#86242
Rep ID-

MONTANA DEPARIMENT OF FISH, WILDLIFE AND PARKS
FISHERIES DIVISION
JOB PROGRESS REPORT

State: Montana Title: Statewide Fisheries Investigation

Project No.: F-46-R-2 Title: Survey and Inventory of Coldwater Streams

Job No.: I-b, Segment 2 Title: West Central Montana Coldwater Stream Investigation

Project Period: July 1, 1988-June 30, 1989

Values for angler use, total catch, and catch rate from the 1988 creel census are generally lower than values from the previous surveys of 1981 and 1986, but do not represent major declines. Instead, these values continue to indicate a high quality fishery for Rock Creek. Float fishing activity has more than doubled since the 1986 census and now accounts for 10.4% of the total summer season pressure. The percent float use is even higher (20.6%) for the early part of the general season ending July 1. Most float fishing occurred above Welcome Creek (78%) while most bank angling took place below Welcome Creek (61.5%). Bank anglers fishing the Mouth to Welcome section accounted for 56.4% of all creek users. Private float anglers comprised 58.5% of the float use while commercial float anglers made up 41.5%. User opinions regarding continued float fishing on Rock Creek indicate substantial tolerance for float fishing with 66.6% to 79.1% either preferring some level of float fishing activity or having no opinion. A water flow level restriction appears to be the most favored alternative for further limits on float fishing. There were substantial encounters or interactions, between bank and float anglers which were largely neutral or positive as 80.5% of bank anglers encountering boats reported that the boat traffic did not interfere with their fishing. The Hogback to Gillies section had the highest catch rate and catch per angler of all creek sections. Rainbow trout are the most prevalent trout species in the anglers' catch, accounting for 66.6% of all trout caught and released on the entire creek during the 1988 general season.

OBJECTIVES AND DEGREE OF ATTAINMENT

This was a state-funded project which satisfies objective #11 of Federal Project F-46-R-2, Job I-b West Central Montana Coldwater Stream Investigation.

The objectives of the 1988 Rock Creek Project were:

1. To determine the degree and 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 and/or wading and to survey users of the creek for their opinion on continued float fishing activity.

This was a state-funded project which satisfies objective #11 of Federal Project 3211, West Central Coldwater Stream Investigation.

BACKGROUND

As one of Montana's designated "blue ribbon" trout streams, Rock Creek is highly valued for its fishery and recreational resources. Because of this high value, these resources have been managed and monitored fairly intensively. Several changes in management have taken place in the past, including the elimination of catchable stocking in the early 1970's. In the late 1970's, creek limits were reduced, size and tackle restrictions were imposed and a segment of the creek was designated for catch-and-release fishing. In 1986, these regulations were refined further to simplify regulations and to encourage better compliance by fishermen while still protecting and enhancing the naturally reproducing fishery.

Also in 1986, the Missoula Ranger District (MRD) of the Lolo National Forest initiated regulation of commercial float fishing activities on its waters and lands within the Rock Creek drainage. This was the first regulatory response to growing float fishing use of Rock Creek (see Appendix 1 - USFS permit). The Montana Department of Fish, Wildlife and Parks (MDFWP) began to document float fishing use in its creel census the same year. The Montana Department of Fish, Wildlife and Parks has noted float fishing on Rock Creek since 1978 and started hearing complaints about float fishing from the public in 1981. Both MDFWP 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.

The 1988 Rock Creek Census Project had two main functions: to continue monitoring fishing pressure and fisherman catch as a tool to evaluate the effects of management changes on the fishery and recreational resources, and to provide more detailed data concerning the nature and extent of float fishing use to aid in management decisions affecting this activity.

PROCEDURES

An in depth creek census/user interview (Appendix 2) was conducted from May through October during the 1988 general fishing season. A single check station near the mouth of Rock Creek was used to check fishermen as they left the creek having completed their fishing for the day. The station was operated from mid-morning to darkness in order to completely sample all those fishing the creek that day. The estimate for total pressure can be viewed as conservative as the assumption of making a complete sample does not account for the following: 1) some fisherman may exit Rock Creek at the upper end travelling toward the Flint Creek drainage or the Rock Creek/Bitterroot divide, 2) fishermen camping overnight and residents of Rock Creek not leaving for the day would not pass through the check station, 3) some fishermen may complete their fishing day very early in the morning or very late in the evening outside the hours of check station operation and, 4) not all fishermen stop at the check station.

A stratified random design was used to estimate total fishing pressure,

differentiating both time periods and weekdays versus weekend/holidays. Estimates of fishing pressure were made for each stratified period by expanding the sampled days mean use to the total days in the period. Period lengths were chosen to minimize sample variance. The variance of each period was estimated by multiplying the variance of sampled days by the days in the period. Use totals and variances for each period were then combined to obtain a point estimate and confidence interval for total fishing pressure for the season. Since no days in November were sampled, two pressure estimates are presented in the next section. The first is based on a 164 day season running through October in which 44.2% of weekend/holidays and 25.9% of weekdays were sampled. The second is based on a 194 day season in which 37.1% of weekend/holidays and 22.0% of weekdays were sampled. Creel census from 1972 to 1986 followed the same basic format as 1988, with somewhat higher percentages of sampled days. Creel census from 1958 to 1967 used both the lower and an upper check stations and sampled approximately 50% of all days in a given season.

All data gathered from personal interviews and completed questionnaires were entered on microcomputer for analysis. Names and addresses for nearly half of those interviewed were also entered to construct a mailing list of Rock Creek users.

FINDINGS

Part 1. Angler Use and Catch

This section presents information from the 1988 census that can be related to historical data.

Angler use of Rock Creek in 1988 shows an appreciable decline from pressure estimates made in 1981 and 1986 of 8,247 and 7,954 anglers respectively (Table 1). The estimate for 1988 based on a 164 day season was 6,635 users and 7,185 users for a 194 day season. This level of use remains above the lowest use recorded in 1978 when 5,816 anglers exited the lower station. The confidence interval for the 1988 point estimate is presented in Table 2 along with those from other years when confidence intervals were calculated.

Perhaps the most likely explanation for the decline in 1988 can be derived from the drought conditions affecting the region during the 1988 season including abnormally low water flows and high daily temperatures. The MDFWP in Region 2 reacted to this situation by enacting mid-season restrictive regulations on all streams in the Clark Fork drainage such that only two trout under 14 inches could be taken.

The 1988 estimate for total hours fished was 23,269 for a 164 day season and 25,198 for a 194 day season. This represents a relatively consistent level of use over the past 20 years (Table 1).

The number of nonresidents using Rock Creek has continued to increase to a level of 28 percent in 1988, up from 24 percent in 1986 and well above the 1961 level of 10 percent.

In 1988, 87 percent of the anglers checked fished below Hogback Creek,

compared to 91 percent in 1986.

The total estimated trout catch for 1988 is presented in Table 1 along with data from previous years. Beginning in 1978, records of fish caught and released were kept separate from fish caught and kept, due to the increase in catch-and-release fishing. The 1988 estimate of total trout kept was 1,730 for a 194 day season, down from 2,276 trout kept in 1986. The 1988 estimate of 32,385 trout caught and released is down somewhat but compares favorably to the 1986 estimate of 33,649. Combining estimates for trout caught and kept and trout caught and released continues to result in a total catch nearly equivalent to the years when the creek was heavily stocked with catchable fish.

The catch rate, or trout catch per hour, is a good measure of how a fishery is responding to changing levels of fishing pressure from year to year (Table 1). In 1988, the caught and kept catch rate continued to decline to a level of 0.07 trout per hour, down from 0.09 in 1986 and down from the high of 0.87 during the years of heavy stocking of catchable fish. The catch rate for trout caught and released in 1988 was 1.25 trout per hour. Combining this with the rate for trout caught and kept, an overall catch rate of 1.32 trout per hour was obtained for 1988. This is down from the overall rate of 1.53 trout per hour obtained for 1986, but compares closely to the overall rate in 1981 of 1.35 trout per hour. (See Peters, 1986, for a more complete discussion of catch rate trends.)

Table 1. Comparison of creel census estimates for the lower check station for the years 1958 thru 1988 (modified from Peters, 1986).

Year	Total Anglers	Hours Fished	Fish Kept	Fish Released	Catch Per Hour
1958	11,498	41,989	35,844		0.85
1959	12,268	39,961	35,969		0.90
1960	11,513	40,129	34,996		0.87
1961	9,489	27,829	20,482		0.74
1962	10,936	32,101	22,122		0.69
1963	9,042	28,915	18,210		0.63
1964	8,651	32,741	18,946		0.58
1965	8,914	30,850	19,916		0.65
1966	8,956	33,150	20,578		0.62
1967	6,516	25,033	19,426		0.78
1972	7,432	26,908	12,331		0.46
1978	5,816	20,546	11,077	18,064***	1.42
1981	8,247	26,800	5,241	25,641	1.15
1986	7,954	24,863	2,276	33,649	1.44
1988*	6,635	23,269	1,597	29,906	1.35
198[8]**	7,185	25,198	1,730	32,385	1.35

* Based on 164 day season.
** Based on 194 day season.
*** Combined kept and released

Table 2. Comparison of the point estimates for number of fishermen using Rock Creek during the general open fishing season for the censused years between 1960 and 1988 (modified from Peters, 1986).

Year	Point Estimate	95% Confidence Interval	Confidence Interval Percentage of Point Estimate
1960	11,513	452	3.9
1961	9,489	500	5.3
1962	10,936	503	4.6
1963	9,042	402	4.4
1964	8,651	404	4.7
1965	8,914	399	4.9
1966	8,956	506	5.6
1967	6,516	485	7.4
1986	7,954	762	9.9
1988/1	6,635	307	4.6
1988/2	7,185	325	4.5

1 Based on a 164 day season.
2 Based on a 194 day season.

Table 3. Residency of anglers using Rock Creek for selected years from 1961 to 1988 (modified from Peters, 1986).

Year	Percent 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

The catch per angler is another useful indicator of a fishery's response to fishing pressure. In 1988, the catch per angler for trout caught and kept was 0.24 trout per angler. The rate for trout caught and release, however, was 4.51 trout per hour, yielding an overall rate of 4.75 trout per angler. If whitefish were also considered, the overall rate increases to 5.16 fish per angler for 1988.

A more detailed analysis of the creek data is presented in Part 4 of this report and includes a breakdown of catch per hour and catch per angler for four sections of Rock Creek, a comparison of rates for different user types (bank and wade fishermen versus float fishermen), and some data indicating the relative distribution or importance of different trout species in the fisherman's catch for four sections of the creek. A more detailed analysis of the distribution of fishing pressure is also presented in the following section.

Part 2. Float Fishing Use

This section primarily discusses the extent and distribution of float fishing use on Rock Creek during 1988 and the opinions held by users of the creek concerning whether float fishing activity should be continued.

As previously noted, MDFWP began to notice float fishermen using the creek in 1978 and began receiving some public comments of dissatisfaction with the float traffic in 1981. In 1986, MDFWP began recording float fishing use as part of the check station creek census and estimated that five percent of all Rock Creek users were float fishermen. The 1988 census data shows that float fishing use has more than doubled since 1986, estimating that 10.4 percent of all users during the 1988 season were float fishermen. Such a level of increase in float fishing activity substantiates the attention being given this issue by the MDFWP and the Missoula Ranger District of the LoLo National Forest.

The level of float fishing use is even more substantial if percent use is based only on the time period when float fishing actually was taking place. The last recorded float fishing in 1988 was on July 12 and using that date as a cutoff for the float season, float fishing represented 17.6 of all users through the float season. If July 1 was used as a cutoff date for the float season, the level of float fishing increases further to 20.6 of all users. Therefore, float fishing can be recognized as an important activity on Rock Creek, especially during the early six to eight weeks of the season. It should also be recognized that flow levels vary from year to year and impact the length of season that floating is desirable, or even possible. Since 1988 had a low flow level compared to the average, float fishing activity might have been recorded later into the season had water levels been higher and the percentage of float use could have been even greater under such conditions.

