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Memorandum

To: All Regional Directors

From: Acting Associate Director, Park System Management

Subject: Report on Backcountry Study, Rocky Mountain

During the summer and autumn of 1973 a research project conducted by Colorado State University took place in Rocky Mountain National Park. The enclosed summary was prepared for participants, but serves to point out many factors that have application Servicewide.

Key conclusions drawn from the study include: the public will accept capacity permit systems to protect resources and the "quality" camping experience; and only certain interpretive techniques are effective in reaching backcountry users.

We are pleased to enclose several copies of the summary of the report. A microfilm copy of the entire report is available from: University Microfilms, A Xerox Company, Ann Arbor, Michigan 49904. A printed copy is contained in the library of Colorado State University and is available through most intra-library loan systems. May we also invite you to direct any specific questions or comments to the author:

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Many of the recommendations which resulted from this study have already been adopted or are presently under consideration. You may want to bring this research to the attention of both the managers and interpreters involved with backcountry programs.



The need for our present effort toward implementation of a Servicewide backcountry use permit is reflected both in public response to this survey and the need for fiscal efficiency.

Enclosures

Wm C. Purdie

SUMMARY FOR RESEARCH PARTICIPANTS

A MANDATORY PERMIT SYSTEM AND INTERPRETATION FOR BACKCOUNTRY USER CONTROL IN ROCKY MOUNTAIN NATIONAL PARK: AN EVALUATIVE STUDY

Conducted by: James R. Fazio
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Purpose

The broad intent of the study was to evaluate success of the backcountry permit system in Rocky Mountain National Park. "Success" was judged in terms of visitor acceptance of the management program and the effectiveness or efficiency of selected administrative procedures.

A second objective was to determine, through experimentation, the optimum interpretive (communication) method for increasing backcountry users' knowledge of camping procedures which would help preserve the wilderness environment.

Rocky Mountain National Park was selected for the study because of its extremely high popularity, making it one of the most heavily impacted wilderness-type areas in the United States.

Methods

Individuals requesting a backcountry use permit were surveyed by questionnaire in the backcountry office during a sixty-day period from July 8, 1973 through September 8, 1973. Day hikers were intercepted along selected trails to complete the same questionnaire. Day hikers received only one questionnaire, whereas among the overnigheters one member from each party was randomly selected to receive a second, or post-visit questionnaire, by mail five weeks following his or her visit.

Between the time of completing the first and second questionnaires, some individuals received an interpretive brochure, others were asked to view a set of slides, some passed an interpretive sign placed at certain trailheads, and some (a "control group") were exposed to none of these. Newspaper feature articles were published and a half-hour television program was aired in Colorado to also see how these methods compared with the others in influencing backcountry users. All media tested contained essentially the same information, or "messages".

In addition, the researcher recorded many observations, conducted interviews with employees and backpackers, and corresponded with personnel in other national parks which used permit systems in an attempt to preserve wilderness and the wilderness experience.

Results and Discussion

Visitors and the Survey

Number of permits issued in 1973: 8,692
Number of backcountry users with permits in 1973: 23,489
Average overnight party size: Approximately 2.6
Average day hiker party size: Approximately 3.2
Total camper-days in 1973: 37,180
Estimated total number of day hikers: Approximately 200,000

Fifteen percent of parties using the park during the summer research period had one of their members included in the survey. These included:

604 class 1 permittees (regular designated sites)
33 class 2 permittees (cross-country)
15 class 4-Permittees (bivouacs with technical climbs)
29 class 5 permittees (technical mountain climbers)
9 class 6 permittees (group leaders)
113 rejectees (individuals unable to receive a permit)
217 day hikers

Approximately 83% of the participants responded to the post-visit mail survey, with rejectees being lowest at 75%. Non-respondents generally had lower scores on the initial test of low impact camping knowledge, and their level of educational attainment was significantly lower than respondents.

