

F-78-R-3
3291
Region 2

MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

FISHERIES DIVISION
JOB PROGRESS REPORT

STATE: MONTANA PROJECT TITLE: WEST CENTRAL MONTANA
COLDWATER STREAMS
PROJECT NO: F-78-R4 STUDY TITLE: SURVEY AND INVENTORY
OF COLDWATER STREAMS
JOB NO: _____ JOB TITLE: ROCK CREEK CREEL CENSUS
PROJECT PERIOD: JULY 1, 1996 THROUGH JUNE 30, 1998

ABSTRACT

We estimated $12,241 \pm 381$ (95 % C.I.) angler days of pressure on Rock Creek for the period April 1 through November 1997. Of that total pressure we estimated 11,673 were bank or walking anglers and 568 anglers that utilized boats.

Anglers on Rock Creek caught and estimated 23,913 fish from April 1 to November 30, 1997. Most of the fish caught were released (97.7%). An estimated 540 fish were kept.

The catch of rainbow trout, over all sections on Rock Creek declined 16% from 57% of the total catch in 1993 to 41% in 1997. Catch of brown trout has increased 13% to 28% of the total Rock Creek catch comparing 1993 to 1997. Cutthroat trout have also increased in the catch from 11% in 1988 to 16% in 1993 and 20% in 1997.

Respondents to the Rock Creek User Survey strongly supported the regulation change to make cutthroat trout catch and release only in the Rock Creek drainage. They also strongly supported angler education efforts aimed at angler etiquette, species identification and resource issues.

The species composition of the fish population in Rock Creek appears to be changing in response to whirling disease.

Sixty-nine percent of surveyed anglers rate their fishing experience from excellent to good. Fair to poor approval ratings were given by 28% of the respondents.

OBJECTIVES

1. To determine the distribution of summer fishing pressure as well as other aspects of fisherman catch, including hours fished, species and number of fish caught and type of tackle used.
2. To determine the extent and distribution of float fishing, to examine the degree of conflict between those float fishing and those fishing from the bank.

3. To survey all recreational users of Rock Creek for their opinions on an array of user questions including some identified management options.

BACKGROUND

Rock Creek is highly valued for its fishery and recreational values. The high resource values in Rock Creek have prompted fairly intensive management and monitoring through the years. Two significant fishery management changes have taken place over the last two decades: elimination of catchable size rainbow trout stocking in the early 1970's and the implementation of restrictive creel and size limits in 1979. The changes have resulted in a fishery managed as a "Wild Trout" fishery. Fish populations are all self-sustaining. Angler harvest is managed to maintain a fish population age structure that is close to what might occur without anglers. Older-aged fish are protected with a slot limit regulation which requires the release of rainbow, brown and cutthroat trout between 12 and 20 inches of length.

In 1986, the Missoula Ranger District (MRD) of the Lolo National Forest initiated regulation of commercial float fishing activities on it's waters and lands within the Rock Creek drainage. This was the first regulatory response to growing float fishing use of Rock Creek. The Montana Department of Fish, Wildlife and Parks (MTFWP) began to document float fishing use in the 1986 creel census. The MTFWP has noted float fishing on Rock Creek since 1978 and started hearing complaints about float fishing from the public in 1981. Both MTFWP and MRD have recognized float fishing as a significant but controversial use of the creek and in January 1988 began to cooperatively examine the float fishing issue. In 1992 the MTFWP also initiated regulation of fishing from boats by prohibiting the fishing from boats July 1 through November 30.

Evaluation of boat angler and walking angler interactions indicated a high level of acceptance of boat anglers on Rock Creek. Acceptable boat angler etiquette appears to have been a key to the high acceptance level. However, the potential for conflict is high with increasing private boat use.

Monitoring of angler use and fish populations is conducted every three years by the Montana Department of Fish, Wildlife and Parks to evaluate ongoing management and overall fishery condition. In 1993 angler use and fishing success declined slightly compared to efforts in 1986 and 1988. Wet and cool weather conditions in the summer of 1993 and continued drought impacts in western Montana are the suspected main contributing factors to the declines. Whirling disease, detected in the fall of 1996 in Rock Creek, may also have been a factor.

PROCEDURES

Creel Census

We changed the basic format of the Rock Creek creel census in 1997 in response to concerns raised during the 1993 census. In 1993 and likely some previous censuses, we felt total angler pressure was underestimated because our sampling did not account for the following: 1. some anglers exit the creek from the upper

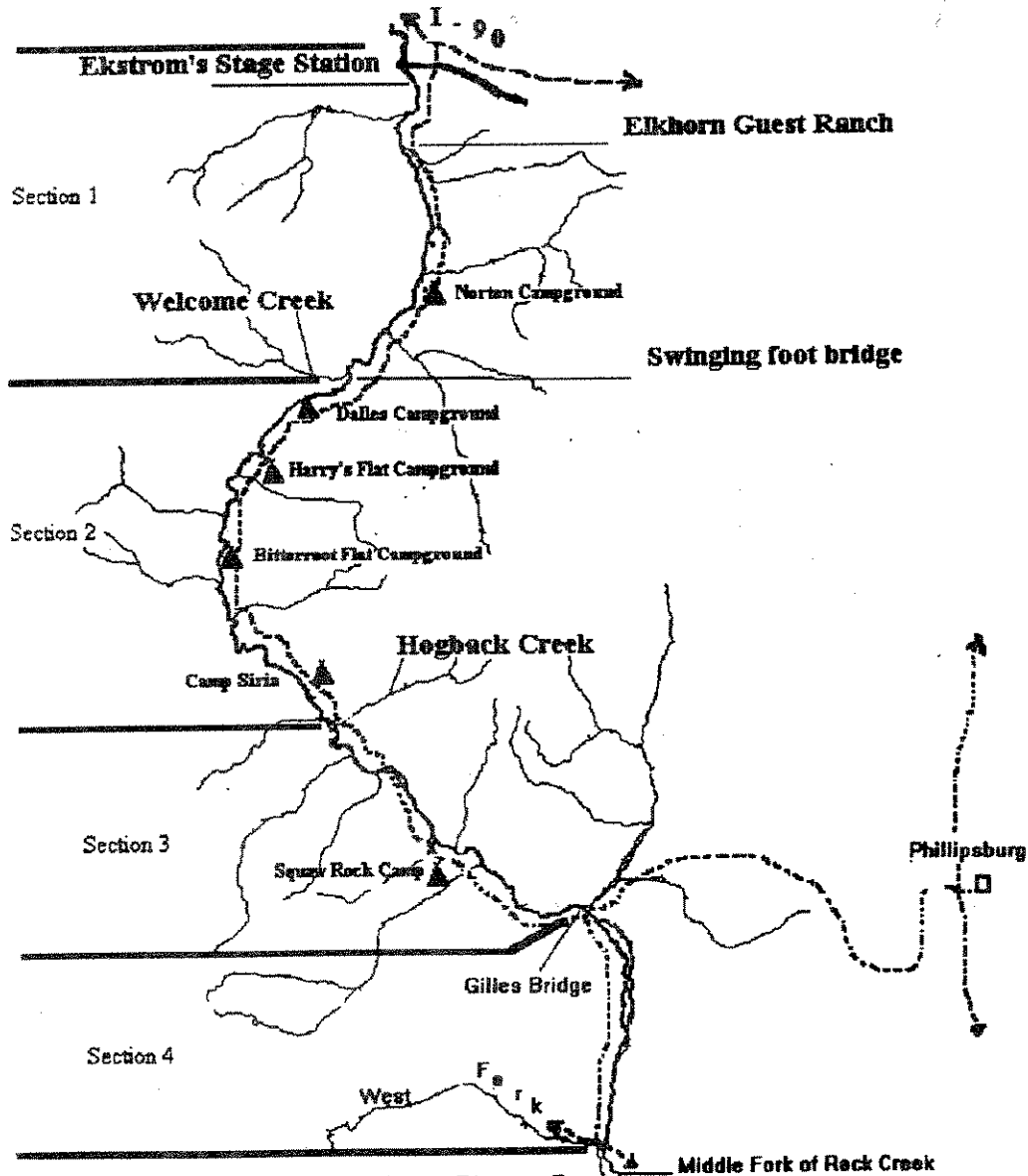


Figure 1. Map of the Rock Creek drainage with the four creel census sections used in this study.

