheries. Three stocked with Cutthroat, two with Golden Trout, and one with Rainbow Trout may become self-sustaining. Another 14 lakes are stocked at intervals to maintain a fishery.

The drainage has 20 lakes with Cutthroat Trout, ten with Rainbow Trout, two with Golden Trout and three with Rainbow-Cutthroat Trout hybrids. A total of 67 lakes are barren of fish;

of these, 57 have no potential as future fisheries. The remaining ten lakes with fisheries potential will be discussed under management recommendations.

Stocking of these lakes by the State of Montana, Department of Fish, Wildlife and Parks (Table 4) included 22 lakes with Cutthroat Trout, four with Golden Trout, and eight with Rainbow Trout. Present management includes eleven lakes with Cutthroat Trout, four with Rainbow Trout, two with Golden Trout, and one with Grayling and Cutthroat Trout. One unusual feature of the Boulder River drainage is the lack of brook trout. Brookies were widely distributed in the Beartooths during the 1920's. Most were conveyed out of the Red Lodge area by members of the Rod and Gun Club.

Planting records show Brook Trout were planted into Fish Lake in 1944, but this must be a mistake because all subsequent surveys have shown the lake was inhabited with a self-sustaining population of Yellowstone Cutthroat Trout of unknown origin. An earlier recommendation to introduce Brook Trout into Weasel Lake (#47) to provide additional species diversity was not done, because of concern for potential Brook Trout movement into other lakes in the area.

Little has been learned about the history of early plants of fish in the Boulder River drainage. It is assumed that many of the Rainbow Trout plants were made by air drops during the 1940's. The earliest stockings in Montana by this method were made in several lakes on Lake Plateau. Records were poorly kept and no specific lake names were given. Golden Trout (12,000) were planted in Lake Pinchot (Stillwater drainage) in 1938. The goldens hybridized with Rainbow Trout, and various degrees of these hybrids are common in Flood Creek. None of these goldens or golden crosses were transported to nearby lakes in the Boulder River drainage. Several transplants were, however, made in nearby lakes in the Stillwater River drainage.

Several other fisheries have unexplained origins. Those with Cutthroat Trout include Camp, Fish, Weasel (Chippy) and Davis lakes. Rainbow Trout of unknown origin occur in Silver and Lower Great Falls Creek Lake.

Creel census data collected on some of the more accessible lakes in the drainage revealed a catch of .77 Rainbow Trout per hour and one Cutthroat Trout per hour. Fly fishermen produced the best catch rate. Lakes receiving the most use by anglers were on Lake Plateau.

During 1988 and 1989 (Poore & Frazer 1990), a voluntary trailhead creel information survey was implemented at the major access points to the Absaroka-Beartooth Wilderness Area (A-B). That study showed, in spite of liberal fish limits for the A-B mountains, anglers kept only 26% of their catch in 1988 and 27% in 1989. Anglers release three out of four fish they presently catch

without being required to by restrictive regulations. By a four to one majority, those fishermen responding to the survey wanted to see the present liberal fish limits retained in the A-B.

A-B anglers kept 35% of the Brook Trout they caught, 24% of the Rainbows and 22% of Cutthroat. The average catch per hour for each fish species was; 0.94 for Cutthroat Trout, 0.72 for Rainbow Trout, and 1.27 for Brook Trout. Catch rates for 1988 and 1989 were identical with 2.6 fish per hour on lakes, 4.3 fish per hour on streams, and 2.4 fish per hour for people fishing both lakes and streams.

The majority of the streams in the Boulder River drainage are high gradient flows with little liveable habitat for fish. The Boulder, West Boulder and East Fork do have many miles of excellent fishing opportunities in the Gallatin National Forest (Marcuson, 1976a), (Poore, 1987), (Fredenberg, et. al. 1986).

MANAGEMENT RECOMMENDATIONS FOR LAKES IN THE BOULDER RIVER DRAINAGE

If all the management recommendations in this plan are carried out, the following species of fish will be present in the drainage:

Number of lakes	Species of Fish
2	Golden Trout
10	Rainbow Trout
20	Cutthroat Trout
3	Hybrids (RB x CT)
1	Multiple Species (GR & CT)
36	

These 36 lakes represent 35% of the 103 lakes in the Boulder River drainage with fisheries. At present, Rainbow, Golden, Cutthroat and hybrids of the two trout are available in the drainage along with a Grayling-Cutthroat combination in one lake.