Generally, the so-called "average" summer backpacker in Rocky Mountain National Park might be expected to be a young, out-of-state male, probably a student or professional, and from a high income background. This visitor comes to the park with little experience in wilderness camping, but a moderately high sensitivity to wilderness values and a high propensity for learning about his new recreational activity. Following is a summary of the data from which this mythical character is derived.

Only about 1/3 of the survey participants were from Colorado, and practically all of these came from within 100 miles of the park. The park has a special attraction for residents of the heavily populated Midwest, probably due to Rocky Mountain's geographic position as the first well-known park west of the plains, and conveniently near a major interstate highway. Respondents generally had urban addresses. Forty-one states and two Canadian provinces were represented in the survey. Local residents made up a higher percentage of the mountain climber classes, and a relatively low percentage of the day hikers or campers at designated backcountry sites (class 1 permittees).

Wilderness users are generally young, and this age characteristic was especially pronounced in Rocky Mountain National Park where 50 percent of the sample was between the ages of 20 and 29 years old. Day hikers tended to be older. Most of these young visitors were students, with at least 40 percent of the sample having obtained a high school diploma as their highest educational attainment to date. This was an even higher percentage than in any of eight wilderness studies reported

by Hendee et al (1968) in support of his preliminary evidence for the supposition that the appreciation of wilderness is beginning to diffuse "downward" in society.

While students were the major user of the park's backcountry for overnight recreation (49 percent of all class 1 permittees in the study), professionals comprised the second largest occupational group with 22 percent of the class 1 permittees. In the day hiker use class, professionals outnumbered students.

Closely related to these characteristics is backpacking experience. The experience category having the most individuals in this study was comprised of people (excluding day hikers) in their first year of backpacking (31 percent), followed by those with two years of experience (21 percent). Most were also visiting the park's backcountry for the first time, leading to the conclusion that most of the park's summer backpacker population are novices, and that the park is a testing ground for their new-found recreational activity. Generally, as the number of years of experience increased, the percentage of users showed a corresponding decrease.

The significance of the preceding data is that from it might be concluded that park interpreters have an unusual opportunity to reach large numbers of wilderness recreationists at a point in time when they are most likely to not only be in need of, but also be highly receptive to educational input. From this standpoint, it would be highly advantageous, not only for the protection of the park's wilderness resources, but for those throughout the nation, for a special interpretive emphasis to be placed on proper wilderness use.

It might also be expected that by reaching this segment of the population, interpreters would be reaching influential citizens in communities throughout America. Besides educational and occupational data in support of this contention, there is the finding that users in Rocky Mountain National Park came from families of incomes far out of proportion with the national norm. The family income mode was between \$18,000 and \$29,999, with a remarkable 12 percent of the class 1 backpackers coming from families with annual incomes in excess of \$30,000. These incomes appeared to be higher than those of users in most other wilderness-type areas that have been studied.

A "wildernism-urbanism" attitude test was used to gauge visitors' sensitivities to wilderness values. It was found that in general backcountry users in Rocky Mountain National Park possessed a sensitivity equal to, or slightly higher than, most of the subjects in a Forest Service study of northwest wilderness areas. Most participants were in the score range of 75-84, considered by the scientist who developed the scale, to be a classification for "moderate wildernists". Day hikers and group leaders exhibited less sensitivity to wilderness values than overnight backpackers. Both categories of technical climbers, those making day climbs and those with bivouac permits, scored highest. A slight correlation was found to exist between wilderness value sensitivity and knowledge of low impact camping procedures, but variation among individuals was too great to allow use of the former as a predictive instrument. Similarly, a small, negative correlation was found between wilderness value sensitivity and party size. That is, as a respondent's party size went up, his sensitivity score went down.