end,
therefore
not passing
through our
check
station, 2.
anglers camping
overnight
and leaving
the creek
when check
stations
were not
operating,
3. some
anglers may
complete
their
fishing
outside the
hours of the
check
station

operation, 4. some anglers ignore the check station and do not stop, and 5. a significant amount of use is currently missed during the spring "catch and release" season. In order to eliminate some of these problems, we used an instantaneous count and personal interviews methodology to sample fishing pressure (Neuhold, J.M. and K. H. Lu 1957). We also completed an estimate of

pressure
using the
lower check
station
method that
had been
used in
prior years
(Peters, D.
and N. Snow
1994).

Estimated
instantaneo
us counts
were
obtained
using a
small
fixed-wing
aircraft
flown three

Strata	Month	Day	Total Days	Total Counts	Daylight Hrs.
1	April	1-31	22	4	14.26
2	May	1-16	12	6	16.13
3	May	19-29	9	3	16.13
4	June	2-13	10	3	16.46
5	June	16-30	11	5	16.46
6	July	1-16	13	6	16.56
7	July	21-31	9	4	16.56
8	August	1-15	11	4	15.23
9	August	18-29	10	4	15.23
10	Sept.	1-12	9	3	13.00
11	Sept.	15-30	12	6	13.00
12	Oct -Nov	1-31	42	6	11.90

Table 1. Definition of weekday stratification of time periods for Rock Creek aerial and check station data collection.

Strata	Month	Day	Total Days	Total Counts	Daylight Hrs.
13	April	1-31	8	2	14.26
14	May	1-31	10	4	16.13
15	June	1-15	5	4	16.46
16	June	21-29	4	6	16.46
17	July	4-13	5	4	16.56
18	July	19-27	4	4	16.56
19	August	2-17	6	6	15.23
20	August	23-31	4	4	15.23
21	Sept.	1-14	5	4	13.00
22	Sept.	20-28	4	3	13.00
23	Oct.	4-26	8	4	11.90
24	Nov.	1-30	10	2	10.22

Table 2. Definition of weekend and holiday stratification of time periods for Rock Creek aerial and check station data collection.

times weekly: twice daily on a weekend day or holiday and once during weekdays. The entire river count required about 30 minutes to obtain. Each wade angler, boat, boat angler and parked vehicle was counted in each of Rock Creek's representative four sections.

The creel clerk interviewed anglers at the lower Rock Creek check station (across the road from Ekstrom's Stage Station) and on the stream bank from mid-April through November 1997. Interviews were obtained from anglers throughout the survey period and from all sections of the River (Figure 1). Completed and uncompleted trips were kept separate for trip length calculations. The format of the interview census occurs in Appendix A. The majority of interviews were conducted near the mouth of Rock Creek on the main road exiting Rock Creek some creel checks were completed on the banks of Rock Creek and campgrounds.

Creel check interviews were operated from midmorning until dark in an attempt to survey completed fishing trips for all people fishing the creek that day.

A stratified random sampling design was used to estimate total fishing pressure. Count days were chosen randomly for each week and weekend. Holidays were included with the weekends. Time of the counts was randomly selected for each sample day during daylight hours.

Estimates of fishing pressure were made for each stratified period and river section (Table 1 and 2). The river section and stratified periods were summed to obtain a total fishing pressure estimate and variance. Pressure for each river section and stratified period was estimated by multiplying the sampled days mean instantaneous count (in that strata and river section) times the total possible hours fishable within the strata. Period lengths were chosen to minimize sample variance. The variance of each river section-strata period was estimated by multiplying the variance of sampled counts by the total hours in the strata period. Use totals and variances for all strata periods-river sections were summed for the total season pressure and variance estimate.

Creel censuses from 1972 to 1993 followed the "lower check station" basic format. The 1997 creel census using instantaneous aerial counts was the first time this method was used on Rock Creek.

All data gathered from personal interviews and completed questionnaires were entered on microcomputer for analysis.

Rock Creek User Survey

Anglers contacted for interviews were asked standard creel census questions and given a Rock Creek user survey booklet. Rock Creek residents that are members of Rock Creek Protective Association received surveys at a meeting held at the Elkhorn Guest Ranch during the general fishing season. The survey booklet contained 5, 5"x 8" pages with an array of recreational

based questions. The questionnaire format appears in Appendix B. Questions for the survey were adapted from the Bighorn River Angler Survey, MTFWP. Rock Creek specific questions were developed by Region 2 fisheries personnel, Lolo National Forest personnel, Univ. of Montana - survey researcher, and MTFWP - survey researchers.

RESULTS\CONCLUSIONS

Fishing Pressure Estimates

Two methods of estimating fishing pressure were employed on Rock Creek in 1997. The first method utilized randomized sampling of fishing days at a check station located on lower Rock Creek road the main exit from the drainage. This first method has been the traditional method to obtain pressure estimates on Rock Creek since 1961 to 1993, although 1960's estimates also utilized an upper check station (Peters D. 1994). The second method utilized interview data from the lower check station as well as aircraft to obtain angler counts along the 50 miles of Rock Creek. All 1997 analysis related to pressure and catch estimates were completed with the aerial count methodology with the exception of the comparison of the two methods that appear in Figure 3.

We estimated $12,241 \pm 381$ angler days of pressure on Rock Creek utilizing aerial instantaneous counts for the period April 1 through November 1997. Of that total pressure we estimated 11,673 were bank or walking anglers and 568 anglers utilized boats. The Rock Creek watershed experienced a significant flooding event in 1997 with high sustained flows from late May through much of June. Angler days normally peak during the June hatches of "salmon flies," however in 1997 angler days were strongly depressed (Figure 2). Stratum's four and five as well as stratum's 15 and 16 on Figure 2 are estimation periods for June.

The lower check station pressure estimate for April 1

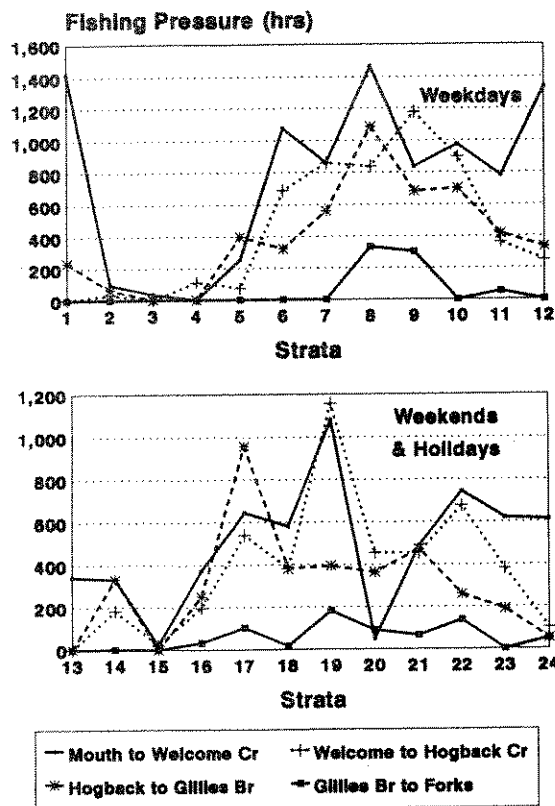


Figure 2. Estimates of fishing pressure among four sampled sections and 24 strata periods for Rock Creek.

through November 30 was $4,374 \pm 329$ (95% C.I.) angler days (Figure 3). Angler pressure estimates utilizing this method have declined over the previous three censuses in 1986, 1988, and 1993 and again in 1997. However angler pressure appears to be increasing, based upon angler comments, landowner complaints, and our observations of anglers along Rock Creek.