Given the level of overall use described in Part 2 and the increase in float fishing, it is of interest to see how fishing pressure is distributed along Rock Creek and if there is any difference in distribution patterns between float fishermen and bank fishermen. The creek was divided into four continuous sections as follows: Section 1 - from the mouth of Rock Creek at the Clark Fork River upstream to the mouth of Welcome Creek (Mouth to Welcome;

Section 2 - from the mouth of Welcome Creek upstream to the mouth of Hogback Creek (Welcome to Hogback); Section 3 - from the mouth of Hogback Creek upstream to the Gillies Bridge (Hogback to Gillies); and, Section 4 - from the Gillies Bridge upstream to the junction of the East and West Forks of Rock Creek (Gillies to Forks).

Float fishing use was highest in Section 2 (43.6%) and Section 3 (28.0%) (Figure 1), whereas bank fishing use was highest in Section 2 (61.5%) and Section 2 (28.7%) during the active float season (Figure 2). Therefore, it appears that some segregation of use is occurring during the active float season in that most of the float fishing is taking place above Welcome Creek (78%) while most of the bank fishing is taking place below Welcome Creek (61.5%).

However, this apparent segregation may not be due to conscious choice by bank anglers, because of floaters. The percentage of bank anglers using Section 1 after the active float season increased to 67.3% (Figure 3), rather than decreased as might be expected if bank anglers were actively avoiding the upper sections of the creek due to the pressure of boats. Perhaps, a better explanation of the difference in distribution patterns is that many bank anglers simply may not want to travel the added distance to the upper creek while floaters, averaging longer fishing days, may be more prone to travel added distance to access the creek. In addition, commercial floating is more restricted in both space and time on Section 1, possibly resulting in some avoidance of the lower creek by these users (see Appendix 1 Outfitter/Guide Annual Operating Plan). Also, access for float craft put-ins and take-outs is probably more abundant and convenient along the upper sections of the creek.

The apparent preference by bank anglers for the Mouth to Welcome Section is an especially noteworthy consideration for the continued management of Rock Creek. More than half (56.4%) of all users of Rock Creek over the course of the entire season were bank anglers fishing the Mouth to Welcome section, making this group the largest component of users for any section of the creek.

Another measure of fishing pressure having a distribution of interest is the number of hours fished. Floaters have a higher average number of hours fished than walking anglers in each of the four creek sections (Figure 4). When these averages are multiplied by corresponding numbers of users for each section, a breakdown by creek section of total hours fished is obtained for both user types. Although the same order of rank for creek sections is obtained as presented in Figures 1, 2, and 3, there is some shift of pressure indicated for both user types. Float fishing use is still highest in Section 2 (43.17%) and Section 3 (31.1%), but Section 1's percent use drops to 17.8% from 22.0%, indicating 82.2% of the float fishing activity takes place above Welcome Creek. Bank fishing use remained highest in Section 1 (59.3%) and Section 2 (29.7%), but the percent of use in Section 2 is lower, indicating somewhat less a preference for Section 2 than indicated earlier. Using percent of total hours fished, bank anglers fishing Section 1 are still the largest component of creek users with 50.6% of all users for the season being represented by this group.

Additional insight into differences in the distribution of fishing pressure between user types can also be gained by looking at percent use (hours fished) by bank anglers versus floaters for each section (Figure 5). Using

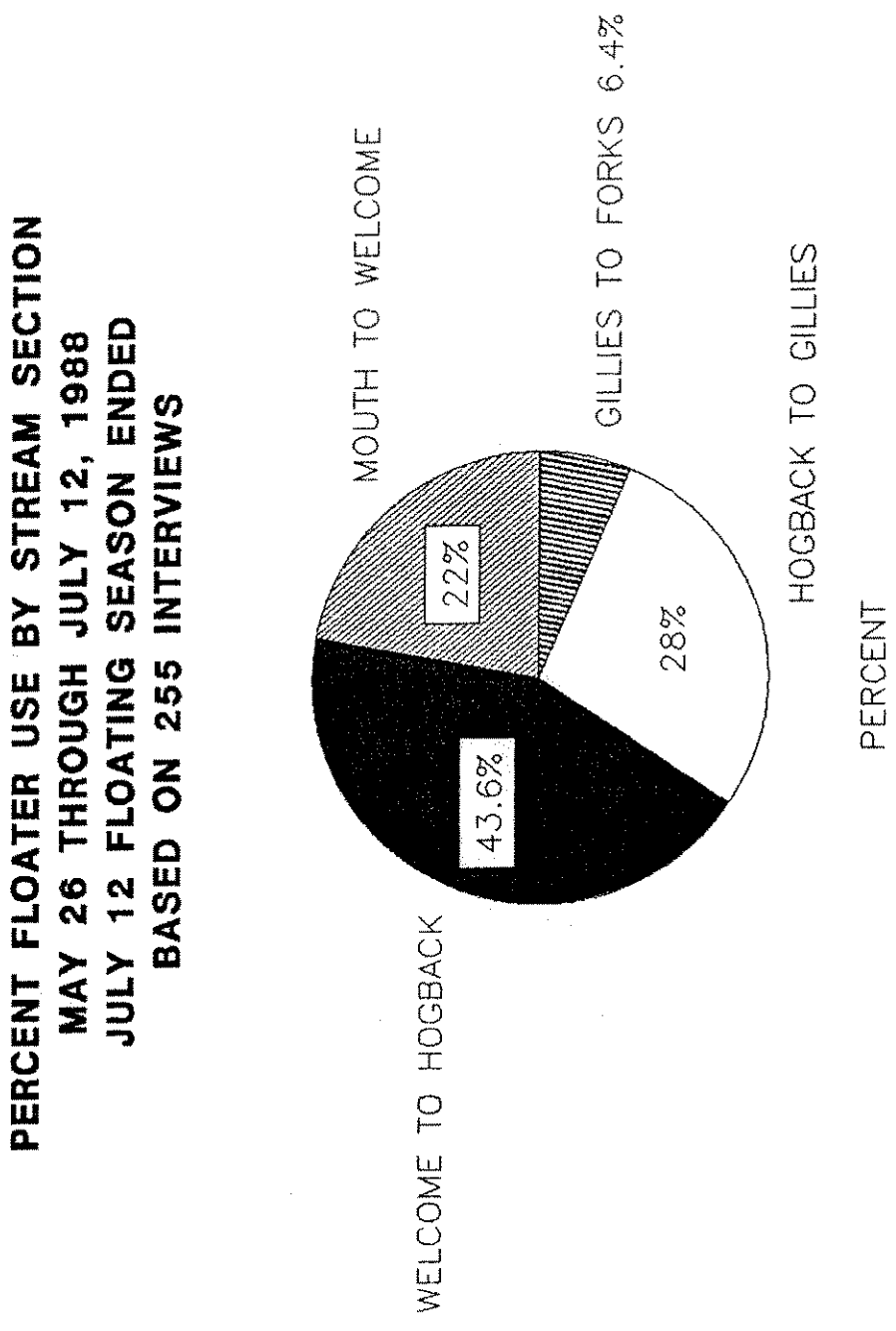

Figure 1. Percent floater use by stream section.

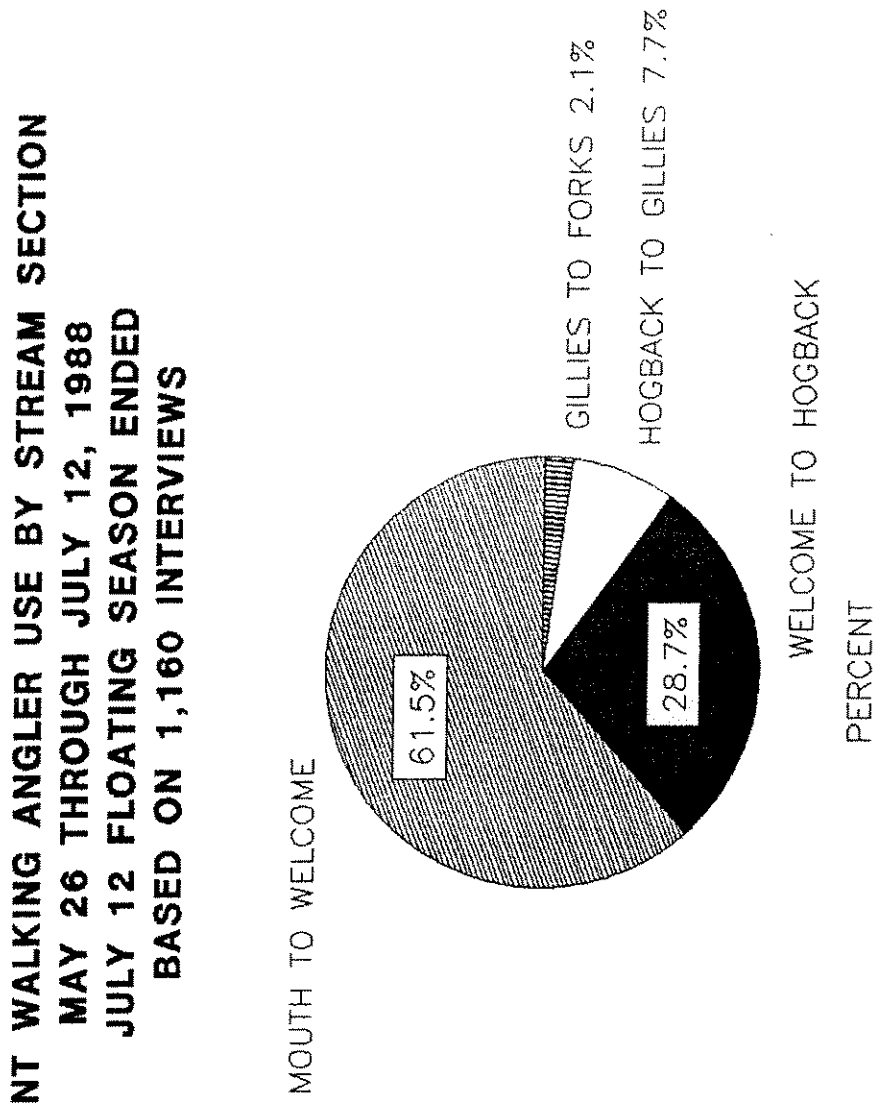

Figure 2. Percent walking angler use by stream section during the floating season.

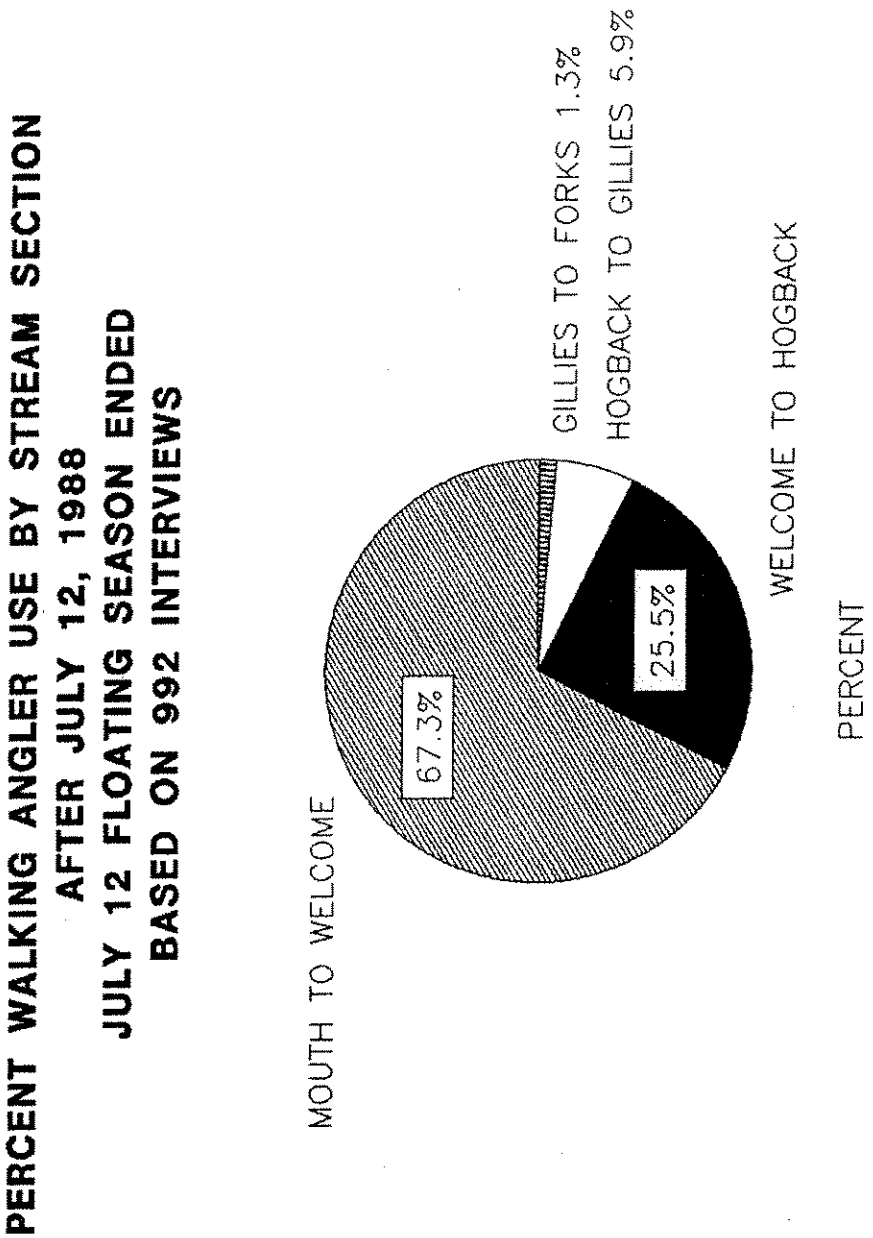

Figure 3. Percent walking angler use by stream section after the floating season.