The Permit System

The very essence of wilderness recreation is freedom from the constraints of civilization. However, transcending every man's freedom is an obligation to greater societal needs. The Wilderness Act of 1964, and more importantly, the spirit of that law (which can be applied to undesignated wilderness-type areas as well as those legally protected) establish society's mandate for the protection and preservation of wilderness remnants in the United States. Broad National Park Service policies underscore this obligation to protect wilderness values within its jurisdiction. Administratively, these guidelines can be put into practice in many ways, and a mandatory permit system is one of them. However, it should be viewed as a last resort in accomplishing the mission of protecting natural resources and the social values believed to be inherent to a wilderness experience.

Despite the highly restrictive nature of the permit system in Rocky Mountain National Park, a plethora of rules, and issuance procedures which were at best inefficient during peak use periods, an overwhelming majority of visitors agreed that the program was necessary. From the vital standpoint of good public relations, this is significant for future success of the pioneering program. A measure of early success might also be construed from findings that a majority of visitors believed that backcountry use is presently at an optimal level. Most others indicated there was still too much use of the park's wilderness. This would strongly suggest that any increase in the number of campsites in the park's backcountry would be ill advised.

Permits for day hikers was a concept not acceptable to the survey participants and there was little evidence of anti-hiker sentiment among overnight users. Still, trails in some areas, particularly Longs Peak, Loch Vale and areas close to Bear Lake, often contain hundreds of hikers each day--hardly conducive to solitude and certainly compounding the physical impact on these areas. Trail compaction, sanitation and--on Longs Peak--safety conditions warrant close monitoring. A day hiker permit system, established by the U. S. Forest Service for Mt. Whitney, in the summer of 1974, may serve as a prototype for day restrictions in high use areas if at some future date such a drastic measure would become necessary.

The park's permit system was judged "convenient" by slightly more than half the permit applicants. Convenience appears to be highly variable between individuals, with some marking this response even after standing in line for more than one hour. Others complained bitterly about inefficient issuing procedures. There was a cyclic pattern to reports of inconvenience, with Fridays and Saturdays, and Mondays and Tuesdays being days of greatest inconvenience to the visitor. Surprisingly, even 46 percent of the rejectees labeled the system convenient, although some of these people may have done so before discovering they were unable to obtain a permit. Going beyond the data, it was a conclusion of this study, based on observations and visitor statements, that convenience is a weak part of the overall program, and that an advance reservation system and streamlined issuance procedures are part of a humane obligation due the visitor. Where advance reservations were in use, reports from park managers were unanimous in support of the system--both as a convenience to the vacationing

public and as a workable program. Such a system would also facilitate better distribution to sites in remote areas of the park which frequently were underutilized in 1973.

Backcountry users overwhelmingly supported enforcement of regulations, and 92 percent of the users were found to be in compliance with the permit system. Violators were unproportionately local, i.e. resided within 100 miles of the park, and there was reason to believe that a high percentage knowingly were in violation of the permit regulation. Enforcement problems arise not only from visitors' failure to obtain permits, but also from their failure to camp at the sites designated on their permits. Another problem is permittees cancelling their plans without notifying park personnel. The results of violations are often causes of damage to the resource, and always injustices to those visitors who do obtain permits, or those who are turned away because the quota is full. Therefore, it behooves park managers to shore up their enforcement program which during 1973 in Rocky Mountain National Park was deficient in several ways.

When a permit system is coupled with the required use of designated campsites, as it is in Rocky Mountain National Park, it is almost mandatory that the agency supply certain facilities in order to reduce the impact of human use on the area and to protect human health. Survey respondents could see the need for campsite markers, but acceptance of metal fire rings and privies was rather low. The percentage of class 1 permittees in the initial survey who viewed these facilities as necessary for protection and management purposes was 72 percent, 38 percent and 31 percent, respectively. A printer's error on the follow-up questionnaire precluded testing change in attitudes toward the metal fire rings, but with no direct interpretive input, acceptance of markers went up to 82 percent and privies to 47 percent. The markers undoubtedly provided a sense of assurance to the visitor that he was indeed in the right place, as required. The necessity of metal fire rings and privies, however, apparently needs to be explained to the visitor. Only metal fire rings were included in the experimental portion of this study, but as mentioned above, the effects of interpretation are unknown because of a faulty test item on the second questionnaire.