The total number of fishless lakes is 67 or 65% of the 103 lakes. Another eight of these 67 lakes have fisheries potential, but are recommended to remain barren for scientific reasons and retention of wilderness attributes (Marcuson, 1976).

This plan recommends stocking Cutthroat Trout of the McBride variety in eleven waters, Rainbow Trout in four waters, Golden Trout in two waters, and Arctic Grayling in one lake (Table 5). These stocking recommendations take into account features typical of lakes where these species do well elsewhere in the Absaroka-Beartooth Study Area (Marcuson, 1974). Fish species recommendations, except the Cutthroat Trout plants and three Rainbow plants are one-time attempts to establish fisheries. In some cases, the lakes could be managed with another species should

the planned fisheries fail to become self-sustaining.

The next plant of McBride Cutthroat Trout scheduled for 1995 into West Boulder Lake should be replaced with Golden Trout if they are available. Golden Trout planted in the lake during 1958 grew well and survived for 14 years. A plant of 75 Golden Trout per acre would have the potential to provide a long lived trophy Golden Trout fishery.

Fourteen lakes will be on a regular stocking schedule for the entire drainage. The opportunities for trophy fisheries exist at approximately eight lakes.

This plan attempts to provide ample opportunity to catch fish in accessible areas as well as provide the chance of landing a big one. It also attempts to provide fishing opportunity and maintenance for species whose numbers are diminishing.

For such a large drainage, relatively few lakes have characteristics suitable for fish. Many small, uninhabitable waters are common to the terrain. Fishable lakes in the Stillwater River drainage portion of Lake Plateau are, however, readily accessible from the Boulder drainage.

Implementation of more restrictive regulations throughout the entire A-B Wilderness at this time is not warranted because: 1) Use is restricted by difficult access and the large number of lakes containing fisheries. Maintained trails lead to less than half the lakes with fish. 2) Many A-B lakes need more harvest because they contain overabundant populations of Brook Trout and (in some lakes) Yellowstone Cutthroat. 3) Unlike most wilderness lakes many A-B lakes are uniquely fertile and productive. Even with liberal limits, optimum harvest has not been reached. 4) Our trailhead creel survey indicates people are regulating their own harvest and prefer this to being required to follow unnecessarily stringent regulations.

Several areas along major trails (especially where horses are allowed) are showing signs of overuse and may require some type of special management. Most A-B wilderness users, however, are satisfied with present management and the resource is in excellent shape.

REFERENCES

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Location Code[1/]

Name

County[2/]

Forest[3/]

Elevation in feet

Area in acres
t=total

Maximum depth in feet

Shoal (% of lake less
than 15 ft. deep)

Ecological zone[4/]

Fish species[5/]

Fish population type[6/]

Fish management[7/]

Table 1. Summary of locations, physical features and fisheries information for lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range.

	EAST BOULDER									
1.	Unnamed	40	P	6,340	3.5	2	100	1	B	3
2.	Moccasin	40	G	7,390	1.4	3	100	1	B	3
3.	Camp	40	G	8,995	7.8	58	36	1	CT 1	1
	MAIN BOULDER									
4.	Narrow Escape	40	G	9,340	11.6	20	78	3	CT 2a	1
5.	Squeeze	40	G	9,535	7.0	45	20	3	B	2
6.	Helicopter	40	G	8,950	4.1	15	100	1	B	1
7.	Hawley	40	G	9,040	1.9	4	100	1	B	3
8.	Emerald	40	G	9,075	3.2	21	95	1	B	1
9.	Lower Hicks	40	G	9,630	5.8	15	100	3	B	1
10.	Upper Hicks	40	G	9,770	1.9	5	100	3	B	3
11.	Horseshoe	40	G	9,490	15.9	10	100	3	CT 2a	1
12.	Diamond	40	G	9,625	11.6	13	100	3	B	3
13.	Unnamed (3)	40	G	10,070	4.2t	9	100	3	B	3
14.	Unnamed	40	G	9,880	2.3	12	100	3	B	3
15.	Chickadee	40	G	9,690	4.0	8	100	3	CT 2	2
16.	Mirror	40	G	9,740	16.4	80	27	4	RB 1	1