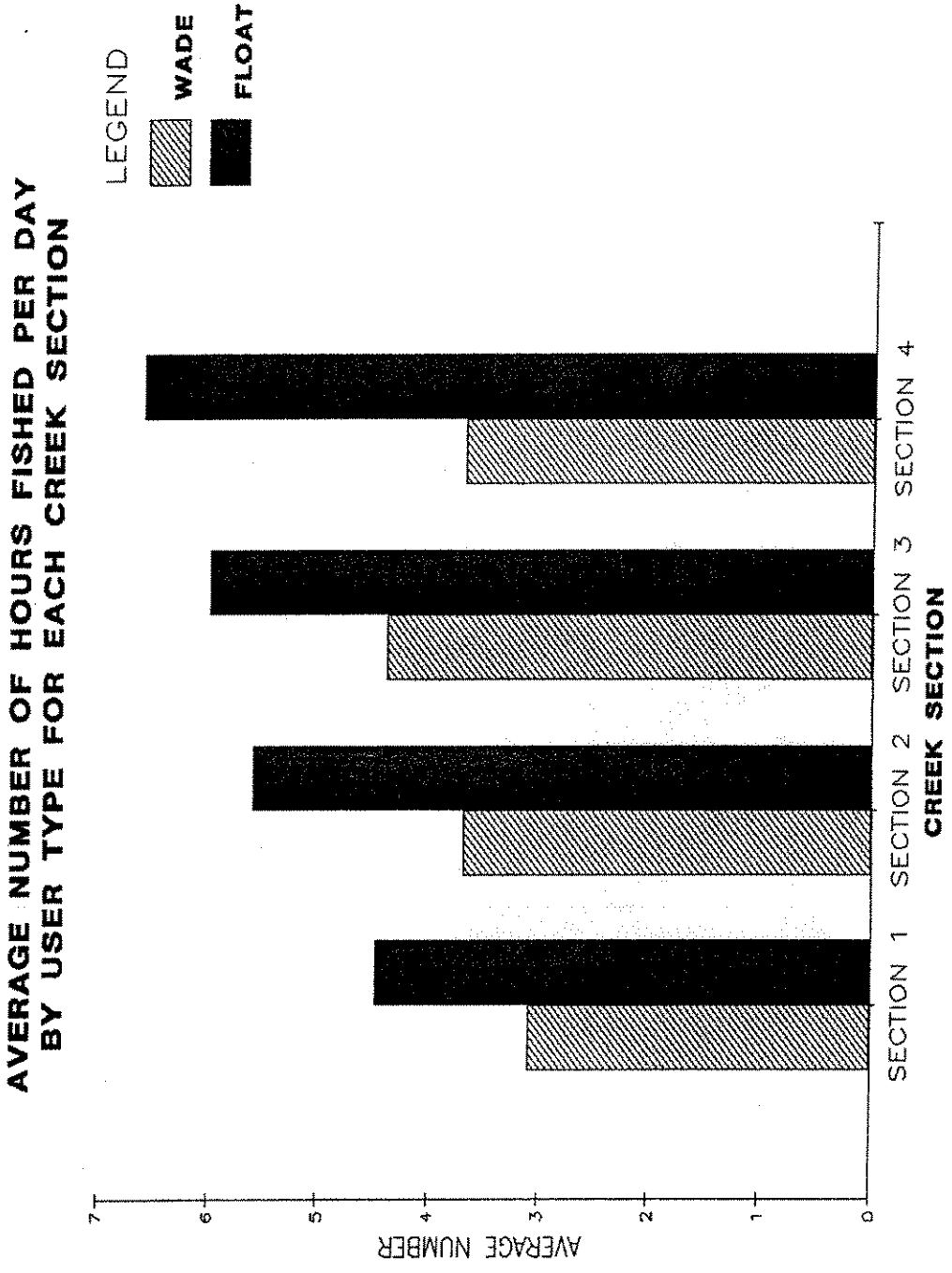

Figure 4. Average number of hours fished per day by user type for each creek section.

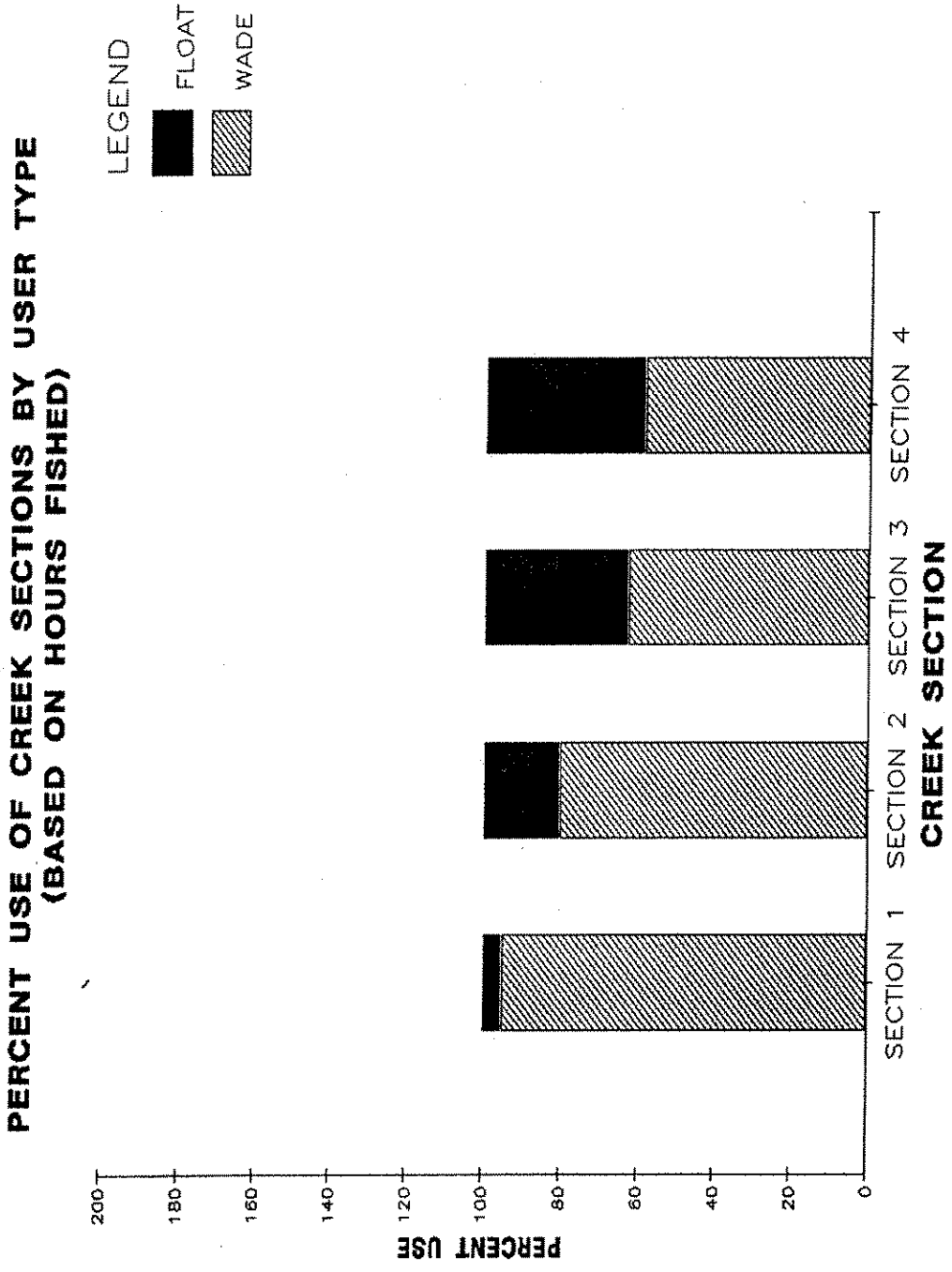

Figure 5. Percent use of creek sections by user type.

total hours fished as a measure, 95.1% of all use in Section 1 was by walking anglers, decreasing to 80.1% in Section 2, 62.7% in Section 3 and 58.7% in Section 4, providing another indicator that some segregation of use is presently occurring with Section 1 being dominated by walking anglers.

The relative importance of float fishing over the course of the season increases when comparing total hours fished as a measure rather than total number of users. Using total hours fished for the entire season 85.3% of all use was by walking anglers and 14.7% by floaters, again indicating substantial float fishing use on Rock Creek, but a dominance of use by walking anglers.

There has also been a growing interest in distinguishing the roles played by commercial versus private float fishing use. This question was added to the user interview after the census project had begun; therefore, the sample size for commercial versus private floater comparisons is smaller (by 24.5%) than for the previous analyses. It has been believed that the majority of those floating the creek were commercial floaters. In 1986 it was estimated that 64.2% of those float fishing Rock Creek were commercial floaters based on creek census data and USFS outfitter reports (Peters, 1986). In 1988 the proportion shifted such that private floaters comprised the majority of those float fishing (58.5%) with 41.5% of those float fishing being commercial (outfitters, guides and clients) floaters.

Some differences in the distribution of float fishing use for private versus commercial floaters does seem to exist. Private floaters show a preference for Section 2, with 55.4% of private floaters using this section (Figure 6) while commercial floaters were much more evenly distributed (Figure 7). Looking at the proportion of private versus commercial floaters for each creek section, Sections 1 and 3 are evenly split while Section 2 is dominated by private floaters (71.3%) and Section 4 by commercial floaters (75.0%) (Figure 8).

Since the MRD is considering a weekend restriction on commercial float fishing as one of its management alternatives, it may be of interest how private versus commercial floating breaks down with respect to weekdays versus weekend/holidays. Using estimates based on a 164 day season, the proportions of weekday (46.7%) versus weekend (53.3%) overall float use is fairly even. However, the majority of private floating occurred on weekends or holidays (71.9%) while weekdays comprised the majority (72.8%) of commercial float use. Commercial floating on weekends accounted for only 11.3% of the total float fishing use. Therefore, it seems doubtful that special regulation of this segment of users will yield much change in any conflicting use patterns.

It may also be of interest to consider any differences between private and commercial floaters with respect to the proportion of nonresidents in each group. Residents of Montana comprise the majority (68.7%) of all floaters, however, the proportion of residents increases to 82.5% for private floaters, but falls to 49.4% for commercial floaters. Another way of viewing the relative importance of private versus commercial float fishing activity is to consider that 70.1% of all residents float privately while 67.2% of all nonresident floaters do so commercially. Thus, it appears that nonresidents exhibit some reliance or preference for the services provided by commercial float fishing while resident floaters do not.