Of the four sections sampled in Rock Creek, the mouth to Welcome Cr. section continued to be the heaviest fished section in 1997, accounting for 41% of the total pressure. Comparing distribution of angling pressure between the four sampled sections in 1993 and 1997, angling pressure on the mouth to Welcome Creek section declined 10%, Welcome to Hogback Creek declined 13% and the Hogback to Gillies Bridge increased 20% (Figure 4). These changes are probably the result of using the aerial count method which gives more equal opportunity for anglers in upper creek sections to be counted vs. the lower check station method. Anglers in the upper reaches can exit Rock Creek in at least three ways that avoids detection at the lower check station.

Float angling pressure accounted for 4.6 % of the total pressure in 1997 the lowest since record keeping began on floaters in 1986

Year	Percent Float	Percent Bank
1986	5.0	95.0
1988	10.4	89.6
1993	8.2	91.8
1997	4.6	95.4

Table 3. Comparison between float and walking anglers percentage of total angling pressure.

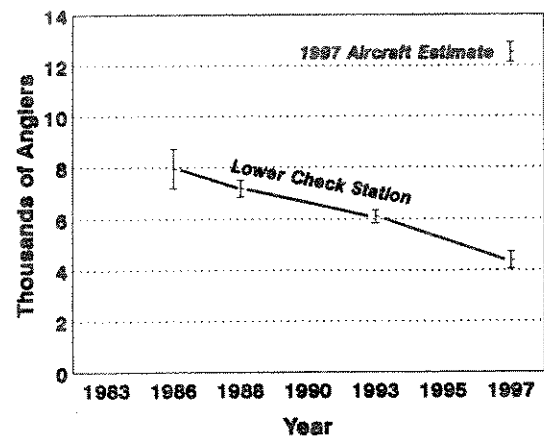


Figure 3. Comparison of estimated angler pressure on Rock Creek using two different methods.

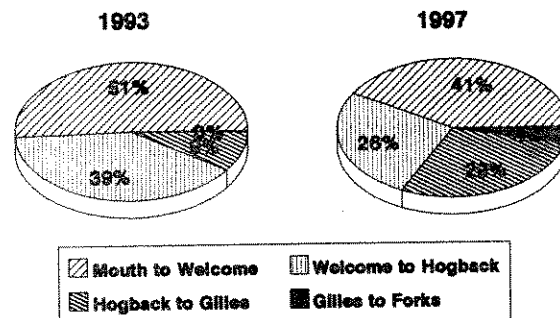


Figure 4. Comparison of sections of Rock Creek used by anglers during the 1993 and 1997 fishing seasons.

(Table 3). Sixty percent of float anglers used the Hogback to Gillies Bridge section and 38% the Welcome Cr. to Hogback section (Table 4). Walking anglers used the mouth to Welcome Cr. and Welcome Cr. to Hogback Cr. sections most, respectively 45 and 42% of their total usage of Rock Creek. No boating traffic was observed on the Gillies Bridge to Forks section and it received 1% of the walking angler pressure. Generally this section is

not suitable for floating and relatively inaccessible to walking anglers.

We interviewed 1879 anglers at the Rock Creek check station and along the banks of Rock Creek in 1997 (Table 5). Twenty-four or 1 % of the total interviewed anglers were float anglers and 1855 were walking anglers.

Method	Mouth to Welcome Cr.	Welcome Cr. to Hogback Cr.	Hogback Cr. to Gillies Br.	Gillies Br. to Forks
Float Anglers	113 (2)	215 (38)	340 (60)	0
Walking Anglers	5252 (45)	4903 (42)	1401 (12)	117 (1)

Table 4. Estimated number of anglers (percent in parenthesis) by section for census period April 1 to November 30, 1997.

Method	Anglers Interviewed	Hours Fished	Total Fish Caught	Fish Per Hour	Average Hours Fished
Float Anglers	24	137	880	6.42	5.71
Walking Anglers	1855	5582	5085	0.91	3.01

Table 5. Summary of angler interviews for complete census period of April 1 through November 1997.

Angler Residence

Sixty two percent of the interviewed anglers were Montana residents and 38% nonresident (Table 6), relatively unchanged since the 1993 creel census. A long term trend in Rock Creek has been toward greater nonresident participation. In 1961 10% of the anglers were nonresident that percentage has increased slowly to 39% in 1993.

States with the highest visitorship included: Washington 11% of all nonresident, California 6%, Oregon 3% and Idaho 2%.

Resident anglers came from all over Montana to fish Rock Creek and were represented from 45 different home towns. The majority of resident anglers came from the towns of: Missoula 75%, Clinton 3%, Helena 3%, Polson 2%, and Bozeman 2%.

Angler Attributes

Gender of anglers interviewed on Rock Creek was 6% female and 94% male.

One percent of anglers interviewed indicated they used an outfitter on Rock Creek.

Lure choice of anglers on Rock Creek is regulated for anglers older than 15 years of age to artificial lures only. Eighty four percent of Rock Creek anglers use artificial flies, 1.9% bait, 2.8% combinations of lures, and 10.9% hardware lures.

Year	Percent MT. Residents	Percent Non-residents
1961	90	10
1964	80	20
1967	78	22
1972	80	20
1978	79	21
1986	76	24
1988	72	28
1993	61	39
1997	62	38

Table 6. Residency of anglers interviewed at the lower check station.

Angler Catch

Catch Status	Brown Trout	Cutthroat Trout	Brook Trout	Whitefish	Bull Trout	Rainbow Trout	Rainbow X Cutthroat Trout
Kept	112	164	32	108	4	100	20
Released	6617	4844	556	1829	380	8239	1108

Table 7. Estimated angler catch in Rock Creek during the census period of April 1 through November 1997.

Anglers on Rock Creek caught and estimated 23,913 fish from April 1 to November 30, 1997 (Table 7). Most of the fish caught were released (97.7%). An estimated 540 fish were kept including: 164 cutthroat, 112 brown trout, 108 whitefish, 100 rainbow, 32 brook, 4 bull, and 20 rainbow-cutthroat hybrids.

Catch between walking and floating anglers is disproportionate with floating anglers catching more than six times more fish per hour than walking anglers (Table 5). Catch rate has remained high for both walking and floating anglers on

Rock Creek, respectively 0.91 and 6.43 fish per hour in 1997. Floating anglers' fish almost twice as long, fishing 5.71 hours per trip versus 3.01 for walking anglers.

The catch of rainbow trout, over all sections on Rock Creek declined 16% from 57% of the total catch in 1993 to 41% in 1997 (Figure 6). Catch of brown trout has increased 13% to 28% of the total Rock Creek catch comparing 1993 to 1997. Cutthroat trout have also increased in the catch from 11% in 1988 to 16% in 1993 and 20% in 1997.