17.	Rainbow (Figure 2)	40	G	9,638	1.2	10	100	3	B	3
18.	Rainbow	40	G	9,432	17.5	30	60	3	H_2 1	1
19.	Rainbow	40	G	9,395	6.8	25	97	3	RB 1 H_2 1	1 1
20.	Rainbow	40	G	9,425	7.9	34	75	3	RB 1 H_2 1	1 1

Table 1. Summary of locations, physical features and fisheries information for lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range (Continued)

21.	Rainbow	40	G	9,635	5.1	12	100	3	RB 1	1
22.	Rainbow	40	G	9,652	2.4	10	100	3	RB 1	1
23.	Rainbow	40	G	9,658	9.5	24	97	3	RB 1	1
24.	Unnamed (3)	40	G	9,820	4.5t	5	100	3	B	3
25.	Fish	40	G	9,472	18.0	45	12	3	CT 1	1
26.	Burnt Gulch	40	G	9,040	9.1	43	21	3	CT 2	2
27.	Lake Raymond	40	G	9,630	11.5	18	93	3	B	3
28.	Lake Kathleen	40	G	7,590	3.1	18	96	2	B	3
29.	Unnamed (2)	40	G	9,080 9,280	1.0 2.6	4 8	100 100	2 2	B B	3 3
30.	Lake Columbine	40	G	9,132	5.3	10	100	2	B	6
31.	Blue	40	G	9,460	10.2	27	51	3	CT 2	2
32.	Lamb	40	G	9,180	4.8	5	100	3	B	3

33.	Wool	40	G	9,215	2.4	4	100	3	B		3
34.	Mutton	40	G	9,235	2.6	4	100	3	B	3	
35.	Elk	49	G	9,580	9.2	22	53	3	CT	2	2
36.	Bridge	49	G	9,585	13.9	42	10	3	CT	2	2
37.	Trout (Brays)	40	P-G	6,140	.9	5	100	1	RB	2	2
38.	Bramble Creek	49	G	8,400	1.2	3	100	1	B	2	3
39.	Bramble Creek	49	G	8,775	3.3	26	30	1	CT		
40.	Bramble Creek	49	G	9,575	3.7	4	100	3	B		3
41.	Bramble Creek	49	G	9,525	4.1	70	11	3	B		2

Table 1. Summary of locations, physical features and fisheries information for lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range (Continued)

42.	Silver	49	G	9,046	10.0	30	75	2	RB	1	7
43.	Prospect	49	G	9,640	6.8	30	15	3	RB	2a	2
44.	Patient	49	G	9,680	6.6			3	B		1
45.	Speculator	49	G	9,449	9.7	35	18	3	CT	2	2
46.	Weasel Creek [a/]	49	G	9,525	1.1	3	100	2	B		3
47.	Weasel Creek	49	G	9,630	5.7	42	51	3	CT		6
48.	Weasel Creek	49	G	9,440	8.6	75	23	2	CT	1	1
49.	Weasel Creek	49	G	9,720	4.7	8	100	3	B		3
50.	Weasel Creek	49	G	9,730	1.4	3	100	3	B		3
51.	Weasel Creek	49	G	9,890	5.4	35	30	4	CT		2
52.	Weasel Creek	49	G	9,980	1.8	15	100	4	B		3
53.	Great Falls Creek	49	G	9,452	12.8	6	100	3	RB		6
54.	Great Falls Creek	49	G	9,285	4.7	8	100	3	B		3
55.	Great Falls Creek	49	G	9,051	6.6	23	50	2	RB	1	1
56.	Falls Creek	49	G	9,480	2.1	8	100	3	B		3
57.	Froze to Death	49	G	9,340	5.8	6	100	3	B		3
58.	Froze to Death	49	G	9,445	4.6	5	100	3	B		3

59.	Froze to Death	49	G	9,530	3.6	5	100	3	B	3
60.	Froze to Death	49	G	9,550	8.1	15	100	3	B	3
61.	WEST BOULDER Nurses	49	P	6,360	4.7	15	100	1	B	1
62.	Nurses	49	P	6,350	2.2	3	100	1	B	3

Table 1. Summary of locations, physical features and fisheries information for lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range (Continued)