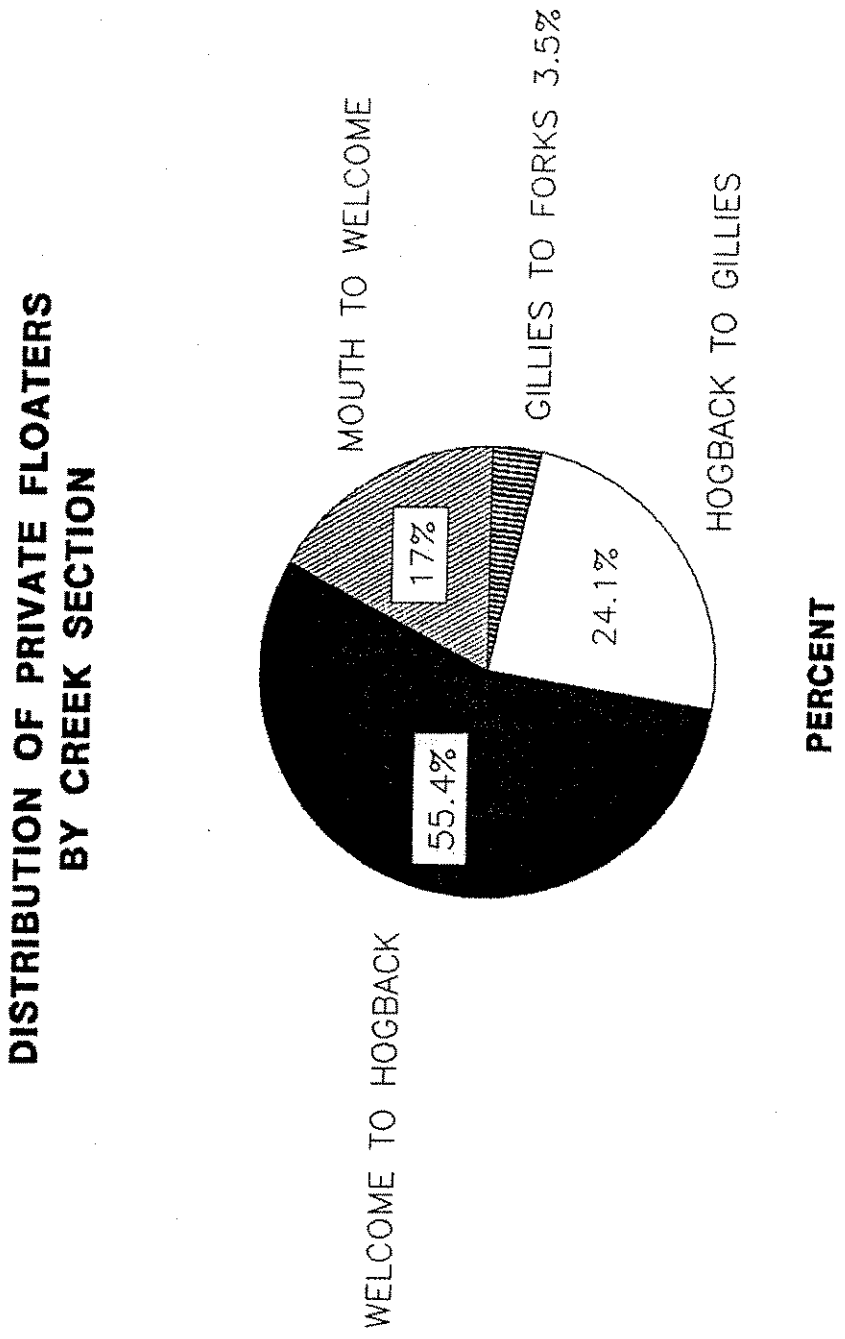

Figure 6. Distribution of private floaters by creek section.

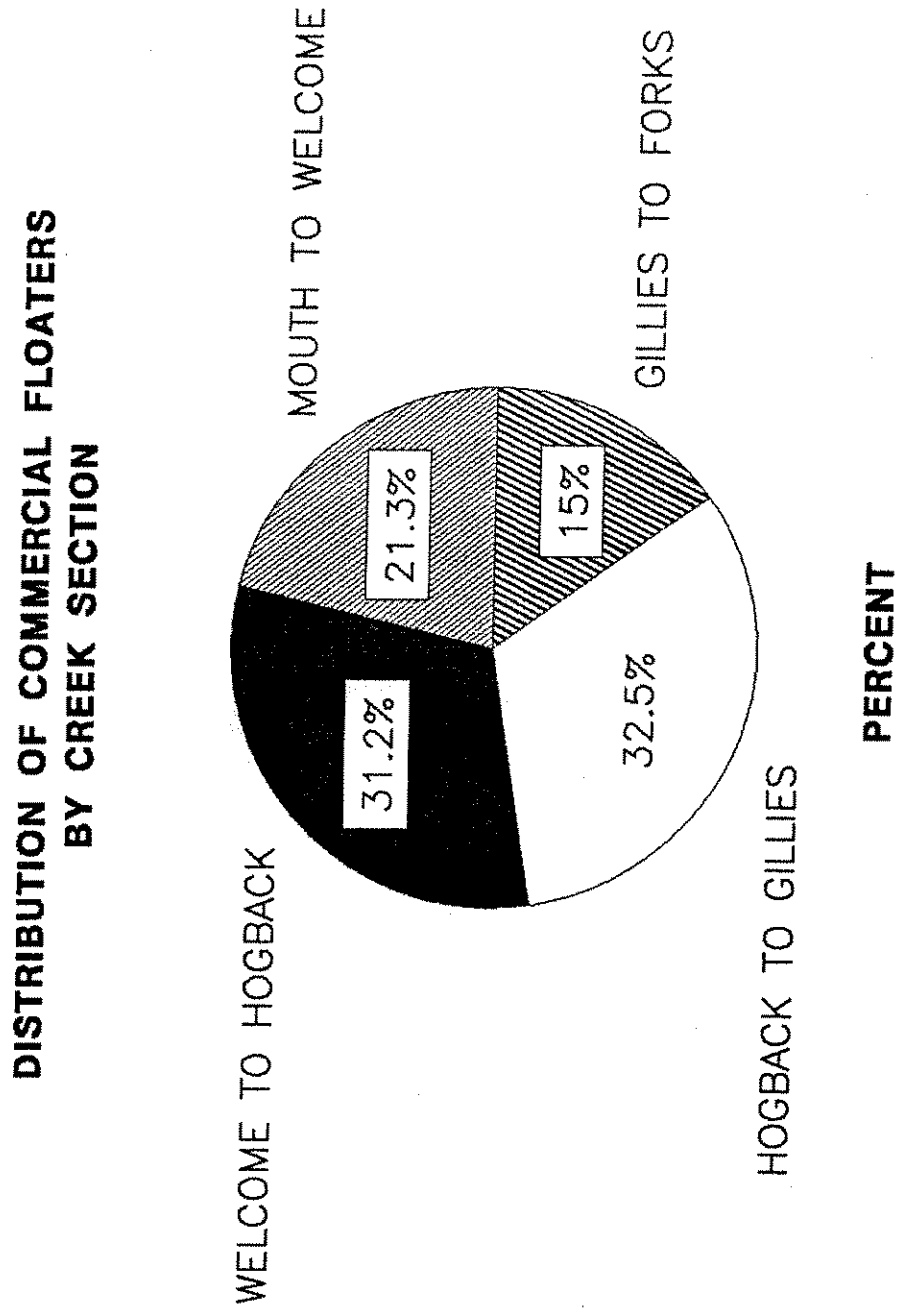

Figure 7. Distribution of commercial floaters by creek section.

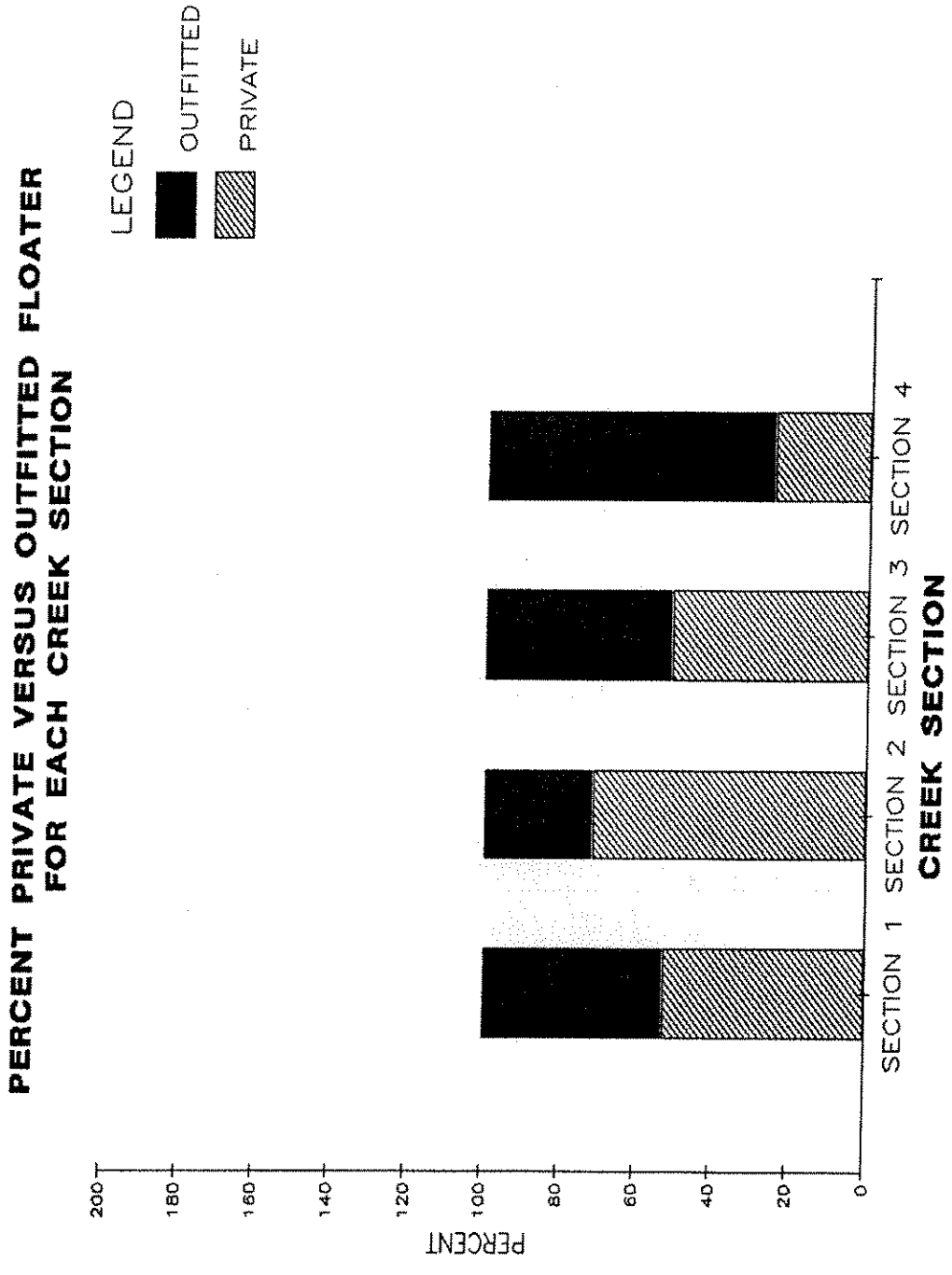

Figure 8, Percent private versus outfitted floater for each creek section.

Regarding the proportions of nonresident versus resident walking anglers, it was noted that the proportion of nonresident walking anglers increased from 24.2% during the active float season to 31.3% after the active float season.

A few questions were asked of floaters in an attempt to characterize some aspects of float fishing. The overall average number of float trips per year was three trips, but separating private from commercial floaters yielded an average of two trips per year for private floaters compared to an average of six trips per year for commercial floaters. The average number of people in each boat was three for both private and commercial floaters and the average number of people that actually fished in each boat was two for both user groups. Floaters were also asked the extent to which they fished from the boat versus stopping the boat to get out and fish (Figure 9). That 63.9% of all floaters responded that they fished some of both ways is somewhat surprising and perhaps misleading. A better approach to this question may have been to ask the number of hours spent fishing from the boat versus out of the boat. This would have presented a more accurate representation of the actual proportion of fishing effort expended while actually floating. It is suspected that many of those who responded also stopped to fish and did so only briefly and probably only a small portion of the float time was actually spent fishing from outside the boat while stopped.

All anglers checked were asked their opinion whether float fishing should either be allowed under current rules, limited more, or eliminated altogether. An attempt was made to exclude repeat or multiple interviews by asking if the anglers had been censused before in 1988. Between 28.3% and 33.6% of interviews were repeat responses which indicates a substantial number of users visit Rock Creek more than once per season. There was essentially no difference between floaters and walking anglers in the proportions of repeat and first time interviews.

