

NATIONAL PARK SERVICE

RESEARCH/RESOURCES MANAGEMENT REPORT SER - 75

**Evaluating Communications with Visitors
to Great Smoky Mountains National Park**



United States Department of the Interior

**National Park Service
Southeast Region**

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EVALUATING COMMUNICATIONS WITH VISITORS
TO GREAT SMOKY MOUNTAINS NATIONAL PARK

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NATIONAL PARK SERVICE - Southeast Region

Research/Resources Management Report SER-75

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December 1984

**UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE**



Peine, John D., Craig A. Walker, Paul H. Motts and William E. Hammitt.
1984. Evaluating Communications with Visitors to Great Smoky
Mountains National Park. U. S. Department of the Interior,
National Park Service, Research/Resources Management Report
SER-75. 45 pp.

EXECUTIVE SUMMARY

The study reported here spanned two years and was conducted at Great Smoky Mountains National Park in Tennessee and North Carolina. First, managers and personnel directly in contact with the public were interviewed concerning their opinion on which priority messages should be conveyed and how effectively they are conveyed. Park visitors, in turn, were either interviewed or unobtrusively observed as to their information preferences and their awareness and utilization of the following park media: park newspaper, short-range radio stations, and park bulletin boards. Interviewing was conducted at Sugarlands Visitor Center for the bulletin board, at the Noah "Bud" Ogle farm for the short-range radio stations, and at the three major exit points from the park (Gatlinburg, Cherokee, and Townsend) for the General Media questionnaire. The General Media questionnaire covered all three media mentioned above.

For park managers, priority messages focused on resources protection and health and safety. Visitor priorities focused on how to enjoy the park. A literature search concerning principles of media application was also conducted. Two other elements of the study not reported here included use of the touch screen computer in a visitor center and communications at the backcountry permit registration stations.

The park newspaper is the primary vehicle available to managers to convey detailed information to visitors. No other medium generated at the park level has as great a potential to affect behavior patterns. It is the primary voice of the Superintendent in the park. Only 39 percent of the visitors queried in the General Media questionnaire were aware that a newspaper exists. Only 11 percent of them used it. Even 40 percent of those who stopped at a visitor center where is the paper is distributed were unaware of its existence. However, those who stopped at a visitor center were more likely to be aware of the paper than those who did not stop. Campers and those who stayed longer in the park were more likely to be aware of the newspaper than were their counterparts. Campers were more likely than noncampers to use the newspaper, be aware that an interpretive program schedule is included in it, and to attend programs based on what they read. Only 3 percent of the visitors surveyed attended an interpretive program after reading about it in the paper, but 48 percent of those who read the paper and knew it contained an interpretive program attended one based on reading about it. Similarly, 42 percent of those who read the front page article did something based on what they had read. These findings suggest that the paper can affect behavior, once read by the visitor. It was concluded that the newspaper needed better marketing and improved layout and design.

The radio system has the potential to reach a greater percentage of park visitors than any other medium available to park management. The radio provides a means to penetrate the sanctity of the visitor's private environment where most of the park visit is likely to take place: inside the private vehicle. Although 75 percent of the respondents indicated they were aware of the radio stations, only 26 percent of them had listened to it. Several groups were more likely to be aware of the radio stations than their counterparts: those who stopped at visitor centers, stayed longer in the park, and were campers. Stations at the two main entry points to the park (Sugarlands and Oconaluftee) received the most use. Of those questioned, 72 percent were unaware there were different radio messages throughout the park. Those who listened to the radio were more likely to realize there were different messages than were nonlisteners. The visitors who wanted most to hear interpretive messages from the radio accounted for 61 percent of those questioned. Only 6 percent of the total surveyed decided to do something based on a radio message heard, but this represented 23 percent of those who

had listened to a radio message. This is another indication that the radio can affect behavior once it has gained the attention of the visitor.

The radio message was changed at one station in mid-summer to see if the application of principles of radio advertising would increase retention of the message and therefore have a greater influence on behavior. The retention of the message was significantly greater, but the test for the effect on behavior was inconclusive. It is suggested that the radio system needs better marketing, with the messages shortened, simplified, and made more interesting.

The often neglected bulletin board can be a powerful communications tool. More visitors are likely to look at bulletin boards than to stop at a visitor center or listen to a radio message. Locations are more widely distributed throughout the park. Bulletin boards are usable 24 hours a day; visitors can potentially communicate with each other via a message board.

Two-thirds of the visitors were aware that the park had bulletin boards at various places. That represented more awareness than for the newspaper (39 percent) but less than for the radio (75 percent). Campers, males, and people stopping at the visitor centers were more likely to be aware of the bulletin boards than their counterparts. First-time visitors were less likely to be aware of the bulletin boards. People who were aware of the bulletin boards stayed longer in the park. More people looked at the bulletin boards (54 percent) than listened to the radio (26 percent) or read the newspaper (11 percent). The most popular boards were those at Sugarlands and Cades Cove. Campers and first-time visitors are more likely than their counterparts to look at the bulletin boards. Bulletin board users stay longer than nonusers.

Of the respondents who looked at park bulletin boards, 22 percent indicated that they had used some of the information. This proportion of use compares to 11 percent for the newspaper and 6 percent for the users of the radio stations. The most frequently mentioned items were the schedule of naturalist programs (27 percent), road maps and directions (14 percent), and bear information (14 percent). Observation and interviews with users of the boards clearly demonstrated that just posting something on the board has little relationship to whether or not it has been effectively communicated.

Design effects were tested by changing the board layout in mid-summer. The prechange board did not have any particular arrangement. There were no flow patterns. Articles were helter-skelter and some were in disrepair. A contrasting style of design and order was then applied. The change resulted in people spending less time at the board but finding more new information beyond that for which they were looking. The new design did not attract a significantly greater number of people to the board. There was also no difference in response concerning the need to return to the visitor center after using the board. The communicative power of the cartoon to depict complex topics was clearly demonstrated. In general, the major features of the postchange board were much more likely to be retained than were the items posted on the prechange board. It was concluded that the communications potential of bulletin boards would be improved via better design techniques.

ACKNOWLEDGMENTS

The Great Smoky Mountains Natural History Association provided salary moneys for Paul Motts and Craig Walker during the months of April through September of 1983. Without this support, the project which was done in conjunction with resources of Uplands Field Research Laboratory would not have been possible. Mr. Stanley Canter, Chief of the Division of Interpretation at Great Smoky Mountains National Park, provided counsel throughout the project. Mark MacKenzie provided invaluable assistance with computer analysis of data. Jan Quarles collected the data for that portion of the project completed in 1982. Mike Provost assisted in data collection for that portion completed in 1983.

