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LITTERBAGS: AN EVALUATION OF THEIR USE

by

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ABSTRACT

A study conducted in Mount Rainier National Park indicates that only a very small proportion of the litterbags handed out end up in park trash cans. Furthermore, most of the remaining litterbags are carried away unused from the Park. Of the two types of litterbags tested, plastic bags were used more often than paper bags.

Portions of this study were conducted under cooperative agreement between the Forest Service and the College of Forest Resources, University of Washington.

Keywords: Litter (public places).

Litterbags are commonly provided in recreation areas with the assumptions that they will be used for litter disposal and that, through their use, the amount of litter on the ground will decrease.

A test of the first assumption, that people use litterbags when they are provided, was conducted over a 3-day period during July 1971 in Mount Rainier National Park.[1/] The objectives were to determine: (1) if the litterbags routinely handed out at park entrances are used by visitors; and (2) if the type of litterbag, plastic or paper, influences their use.

METHOD

During the study period, two types of litterbags were handed out at the National Park entrances. Their use was traced by checking a sample of garbage cans in the Park and by briefly questioning visitors at exits when they left.

For three July weekdays, a paper or a plastic litterbag was alternately handed out to a total of 2,821 cars at the Nisqually entrance, on the west side of Mount Rainier National Park, and the Stevens Canyon entrance, on the east. The Sunrise entrance on the opposite side of the Park was not included, and visitors entering through that gate were not given a litterbag unless they specifically requested one. Litterbags used were the Johnny Horizon plastic litterbags, which have a hole for hanging from car windows or dash, and the paper lunchbag type commonly used in National Parks.

To help identify the litterbags included in the study, they were all marked inconspicuously. In addition, no litterbags were given out the days preceding and following the study.

To determine the number of litterbags disposed of in the National Park, a 30-percent random sample of the 260 public trash cans along roads and in parking areas was selected. The cans in the sample were so marked that regular garbage collection crews would not empty them. Garbage accumulating in these cans was collected on each of 3 days, beginning on the second day of the study and ending on the day following the last day that litterbags were given out. When marked litterbags were found, the type of bag, plastic or paper, was recorded. Observers also indicated whether the bag had been used.

To account for bags not disposed of in the Park, all visitors were stopped at the exits to determine: (1) which day they had entered the Park, (2) which gate they had entered, (3) which type of litterbag

[1] The generous cooperation of Mr. John Townsley, Superintendent of Mount Rainier National Park, and several of his staff is gratefully acknowledged. Several members from the nearby Youth Conservation Corps camp also played a major role in making this experiment successful.

they had received, (4) if they still had the bag, and (5) if the litterbag was being used. The gates were manned from 8 a.m. to 5 p.m. by boys and girls from the nearby Youth Conservation Corps camp. Prior to the beginning of the study, the procedures for asking questions designed to measure the above were explained in detail to the interviewers.

An essentially "closed system" was established with the above procedures, so that it was possible to account for almost all the litterbags handed out with relatively little error. However, three potential sources of error should be noted. First, the projected total number of bags to be found in trash cans was estimated from a sample and therefore subject to the small sampling error associated with a 30-percent random sample of a finite population. Second, some visitors left the Park after the entrance stations were closed, but this was not viewed as serious since officials estimated that over 90 percent of the visitors generally leave before closing time. Third, people who entered the Park during the study period, but left after the study was over, were not interviewed. Again, this was not a serious source of error, since officials report that few visitors usually remain in the Park for more than a single day and night.

RESULTS

The results from this study are shown in table 1. During the study 2,821 litterbags were handed out--1,410 paper and 1,411 plastic.

A total of only 29 litterbags were found in the sample of trash cans, representing a projected total for all trash cans of 94 bags of the 2,821 handed out (3.3 percent).[2] Of the 29 litterbags found, only one was plastic. Of the 28 paper bags found, 25 (89.3 percent) had been used.

A total of 2,382 cars were stopped as they left the Park, and 2,290 (96.1 percent) still had their litterbags with them. Of these, 48.6 percent were paper and 51.4 percent were plastic. When it could be determined, it was found that, of the bags in the cars, 35.5 percent of the paper bags and 48.0 percent of the plastic bags had been used.