Responses to the opinion question were analyzed first with respect to the active float season (Figure 10), and second for the time period following the active float season (Figure 11) in order to see if any shift in opinions occurred as the season progressed. The results indicate a fairly high tolerance for float fishing by creek users in 1988 with only 20.9% of those interviewed during the float season calling for complete elimination of the activity, while 64.4% of users support some level of float fishing, and 14.7% had no opinion (Figure 10). Tolerance for float fishing does decrease during the period following the active float season when water levels in the creek have dropped significantly and wading is possible in nearly all of the creek. For this period, 33.4% of all users favored total elimination of float fishing, the percent of users supporting some level of float fishing dropped to 43.9% and 22.7% had no opinion (Figure 11).

Those users responding that they would like to see float fishing limited more were also asked how they would like this accomplished. Four alternatives for limiting floating were offered: 1) base the allowed float season on water flow level, 2) designate certain stream sections for floating and others for bank and wade fishing, 3) establish a permit system limiting the number of boats per day per section, and 4) establish a float season cutoff date. No alternative received an overwhelming proportion of choices (Figure 12); however, some preference for a flow level restriction is indicated as this alternative received the highest (30.5%) proportion of choices. The other

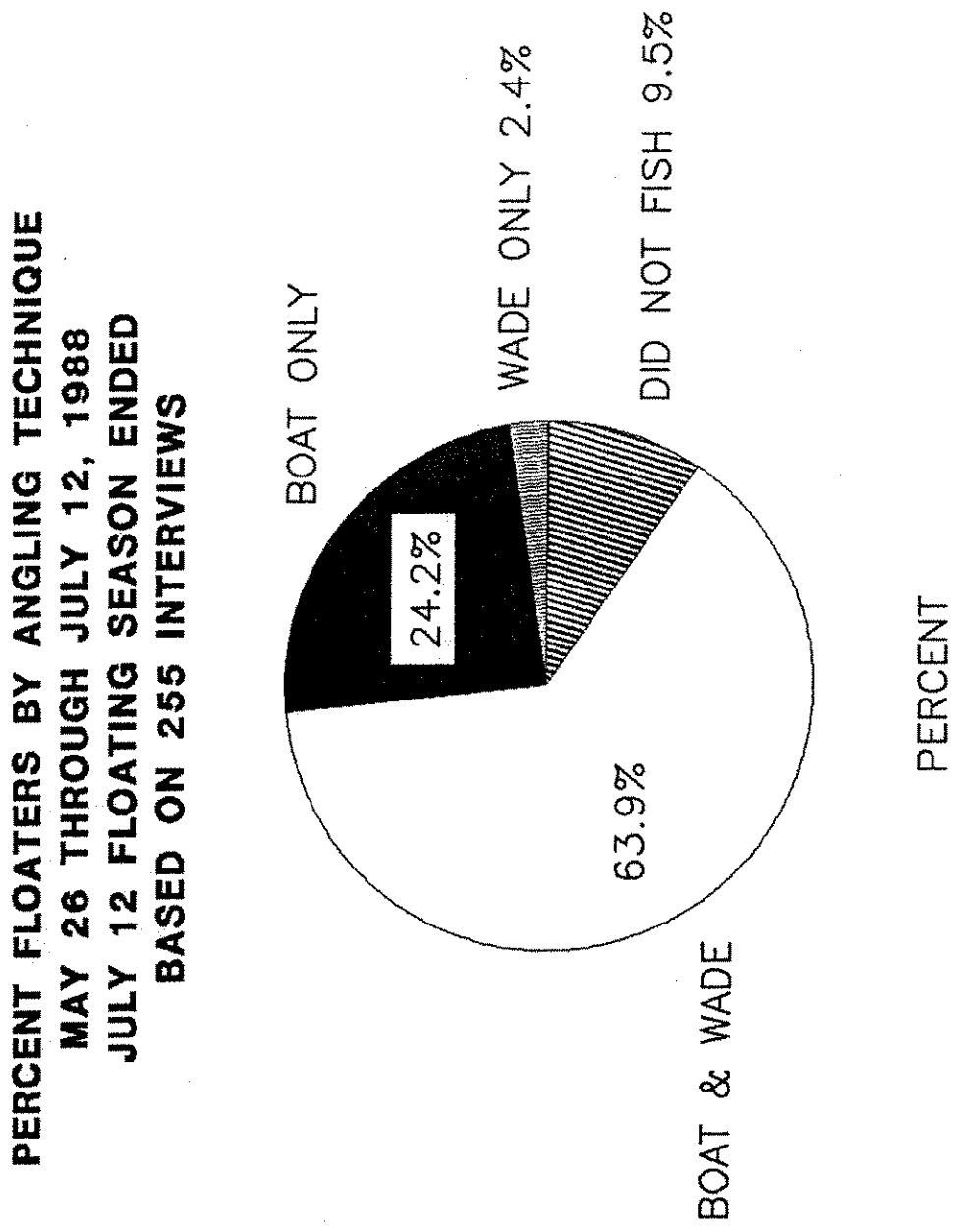

Figure 9. Percent floaters by angling technique.

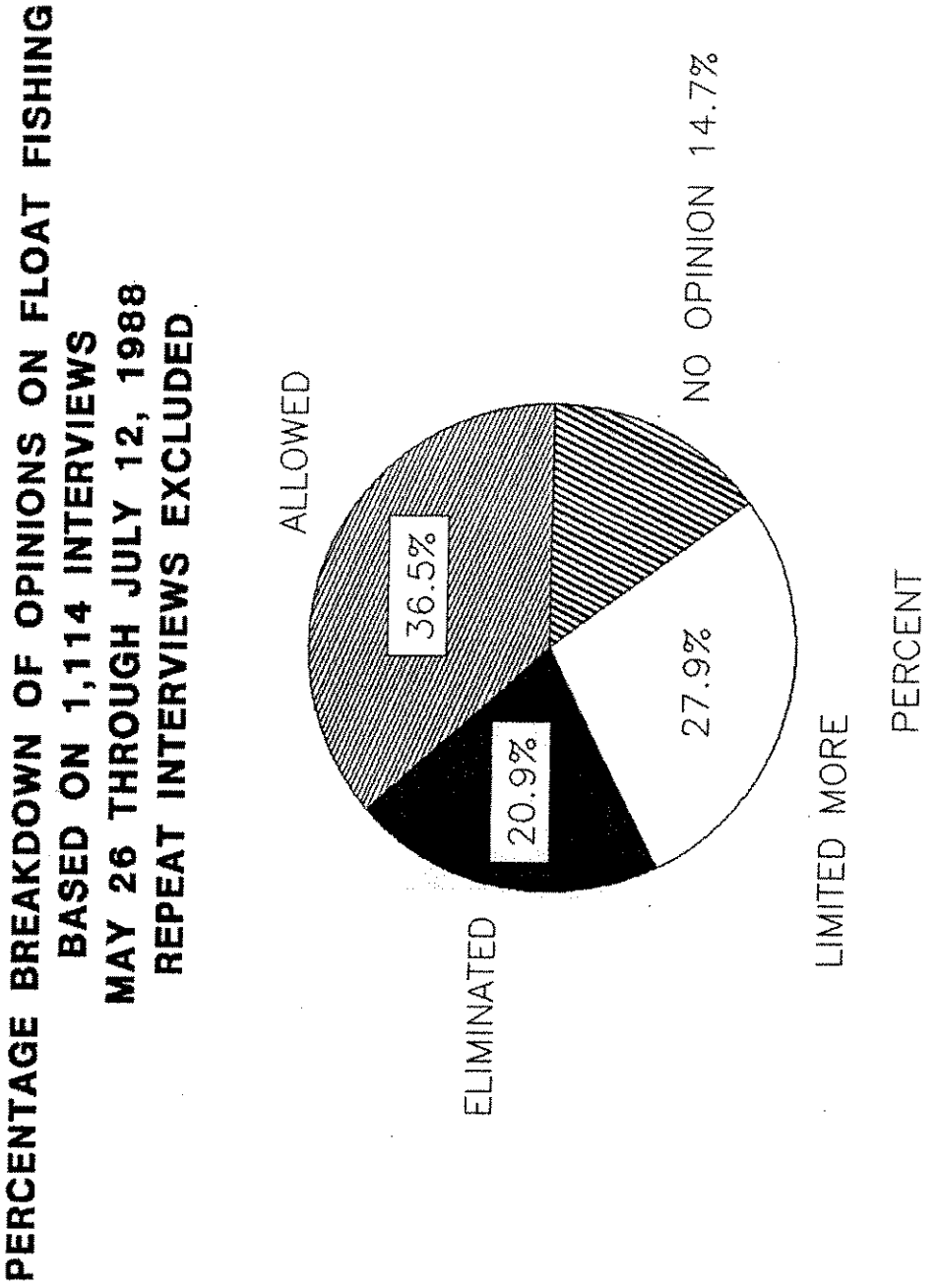

Figure 10. Percentage breakdown of opinions on float fishing during the floating season.

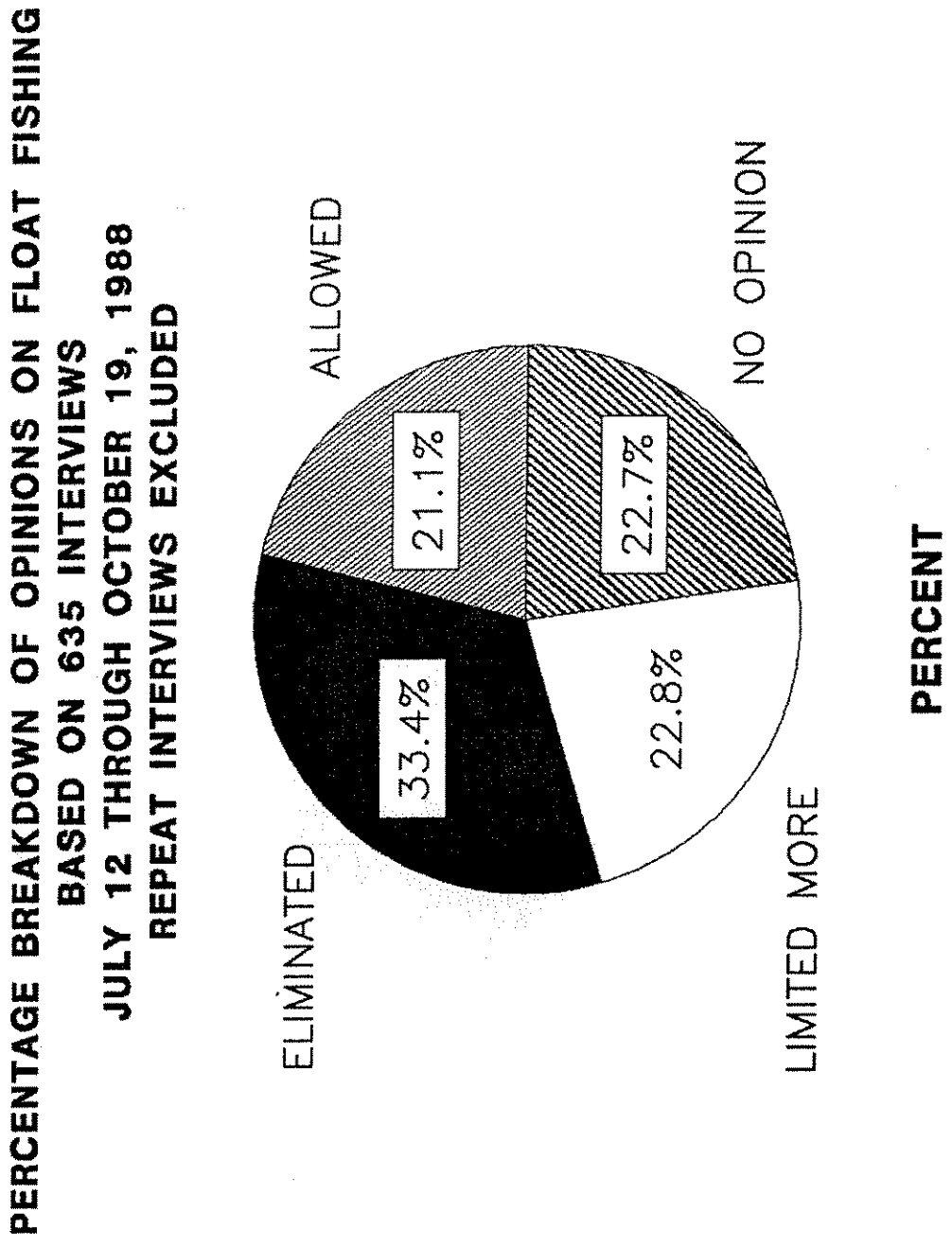

Figure 11. Percentage breakdown of opinions on float fishing after the float season.