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THE IMPORTANCE OF EFFECTIVE COMMUNICATIONS

Why should a national park manager be vitally interested in communications with visitors? Because it is the primary means of managing visitor behavior short of implementing use restrictions or altering the infrastructure of facilities available. Effective communications between manager and visitor enhances every phase of park operations, from maintenance and law enforcement to interpretation and resources management. Extensive litter is not necessarily inevitable. Increased law enforcement patrol is not the only effective response to vandalism. Poor attendance at interpretive programs may not be due to lack of interest. The public need not automatically resist efforts to control exotic animals. Effective communications can be an alternative in addressing each of these park management problems.

It is important for park management to develop an overall communications strategy: understand the behavior of target audiences and decide how various media can best contribute to the efficient conveyance of a clear set of priority messages. This study focused on how to best use the variety of media commonly employed to communicate with visitors in the national parks.

STUDY DESIGN AND METHODS

The study reported here was conducted at Great Smoky Mountains National Park (GRSM) in Tennessee and North Carolina. Its overall goal was to determine the extent to which visitors receive, retain, and use messages sent by park management--in short, to evaluate the effectiveness of selected media. Study topics were limited to those media applications generated at the park level. Specific objectives were as follows:

1. Determine the message content most important to park managers, public contact employees, and visitors.
2. Determine readability, subject content, visitor awareness, and use of the park newspaper.
3. Determine subject content, visitor awareness, message retention, and visitor use of the park radio messages.
4. Determine subject content, visitor awareness, message retention, and use of the bulletin board at visitor centers.

The study spanned two years. In 1982, park managers and personnel directly in contact with the public were interviewed concerning their opinions on the priority of messages to be conveyed to visitors and how effectively they felt they are conveyed. In 1983, park visitors were either interviewed or unobtrusively observed as to their information preferences and their awareness and use of selected park media. As depicted in Table A-1 in the appendix, a total of eight survey instruments was used. Table A-2 in the appendix gives the number of sampling periods by date.

Data concerning park visitors were gathered in the summer months of 1983. Media selected for study were the park newspaper, short range AM radio stations, and the bulletin board outside Sugarlands Visitor Center. A General Media questionnaire covering all media was administered at the three major exit points of the park--Sugarlands, Oconaluftee, and Townsend. The short range radio station message on the Cherokee Orchard Road in the park was surveyed onsite, as was the bulletin board at Sugarlands Visitor Center. Users of the bulletin board were both interviewed

and/or unobtrusively observed. The radio message and bulletin board designs were changed in mid-summer to test the effect of applying media-specific principles to them.

For the General Media questionnaire, roadside interviews were conducted with visitors exiting the park. Visitors were flagged down and interviewed in their automobiles. Interviews took approximately 5 to 7 minutes. As soon as one interview was completed, the next available car was flagged down and the process repeated. Sampling was conducted in proportion to the frequency of use of the three major exit points of GRSM. Proportioning was done according to data reported in the 1975 ARMS survey (Amusement Recreation Marketing Services 1975). Sampling periods were randomly assigned to days throughout the summer.

Visitors in the vicinity of Cherokee Orchard short-range radio station were queried using the same methodology as was used for the General Media questionnaire. These interviews generally took about 5 minutes or less to complete.

Personal interviews and unobtrusive observation were both used to sample users of the bulletin board outside Sugarlands Visitor Center. For unobtrusive observation, an observer was stationed approximately 30 feet from the bulletin board. This distance provided the opportunity to be able to see the board well and yet remain unobtrusive. The first visitor to approach the board at the start of the 3-hour observation period was observed until he/she left the board. The next person to approach the board became the next subject for observation, beginning the process again. Visitors leaving the bulletin board on their way to the parking lot were approached by a researcher for the personal interviews. The interviewer was stationed on the sidewalk leading to the parking lot. Interviewing and observing took place simultaneously; however, an interviewee may or may not have been observed and vice versa.

After the interview was completed, the next available subject was approached to start the process again. Interviews took approximately 5 minutes to complete. Randomly assigned time periods of 3 hours in duration were employed for both the interview and observations. Unlike the General Media questionnaire, no proportioning was done, since sampling was not affected by location. The nonresponse rate was negligible for all instruments in the study.

A companion study of visitors to the backcountry of GRSM was also conducted during the summer of 1983. Use patterns were recorded, along with attitudes, concerning management policy, equipment carried, and awareness of health hazards. This study, reported in a separate document, provides valuable insight into the effectiveness of communication with backcountry users.

RESULTS

Overview of Messages

Managers' Priorities. Managers' perception of communication effectiveness is important to assess. Where do employees see strengths and weaknesses? Do perceptions vary much by job function? Table 1 displays the results of a 1982 employee survey measuring perceived effectiveness for specific subject areas. The range of responses varied markedly. On the average, respondents considered that only 4 of the 18 subjects listed were effectively communicated to park visitors, with the responses ranging from strongly disagree to strongly agree.

Unfortunately, air pollution, the most serious threat to the park, is perceived to be the most poorly conveyed management issue. Opinion concerning the effectiveness of communicating the hog management issue was mixed.

The data were also compiled for top managers versus employees dealing daily with visitors. These results are displayed in the two right-hand columns of Table 1. This dichotomy showed less favorable perception of effectiveness by public contact employees concerning threats to the park.

Park employees were also asked their opinions concerning the effectiveness of various media applied in the park. Results are displayed in Table 2. Most of the media applications were considered to be effectively applied. Press releases, meetings, and public involvement were the least supported.

Employees also indicated which message they felt was most important to convey to the public. The majority of the responses related to either resource protection or health and safety issues. Typical responses are as follows: "a healthy respect for wildlife, nature, and historical structures" and "this park is yours too; take care of it accordingly," and "convey a better understanding of nature in its broadest forms." No one mentioned that the primary message should be how to enjoy the park.

Visitor Priorities. Visitors exiting the park in 1983 were asked to indicate the kind of information most important to them during their visit. It was assumed that this perspective would also reflect their receptivity to the messages conveyed. Responses are displayed in Table 3. People want to know what to do in the park. General orientation and information on the pursuit of specific activities account for 61 percent of the responses. These results are consistent with the findings of a study done in Rocky Mountain National Park (Ormrod 1984). The most popular response was: "How to see the park in a limited amount of time." The category "park history" was mentioned more often than "schedule of nature programs" or "natural history interpretation." Cultural history is perhaps more important to visitors than natural history.

Less than one percent of park visitors expressed interest in management issues as a priority point of information. This was on a par with knowing where the public telephones were located. By contrast, park employees placed management issues very high on their list of priority messages.

Visitors and managers have different perceptions of what messages are important. Employees interacting daily with the public have different perspectives on how well park messages are being received than does top management. The most critical need is to relate park orientation information succinctly to first-time visitors with limited time to visit the park.