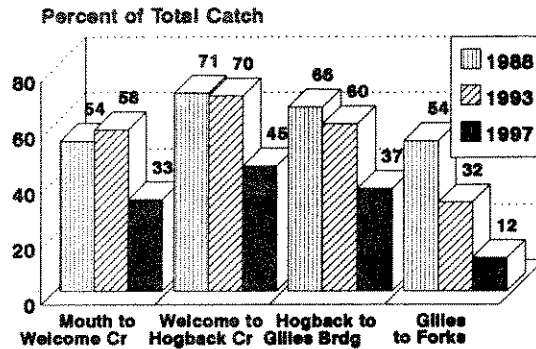
If we split the catch further among the four sampling sections in Rock Creek, rainbow trout composition in the total catch has declined in all sections (Figure 5). The largest percentage decline occurred in the upper two sections of Rock Creek: the Hogback Creek to Gillies Bridge section and the Gillies Bridge to Forks section respectively 29 and 42%.

In order to put these large declines in perspective, additively the two sections accounted for only 13% of the total Rock Creek catch of rainbow in 1988, prior to rainbow trout population declines.

In contrast to rainbow, brown trout occurrence in the species composition of the angler catch has increased in the three lower sections (Figure 7). The greatest increase in the catch of brown trout occurred in the Hogback Creek to Gillies Bridge section: increasing from 4% of the total catch in 1988 to 37% in 1997.

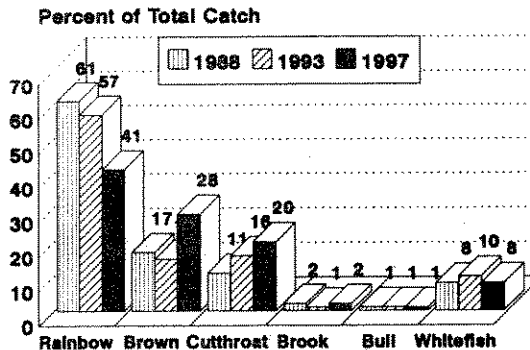
Cutthroat trout occurrence in the angler catch has increased in three of the study sections; mouth to Welcome Creek, Welcome Creek to Hogback Creek and Gillies Bridge to the Forks (Figure 8).

Fish species composition in long term population monitoring sections (electrofishing based population estimates)



Rainbow Trout data includes cutthroat hybrids

Figure 5. Comparison of the rainbow trout catch among the four survey sections.



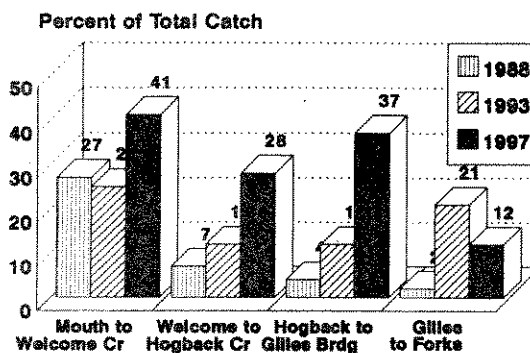
Rainbow Trout data includes cutthroat hybrids

Figure 6. Comparison of fish

near Welcome and Hogback Creeks have show similar changes in 1996 sampling.

The species composition of the fish population in Rock Creek appears to be changing in response to whirling disease. Generally Rock Creek fish populations have fewer rainbow trout and increasing numbers of brown and cutthroat trout from the mouth to the forks of Rock Creek. These fish population changes are suspected to result from significant losses of rearing juvenile rainbow trout in the mainstem of Rock Creek. The results may also indicate that juvenile rainbow trout densities in the mainstem of Rock Creek were a factor in suppression of both brown and cutthroat trout numbers

Comparison of Brown Trout Catch by Section in Rock Creek for 1988, 1993 and 1997



Comparison of Cutthroat Trout Catch by Section in Rock Creek for 1988, 1993 and 1997

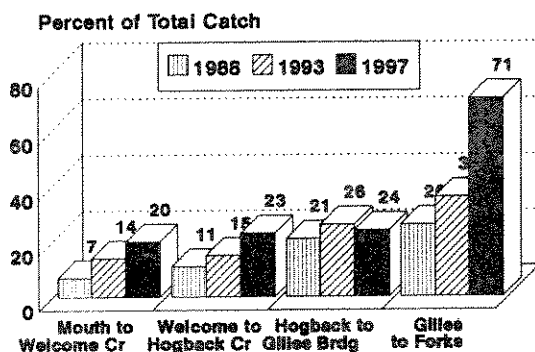


Figure 7. Comparison of brown trout catch among the four sampling sections on Rock Creek.

Figure 8. Comparison of cutthroat trout catch among four sampling sections on Rock Creek.

DISTRIBUTION OF RECREATIONISTS AGE GROUP ON ROCK CREEK 1997

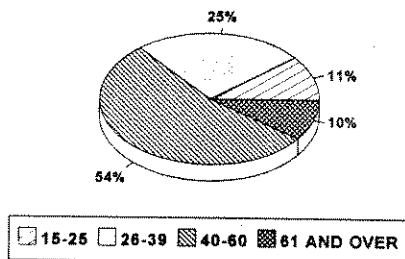


Figure 9. Age distribution of respondents to the Rock Creek User Survey.

DISTRIBUTION OF ANNUAL DAYS RECREATED ON ROCK CREEK 1997

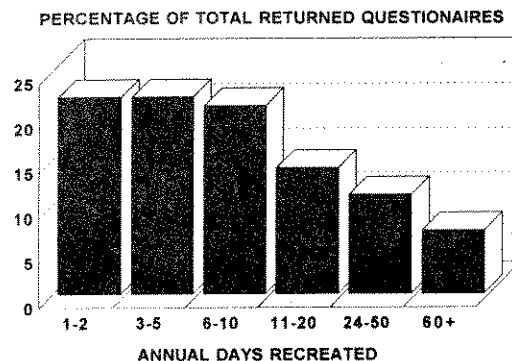


Figure 10. Distribution of annual days recreated by respondents to the Rock Creek User Survey.

Rock Creek User Survey

The creel clerk distributed 1,500 survey forms and 303 were returned for a return rate of 20%. Surveys were primarily distributed to anglers at the creel census check station. Therefore the results compiled in this report apply to angler attitudes rather than the greatly diversified non angling recreational user we initially intended to sample. Overall the representation of survey respondents among angler gender, residency, equipment use, outfitter use and section fished compares closely with estimated pressure and distribution of anglers using Rock Creek. Floating anglers were sampled more heavily than their estimated representation of anglers on Rock Creek.

DESTINATIONS OF RECREATIONISTS WHILE RECREATING ON ROCK CREEK 1997

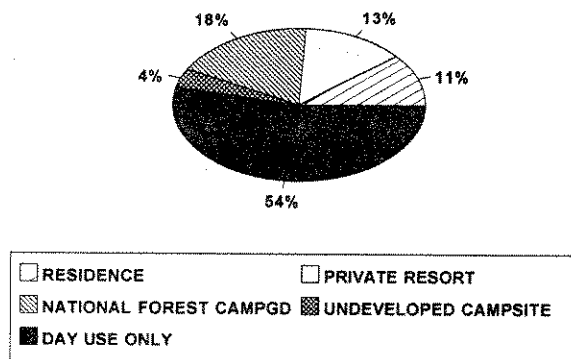


Figure 11. Distribution of Rock Creek User Survey respondents trip type and overnight accommodations.

Eighty-three percent of the respondents were males, 11% female and 6% did not specify a gender. Residents comprised 58% of the respondents and nonresident 42% which are close to the estimated pressure estimate among these groups.