63.	Nurses	49	P	6,350	.6	3	100	1	B	3
64.	Nurses	49	P	6,350	.09	3	100	1	B	3
65.	Nurses	49	P	6,350	1.1	5	100	1	B	3
66.	Nurses	49	P	6,350	1.0	10	100	1	B	3
67.	Nurses	49	P	6,350	7.3	20	80	1	B	1
68.	Nurses	49	P	6,350	.4	3	100	1	B	3
69.	Nurses	49	P	6,350	.9	3	100	1	B	3
70.	Nurses	49	P	6,350	1.7	5	100	1	B	3
71.	Nurses	49	P	6,350	.5	3	100	1	B	3
72.	Lost	40	G	6,305	4.8		100	1	B	3
73.	Lost	40	G	6,300	5.7		100	1	B	3
74.	Icicle (2)	49	G	9,520 9,450	2.0 6.7	5 13	100 100	3 3	B B	3 1
75.	West Boulder	49	G	9,628	13.0	55	35	3	CT	2
76.	Kaufman (Falls Cr)	49	G	8,942	39.7	70	28	3	CT	2a
77.	Pocket	49	G	9,030	7.1	17	98	3	B	1
78.	Yodel	49	G	9,122	5.5	12	100	3	B	3
79.	Unnamed	49	G	9,075	.5	2	100	3	B	3

80.	Tumble Creek	49	G	9,380	5.5	15	100	3	B		3
81.	Tumble Creek	49	G	9,280	1.7	4	100	3	B		3
82.	Tumber Creek	49	G	9,290	.9	4	100	3	B		3
83.	Alpine	49	G	8,680	10.5	20	62	3	CT	2	5
84.	Trapper	49	G	8,725	2.4	15	100	1	B		1

Table 1. Summary of locations, physical features and fisheries information for lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range (Continued)

85.	Second Creek	49	G	8,240	2.8	4	100	1	B		3
86.	Basin Creek	49	G	9,080	1.3	5	100	1	B	3	
87.	Davis	49	G	8,790	5.1	15	100	1	CT	2	5
88.	Scout	49	G	9,150	3.2	13	100	3	B		3
89.	Upper McKnight	49	G	9,134	3.4	20	53	3	GT	2a	6
90.	Lake McKnight	49	G	9,120	10.8	60	39	3	GT	2a	6
91.	Blacktail	49	G	8,700	4.2	20	54	2	CT	2	2
92.	Horseshoe	49	P	6,200	1.1	3	100	1	B	3	
93.	Ball Noah	40	P	5,315	.7	3	100	1	B	3	
94.	Jarrets Pond	40	P	6,128	.5	6	100	1	RB	2	2
95.	Beaver Pond	40	G	6,080	.5	3	100	1	B	3	
96.	Woolsey	40	P	5,420	.2	3	100	1	B		3
97.	Beaver Ponds	40	G	8,000	.2	3	100	2	CT	2a	1

1/ See Figure 1 for locations.
2/ 49 = Park; 40 = Sweetgrass.
3/ G = Gallatin National Forest; P = Private.
4/ 1 = Transition; 2 = Canadian; 3 = Sub-alpine; 4 = Alpine
5/ RB = Rainbow Trout; CT = Cutthroat Trout; GT = Golden Trout; H_2 = CTxGT (Cutthroat x Golden); B = Barren
6/ 1 = self-sustaining; 2 = stocked; 2a = stocked but may become self-sustaining.
7/ 1 = No management necessary; 2 = Stock at intervals; 3 = No fisheries potential; 5 = Stock new species after present fisheries die out; 6 = Stock to establish self-sustaining population; 7 = Stock periodically to augment fishery.
8/ Weasel Creek Lakes are also referred to as the West Chippy Creek Lakes.

Location code[1]/

Name of lakes

pH

Conductivity (mhos)

Alkalinity (ppm)

Total hardness (ppm)

Silica (ppm)

Iron (ppm)

Total phosphate (P)
t = trace (no units)

Table 2. Chemical attributes of lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range.

3.	Camp	6.8	29	10	30	1.0	.03	.07
4.	Narrow Escape	6.1	17	25	5	1.7	0	.17
5.	Squeeze	6.4	18	17	8	1.4	.10	.08
11.	Horseshoe	5.9	6	28	3	1.7	.01	.10
13.	Unnamed	6.0	4	20	9	1.3	.15	.30
14.	Unnamed	6.0	6	14	9	1.2	.24	.10
15.	Chickadee	6.2	12	25	5	1.2	.11	.10
16.	Mirror 6.5	8	27	26	2.4	.02	.42	
18.	Rainbow	6.4	9	35	2	2.8	0	.25
24.	Unnamed		40					
25.	Fish	6.2	14	25	5	1.0	.02	.09
28.	Lake Kathleen	6.1	18	20	5	1.7	.12	.09
30.	Columbine		35					
31.	Blue	6.1	18	120	15	1.9	.06	.14
32.	Lamb	6.1	18	45	8	2.7	1.1	0
35.	Elk	6.6	25	15	24	5.7	0	
36.	Bridge 6.4	24	30	7	2.9	.08	.01	
37.	Trout 5.9	85	42	20	.6	0		
42.	Silver 6.5	9	13	5	1.3	0	.06	