The Park Newspaper

Awareness by Visitors. Possibly the most important finding of the study was that only 39 percent of the park visitors were aware that the park newspaper exists. This situation greatly curtails the potential of the paper to influence visitor behavior. A well designed newspaper must also be well marketed. GRSM is at a distinct advantage since there is no fee collection at the points of entry, thus no chance to physically thrust a copy into the visitors hands. The park's visitor centers are the primary distribution points for the newspaper.

As depicted in Table 4, persons stopping at the visitor center are significantly more likely to be aware of the newspaper. These data clearly point out the limitations of present marketing strategy. On the other hand, 40 percent of the visitor center patrons were unaware that the newspaper was available. It seemed that just displaying them at the desk may have been too subtle a marketing strategy.

Table 1. GRSM employee perception of message effectiveness.

"Great Smoky Mountains National Park does an effective job of telling visitors about..."

Subject Category	Effectiveness Category Mean 1/	Standard Deviation	% Respondents by communcations effectiveness categories ^{2/}		% That agree by job ^{3/}	
			SA, A	DK, D, SD	Top Mgmt	Public Contact
Bears	4.3	.85	91	9	80	93
Backcountry Use	4.2	.78	91	9	90	91
Interpretive Program	4.1	.97	91	9	90	91
Cultural History	4.0	.91	88	12	90	88
Drinking Water	3.9	.93	87	13	70	90
Natural Features	3.9	.92	84	16	90	83
Traffic Safety	3.6	1.03	61	39	60	61
Weather	3.5	1.1	69	31	50	72
Brook Trout	3.2	1.05	58	42	50	60
European Wild Boar	3.2	1.07	55	45	60	54
Waterfalls	3.2	1.16	57	43	60	57
Fire	3.1	1.07	52	48	50	52
Snakes	2.9	1.05	46	54	40	47
Streams	2.8	1.05	40	60	40	40
Endangered Species	2.8	1.07	37	63	40	37
Balsam Wooly Aphid	2.7	1.04	27	73	40	25
Acid Rain	2.4	.99	18	82	30	16
Air Quality	2.3	.94	15	85	20	14

^{1/} Mean responses which were coded as follows:

- ^{2/}
- 1 = strongly disagree (SD)
 - 2 = disagree (D)
 - 3 = don't know (DK)
 - 4 = agree (A)
 - 5 = strongly agree (SA)

^{3/} Agree = Strongly agree + agree categories

Source: 1982 messages to convey by management questionnaire

Table 2. GRSM employee perception of media effectiveness.

The park communicates effectively through the following means:

Media Applications	Effectiveness category response mean ^{1/}	Std. deviation	% Respondents by effectiveness category ^{2/}		% That agree by job ^{3/}	
			SA,A	DK,D,SD	Top Management.	Public Contact
Evening programs	4.1	.66	91	9	80	93
Visitor center	4.0	.84	88	12	70	91
Newspaper	3.9	.92	86	14	60	91
Brochures	3.8	.99	78	22	70	80
Wayside exhibits	3.7	.91	72	28	60	74
Park map	3.7	1.03	83	17	78	83
Interpreters	3.6	.80	73	27	75	73
Rangers	3.5	.92	73	27	62	75
Park radio stations	3.4	1.05	62	38	50	65
Off-site talks	3.4	.81	51	49	50	51
Press releases	3.2	1.03	43	57	62	40
Meetings with groups	3.1	.80	36	64	75	30
Public involvement	2.8	.94	28	72	62	40

^{1/}Mean of responses which were coded as follows:

^{2/}1 = strongly disagree (SD)

2 = disagree (D)

3 = don't know (DK)

4 = agree (A)

5 = strongly agree (SA)

^{3/}Agree = Strongly agree + agree categories

Source: 1982 messages to convey by management questionnaire

Table 3. Types of information most important to the GRSM visitor.

Information categories	Degree of Importance		
	Most Important n=667	2nd Most Important n=658 % of Respondents ^{1/}	3rd Most Important n=652
1. Things to do/general orientation			
How to see park in limited time	14.2	9.1	9.1
Places to see	9.3	7.8	6.9
Auto touring	4.4	6.1	6.1
Backcountry information	<u>1.4</u>	<u>4.4</u>	<u>4.8</u>
Sub-total	29.25	27.4	26.9
2. Activities			
Camping	9.4	8.7	5.2
Hiking	6.6	7.0	5.1
Fishing	3.3	4.0	4.4
Picnic	1.6	2.3	2.4
Whitewater canoe	1.6	2.0	2.4
Horseback riding	1.4	1.5	2.0
Bicycling	<u>1.8</u>	<u>.8</u>	<u>1.1</u>
Sub-total	25.7	26.3	23.4
3. Interpretation			
Park History	6.0	4.6	9.1
Natural history interpretation	4.8	4.7	2.9
Daily events	3.2	5.3	5.4
Schedule of nature programs	2.4	3.6	3.1
Management issues	<u>0.4</u>	<u>0</u>	<u>0.3</u>
Sub-total	16.8	18.2	20.8
4. Personal Safety			
Emergency Services	7.2	5.5	3.8
Health and Safety	6.9	4.0	3.2
Weather	<u>2.0</u>	<u>3.3</u>	<u>3.7</u>
Sub-total	16.1	12.8	10.7
5. Specific park facilities			
Lodging	6.6	5.6	5.4
Restrooms	1.2	3.3	5.4
Phones	<u>0</u>	<u>.5</u>	<u>.8</u>
Sub-total	7.8	9.4	11.6

^{1/}Percentages may not equal 100% due to rounding.

Source: 1983 General media survey

Campers were much more aware of the newspaper than noncampers. Similarly, people spending more time in the park were much more likely to be aware of the park newspaper. No significant relationship occurred between awareness of the newspaper and age, sex, or number of visits to the park. It is surprising that a greater number of visits does not result in greater awareness of the newspaper.

Table 4. Relationship between visitors' stopping at a GRSM visitor center and their awareness of the GRSM newspaper.

Question:	Did you stop at a visitor center? (number of respondents)	
	YES	NO
YES	194	70
Are you aware of the park's newspaper?	NO	129
		288

N = 681 Chi-square = 117.380 DF = 1 Prob = 0.001

Source: 1983 General Media questionnaire

Use by Visitors. A series of questions was directed to visitors via the General Media questionnaire to ascertain their use of the park newspaper. Results are displayed in Tables 5 and 6. The second column in Table 5 reveals that 11 percent of the respondents had used the park newspaper. Only 3 percent of the respondents attended an interpretive program based on the schedule in the paper. The lead articles, which occupied 100 percent of the most valuable attention-getting space in the paper, affected behavior in only 2 percent of those who responded to the questionnaire.

On the other hand, the fourth column in Table 5 suggests that once you have the public's attention, the paper can affect behavior. For instance, 48 percent of the visitors who knew the paper contained an interpretive program schedule had decided to attend a program based on what they had read. Similarly, 42 percent of the people who read the front page article did something during their visit based on what they had read. Management issues might be appropriate for the paper, since 75 percent of the people who were aware of the paper indicated they would probably use it after leaving the park.