The majority of respondents to our survey came from the 40 to 60 year old age group comprising 54% of the sample (Figure 9).

Seventy-seven percent of recreationists are multiple day users, recreating more than two days per year on

Rock Creek (Figure 10). Day-experience on Rock Cree by survey use accounted for 54% of the respondents. surveyed recreationist's trips and 46% overnight types of trips. Overnight destinations of respondents were: 18% national forest campgrounds, 13% private resort, 11% had a residence in Rock Creek drainage, and 4% used undeveloped campsites (Figure 11).

One of the angler groupings that has been identified in Rock Creek is based upon anglers mode of transport while fishing: Anglers that use boats (or floating anglers) and anglers that walk (or wading anglers). Eighty-five percent of anglers responding to the Rock Creek User Survey were walking anglers and 14% floating anglers. Floating anglers were therefore over represented in the survey at a rate of nearly three times their estimated usage level of 4.6 %.

Ninety-four percent of anglers surveyed did not use the services of a licensed outfitter. Fishing equipment used by surveyed anglers was dominated by flies with considerably fewer lures, bait and combination anglers.

Importance of Diversity of Opportunities Among Anglers

We asked the survey respondents to indicate which types of recreational activities they participated in and it's relative importance to their recreational experience (Table 8). Fishing, relaxing, bird-animal watching, hiking-sightseeing, and camping were the most important activities identified by respondents. Ninety-seven percent viewed fishing as an important component of their recreational experience. The responses to this question further substantiate that this survey effort primarily sampled anglers. Non angling recreational activities were not adequately surveyed.

FISHING EXPERIENCE RATING ON ROCK CREEK
1997

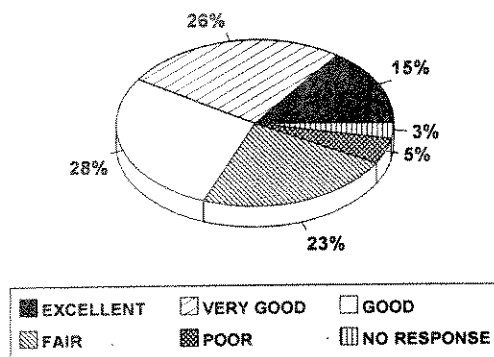


Figure 12. Rating of fishing experience on Rock Cree by survey

Table 8. Number of responses to question 4 in the Rock Creek User Survey.

4. On today's trip to Rock Creek which of the following recreational activities did you participate in and what is it's relative importance to your recreational experience?

	VERY IMPORTANT	IMPORTANT	NOT VERY IMPORTANT	NOT AT ALL IMPORTANT	NO RESPONSE
Picnicking	22	49	27	18	186
Rest,relaxation	121	63	8	6	105
Bird-animal watching	56	70	23	10	144
Fishing	274	20	1	0	8
Photography ...	23	39	30	14	197
Horseback ride	3	5	16	48	231
Berry or food gathering	1	6	22	43	228
Bicycling	7	20	18	34	224
Camping	47	62	10	12	172
Floating	26	11	15	30	221
Hunting	17	11	11	38	226
Motor Biking ..	1	3	7	56	236
Walking, Hiking					
Sightseeing ...	50	48	12	13	180
Kayaking	1	4	15	47	236

Angler Rating of Rock Creek Fishing Experience

Sixty-nine percent of surveyed anglers rate their fishing experience from excellent to good (Figure 12). Fair to poor approval ratings were given by 28% of the respondents. Factors that were considered very important to quality fishing on Rock Creek were just being on the river, no crowding, good water level, solitude, good access, and being with friends (Table 9). Landing large fish, landing many fish and good weather were also

CONTRIBUTIONS TO FISHING QUALITY ON ROCK CREEK 1997

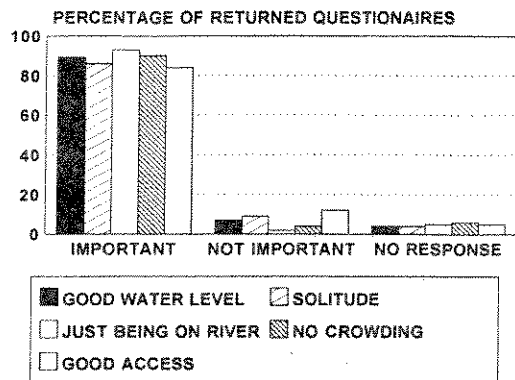


Figure 13. Rating of factors contributing to a quality fishing trip on Rock Creek by survey respondents.

Comparison of Ratings of Crowding by Floating and Walking Anglers

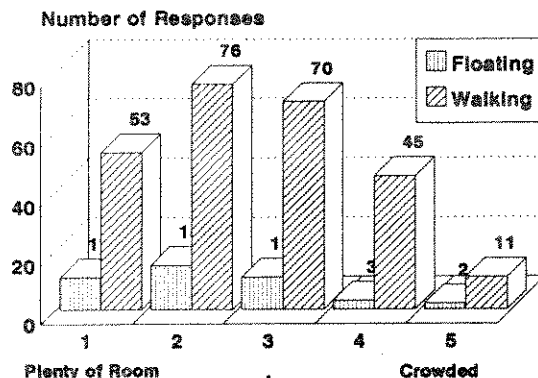


Figure 14. Comparison of crowding ratings between floating and walking anglers.

important to anglers. More than 80% of the respondents felt good water level, just being on the river, good access, solitude and no crowding were important contributing factors to the quality of fishing experience on Rock Creek (Figure 14). More than 50% of the respondents felt landing large fish, landing many fish, being with friends and good weather were important factors that contributed to the quality of fishing experience on Rock Creek. More than 80% of anglers surveyed felt that keeping fish to eat and keeping a limit were not important to the quality of fishing experience on Rock Creek.

CONTRIBUTIONS TO FISHING QUALITY ON ROCK CREEK 1997

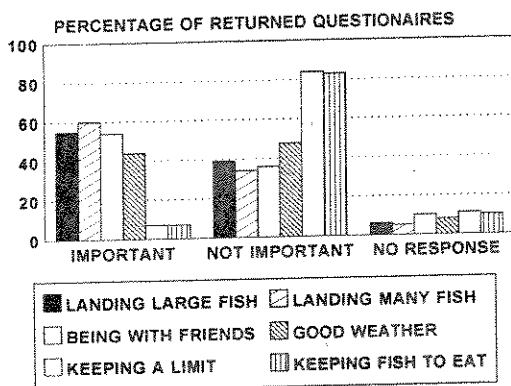


Table 9. Number of responses to question 10 on the Rock Creek User Survey.

10. How important are each of the following in contributing to a quality fishing trip on Rock Creek for you?

	<u>VERY</u> <u>IMPORTANT</u>	<u>IMPORTANT</u>	<u>NOT VERY</u> <u>IMPORTANT</u>	<u>NOT AT ALL</u> <u>IMPORTANT</u>	<u>NOT</u> <u>SURE</u>
Good water level ..146		125	18	2	12
Landing large fish 43		125	107	11	17
Landing many fish . 51		131	95	9	17
Keeping a limit ... 14		7	32	220	30
Solitude134		128	25	25	13
Just being on river165		117	4	2	15
No crowding155		118	10	2	18
Good access120		133	32	0	14
Being with friends 73		92	80	31	27
Keeping fish to eat 7		16	62	187	31
Good weather 22		113	102	43	23

Angler Perception of Crowding on Rock Creek

We asked anglers how they rate the level of recreational use on Rock Creek on a scale of 1 to 5, with 1 being plenty of room and 5 being crowded. Most respondents to the survey indicated that Rock Creek is not crowded. However, the majority of respondents also placed the level of crowding between plenty of room and crowded (Figure 14). The perception of crowding is probably related to both actual observations of other anglers but also the behavior of those anglers. Etiquette and common courtesy provides a frame work for social contact in fishing among anglers.