The disposition of approximately 437[3] (15.5 percent) of all litterbags handed out could not be ascertained. It is likely, however, that they were in the 439 cars which passed through the gates when the interviewers were not on duty.

DISCUSSION

The results of this study suggest, first, that the majority of the litterbags provided at park entrances

[2] Confidence limits for the projection at the 95-percent level of probability were 68 and 120.

[3] The figure 437 is based on the total number of bags handed out, minus the total found in cars, plus the projected number to be found in all trash cans, i.e., 2,821 – (2,290 + 94) = 437.

Table 1.--*Disposition of litterbags by type*

Litterbags	Paper		Plastic	
	Number	*Percent*	*Number*	*Percent*
Number handed out	1,410	50.0	1,411	50.0
Found in trash cans:[1/] (sample)				
Used	25 (81)	86.2	1 (3)	3.2
Empty	3 (10)	10.6	0 (0)	--
Total	28 (91)	96.8	1 (3)	3.2
Found in cars:[2/]				
Used	380	35.5	552	48.0
Empty	691	64.5	599	52.0
Total[3/]	1,071	100.0	1,151	100.0

[1/] Projected numbers are shown in parentheses following actual numbers.

[2/] 2,382 cars were stopped as they left the Park.

[3/] The total excludes 41 paper and 27 plastic bags for which it could not be determined whether used.

are not likely to be used, at least up until the time the visitors leave the Park. Whether those bags which leave the Park empty are ever used is not known.

Second, of the few bags discarded in the Park, 96.8 percent were paper. At first glance, it may appear that paper litterbags are the type most likely to be used. But additional evidence suggests otherwise. Of the paper litterbags found in trash cans, 10.6 percent were thrown away empty. In addition, of the litterbags remaining in cars leaving the Park, a greater percentage of the plastic bags (48.0 percent) were being used than of the paper bags (35.5 percent). *Thus, plastic bags were kept longer and were more often used than paper bags, even though they were less likely to be found in park trash cans.* It appears, therefore, that plastic litterbags stimulate use more effectively than paper bags. This is an important finding but should not overshadow the fact that well over half the litterbags handed out were unused when taken from the Park.

Results from this study are highlighted by findings from two other studies of anti-litter behavior. Evidence from these studies also suggests that not only are litterbags

unlikely to be used when provided, but they may in fact have little or no effect on the level of litter already on the ground.

The provision of litterbags in a theater reduced the amount of litter normally found on the floor from about 80 to 70 percent of the total litter in the theater.[4] It is interesting to note, however, that less than half the children who were given litterbags actually used them. In fact, many of the litterbags ended up on the floor as additional litter.

In a study of four widely dispersed car camping locations, litterbags were given to campers for their use, with the bags to be left for the Ranger to pick up.[5] It was found that in the absence of any incentive to use the litterbags litter levels remained about the same. Only "fresh" garbage was deposited in the litterbags. No *old* cans, bottles, or paper were found, although such "litter" was scattered around each area. It seems, therefore, that although litterbags may be used to dispose of waste material which otherwise might end up on the ground (garbage), they do not by themselves encourage other anti-litter behavior, i.e., litter pickup.

SUMMARY AND CONCLUSIONS

The results of this and related studies suggest several things about the use of litterbags. It appears that most litterbags provided at Parks such as Mount Rainier are not likely to be used. Only 3 percent of all bags distributed were found in park garbage cans, and over half the bags handed out were taken from the Park, unused. Plastic litterbags were more likely to be retained and used than the paper bags. Furthermore, when litterbags were used in a dispersed car camping environment, they seemed to have only a small impact on litter levels as they were used primarily for "garbage disposal" and not litter pickup.

Provision of litterbags is an important ingredient in a successful litter control program and provides a means of disposing of refuse as it is created. However, litterbags alone do not solve the problem, since they do not stimulate the picking up of existing litter.

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[4] Robert L. Burgess, Roger N. Clark, and John C. Hendee. 1971. An experimental analysis of anti-litter procedures. J. Appl. Behav. Anal. 4: 71-75, illus.

[5] Roger N. Clark, John C. Hendee, and Robert L. Burgess. The experimental control of littering Accepted for publication in the Winter 1972 issue of The Journal of Environmental Education.

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