Campers were more likely than noncampers to use the newspaper, be aware that an interpretive schedule is included in it, and attend programs based on what they read. Likewise, people spending more time in the park are much more likely to use the paper and to attend interpretive programs after reading about them in the paper. No significant relationships occurred between newspaper use and age, sex, or number of visits to the park.

Visitors sampled via the General Media questionnaire were asked if they had used the newspaper. The users were then asked which articles they had read. Results of this question are displayed in Table 6. The distribution of articles read was quite uniform for the small sample taken at the beginning of the season,

Table 5. Use of park newspaper by GRSM visitors.

Question	Number of Positive Responses	% Positive response from total survey n = 682	Previous question	% Positive response in relation to a previous question ^{1/}
A. Are you aware of Park newspaper?	265	39	N/A	N/A
B. Did you pick one up?	165	24	A	62
C. Have you used it yet?	77	11	B	47
D. Will you use it after you leave the Park?	124	19	B	75
E. Did you know the paper lists Nature programs?	50	7	C	65
F. Did you attend a nature program based on newspaper?	24	3	E	48
G. Did you read the feature article?	38	6	C	49
H. Did you do something based on the article?	16	2	G	42

^{1/}For example, of the 265 respondents aware of the park newspaper (question A), 165, or 62%, had picked one up (question B).

Source: 1983 General Media questionnaire

Table 6. Newspaper articles read by GRSM visitors.

1983 Spring Edition:			1983 Summer Edition:		
<u>Article</u>	<u>% of Users n = 19</u>	<u>Page #</u>	<u>Article</u>	<u>% of Users n = 58</u>	<u>Page #</u>
Thru a camera lens	32	1	Schedule of Interp. events	72	2-3
Spring delight	26	1	Just listen	50	1
Self-guided nature trails	26	2	Barns	38	1
Four-footed friends	26	2	On foot	21	4
Radio Smokies 1610	21	1	By car	19	4
Schedule of Interp. events	21	3	Horseback riding	17	4
Campground store	21	4	Medical services	16	4
Horseback riding	21	4	Campground store	14	4
Planting by the signs	16	2	Notice to visitors	14	4
Publishing information	16	2	On a bike	14	4
Reservation camping	16	3	Worship service	12	4
Study in the Smokies	16	3	Accomodations	12	4
Accommodations	16	4	Sightseeing/Tour	12	4
On foot	16	4	Water activities	10	4
On a bike	16	4	Emergency message	10	4
Emergency message	16	4	Lost and found	10	4
By car	16	4	Publishing info.	10	4
Water activities	16	4			
Worship service	16	4			
Sightseeing	16	4			
Med.-Service and First Aid	16	4			
Schedule of events	11	2			
Facilities blossom	11	2			
Spring Wildflower Pilgrimage	11	3			
Don't pick blossoms	11	3			

Source: 1983 General Media questionnaire

while the spring edition was still in use. Data for the summer edition show the highest use made of the schedule of interpretive events. The front page articles were the next most popular, probably due to their prominent position. Health and safety articles got very little attention.

In comparing the summer newspaper content displayed in Table 6 with information preferences expressed by managers and visitors as reported in the previous section, several major omissions are evident. The newspaper did not address the highest priority messages desired by management or visitors. Managers keyed on the values of a wilderness park and how to minimize adverse impacts during the visitor experience. Visitors wanted to know how to enjoy the park in a limited amount of time or how to pursue specific activities. Camping and fishing, the first and third most frequently mentioned activity information needs, for instance, were not at all mentioned in the summer paper of 1983. These subjects are addressed in separate brochures. The issue then become whether or not to use space in the paper to alert visitors as to the availability of these brochures. Again, what are the priority messages of managers?

The Park Radio

Subject Content Analysis. There are 14 active radio stations in the park, each broadcasting a unique message. Subject categories of these messages are displayed in Table A-3 in the appendix. The Cades Cove message, for instance, focused primarily on interpretation, with 70 percent of the sentences of the message devoted to it. By contrast, the station at the Gatlinburg entrance to the park (Sugarlands) is more diverse. As displayed in Table A-3, the most prevalent commonality among radio messages is their diversity in subject content. Most are a potpourri of short statement on unrelated topics. The messages are quite long and range from 232 to 501 words, an average of 401 words or twice what is recommended for radio advertising. This pattern is understandable, considering the messages are broadcast primarily (8 out of 14) in the vicinity of campgrounds. The detailed campground information is provided while people slowly approach the campground and are more likely to be looking for specific information. In these locations, the bulletin boards may be quite sufficient for conveying the information now broadcast on the radio. This would free the transmitters for alternative use at sites of greater visitor traffic and interpretive potential. Interpretation was the primary use of the radio message at Cades Cove, Cherokee Orchard, Newfound Gap, and Clingmans Dome.

Awareness by Visitors. Visitors are aware of the radio stations. Over 75 percent so indicated in the General Media questionnaire. Several groups were more likely to be aware of the radio stations than their counterparts: those that stopped at visitor centers, stayed longer in the park, and were campers. No significant correlation occurred between first-time visitation and awareness. On the other hand, and this may be the second most important finding of the study, only 27 percent of the visitors who knew about the radio stations were aware that there were different radio messages around the park. Stated another way, 73 percent of those aware of the radio stations did not realize that there was more than one message in the park.

Use by Visitors. A series of questions were asked to ascertain visitor use of the radio messages. Results are shown in Tables 7 and 8. Only 26 percent of the visitors had listened to the park radio during their visit. This compares to over 78 percent of the visitors at Yellowstone National Park (Starobin 1973). Why the dramatic difference? It is probably a combination of factors. For one

Table 7. Use of park radio stations by GRSM visitors.

Question	% Positive response n = 682	% of all those listening to radio during visit n = 178
1. Did you listen to the park radio during your visit?	26	N/A
2. Where in the park was that?		
Cades Cove	3	13
Cataloochee	0	0
Cherokee Orchard	1	3
Clingmans Dome	1	3
Cosby	0	0
Deep Creek	0	0
Elkmont	2	7
Greenbrier	0	0
Look Rock	0	0
Newfound Gap	2	7
Oconaluftee	6	23
Smokemont	3	12
Sugarlands	15	59
Townsend	0	2
3. Have you listened to the park radio during previous visits?	15	N/A
4. Did you decide to do something based on the radio messages? ^{1/}	6	23

^{1/} During this or previous visit

Source: 1983 General Media questionnaire

Table 8. Most important radio message desired by GRSM visitors.

Question:

What is the one main thing you would like to know from the radio message?