Some of the factors associated with perception of crowding were included in the Rock Creek User Survey. Overall less than 10% of surveyed anglers identified factors that were a major problem on Rock Creek. Approximately 80% of the survey

respondents did not encounter problems with rude anglers, unethical anglers, boat traffic or the ability to avoid wading anglers (Table 10). The worst problems anglers identified associated with the number of anglers using Rock Creek were: fishing holes occupied, fish stopped biting, and no solitude.

Table 10. Number of responses to question 12 on Rock Creek User Survey regarding effects of number of people on recreational experience.

12. What were the effects you experienced on your recent trip due to the number of other people using Rock Creek?

<u>PROBLEM</u>	<u>DID NOT ENCOUNTER</u> <u>DID ENCOUNTER AND IT WAS:</u> <u>NOT A PROBLEM</u> <u>MINOR PROBLEM</u> <u>MAJOR</u>			
Fishing holes occupied	67	101	106	18
Other anglers rude	179	74	28	5
No solitude ..	84	114	71	11
Fish stopped Biting	56	109	89	29
Unethical anglers	178	67	29	6
Lengthy delay at launch	201	34	3	2
Lengthy delay at take-out ..	203	32	3	2
Crowded by boat traffic	197	38	8	9
Avoiding walking anglers was difficult ...	153	69	34	2

Floating and Walking Angler Conflict

ADDITIONAL LIMITS ON COMMERCIAL FLOATING By Floating and Walking Anglers

Rock Creek currently has a limited float fishing season beginning when flows are suitable in the spring and ending on July 1. Float fishing by commercial outfitters is currently limited to 200 trips per year on Rock Creek. Private float angler usage has no limits.

We asked anglers if they would support additional limits on both commercial (outfitting) and private (non outfitted) floating on Rock Creek. Seventy-four percent of walking anglers and 45% of floating anglers supported additional limits on commercial floating (Figure 15).

We also asked anglers if they would support additional limits on private floating on Rock Creek. Seventy-one percent of walking anglers and 43% of floating anglers supported additional limits on private floaters on Rock Creek (Figure 16). If additional limits are supported by anglers on Rock Creek, how the limits are to be imposed should be evaluated.

Anglers were asked several questions on management of floating anglers and possible methods to impose additional limits (Table 15).

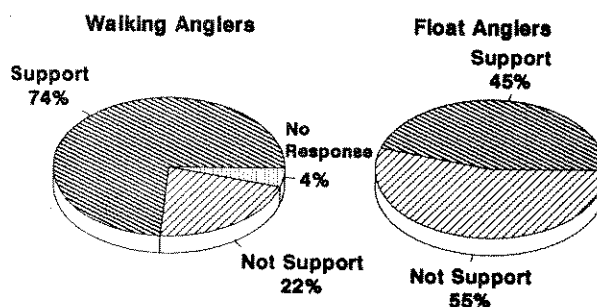


Figure 15. Comparison of support between walking and floating anglers for additional limits on commercial floating.

ADDITIONAL LIMITS ON PRIVATE FLOATING By Floating and Walking Anglers

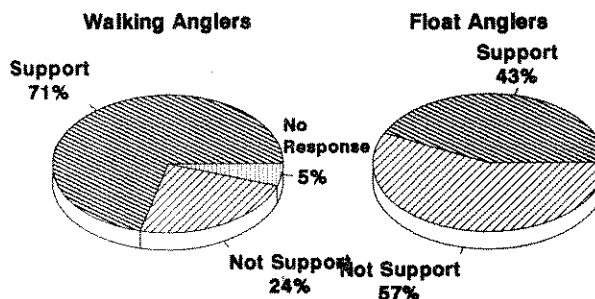


Figure 16. Comparison of support between walking and floating anglers for additional limits on private floating.

Table 15. Number of responses per management issue for question 15 on the Rock Creek User Survey of 1997.

15. It is possible that Montana Fish, Wildlife and Parks will develop new management approaches for Rock Creek. What are your views with regard to each of the following possible management approaches on Rock Creek.

	<u>FAVOR</u>	<u>DO NOT FAVOR BUT WOULD ACCEPT</u>	<u>WOULD NOT ACCEPT</u>	<u>NO OPINION</u>
<u>Managing Number of Anglers</u>				
Eliminate float fishing by commercial interests	143	74	47	25
Eliminate float fishing by private interests	97	80	86	25
Limit number of boats per day with a permit system	162	61	33	19
Keep commercial float fishing at current level of use	88	68	60	50
Expand commercial float fishing.....	7	24	220	23
Pay for floater permit system with user fee .	92	62	78	37
Only allow float fishing on odd or even days ..	69	74	75	52
Only allow boats on select sections of stream	110	68	50	36
No boats allowed below Welcome Creek	104	38	42	84
No boats allowed between Harrys Flat and Camp Siria	87	35	59	85
No boats allowed between Hogback Creek and Gillies Bridge	86	28	66	86
No boats allowed between Gillies Bridge and the junction of West and Middle Forks Rock Cr....	82	36	58	87

Limiting the number of boats per day received the strongest support among anglers as a method to limit floating. However there was lesser support for user fees to implement the permit

system.

Elimination of float fishing by commercial interests was more popular than elimination of float fishing by private interests. This result occurs after our making the statement that commercial floating is currently limited to 300 trips per year and that private floaters account for an increasingly larger percentage of float trips on Rock Creek. Float fishing received significant support for continuation among Rock Creek anglers that do not float fish.

Expansion of commercial float fishing on Rock Creek was strongly opposed by the majority of respondents.

Only allowing boats on select sections of Rock Creek received some support among respondents. However there was a fairly high level of nonacceptance and non favor attitude associated with this method. Anglers may appreciate utilizing all of Rock Creek and are unwilling to give up sections or have sacrifice areas for uses they tolerate (float fishing) but would not like to see usage expectations exceeded by those uses (float fishing) in certain sections. This would explain the strong support for daily usage limits.

Only allowing float fishing on odd or even days received the least support of any of the limitation methods we recommended to survey participants.

Fishery Management Opinions

Respondents to the survey strongly supported the regulation change to make cutthroat trout catch and release only in the Rock Creek drainage. They also strongly supported angler education efforts aimed at angler etiquette, species identification and resource issues (Table 12).

Harvest of rainbow and brown trout by anglers is viewed favorably or acceptable among most respondents. However significant numbers of respondents seem to give harvest only marginal acceptance.

Table 12. Number of responses to fishery management issues in question 16 on Rock Creek User Survey, 1997.

16. Westslope cutthroat, trout that live in the mainstem of Rock Creek, are at extremely low densities (less than 25 fish per mile). Angler harvest cannot be justified biologically on such a low density of fish. Restrictions will need to address Rock Creek's tributary streams as well, since the tributaries are used for spawning (May & June), rearing (1st three years for juvenile cutthroat) and late summer migrations by the Rock Creek cutthroat.

	FAVOR	DO NOT FAVOR BUT WOULD ACCEPT	WOULD NOT ACCEPT	NO OPINION
<u>Fishery Management Issues</u>				
Cutthroat trout should be catch and release only in all of Rock Creek drainage	278	8	4	5
Some harvest should be allowed on rainbow and brown trout as currently allowed ..	130	84	67	6
Angler education is nec- essary for informing Rock Creek anglers of etiquette, species identification and resource issues ...	236	21	11	18

Recommendations

1. No new float fishing opportunities for Rock Creek should be considered. Lack of public support, high usage levels approaching public perceived overcrowded conditions, high support for more limitations on floating and marginal support for existing floating use levels.