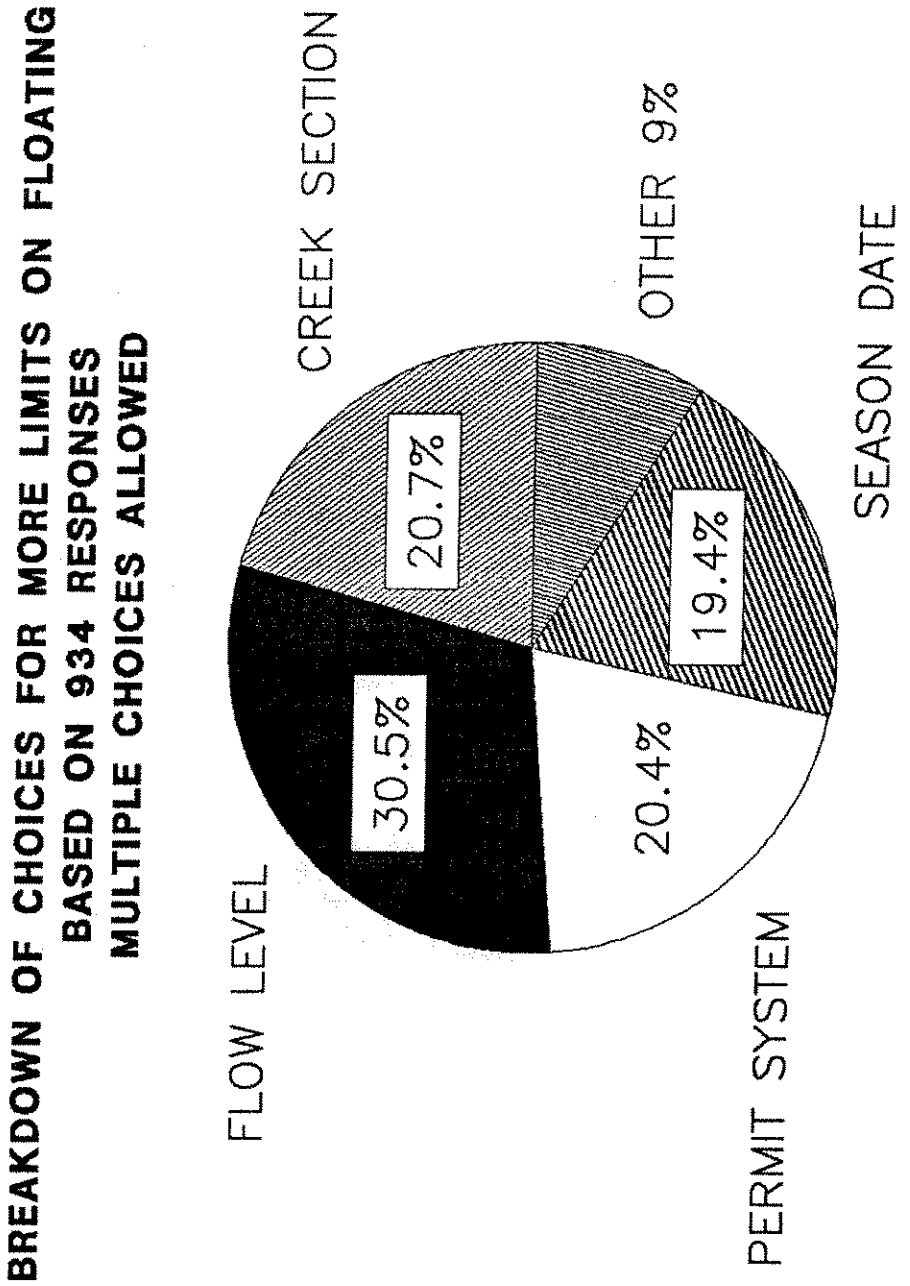

Figure 12. Breakdown of choices for more limits on floating.

alternatives received nearly equal proportions of choices. Since flow level is embodied in both season date and flow level choices, combining these two alternatives indicates that flow level was considered in 49.9% of all choices (Figure 12).

Part 3. User Interactions

This section describes data dealing with encounters and interactions between walking anglers and floaters, first with respect to the extent of any interference that may be occurring, and second with respect to perceptions of float fishing behavior.

The average number of walking anglers encountered by floaters was eleven, thus substantial interaction does occur. The average number of encounters varies by creek section, with the lowest average eight (8) in Section 1, rising to twelve (12) in Section 2, eleven (11) in section 3 and ten (10) in section 4 (Figure 13). The average number of encounters on weekends and holidays (14) was twice the average for weekdays (7).

The average number of boats encountered by walking anglers was one (1). Averages for creek sections varied from one (1) in Section 2, to three (3) in Sections 2 and 4, and four (4) in Section 3. Comparing these averages with those in the preceding paragraph, one observes that floaters are much more likely to encounter walking anglers than walking anglers are to encounter floaters.

Floaters are also much more likely to encounter other boats than are walking anglers averaging four (4) boat encounters compared to one (1). Less than 20% of the season's walking anglers reported encountering boats, but if one looks at only the active float season, 33.9% of the walking anglers reported encountering at least one boat. More than half (52.4%) of all encounters occurred in Section 2. Sections 1 and 3 had nearly equal numbers of encounters (22.4% and 21.0%, respectively), while only 4.2% of boat encounters took place in Section 4.

Given the extent of interaction taking place, a great degree of interference between user types might have been expected. It was encouraging, if not surprising, that 85.1% of all users that encountered boats reported that boat traffic did not interfere with their fishing. Looking at walking anglers, 80.5% of those encountering boats reported no interference with their fishing. Only 5.2% of those float fishing reported that other boat traffic interfered with their fishing.

A somewhat higher level of interference occurred on weekends/holidays (55.7%) than on weekdays (44.3%). Creek sections varied with respect to the relative level of interference taking place, the highest levels occurring in Sections 3 and 4 where about 40% of those encountering boats reported interference. It is interesting that the highest relative level of interference occurred in these upper creek sections.

Walking anglers reporting interference were asked how the boat traffic interfered with their fishing (Figure 14). Response to the six choices offered was very even with "Had to stop fishing" receiving the highest proportion 23.0%, followed by "Boaters fished through my area" (20.9%), "Too many boats"

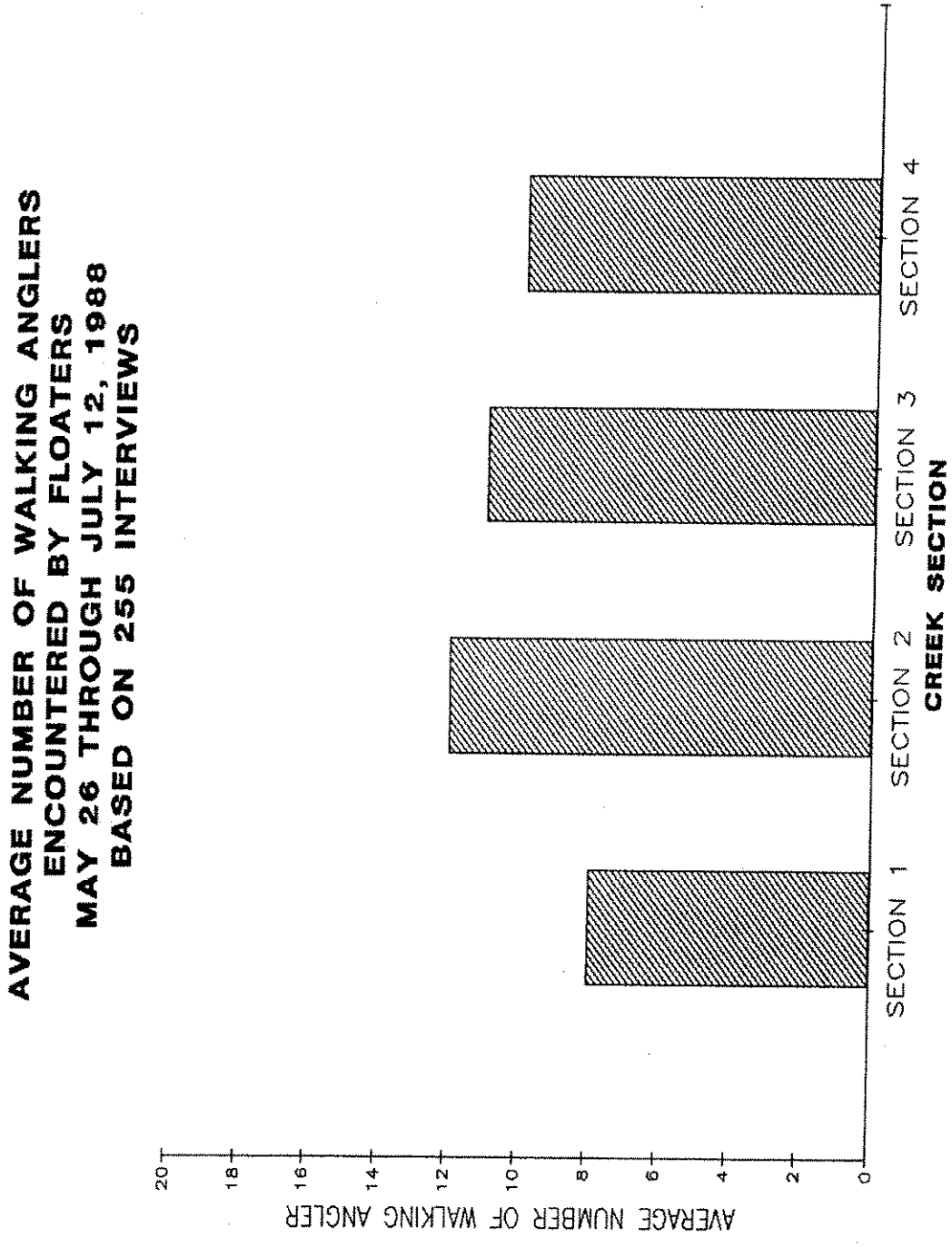

Figure 13. Average number of walking anglers encountered by floaters by creek section.