<u>Message</u>	<u>% of Population</u>
Natural history interpretation	39
Park history interpretation	22
Places to see	9
Health and safety	7
Weather	7
Camping information	6
Hiking information	4
Lodging information	3
Schedule of daily events	3

Source: 1983 General Media questionnaire

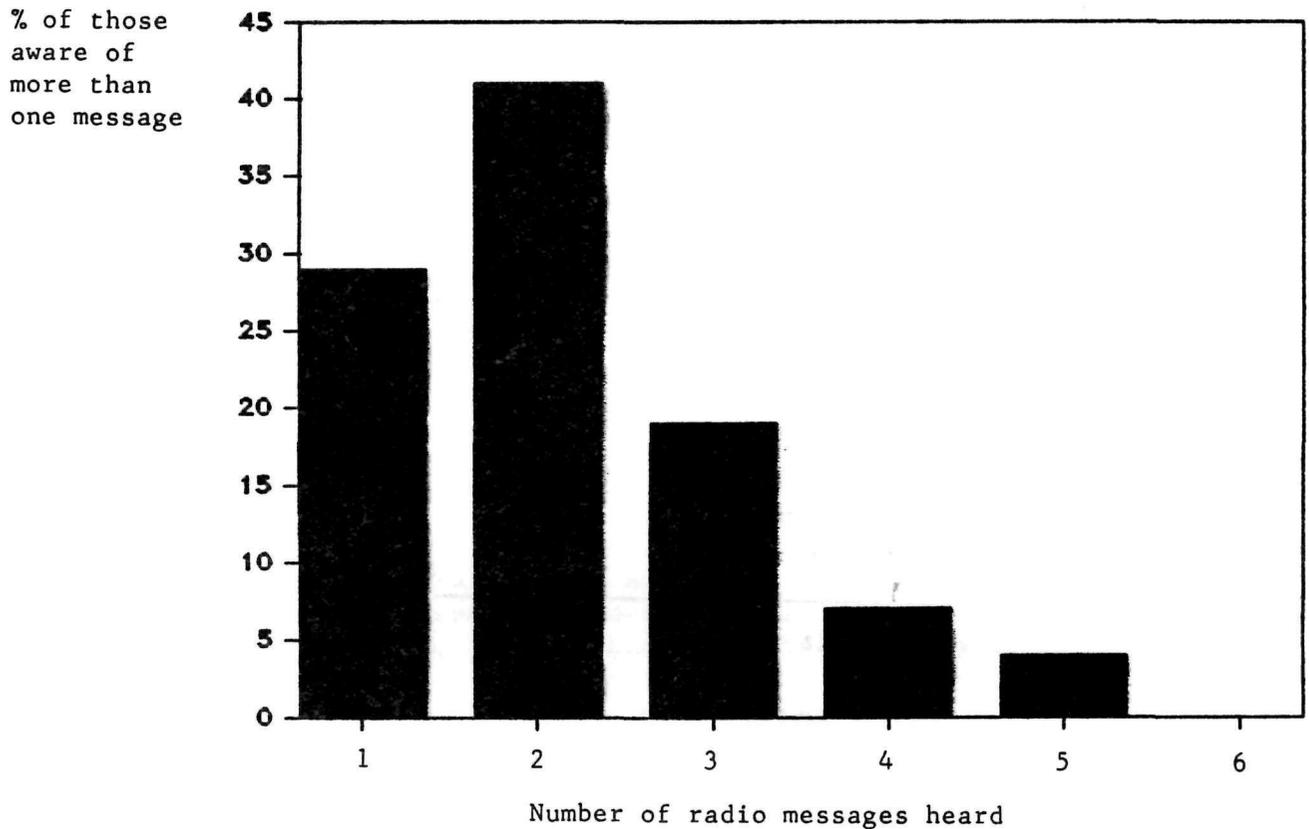


Figure 1. Number of radio messages heard by those aware of more than one message.

Source: 1983 General Media questionnaire

thing, GRSM has a much higher percentage of repeat visitors, who are far less likely to use the radio. First-time visitors were more likely than repeat visitors to use the radio system (48 to 34 percent). Just as important is the fact that 72 percent of the visitors who were aware of the radio system were unaware that there are different radio messages around the park. Also, the radio system in Yellowstone is a more integral part of the interpretive strategy than at GRSM (Chief of Visitor Services Center, personal communication, 1983). Visitors at Yellowstone are likely to be more attuned to turning the radio on.

Not surprisingly, stations at the two main entrances, Oconaluftee and Sugarlands, received the greatest use (Table 7). Sugarlands is the most strategic station in the entire park for intercepting first-time visitors, since 57 percent of all visitors stop there (ARMS 1975). Figure 1 shows the number of radio messages heard by visitors aware that there were more than one. Seventy percent had heard only one or two. Very few listened to many messages. Radio listeners are more likely to realize there are different radio messages than are nonlisteners. As shown in Table 8, 61 percent of the visitors wanted most to hear interpretive messages from the radio. This supports the contention that the radio system should be used more for interpretive activities. Only 6 percent of the park visitors decided to do something based on the radio messages heard. On the other hand, one in four of those who had listened to a radio station had decided to do something based on what they heard. No significant correlations were detected between use of the radio and age, sex, campers versus noncampers, and length of stay.

Treatment Effects. To test the effects of applying the principles of radio advertising (see appendix) to park radio messages, a test was devised for the Cherokee Orchard station. The transmitter for this station is housed at the Uplands Field Research Laboratory. Before a new message and road sign were installed, 227 interviews were conducted; after installation, 211 interviews were conducted. The standard and test road signs are displayed in Figure 2. To examine population characteristics, 12 questions from the exit interview were asked (Table 9). Except for having a higher percentage of visitors on the Cherokee Orchard Road aware of the radio stations in the park, most characteristics measured, such as age, sex, days in the park, number of visits, stops at visitor centers, and camping were somewhat similar. The most striking difference was the higher interest expressed by Cherokee Orchard respondents for radio messages pertaining to places to see.

The effectiveness of the sign and message were measured by three questions, responses to which are displayed in Table 10. Results were somewhat mixed. There was no significant difference between pre- and post-treatment concerning whether or not people turned on their radio or chose to do something based on what they had heard. Four confounding factors may have influenced results. One was that the treatment road sign was poorly designed so that it was not easily readable by motorists driving the speed limit. Any improvement that the sign message may have had was probably outweighed by its design. Also, circumstances required that people be pulled off the road immediately after they had heard the message rather than giving them time to mull over the information as to whether to take action. Third, although there was a statistically significant larger number of first-time visitors in the post- versus the pre-treatment category (33 percent versus 21 percent, respectively), the vast majority of visitors in both categories were repeat visitors. They therefore probably had an itinerary already in mind. Lastly, a statistically significant fewer post- versus pre-treatment respondents were aware that a park radio system existed. As a result,

Table 9. Comparison of sample population characteristics for the radio station experiment.