2. Float fishing on the Gillies Bridge to the Forks section should be designated as a no float fishing section.

3. Float fishing on Rock Creek from the mouth to Gillies Bridge should be by permit only for private anglers. A limit of 300 trips per year is suggested at this time. This will require additional public input actions, fee structure and special State legislative action.
4. Float fishing on Rock Creek from the mouth to Gillies Bridge should be limited to 200 trips per year for commercial float anglers as current permits allow.
5. Future creel census work on Rock Creek should use the aerial count methodology for estimating pressure. Interviews should be increased through the use of two creel clerks both at the lower check station and on stream.
6. Future attitude surveys should include a broader sampling of all recreationists in Rock Creek through the help of cooperating agency personnel such as the Forest Service and possibly BLM.
7. Opportunities for educational efforts on angling etiquette, species identification and resource issues should be pursued at campgrounds and other appropriate locations/media.

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Prepared by: Don Peters and Greg Robison

December, 1997

Waters referred to:
Rock Creek 06-5263

Key Words:
creel census
aerial counts
user opinion survey
floater/wader conflict
trout harvest
catch and release
catch rate
angler pressure

Appendix

ROCK CREEK USER INTERVIEW

Date: _____ Completed trip: yes no Mail-in contact number: _____

1. CITY AND STATE of Residence: _____, _____

2. Gender M or F

3. Section(s) fished:

1. Welcome Creek to mouth
2. Hogback Cr. To Welcome Creek
3. Welcome Cr. To Gillis Bridge
4. Gillis Bridge to Forks

4. Did you hire a commercial outfitter? Yes No

5. Did you fish:

1. with the use of a boat.
2. from the bank or wading.
3. both

6. Type of lure(s) you used while fishing: 1. Flies 2. Hardware 3. Bait 4. Combination

7. Hours fished (to the nearest 0.5 hr.) ____ . ____ hrs.

Lengths of kept fish

8. Number of RAINBOW TROUT kept _____ released _____

9. Number of BROWN TROUT kept _____ released _____

10. Number of CUTTHROAT TROUT kept _____ released _____

11. Number of BULL TROUT kept _____ released _____

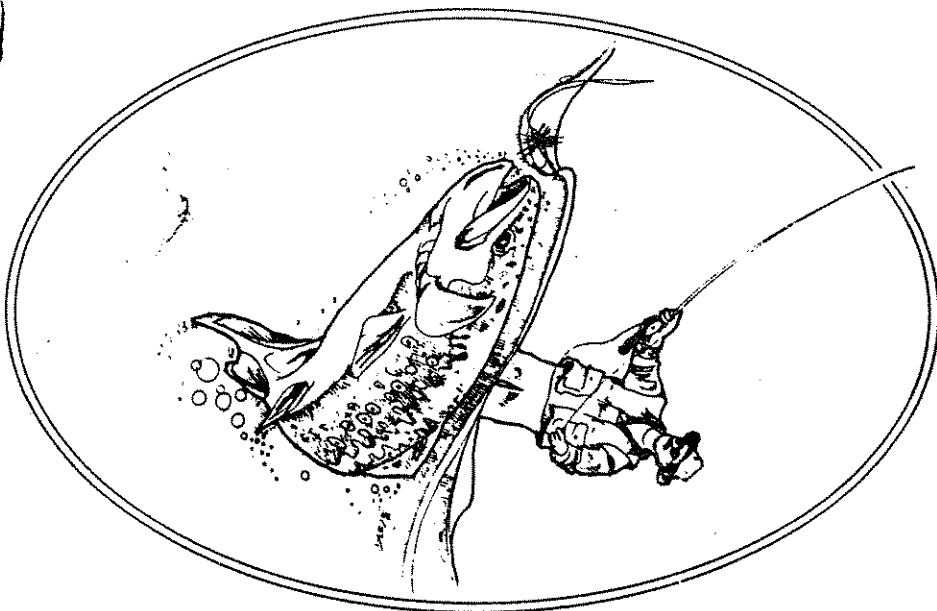
12. Number of BROOK TROUT kept _____ released _____

13. Number of WHITEFISH kept _____ released _____

14. Number of Cut-Bows kept _____ released _____

COMMENTS:

ROCK CREEK USER SURVEY



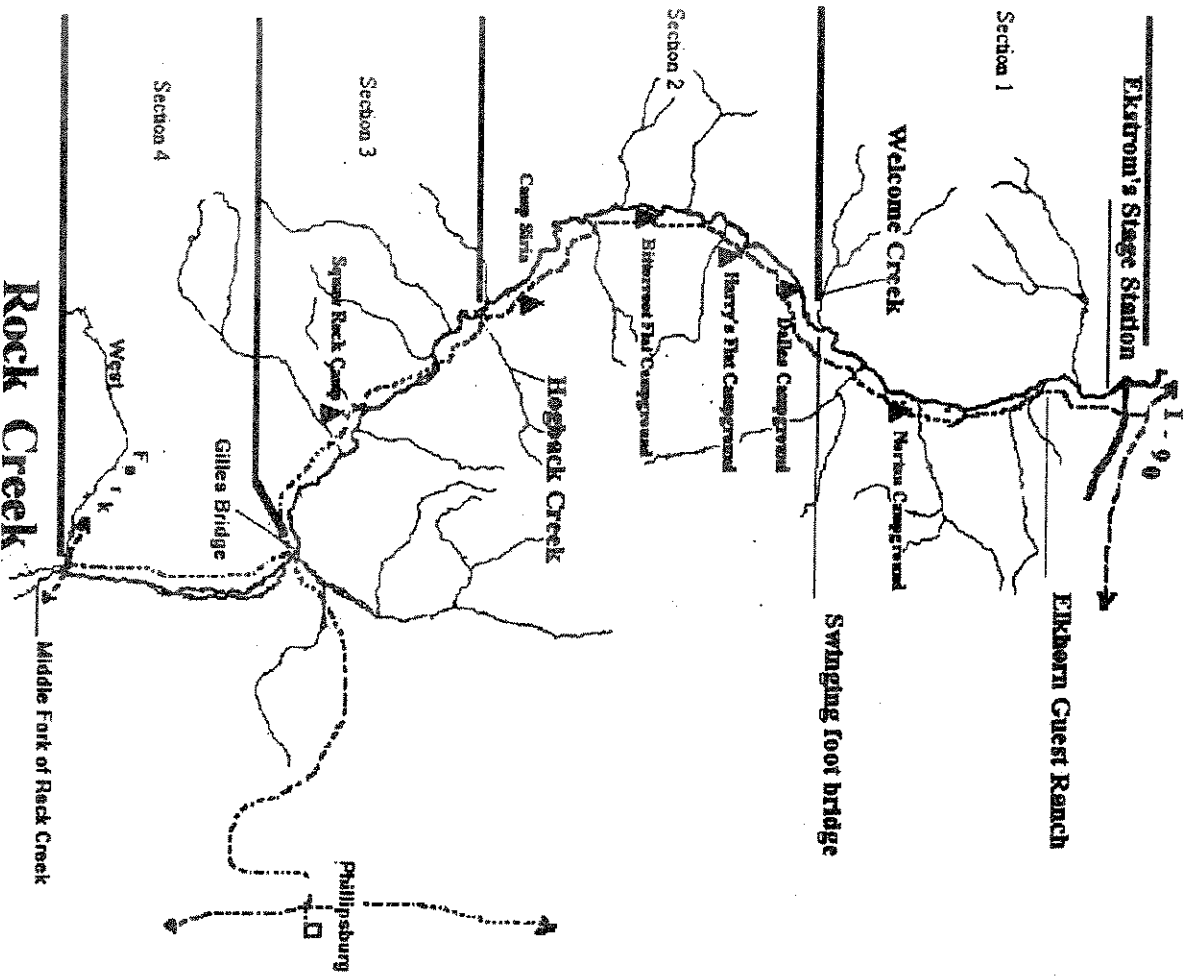
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MONTANA DEPARTMENT
OF FISH, WILDLIFE & PARKS



per mile). Angler harvest cannot be justified biologically on such a low density of fish. Restrictions will need to address Rock Creek's tributary streams as well, since the tributaries are used for spawning (May & June), rearing (1st 3 years for juvenile cutthroat) and late summer migrations by the Rock Creek cutthroat. Please check one box for each item