43.	Prospect	6.5	10	20	7	1.3	0	.08
44.	Patient 6.7	12	20	10	1.1	.08	.09	
45.	Speculator	5.2	8	0	2	1.0	.55	.04
47.	Weasel Creek	6.6	9	10	8	1.0	.07	.06

Table 2. Chemical attributes of lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range. (Continued)

48.	Weasel Creek	6.7	11	15	5	1.5	.05	.07
53.	Great Falls Creek	6.9	17	10	10	2.5	.11	.07
54.	Great Falls Creek	6.8	20	11	10	2.0	.08	.08
55.	Great Falls Creek	6.8	27	12	10	1.6	.06	.05
76.	Kaufman	6.9	15	20	9	1.4	.09	.08
83.	Alpine	6.9	23	25	15	1.7	0	.15
87.	Davis	6.9	21	25	10	1.3	.05	.06
90.	McKnight	7.1	28	30	15	1.1	.04	.12
91.	Blacktail	6.8	13	20	5	1.2	.03	.03

1/ See Figure 1 for locations.

Location code[1]/

Name of lakes

Sample date

Volume of plankton
cc/m^3

Number/m^3 of
zooplankton

Number/m^3 of large
zooplankton

Species of large
zooplankton

Table 3. Plankton samples from lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range.

3.	Camp	8/6/69					D. shoshone
		9/27/79	1.12		45	45	D. shoshone
4.	Narrow Escape	8/6/69					D. middendorffiana
							D. shoshone
5.	Squeeze	8/6/69				D. middendorffiana	
							D. shoshone
11.	Mirror	3/30/76	.26		103	D. pulex	
		8/22/79	.48		407	24	D. pulex
17.	Rainbow	3/30/76	1.50		150		
18.	Rainbow	8/22/79	1.20		203		
20.	Rainbow	8/23/79	.36		24		
21.	Rainbow	8/22/79	1.2	2,298	275	D. pulex	
25.	Fish	8/25/79	.95		24		
31.	Blue	7/18/78	2.87		474		
		9/19/79	.90		30	30	D. shoshone
32.	Lamb	7/19/78	23.0		23		
35.	Elk	7/25/72					D. shoshone
		10/2/79	5.19	2,952	60	D. shoshone	
36.	Bridge	8/13/76	2.99	2,937	239	D. shoshone	
		9/19/76	1.15		517	29	D. shoshone
42.	Silver	7/26/79	4.30	3,030	1,364	D. shoshone	
					1,552	D. middendorffiana	
43.	Prospect	7/26/79	5.13	2,017	34	D. shoshone	

44.	Patient 7/26/79	1.24	124			
45.	Speculator	7/26/79	.15	88		
47.	Weasel Creek	7/27/79	1.03	581		
48.	Weasel Creek	7/27/79	2.99	643	75	D. shoshone

Table 3. Plankton samples from lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range (Continued).

53.	Great Falls Creek	7/28/79	2.05	1,436			
55.	Great Falls Creek	7/28/79	2.05		77		
75.	West Boulder	9/10/73	1.73	1,719	175	D. shoshone	
76.	Kaufman	9/10/73	1.24	1,672			
		7/27/79	2.24	1,458	247	D. shoshone	
83.	Alpine 8/9/78	.24	0				
87.	Davis 8/8/78	.38	19				
88.	Scout 8/8/78	.60	0				
90.	McKnight	8/8/78	.83		221		
91.	Blacktail 8/7/78	2.21	718		200	D. shoshone	
		9/25/79	2.87		402	86	D. shoshone

1/ See Figure 1 for locations.

Location code [1]/

Name of lake

Number of fish

Species and
strain[2]/

Number/acre

Date planted

Table 4. Fish planted by the State of Montana in lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range.