During this study, complaints sometimes surfaced regarding facilities. Several respondents lucidly described examples of poor privy maintenance, which highlights a problem companion to the managerial decision to provide facilities. In regard to this problem, respondents were asked if during their backcountry visit they observed privies being cleaned. Cleaning was accomplished by air lifting removable vaults by helicopter. Only nine percent of the class 1 visitors observed this operation, and approval of the method was nearly unanimous among those who did.

Most other complaints were against horse use on the trails, a subject intentionally not mentioned in the questionnaires or interpretive material. These unsolicited comments comprised the greatest number of marginal remarks, and the most vehement. Very little use of horses is attributable to backcountry permittees (665 stock days in 1972), whereas as many as 40,000 trips may be made by day riders, with 25 percent of these under the provisions of concessionaire operations. The horse-hiker conflict may best be resolved by separate trails and campsites, but this approach is not without drawbacks, especially under limited budgets. Another alternative would be to eliminate horse use, or restrict it to front country trails.

It seems that in a relatively small park, preserved for its natural attributes, the latter would be most consistent with overall park principles. It seems, as several respondents pointed out, somewhat incongruous to prohibit dogs, even on leashes, while at the same time condoning the use of horses.

In spite of crowds, regulations and problems, Rocky Mountain National Park is an area which few choose to forget. In an ultimate evaluation of the park's permit system, visitors were asked if they would return to the backcountry if given the opportunity. An overwhelming 93 percent said "yes"--many penciling notes in the margin about the character and beauty of this park which for decades has had a magnetic effect on countless men and women.

Information Systems

For an agency representing world leadership in preservation and interpretation, it was found that there is much room for improvement in the very basic area of disseminating useful information to an important public--the park's backcountry users. Borrowing a list of four communication objectives set forth in a 1968 report on outdoor recreation by the National Academy of Sciences, it was found that these objectives were not being met. It can be argued that (1) visitors came to the park without being aware of alternative areas available to them, (2) many were not prepared with accurate perceptions of their particular form of recreation, (3) more emphasis has been traditionally placed on instructing visitors to care for themselves rather than how to conserve the site, and (4) at least prior to arriving in the park, and perhaps even once in the park, backcountry visitors were not provided with sufficient interpretive and instructional aids to increase the benefit they received from their experience.

Less than half the respondents in this study believed they had adequate advance information to enable satisfactory planning of their trip. Writing (in the guise of a potential visitor) to 17 national parks having backcountry permit systems, it was found that the quantity of useful information and interpretive material sent to visitors ranged down to zero, and quality was judged to be quite low in most cases. Two significant conclusions must be drawn from these findings. First, while the vast majority of land under the jurisdiction of the National Park Service is of a wilderness nature, interpretive efforts directed at the users of this land were insufficient. Secondly, and more specifically, one of the best opportunities for effective communication was being totally missed in Rocky Mountain and many other national parks--direct mail in response to visitor inquiries. Slow response (or none at all) and highly variable and often low quality material were the results of test mailings to the parks. More importantly, most of the literature simply did not answer the kind of questions which would help the visitor prepare himself for the requirements of a permit system. Similarly, interpretive content was sparse, doing little to help the visitor protect the backcountry environment through low impact camping procedures. Even after arriving at park headquarters, visitors received little or no information about the backcountry or the permit system until it was their turn at the desk to apply for a permit--and this was a major source of frustration and inefficient operation.

Levels of Initial Knowledge

For the entire backcountry user sample of 1,020 individuals, the initial mean score, based on questions related to low impact camping concepts and procedures, was 68.4 out of a possible 100 points. Technical climbers and cross-country campers scored highest; rejectees and day hikers, lowest. The mean score for the principal user group, class 1 permittees, was 69.2. Standard deviation was quite high, being over 10 in all cases and as high as 18.1 for the rejectee group.