<u>Population characteristics</u>	General Media	Radio Message	
	Survey n = 682	Pre-treatment n = 227	Post-treatment n = 211
Average number of days in park	2.82	3.62	3.23
% that camped in park	15	11	9
% on first visit	27	21	33
Average number times visiting park in last year	6.6	8	5
Average number times visiting park in last 5 years	28.8	33	23
% aware of park's radio station	75	90	83
% aware of different messages	28	37	42
Average number of messages heard	.96	.27	.30
% males	54	56	54
Average age	40	38	39
% that stopped at visitor center	47	52	44.5
Main radio message you prefer			
% Natural history interpretation	39	11	12
% Park history	22	9	7
% Places to see	9	45	52
% Health and safety	7	4	3
% Weather	7	1	1
% Camping information	6	7	3
% Hiking information	4	10	9
% Lodging information	3	0	0
% Schedule of events	3	11	11

Sources: 1983 General Media

Table 10. Effects of radio station treatment in GRSM.

<u>Question</u>	<u>Pre-treatment</u>	<u>Post-treatment</u>
	% Responding yes to question	
1. Did you listen to the park radio as you were driving up this road today?	30	34
2. Did you decide to do something based on the radio message?	32	28
3. What kinds of things do you remember from the radio message you heard as you were driving up the road?		
<u>Pre-treatment Item Remembered</u>		<u>Post-treatment Item Remembered</u>
	% respondents ^{1/}	% respondents ^{1/}
Trailhead & Hiking info	53	Grotto Falls 82
Homesteads/cabins/buildings	45	Bud Ogle Farm 77
Pioneer lifestyle & hardships	42	Motor Nature Trail 48
Pioneer relationship to land	19	Senses 20
Motor Nature Trail	16	Other 18
Road characteristics	11	
Average number of items = recalled per respondent	1.87	Average number of items = 2.45 recalled per respondent

^{1/}Total does not equal 100% due to possibility of multiple responses per respondent
 Source: 1983 Radio Message (before and after treatment) questionnaire

Table 11. Relationships between visitor characteristics and awareness and use of bulletin boards.

<u>Relationship</u>	<u>Chi Square</u>	<u>Probability</u>	<u>DF</u>
Awareness versus camping	7.5	0.006	1
Awareness versus sex	24.7	0.001	1
Awareness versus stopping at visitor centers	12.2	0.001	1
Awareness versus first-time visitor	8.1	0.004	1
Awareness versus length of stay (t-test)	--	.02	577
Use versus camping	21.7	0.001	1
Use versus first-time visitors	34.9	0.001	1
Use versus length of stay	18.7	0.001	3
Use versus stopped at visitor centers	45.2	0.001	1

Source: 1983 General Media questionnaire



A. Standard



B. Test

Figure 2. Standard and test road signs for Cherokee Orchard radio station.

the test of the alternative signage was inconclusive.

Respondents did show greater retention of the post-treatment message. More items per respondent were recalled, even though the message was quite a bit shorter (272 words versus 387 words). Also, key points of interests emphasized in the message were retained by more than three-fourths of the respondents. Information retention increased from an average of 1.87 things remembered from the pre-treatment message to an average of 2.45 things remembered from the post-treatment message. Retention of reference to the Motor Nature Trail increased threefold. One out of five post-treatment respondents recalled reference to using their senses.

Park Bulletin Boards

Awareness by Visitors. Two-thirds of the visitors interviewed in the General Media questionnaire were aware that the park has bulletin boards at various places. That represents more awareness than for the newspaper (39 percent) but less than for the radio stations (75 percent). Statistically significant relationships concerning bulletin board awareness are shown in Table 11. Several groups interviewed in the General Media questionnaire were more likely to be aware of bulletin boards than their counterparts: campers, males, and visitors stopping at the visitor centers. People aware of the bulletin boards stayed in the park longer.

Use by Visitors. More respondents in the General Media questionnaire looked at bulletin boards (54 percent) than listed to the radio (38 percent) or read the newspaper (11 percent). Locations of bulletin boards used are shown in Table A-4 in the appendix. The most popular locations were at Sugarlands Visitor Center and Cades Cove. Statistically significant relationships concerning bulletin board awareness and use are displayed in Table 11. Campers and first-time visitors were more likely than their counterparts to look at the bulletin boards. Bulletin board users stayed longer in the park than nonusers.

Of the respondents in the General Media questionnaire that looked at park bulletin boards, 22 percent indicated that they had used some of the information. The most frequently mentioned items were the schedule of naturalist programs (27 percent), road maps and directions (14 percent), and bear information (14 percent). This degree of information use compares to 11 percent for the newspaper and 6 percent for the users of the radio stations. Users of the bulletin board at Sugarlands were observed as part of a design treatment experiment described in the next section. Further insight into visitor use bulletin boards is offered there.

Treatment Effects. In order to test the effects of design change, the bulletin board at Sugarlands Visitor Center was changed at mid-summer. The two design strategies are pictured in Figures 3 and 4. The pre-change board did not have any particular arrangement. There was no flow pattern. Articles of all shapes and sizes were posted over the entire surface, including the corners and across the bottom. Headlines were helter-skelter; some were in disrepair. Several articles were badly bleached out by the sun. Maps were scattered, with a variety of scales and levels of sophistication. As shown in Figure 3, there was a tremendous quantity of information displayed.

This circumstance provided a good opportunity to take an extremely opposite approach to design. Upon consulting with the interpretive staff, it was determined that the large number of information items must be retained. There was no particular sense of priority. An informal balance design described by



Figure 3. Bulletin board design prior to change.