4.	Narrow Escape	1,100	CT'M	94	8/7/89
		1,100	CT'M	94	8/17/77
		2,068	CT'Y	178	8/25/70
11.	Horseshoe	291	CT'Y	18	8/25/70
15.	Chickadee	600	CT'M	150	8/24/78
18.	Rainbow Lakes	3,500	RB		7/24/49
	#2-7	8,000	CT'Y		8/29/32
25.	Fish 1,200		66	8/26/44	
26.	Burnt Gulch	3,978	CT'M	437	7/22/85
	4,074	CT'Y	447	8/25/70	
27.	Lake Raymond	582	CT'Y	59	8/25/70
28.	Lake Kathleen	590	CT'Y	190	7/29/71
	582	CT'Y	187	8/25/70	
31.	Blue 1,530	CT'M	150	8/7/89	
	1,498	CT'M	146	7/22/85	
	1,530	CT'M	150	8/15/81	
	1,000	CT'M	98	8/17/77	
		1,100	CT'Y	107	8/5/71
		900	CT'Y	88	9/6/65
35.	Elk 920	CT'M	100	8/13/90	
		920	CT'M	100	8/17/77
		6,000	RB	652	8/20/36
36.	Bridge	2,085	CT'M	150	8/7/89
		2,114	CT'M	152	8/2/83
		2,050	CT'M	147	8/17/77
		2,063			8/25/70
37.	Trout	220	CT'M	244	6/15/90
		50	CT'M	55	6/24/86

		300	CT'M		333	5/15/86
	476/Ave/Yr	RB	528	1954-1984		
		386	CT'Y		428	4/25/66
		2,940	CT'Y	3,266	7/26/56	
39.	Bramble Creek	3,000	CT'Y		909	8/2/65

Table 4. Fish planted by the State of Montana in lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range. (Continued)

41.	Bramble Creek	600	CT'M		146		8/7/87
		616	CT'M		150		8/16/79
42.	Silver	500	RB		50		8/7/89
		12,000	RB	1,200	8/4/39		
		10,500	CT'Y	1,050	10/12/31		
43.	Prospect	4,080	RB		600		8/7/89
		4,020	RB		591		8/7/80
45.	Speculator	1,455	CT'M		150		8/12/84
		2,425	CT'M		250		8/10/76
47.	Weasel Lake	394	CT'M		69		8/13/90
		423	CT'M		74		8/5/81
51.	Weasel Lake	511	CT'M		89		8/10/87
		547	CT'M		95		8/16/79
53.	Great Falls Creek	3,015	RB		235		8/7/80
55.	Great Falls Creek	1,080	RB		163		8/25/78
		28,000	RB	4,242	10/5/33		
61.	Nurses	1,008	CT'Y		229		9/25/67
		1,200	RB		255		8/9/55
		800	RB		170		8/17/54
75.	West Boulder	2,527	CT'M		194		8/10/87
		1,960	CT'M		150		8/16/79
		5,000	GT		384		9/10/58
76.	Kaufman	900	GR		22		8/5/85
	20,000	CT'M	503		8/16/79		
		3,850	CT'M		96		8/17/77
		21,125	CT'M		532	8/25-9/16/70	
		10,000	GT		251		9/10/58

83.	Alpine	1,050	CT'M	100		89
		1,050	CT'M	100		8/5/81
		2,563	CT'Y	244		8/17/72
87.	Davis	510	CT'M	100		8/16/79
		4,650	CT'Y	442	8/15-9/16/70	
89.	Upper McKnight	1,920	GT	564		7/27/82

Table 4. Fish planted by the State of Montana in lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range. (Continued)

90.	Lake McKnight	1,920	GT	177	7/27/82
91.	Blacktail	575	CT"M	136	8/10/76
93.	Ball Noah	1,497 Ave/Yr	RB 2,138		1950-67
94.	Jarret's Pond	2,100	CT'Y 4,200	7/26/56	
95.	Beaver Ponds	960	RB 1,920	8/24/64	
96.	Woolsey	456	RB 2,280	7/16/56	
97.	Beaver Pond	350	CT'Y 1,750	1974	

1/ See Figure 1 for locations.

2/ RB = Rainbow Trout; GT = Golden Trout; GR = Arctic Grayling; CT'Y= Yellowstone Cutthroat Trout; CT"M = McBride Cutthroat Trout.