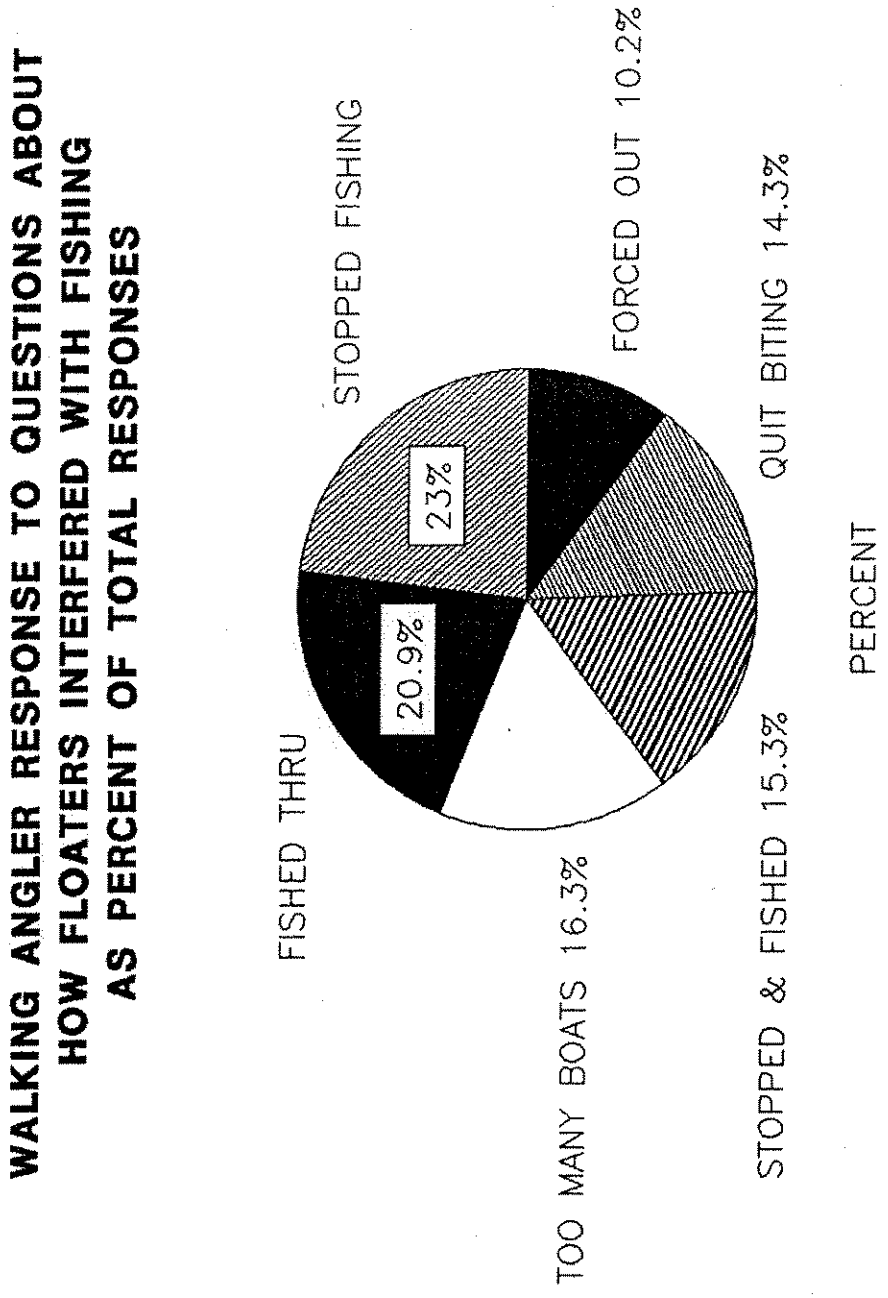

Figure 14. Walking angler response to questions about how floaters interfered with fishing.

(16.3%), "Boaters stopped and fished my area" (15.3%), "Fish quit biting" (14.3%) and "Was forced to move out of water" (10.2%).

The relatively low level of interference reported by walking anglers indicates a substantial tolerance for float fishing. Floater perceptions of bank angler response to boat encounters support this as 60.9% of responses were perceived as friendly, 31.1% as neutral, or were not noticed, and only 8% were perceived as negative. The reaction to floaters reported by bank anglers encountering boats was neutral to positive. Only 4.8% reacted to floaters with an angry response, 45.8% reacted in a neutral fashion and 49.4% reported responding in a friendly or positive way. This may be due in part to efforts apparently taken by floaters to reduce interference with walking anglers. Floaters reported that they floated the bank opposite the walking angler 84.3% to 91.9% of the time and stopped fishing when they encountered walking anglers 80.5% to 89% of the time. These efforts may be important, for when asked to describe floaters behavior, bank anglers responded that floaters were courteous and friendly 60.9% , neutral 30.2% and discourteous or unfriendly only 8.9% of the time.

Part 4. Creel Data Analysis

Creel data from the 1988 census that can be related to historical trends was presented in Part 1. This section describes differences in catch rates and catch per angler between creek sections and between user types, the relative importance of different trout species in the anglers catch and some additional data.

Anglers were asked what type of fishing tackle or method they used (Figure 15). For walking anglers, 75.0% used fly fishing gear, 16.4% spinning tackle, 1.0% bait, and 7.6% used a combination of methods. Fly fishing was even more prevalent with floaters as 95.6% used that method, 1.8% spinning gear, no bait fishing was reported and 2.6% used a combination of flies and hardware.

The overall catch rate for all users over the entire creek was 1.32 trout per hour. However, the rate for all users was higher in Sections 3 and 4 (1.84 and 1.72 trout per hour, respectively) than in Sections 1 and 2 (1.24 trout per hour in both sections).

A large difference in catch rates exist between walk and float anglers, with float anglers enjoying twice the rate of bank anglers (2.29 compared to 1.14 trout per hour). The degree of difference between user types did vary by creek section with the rate for floaters 68.2% higher in section 1 (2.06 to 1.22), 96.6% higher in Section 2 (2.06 to 1.05), 124.5% higher in Section 3 (2.84 to 1.26), and 131.4% higher in Section 4 (2.57 to 1.11).

The catch per angler for all users over the entire creek was 4.75 trout per angler. Considerable variation in catch per angler was observed between sections with the averages as follows: Section 1 at 3.98, Section 2 at 4.95, Section 3 at 9.04 and Section 4 at 7.74 trout per angler.

The catch per angler for floaters (12.80) was greater than three times that for bank anglers (3.87). Again, the degree of difference between user types did vary by creek section with the average for floaters being just under two and one-half times greater than for walking anglers in Section 1 (9.26 compared to 3.29), just under three times greater in Section 2 (11.52 to 3.87),

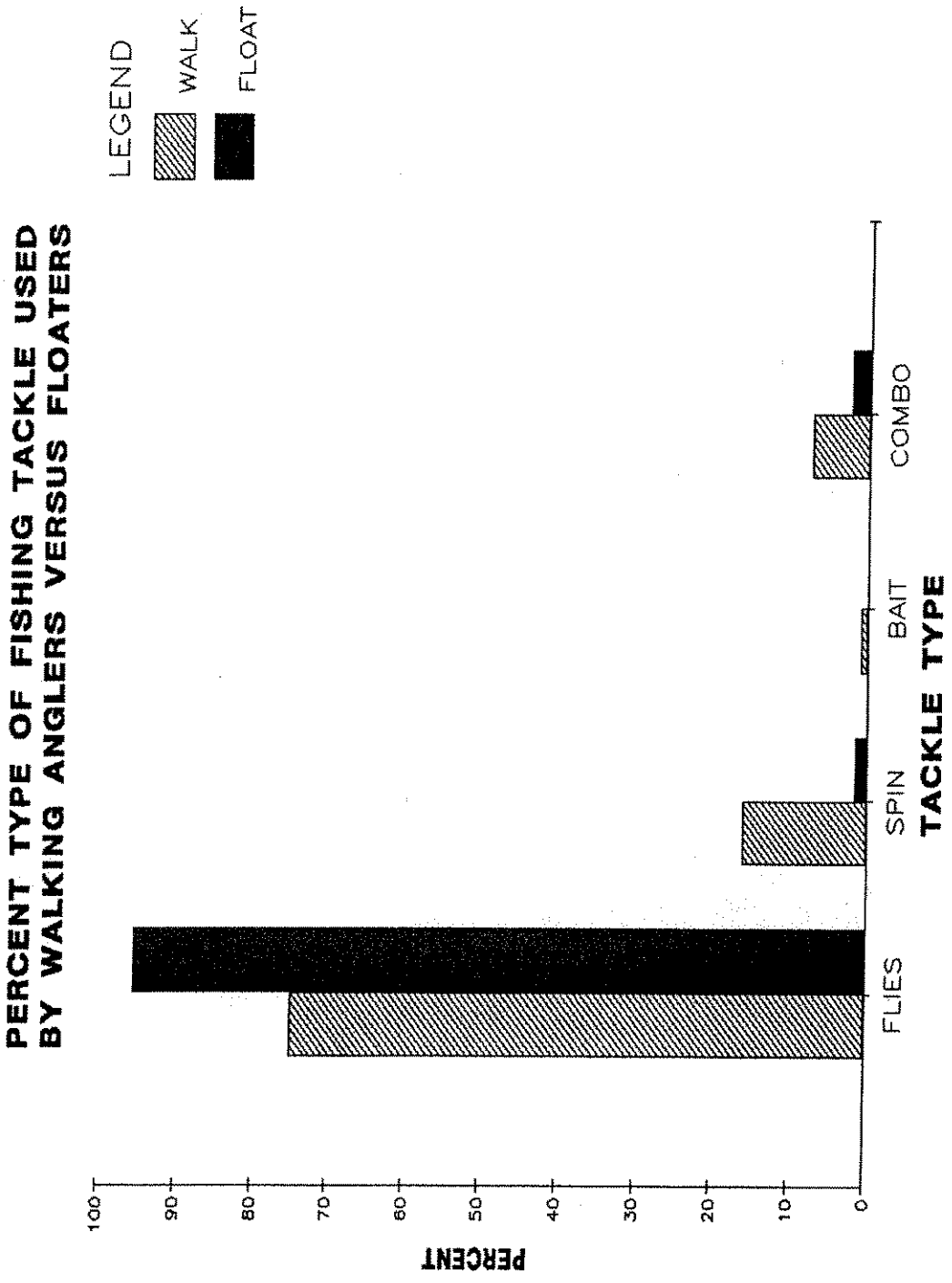

Figure 15. Percent type of fishing tackle used by user type.

more than three times greater in Section 3 (17.03 to 5.56), and more than four times greater in Section 4 (16.93 to 4.11).

It is noteworthy that Section 3 has the highest catch per hour and catch per angler for both walk and float anglers.

Regarding any differences between user groups in their tendency to keep the fish they catch, the average number of trout caught and kept for walking anglers (0.24) was about equal to that of float anglers (0.22). However, the ratio of trout kept per angler to trout released per angler was nearly four times greater for bank anglers (0.066) than for float anglers (0.017). Walking anglers released 15 trout for every trout kept, while floaters released 59 trout for every trout kept. More than one interpretation of this difference in ratios is possible. It may represent a real difference between user types in their tendency to keep fish or it may merely represent a higher success rate by floaters. In any case, it is clear that catch and release fishing is practiced widely by all users of Rock Creek.

Although species identifications reported by the general public may include substantial errors, especially involving rainbow and cutthroat trout, such data has value in indicating the relative importance of different trout species in the anglers' catch. The percent composition of anglers' catch is presented in Table 4 for each creek section and for the creek as a whole. Rainbow trout are by far the most prevalent species caught and released on Rock Creek, comprising 66.6% of all trout over the entire creek. Brown trout had the next highest representation with 18.1%, followed by cutthroat trout at 12.3%, and last by bull and brook trout, each representing only 1.5% of all trout caught and released.

Looking at the species composition for each creek section, the following observations are noteworthy: 1) the representation of rainbow trout is never much less than 60% for any section, 2) brown trout are most prevalent in Section 1 where they comprise 30.1% of trout caught and released with their next highest representation dropping to 7.2% in Section 2, 3) cutthroat trout are most prevalent in Sections 3 and 4 where they comprise 22.4% and 30.1% of the total, respectively, 4) bull trout are nearly absent from Section 1, but are fairly equally represented in the other sections, although they never represent more than 3% of the catch, and 5) brook trout are the least represented species, nearly absent in Section 4, and never representing more than 1.6% of total trout caught and released.

Given the amount of fishing pressure Section 1 receives, it is probably not surprising that nearly half (49.6%) of all the trout caught and released and caught and kept (51.6%) were done so in Section 1. For additional perspective, rainbow trout in Section 1 accounted for close to a third (29.7%) of all trout caught and released on the entire creek over the total season.

The percent composition of trout species caught and kept is also presented in Table 4 and is largely consistent with the representation presented by the data for trout caught and released. The major difference is an increase (about 7%) in the combined representation of bull and brook trout. Section 4 shows some shift in values, however, the proportions presented for trout kept in this section are based on a very small sample size.

Table 4. Percent Composition of Trout Species in the Angler's Catch on Rock Creek for the General Fishing Season.

Trout Species	Section 1		Section 2		Section 3		Section 4		Entir
	%Kept	%Released	%Kept	%Released	%Kept	%Released	%Kept	%Released	%Kept
Rainbow	52.0	59.9	65.9	76.8	78.9	69.0	35.8	64.9	58.7
Brown	32.2	30.1	8.2	7.2	0	4.7	7.1	2.3	19.7
Cutthroat	8.4	7.7	12.0	12.0	12.3	22.4	50.0	30.1	11.4
Bull	2.0	0.6	3.4	2.4	1.8	2.9	7.1	2.3	2.9
Brook	5.4	1.6	10.6	1.6	7.0	1.0	0	0.5	7.3

Data was also gathered for whitefish and shows that this species accounted for 8.0% of all fish caught and released, and 8.3% of all fish caught and kept.

SUMMARY OF FINDINGS

Part 1. Angler use (number of anglers) of Rock Creek in 1988 was lower than pressure estimates calculated in 1981 and 1986 but remained above the lowest use recorded in 1978. The estimate of total hours fished was consistent with the range of estimates made over the last 20 years. Non-resident use of Rock creek continued to increase to 28% of users.