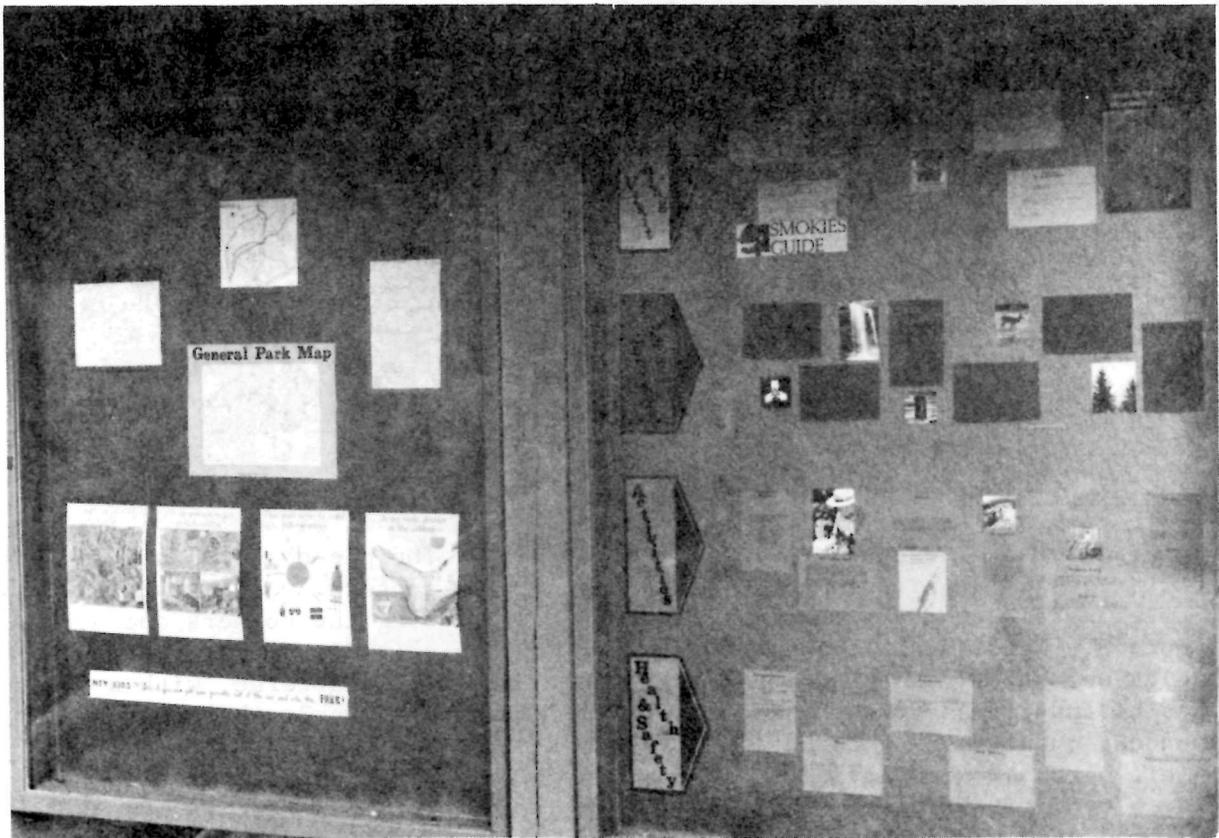


Figure 4. Bulletin board design after change.

Randall and Haines (1961) was chosen. Emphasis was placed on area maps and things to do, the primary user preferences as displayed in Table 14. These were situated at eye level. A portion was also devoted to providing guidance in how to select literature in the visitor center which matched particular interests and circumstances. Another primary feature was the use of a cartoon to explain the "why" for the most publicized "don't" among park messages. See Figure A-1.

A combination of personal interviews and unobtrusive observation was used to evaluate effects of the bulletin board design change. As in the radio treatment questionnaire, respondents at the bulletin board were asked several questions that were also on the exit survey questionnaire. Results of the sample population comparisons are shown in Table 12. The primary difference between the bulletin board respondents and the total population of visitors is that they are more likely to be first-time visitors. This is as expected, since first-time visitors are more likely to stop at the visitor center.

Statistically significant differences in the pre- and post-survey populations include more males and first-time visitors in the pre-treatment population and a younger than average age in the post-treatment population. A couple of things were added to the bulletin board that were designed to attract children. This might have contributed to the age differences.

A comparison of responses to questions used to evaluate the effectiveness of the design are portrayed in Table 13. The only statistically significant population differences were with the percent of respondents finding new information for which they were not looking. The new design apparently fostered greater opportunity to learn new information.

Table 12. Comparisons of sample population characteristics for the bulletin board experiment.

Population characteristics	General Media questionnaire n=682	Bulletin board questionnaire Sugarlands Visitor Center	
		Pre-test n=211	Post-test n=220
Average number days in park	2.8	2.8	2.4
% that camped in park	15	18	18
% on first visit	27	45	36*
Average number times visiting park in last year	6.6	.8	1
Average number times visiting park in last 5 years	29	5.4	6.3
% Males	54	62	48*
Average age	40	39	35*

*Significantly different at $p \leq 0.05$

Sources: 1983 General Media questionnaire; 1983 Sugarlands bulletin board (before and after treatment questionnaires)

Table 13. Comparison of bulletin board design effects.

Question	Sugarlands Bulletin Board Survey	
	Pre-treatment	Post-treatment
	N-211 % respondents	N-220
Were you seeking specific information? ^{1/}	52	45
Did you find information sought? ^{1/}	75	69
Did you find new information? ^{1/}	48	58
When will you use the information? ^{2/}		
Now	50	51
Later	33	34
Now and later	8	3
Never	5	4
Don't know	11	11
Why attracted to Bulletin Board ^{2/}		
Design layout	7	9
Desire for NPS information	34	37
Location	15	9
Curiosity	43	44
Did you need to go to NPS desk ^{1/} for more information?	39	38

^{1/}% of respondents answering yes to the question.

^{2/}Total does not equal 100% due to rounding.

Source: 1983 Sugarlands bulletin board (before and after treatment) questionnaire

Table 14. Information preferences for bulletin boards.

Information type	Pre-treatment	Post-treatment
	N=199	N=220
	<u>% Respondents</u> ^{1/}	
Map	26	32
Hiking	4	10
Camping	5	5
Schedule of events	4	4
Fishing	1	1
Weather	1	2
Lodging	1	1
Health and safety	2	1
Wildlife	6	5
Auto touring	1	0
Places to see	7	9
No opinion	29	16
Other	14	15

^{1/}Total does not equal 100% due to rounding.

Source: Sugarlands bulletin board (before and after treatment) questionnaires

On the other hand, the new design did not attract a significantly greater number of people due to design layout. There was also no difference in response concerning the need to return to the visitor center after looking at the bulletin board. This was unexpected since the new design featured guidance in using literature available at the center.

Users of the visitor center bulletin board were also asked to indicate the item they would most like to see on it. Results are displayed in Table 14. The number one preference is for maps and directions; second is for information on things to do. This is consistent with response to the general question in the exit interview concerning information most desired. (See Table 3.)

Users of the bulletin board also were observed unobtrusively in order to record their habits concerning use of the board. The amounts of time spent at the board are displayed in Figure 5. People spent more time at the pre-change board and were more likely to stop as opposed to glance at it. These relationships are statistically significant. A statistically significant larger number of males than females used the pre-change board. The reverse was true for the post-change board. This relationship was also statistically significant.

Why was more time spent prior to change? The pre-change board was a complex hodgepodge of material with several brochures displaying considerable text. This design invited exploration for interesting

information. Much more time was required to comprehend it as opposed to the post-change board whose deliberately opposite design style was meant to help the reader quickly locate items of interest. These design differences presumably contributed to the time spent differential.