Location Code[1]/

Name of lake

Fish species[2]/

Average catch/net

Average length

Sustaining population

Stocked population

Survey date

Table 5. Species distribution, average length, population status and latest survey date for lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range.

3.	Camp Lake	CT"M	No fish	10.0 Status uncertain	X	8/2/88	7/7/
4.	Narrow Escape	CT'M	8	14.1			7/26/78
5.	Squeeze	CT'M	7	12.2		X	8/7/90
11.	Horseshoe	CT'Y	5	8.3	X		8/7/90
15.	Chickadee	CT'M	22	9.6	X		7/26/85
16.	Mirror	RB	12	9.2	X		8/4/88
18.	Rainbow #2	RB	16	9.2	X		8/2/88
19.	Rainbow #3	RB	10	10.2	X		8/2/88
20.	Rainbow #4	RB	22	8.9	X		8/2/88
21.	Rainbow #5	RB	8	8.6	X		8/3/88
22.	Rainbow #6	RB	13	8.1	X		8/3/88
23.	Rainbow #7	RB	17	9.3	X		8/3/88
25.	Fish CT'Y	43	7.4	X		8/4/88	
26.	Burnt Gulch	CT'M	8	9.8	X		8/7/90
31.	Blue CT'M	18	8.6		X	8/10/90	
35.	Elk CT'M	20	15.0		X	7/12/81	
36.	Bridge	CT'M	10	15.2		X	9/15/81

37.	Trout (Brays)		RB	1	9.3		X	
		CTxRB	1	7.2		X	8/4/71	
39.	Bramble Cr.		CT'Y	13	10.1	Reported Barren (Jarret 1988, Saunders 1989)	7/25/72	
42.	Silver			No fish				8/5/85
			RB	6	12.8	X		8/8/69

Table 5. Species distribution, average length, population status and latest survey date for lakes in the Boulder River drainage of the Absaroka-Beartooth Mountain Range. (Continued)

43.	Prospect		RB	7	9.5		X	8/6/85
45.	Speculator		CT'M	10	11.4		X	8/7/85
48.	Weasel Creek		CT'Y	9	10.0	X		7/24/72
55.	Great Falls Creek	CTxRB	9	8.9	X		8/8/83	
75.	West Boulder		CT'M	6	12.1		X	8/6/85
76.	Kaufman		CT'M	20	9.3	X		8/6/85
83.	Alpine		CT'M	17	12.0		X	7/24/88
87.	Davis Lake		CT'M	4	13.1	Status uncertain	7/23/88	
91.	Blacktail		CT'M	4	13.1		X	9/22/81

1/ See Figure 1 for locations.

2/ CT'M = McBride Cutthroat Trout; RB = Rainbow Trout; CT'Y - Yellowstone Cutthroat Trout; CTxRB = Rainbow-Cutthroat hybrid.

Location code [1]/

Name of lake

Next stocking year

Stocking frequency

Fish species

Number of fish

Number of fish/acre

Comments

Table 6. Fish stocking proposed for lakes in the Boulder River drainage of the Absaroka-Beartooth Mountains.

4.	Squeeze	1995	8	CT'M	700	100		
31.	Blue	1993	4	CT'M	1,020	100		
36.	Bridge	1995	6	CT'M	2,085	150		
37.	Trout	1991	2	CT'M	200	222		
39.	Bramble	1991	8	CT'M	330	100		
41.	Bramble	1995	8	CT'M	600	146		
42.	Silver	1997	8	RB	500	50		
43.	Prospect	1998	0[3/]	RB	680	100		
45.	Speculator	1992	8	CT'M	1,455	150		
51.	Weasel	1995	8	RB	540	100		
53.	Great Falls	1995	8	RB	640	50		
75.	West Boulder	1995	8	CT'M	1,960	150	Substitute 975 Golden Trout if available	
76.	Kaufman	When available	0	GR	800	20		
83.	Alpine	1997	8	CT'M	1,050	100		
87.	Davis	1997	8	CT'M	510	100		
89.	Upper McKnight	1991	0	GT	340	100		
90.	McKnight	1991	0	GT	1,080	100		
91.	Blacktail	1992	8	CT'M	525	125		

1/ See Figure 1 for location.
2/ GT = Golden Trout; GR = Arctic Grayling; CT'M = McBride Cutthroat Trout; RB = Rainbow Trout; EB = Brook Trout.
3/ 0 = plant on one time basis.