The estimate for the total trout catch indicates a continuing trend of fewer trout caught and kept with high numbers of trout caught and released, yielding an overall catch comparable to years when the creek was heavily stocked. The overall catch rate is down from 1986 but comparable to that of 1981. The catch rate for fish kept continued its declining trend. The overall catch per angler was 4.75 trout per angler for the 1988 season.

Part 2. Float fishing use increased from five (5) percent of all use in 1986 to 10.4 percent in 1988. Using 1988 data, this proportion increases to 20.6 percent if calculated for an active float season ending July 1. Float fishing use was highest in the Welcome to Hogback section. Most of the float fishing took place above Welcome creek (78%), and most of the bank and wade fishing took place below Welcome Creek (61.5%), indicating some segregation of users. As a group, walking anglers in the Mouth to Welcome section accounted for 56.4% of all creek users.

Floaters average more hours fished per day than walking anglers for all creek sections. Using total hours fished as a measure, the ratio of walking angler use to floater use decreases steadily moving upstream, providing another indication of user segregation. Floaters comprised 14.7% of the total use based on total hours fished.

Private floaters comprised the majority (58.5%) of those float fishing with commercial floating accounting for 41.5%. Private floaters were most prevalent in Section 2 while commercial floating was fairly evenly distributed among sections. The proportion of weekday versus weekend/holiday float use were fairly equal, however, most private floating occurred on weekend/holidays while most commercial floating took place on weekdays. Private floaters were largely Montana residents (82.5%) while commercial floaters were evenly split between residents and nonresidents. More nonresidents float commercially (67.2%) than do residents (29.9%).

User opinions on continuing to allow float fishing activity indicated a substantial tolerance for float fishing with 66.6% to 79.1% of all users either preferring some level of float fishing be allowed or having no opinion. Of those calling for more limits on float fishing activity, restrictions based on water flow level were chosen most as the preferred alternative.

Part 3. Based on average number of encounters, float anglers are more likely to encounter bank anglers than are bank anglers to encounter floaters. Substantial interaction does occur with half of all encounters taking place in Section 2. During the active float season, a third of all bank anglers reported encountering at least one boat.

The degree of interference between users was low, with 19.5% of the walking anglers reporting boat traffic interfered with their fishing. Interference was somewhat higher on weekend/holidays than weekdays and most prevalent in the upper two creek sections.

The low level of reported interference also indicates appreciable tolerance for float fishing. Reported reactions to floaters were mostly neutral to positive and floaters behavior was largely described as courteous and friendly.

Part 4. The catch per hour and catch per angler was highest in Section 3 for all users. The catch rate for float anglers was twice that for walking anglers and the average catch per angler for floaters was more than three times the average for walking anglers. Floaters released 59 trout for every trout kept, compared to 15 trout released per trout kept for walking anglers.

Rainbow trout are by far the most prevalent species in the anglers' catch for all creek sections. Brown trout are most strongly represented in section 1 and cutthroat trout have their highest relative representation in section 3 and 4. Bull trout and brook trout combined make up only 3% of total trout caught and released. Half of all the trout caught for the season were kept or released from the Mouth to Welcome section.

RECOMMENDATIONS

1. Since the upper check station has not been used in developing pressure estimates since 1967, it may be useful to operate it along with the lower station during the next census to evaluate if more creek users are not exiting the creek at its upper end than was true in the past.

2. Although values for total catch and catch rate are down somewhat from the last census, they remain relatively high indicating the current restrictive creel and tackle regulations are contributing to an overall improved and quality fishery and should be continued.

3. Given the increase in float fishing use, the extent and distribution of this important activity should continue to be monitored along with such aspects as the relative proportions of private versus commercial float use and the importance of commercial floating to nonresident users.

4. Given the level of private float use, consideration should be given to applying any restrictive regulations to the general public as well as commercial float activity in order to maintain the current low level of reported interference between float and bank anglers.

5. User opinions regarding the level of float fishing activity desired on Rock Creek should also continue to be monitored along with measures of encounters and interference in order to potentially establish what level of use increases interference to the point that a major negative shift in tolerance of float fishing occurs. In other words, attempts at assessing the social or cultural carrying capacity for float fishing should continue.

6. Since the behavior or etiquette of floaters may affect the level of

tolerance for float fishing activity, consideration should be given to a public education program encouraging an attitude of mutual respect and cooperation or compromise between those angling on foot and those angling by boat.

REFERENCES

Peters, D. J., 1986, Western Montana Fishery Investigations: Rock Creek Management Survey, Montana Department of Fish, Wildlife and Parks, Fisheries Division Job Completion Report, Project No. F-12-R-33, Job No. II-a, 25pp.

Prepared by James Rokosch and Dennis Workman

August 14, 1989

Waters referred to:
Rock Creek 06-5263

Key Words:
user interviews
attitude/ opinion survey
creel census
trout catch rates
trout harvest
catch and release

EXHIBIT "A"

Outfitter/Guide Annual Operating Plan
Missoula Ranger District
Lolo National Forest

PERMIT HOLDER: Clark Fork Float Fishing Outfitters Association

This Annual Operating Plan is attached to and is a part of a Special Use Permit issued to the above named Permit Holder on May 23, 1986.

This plan authorizes outfitted and guided float fishing activity on Rock Creek on Missoula Ranger District during the outfitting season beginning April 15, 1988 and ending November 30, 1988.

Prepared By: Robert C. Hoverson Date 4/22/88
Resource Forester

Accepted By: [signature] Date 5/9/88
For CFFFOA

Approved By: John C. Foster Date 4/26/88
for District Ranger

ROCK CREEK OUTFITTER/GUIDE OPERATIONS
U.S. FOREST SERVICE PERMIT REQUIREMENTS

IV. STANDARDS AND STIPULATIONS

A. CFFFOA members shall maintain a record of their use to include: date, time and place of put in and out, number of guests, rate charged, and name of guide for each trip. A consolidated use record for all members shall be submitted to the Forest Service by December 31.

B. CFFFOA will furnish the Forest Service a complete list of authorized guides, their boat number, and vehicle license number. This information must be on record prior to the guide floating on Rock Creek.

C. All boats used under this authorization shall be marked with letters and numbers that are legible from the stream bank at all times. Each outfitters boat shall be identified by the first letter of his last name and a 0 or 1, i.e. Roos R-1, O'dell O-1, Jones J-1, and Anderson A-1. Each guide boat shall be identified by the letter of the outfitter they work for and a number as assigned to them by the outfitter.

D. Proof of identity shall be given upon demand to any Forest Service or FWP official.

E. The following are operating standards by creek section:

IRRIGATION DITCH (below VM bridge) TO THE CLARK FORK RIVER

1. Limit of two boats per launch.
2. CFFFOA will maintain one hour intervals between launches.
3. No launches will be made after 12:00 noon.

ELK HORN LANDING TO IRRIGATION DITCH BELOW VM BRIDGE

1. No outfitting permitted.

WELCOME CREEK TO ELK HORN LANDING

1. Limit of two boats per launch.
2. CFFFOA will maintain one hour intervals between launches.
3. CFFFOA will terminate operations between August 1 and Labor Day.
4. No operations will occur on weekends or holidays.
5. Operations will terminate by 4:00 p.m. prior to June 15.

HARRYS FLAT TO WELCOME CREEK

1. No outfitting (Landing at "the egg shaped rock" approx. 1.5 miles below Harry's Flat will be allowed.)

DISTRICT BOUNDARY NORTH TO HARRYS FLAT

1. Limit of two boats per launch.
2. CFFFOA will maintain one hour intervals between launches.

I. PROPOSED OPERATION

Based upon the previously submitted application and proposed itinerary, the following Priority and/or Temporary Boat Days; Reserved and/or Nonreserved Campsites; and Trip Itinerary are approved for the 1988 season.

A. Boat-Day Allocation (MAXIMUM)

RESOURCE AREA	PRIORITY USE	TEMPORARY USE	TOTAL
Rock Creek	-0-	Maximum of 300 days to be split between Association members	300
	TOTAL	300	300

B. Campsites and Improvements

NAME/ TYPE	LOCATION	RESERVED/ NONRESERVED	PERIOD OF USE	IMPROVEMENTS
Base	Harrys Flat or other site as approved by FS	Reserved	4/15 - 11/30	None

Association members may request additional campsites in other locations. Campsites must be approved by the Forest Service in advance of use. A $100 fee per campsite will be assessed.

II. APPROVED ITINERARY - 4/15 - 11/30 1988

OUTFITTER	NO. TRIPS	NO. GUESTS	GROSS REVENUE
Paul Roos	25	50	$ 5,000
Dave Odell	60	120	$12,000
Richard Anderson	25	50	$ 5,000
Mark Jones	25	50	$4,250
TOTAL	135 Trips	270 Guests	$26,250

The Association is responsible for scheduling boat launch locations and times with the membership. Scheduling shall be in conformance with standards and stipulations listed in Section IV of this plan.

The above named individuals are the only outfitters presently authorized, as members of CFFFOA, to operate under this permit. The Forest Service retains authority and responsibility for determining appropriate number and assigning new members to CFFFOA.

III. FEE SUMMARY 270 Service Days - 135 Boat Days

A. Service Day Fee

Client Revenue: $26,250

Use Fee: @ 3% = $787.50

1988 Service Day Fee: $787.50

B. Reserved Campsite Fee

1 site x $100 = $100.00

TOTAL PERMIT FEE: $887.50

Appendix 2

ROCK CREEK USER INTERVIEW

DATE_____ NAME_____ STATE OF RESIDENCE_____

Have you participated in the 1988 census before?_____ times____

1. Did you float Rock Creek today 1. yes 2. no (if "no" go to question 12.)

2. Did you hire a commercial outfitter for your float?
   1. yes
   2. no
3. What section?
   1. Welcome Creek to mouth
   2. Hogback Cr. to Welcome Cr.
   3. Gillis Br. to Hogback Cr.
   4. Forks to Gillis Br.
4. How many times have you floated Rock Cr. this year?_____

5. How many people in your boat? _____

6. How many of them fished? _____

7. Did you fish
   1. only from the boat while floating
   2. always stopped to fish
   3. some of both
   4. did not fish
8. How many walking anglers did you pass? _____

9. Did you:
   1. float by the angler next to the bank nearest the angler
   2. move to side of stream opposite the walking angler
10. Did you:
   1. continue fishing through area of walking angler
   2. stop fishing until your boat passed the angler
   3. stop floating and fish in same area of the angler
11. How did the walking angler respond?
   1. no response
   2. friendly response
   3. stopped fishing
   4. moved out of the water
   5. displayed anger
   6. I didn't notice

---

12. How many boats did you encounter on the water today?_____
13. Did boat traffic interfere with your fishing? 1. yes 2. no

PLEASE TURN THE PAGE AND CONTINUE

14. How did it interfere?
    1. fish quit biting
    2. had to stop fishing
    3. forced to move out of water
    4. boaters fished through my area
    5. boaters stopped and fished in my area
    6. too many boats
15. How would you describe the floaters behavior?
    1. courteous, friendly
    2. discourteous, unfriendly
    3. neutral
16. How did you react to the floaters?
    1. no response
    2. friendly response
    3. nonverbal angry response
    4. verbal angry response
17. Should floating be:
    1. allowed under current rules
    2. limited
    3. eliminated
18. If you answered "limited" how would you like that done?
    1. based on flow level
    2. by designated stream section
    3. limit number of boats per day per section
    4. establish float season dates (i.e. May 31 to July 31)
    5. other (explain)

---

19. Which section(s) did you fish today?
    1. Welcome Cr to Mouth
    2. Hogback to Welcome Cr.
    3. Gillis Br. to Hogback Cr.
    4. Forks to Gillis Br.
20. type of fishing
    1. flies
    2. hardware
    3. bait
    4. combination
21. hours fished (to nearest .5 hrs.) _____

22. number of RAINBOW TROUT kept____ released____ tag # _____
23. number of BROWN TROUT kept____ released____ tag # ____
24. number of CUTTHROAT TROUT kept____ released____ tag # _____
25. number of BULL TROUT kept____ released____ tag # _____
26. number of BROOK TROUT kept____ released____ tag # _____
27. number of WHITEFISH kept____ released____ tag # ____