The test item relating to bright vs. drab colored equipment for wilderness use ranked lowest of all items, with user classes ranging from zero to 47 percent in their preference for colors which blend into the natural surroundings. Stockpiling unused wood, not taking pets into the backcountry, and type of fireplace were other test items reflecting low knowledge scores. The practice of washing dishes away from streams or lakes instead of in the water was the item revealing the most understanding by visitors.

Initial knowledge scores related positively to the respondents' number of visits to the park's backcountry, age (respondents over 30 generally scored higher), and overall experience. Experience, however, only made a difference when comparing the extremes of first year users and those having 10 or more years of experience. Level of educational attainment closely approached statistical significance. All of these were experience factors, while such things as sex, location of residence, permit class and party size had no bearing on knowledge of low impact camping. Experience is a criterion for some types of permits in some national parks, such as those for hiking primitive trails in the Grand Canyon or climbing Mount McKinley. It would be a radical step to require novice wilderness users to take an exam or study interpretive material before receiving a backcountry use permit. While conditions may someday warrant this, it may now be sufficient, and highly advisable, for park rangers who issue permits to strongly encourage visitors--especially young people and those visiting the park for the first time--to take advantage of appropriate interpretive materials. Based on the low initial knowledge scores obtained by group leaders in this study, and observations of the same, this important group of users should receive special interpretive attention because of the "multiplier" effect inherent to their positions of leadership.

The Effects of Interpretation

Through experimentation conducted in this study, it was found that interpretation improved knowledge of low impact camping, and actually raised the mean score by as much as 15.71 points (out of 100). Changes were uniform within each treatment group regardless of all background factors considered except a person's total years of backpacking experience. In that case, changes were significantly greater for individuals in their first year of backpacking (+10.97) than for those with ten or more years (+4.38). Not all the change could be attributed to interpretive effectiveness, however, because novices within the control group also exhibited remarkable knowledge gains.

None of the interpretive methods tested in this study caused a

statistically significant change in attitudes toward necessity of the permit system, permits for day hikers, or the necessity of law enforcement. Some methods came closer to changes significant at the 95 percent level of confidence than others, but 91.5 was the best achieved. The latter was associated with individuals who were exposed to both the slide exhibit and an interpretive sign at trailhead.

When considering the effects of interpretation on knowledge of low impact camping, some techniques were definitely more effective for reaching and/or influencing backcountry users than were others.

Illustrated newspaper feature articles and a half hour color television program aired on a public service basis reached an audience numbering over one half million readers or viewers in Colorado. Nonetheless, so few backcountry users in the survey came in contact with the messages presented through these mass media that it may be considered negligible. Even if these had been national media, it represents a classic example of the poor results from the "shotgun approach" of disseminating information. There is no doubt that many people were reached with the interpretive messages and perhaps were even influenced by them, but these people did not comprise the target audience--those using the backcountry of Rocky Mountain National Park.

To zero in on park users, brochures were handed to some applicants, and others were encouraged to view an 8-1/2 minute slide exhibit. In this case, the user public was definitely reached, and in known numbers. However, whether because it was not read, or because it was a medium less conducive to retention, the brochure had an effect on knowledge change not significantly different, statistically, than no interpretive treatment at all. Of all treatments tested, only the slide exhibit--alone, coupled with a trailhead sign, or in combination with the brochure--significantly improved knowledge of low impact camping concepts and procedures. In these cases, a mean difference between pre- and post-treatment scores resulted between 13.70 and 15.71. The change in score for a control group, attributed to extraneous factors, was 6.54.

Individuals observing only the interpretive trailhead sign showed a mean increase of only 3.54 in their scores, possibly indicating a negative effect on their attitudes which in turn may have made them more steadfast in their questionnaire responses.