DO NOT
FAVOR BUT
WOULD ACCEPT
ACCEPT
NO OPINION

Fishery Management Issues

Cutthroat trout should be catch and release only in all of Rock Creek drainage ☐ ☐ ☐ ☐

Some harvest should be allowed on rainbow and brown trout as currently allowed ... ☐ ☐ ☐ ☐

Angler education is necessary for informing Rock Creek anglers of etiquette, species identification and resource issues ☐ ☐ ☐ ☐

Other ☐ ☐ ☐ ☐

Other ☐ ☐ ☐ ☐

THANK YOU FOR YOUR HELP!

Is there anything else you would like to tell us about fishing Rock Creek? We would appreciate any comments.

1. Questions for all Rock Creek Recreationists.

DATE _____ SEX: **Male** **Female** STATE RESIDENCE: _____

1. What is your age? **Circle the group**
15-25 26-39 40-60 61 and over

2. How many days per year do you recreate in Rock Creek?
_____ number of days per year

3. Did you stay overnight in the Rock Creek area?

Please circle the area you stayed at on map

- ☐ Yes, I have a residence in Rock Creek.
☐ Yes, I stayed at private resort or campground.
☐ Yes, I stayed at National Forest campground.
☐ Yes, I stayed at an undeveloped campsite along the creek.
☐ No, I just came for the day

4. On today's trip to Rock Creek which of the following recreational activities did you participate in and what is its relative importance to your recreational experience?
Please check one box for each activity you participated in, leave blank if you did not participate.

VERY IMPORTANT IMPORTANT NOT VERY IMPORTANT NOT AT ALL IMPORTANT

- Picnicking ☐ ☐ ☐ ☐ ☐
Rest, relaxation ☐ ☐ ☐ ☐ ☐
Bird-animal watching ☐ ☐ ☐ ☐ ☐
Fishing ☐ ☐ ☐ ☐ ☐
Photography ... ☐ ☐ ☐ ☐ ☐
Horseback ride ☐ ☐ ☐ ☐ ☐
Berry or food gathering ☐ ☐ ☐ ☐ ☐
Bicycling ☐ ☐ ☐ ☐ ☐
Camping ☐ ☐ ☐ ☐ ☐
Floating ☐ ☐ ☐ ☐ ☐
Hunting ☐ ☐ ☐ ☐ ☐
Motor Biking .. ☐ ☐ ☐ ☐ ☐
Walking, Hiking ☐ ☐ ☐ ☐ ☐
Sightseeing ... ☐ ☐ ☐ ☐ ☐
Kayaking ☐ ☐ ☐ ☐ ☐

15. It is possible that Montana Fish, Wildlife and Parks will develop new management approaches for Rock Creek. What are your views with regard to each of the following possible management approaches on Rock Creek **Please check one box for each item**

DO NOT FAVOR BUT WOULD
FAVOR BUT NOT ACCEPT ACCEPT NO OPINION

Managing Number of Anglers

- Eliminate float fishing by commercial interests ... ☐ ☐ ☐ ☐ ☐
Eliminate float fishing by private interests ☐ ☐ ☐ ☐ ☐
Limit number of boats per day with a permit system ☐ ☐ ☐ ☐ ☐
Keep commercial float fishing at current level of use ☐ ☐ ☐ ☐ ☐
Expand commercial float fishing ☐ ☐ ☐ ☐ ☐
Pay for floater permit system with user fee .. ☐ ☐ ☐ ☐ ☐
Only allow float fishing on odd or even days ☐ ☐ ☐ ☐ ☐
Only allow boats on select sections of stream ☐ ☐ ☐ ☐ ☐
No boats allowed below Welcome Creek ☐ ☐ ☐ ☐ ☐
No boats allowed between Harrys's Flat and Camp Siria ☐ ☐ ☐ ☐ ☐
No boats allowed between Hogback Creek and Gilles Bridge ☐ ☐ ☐ ☐ ☐
No boats allowed between Gilles Bridge and the junction of West and Middle Forks Rock Cr... ☐ ☐ ☐ ☐ ☐
Other _____ ☐ ☐ ☐ ☐ ☐

16. Westslope cutthroat trout that live in the mainstem of Rock Creek are at extremely low densities (less than 25 fish

II. Questions for all Anglers and All Floaters Only!

5. Please check the box that applies to you.

- ☐ I walk fish Rock Creek.
- ☐ I float fish Rock Creek and walk fish Rock Creek.
- ☐ I only float fish Rock Creek.
- ☐ I float Rock Creek but do not fish.

6. Did you hire a commercial outfitter? ☐ Yes ☐ No

7. What section(s) did you fish? Check all that apply

- ☐ Mouth to Welcome Creek
- ☐ Welcome Creek to Hogback Creek
- ☐ Hogback Creek to Gilles Bridge
- ☐ Gilles Bridge to Forks

8. What type of fishing equipment do you use on Rock Creek? Please check the one that applies to you.

- ☐ Bait ☐ Lures ☐ Flies ☐ Combination

9. Overall how would you rate the fishing experience on your recent trip to Rock Creek. please circle one

- Poor Fair Good Very good Excellent

10. How important are each of the following in contributing to a quality fishing trip on Rock Creek for you? please check one box for each item

	VERY IMPORTANT	IMPORTANT	NOT VERY IMPORTANT	NOT AT ALL IMPORTANT	NOT SURE
Good water level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landing large fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landing many fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Keeping a limit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Solitude	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Just being on river	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No crowding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Good access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being with friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Keeping fish to eat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Good weather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sometimes anglers feel that the number of people encountered on a trip can impact their experience. We would like to know what your experience was during your recent trip on Rock Creek.

11. How did you feel about the level of recreational use on Rock Creek on your recent trip? please circle one number

- 1 PLENTY OF ROOM
- 2
- 3
- 4
- 5 CROWDED

12. What were the effects you experienced on your recent trip due to the number of other people using Rock Creek? please circle all that apply

DID NOT ENCOUNTER AND IT WAS:
ENCOUNTER NOT A PROBLEM MINOR PROBLEM MAJOR PROBLEM

Fishing holes occupied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other anglers rude	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No solitude	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fish stopped biting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unethical anglers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lengthy delay at launch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lengthy delay at take-out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crowded by boat traffic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Avoiding walking anglers was difficult	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Float fishing by commercial outfitters is currently limited to 40 trips per season on Rock Creek but private float angler usage has no limits. Private floater use has increased from 35 percent of floaters in 1986 to 73 percent in 1993. circle your choice

13. Would you support additional limits on commercial float anglers on Rock Creek? support not support

14. Would you support additional limits on private float anglers on Rock Creek support not support