Conclusions

A one-paragraph conclusion to this evaluative study could be stated as follows: In brief, it can be said that the backcountry use permit system in Rocky Mountain National Park is already highly successful from the standpoint of visitor acceptance. It is not without flaws, but as a pioneering effort at wilderness protection it is evolving toward an efficient and fair method of distributing visitor numbers and controlling use. To date, interpretation has not been used to aid backcountry management to the extent needed, and some excellent opportunities exist for using this educational tool toward the goal of preserving wilderness in a state of high physical and social quality.

A list of 40 recommendations were an outgrowth of this study. They were presented to the National Park Service to help the agency accomplish its dual missions of protecting wilderness quality while at the same time providing outstanding opportunities for growing numbers of wilderness recreationists.

Cooperators

Dr. Douglas L. Gilbert, Assistant Dean, College of Forestry and Natural Resources, Colorado State University

Dr. Perry J. Brown, Associate Professor, Department of Recreation Resources, Colorado State University

Dr. Howard D. Bruner, Professor, Department of Education, Colorado State University

Mr. David B. Butts, Resource Management Specialist, U. S. Department of the Interior, National Park Service

NATURAL RESOURCES MANAGEMENT PLAN - MOUNT MCKINLEY
Fiscal Years 1976-1980
PROJECT PROGRAMMING SHEET

App. No.	Project Name and Number	FY 1976		FY 1977		FY 1978		FY 1979		FY 1980		PRIORITY	Park Base Support		Regional Office Professional Support (Research)	Remarks
		Amount	MY	Amount	MY	Amount	MY	Amount	MY	Amount	MY		M&P	M&R	M&P	
1.	Assessment of the effects of human activities on Wonder L. MOMC-N-18a	30,963	1.25									I			30,963	
2.	Geology of MOMC and proposed extensions MOMC-N-18a			75,400	3.7	75,400	3.7	75,400	3.7	75,400	3.7	B				
3.	Impact of off-road use on the natural & aesthetic resources MOMC-N-19a	30,620	2.2	30,620	2.2	45,000	1.0	45,000	1.0	45,000	1.0	I			30,620	
4.	Impact of Denali Road on wildlife behavior no. & distribution MOMC-N-21	37,518	2.3	37,518	2.3	14,010	.3	14,010	.3	14,010	.3	A			37,518	
5.	Cooperative Ecological Study of large mammals MOMC-N-22	11,140	.1	11,140	.1	11,140	.1	11,140	.1	11,140	.1	I			11,140	
6.	Grizzly bear-human interaction MOMC-N-23	13,110	.2	6,554	.1	6,554	.1	6,554	.1	6,554	.1	I			13,110	
7.	characteristics of Socio-ecological of existing transportation and campground systems MOMC-N-24			355,100	12.5	360,300	12.5	156,300	4.5			I				
8.	Natural Resource Atlas MOMC-N-25	300,100	5.	311,100	11.	250,800	24.7	582,000	20.9	451,200	16.2	I			300,100	
9.	Sound, air & water quality benchmark study MOMC-N-26	86,650	3.33	21,700	.8	21,700	.8	21,700	.8	21,700	.8	B			86,650	
0.	Survey of archeological resources 10-238			10,000	0.4							C				

APP. NO.	Project Name and Number	FY 1976		FY 1977		FY 1978		FY 1979		FY 1980		Priority	Park Base Support		Regional Office Professional Support (Research) M&P	Remarks
		Amount	MY	Amount	MY	Amount	MY	Amount	MY	Amount	MY		M&P	M&R		
11.	Survey of Historic Resources 10-236			7,500	0.3							I				
12.	Evaluation of animal species of low density & low production MOMC-N-27			11,250	1.0	11,250	1.0					A				
13.	Socio-ecological characteristics of proposed transportation routes and systems and other developments and their impact on the proposed park extensions. MOMC-N-28	395,000	11.9	421,500	12.3							I			395,000	
	TOTALS	905,101	26.28	1,299,382	36.8	796,154	44.2	912,104	31.4	625,004	22.2				905,101	

Priority: I - Imperative
A - Very Important
B - Important
C - Less important (but still needs doing)