Significant insight is gained from the unobtrusively gathered data portrayed in Tables 15 and 16. The percentage of users reading and scanning each article is presented. As one would expect, the park map was the most popular item in both the pre- and post-change boards. The pre-change board had a prominent article on the potential for car break-ins and how to protect against them. This was the next most often read article by visitors. The visitors' vested interest in this topic was displayed by the behavior recorded. The cartoons incorporated in the post-treatment board proved popular. The cartoons (Figures 6 and A-1) depict proper and improper behavior during bear encounters, and hints on health and safety. Both sets of cartoons also depicted the potential adverse effects if the recommended behavior was not followed. The "why" behind the "don't" was explained. The cartoons were used as vehicles to portray complex issues, and they drew attention.

By contrast, it is interesting to make note of what wasn't read. Just because items are posted on a bulletin board doesn't necessarily mean that any communication will take place. For example, an item was included on the pretreatment board concerning the "quiet walkways" in the park. These short loop trails were provided just a few years ago to entice people out of their cars at less popular points in the park. Less than 1 percent of the board users took time to read the quiet walkways article. No reference was made to these facilities in the newspaper. As a result, the only publicity that this new and innovative program gets is the "Quiet Walkway" signs along the park roads. Articles on hypothermia and giardia (a human disease carried by water) had similar lack of attention, along with all other health and safety messages (excluding the notice on bears).

To gauge the recollection of messages read and scanned, bulletin board users were asked which articles they remembered from the board. Results are portrayed in the right-hand column in Tables 15 and 16. These data reveal the value of attention-getting techniques. On the pre-treatment board, 8.5 percent of the respondents recalled seeing the cigarette butts on the board. The article concerning vehicle break-ins with the large heading entitled "Beware" was remembered more frequently, as was the flyer on bears in the park. On the post-treatment board, the recall of the cartoons was number one. Over one half of the people looking at the board recalled seeing them. This again illustrates the value of this technique for communicating. Almost half of the post-treatment respondents also recalled seeing items concerning park features and activities. These items occupied the prime eye-level viewing space on the boards. In general, the major features of the post-treatment board were much more likely to be recalled than for those items posted on the pre-treatment board.

It may be concluded that the design change did affect behavior. People spent less time, found more new things they were looking for, and had a generally higher recall level.

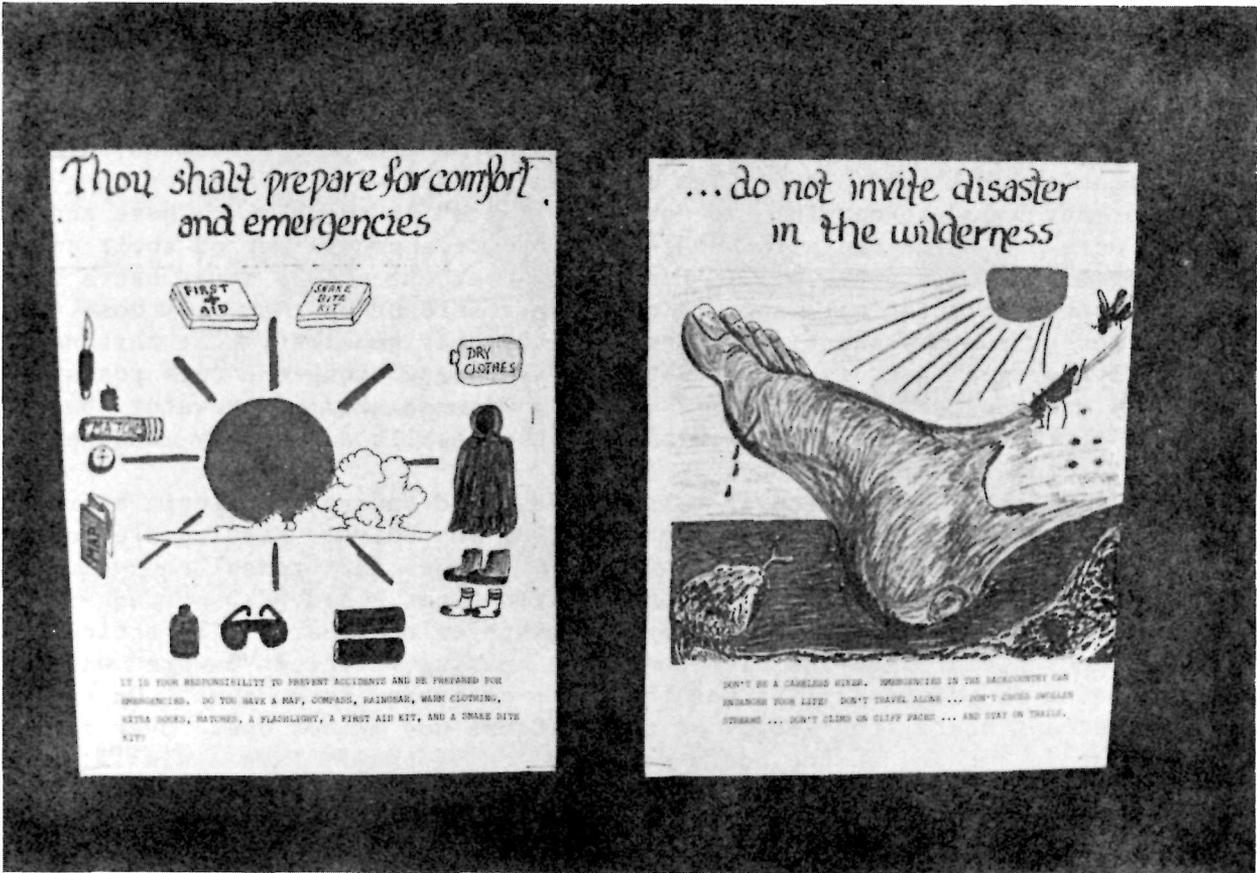


Figure 6. Cartoon illustrating health and safety hints.

Table 15. Use of bulletin board articles before design change.

	Unobtrusive Observation (N=744)			Oral Interview (N=211) % Recalled article
	% Looked at article			
	Total ^{1/}	^{2/}	Scanned ^{3/}	
Tour map	50.5	34.5	15.9	14.7
Beware of theft	42.9	22.6	20.3	16.2
Bears	25.7	15.0	10.6	21.8
Campground map	13.4	8.6	4.8	4.7
Backcountry	10.2	3.1	7.1	4.3
Interp. Sched.	8.9	4.3	4.6	1.4
Picnic areas	8.3	2.2	6.2	1.9
Plant and animal regulations	8.1	4.7	3.4	3.8
Self-guiding trails	7.7	.7	7.0	5.2
Fishing	6.6	3.6	3.0	3.3
Self-guiding trail art.	5.1	2	3.1	.5
15¢ maps	4.2	1.9	2.3	12.3
Camping	3.8	1.6	2.2	3.8
Hypothermia	3.1	1.3	1.7	3.8
Gatlinburg Bypass	2.6	1.7	.8	0
Shower	2.4	1.7	.7	1.4
Gatlinburg Med. Cntr.	2.3	1.3	.9	1.0
Quiet walkways	2.0	.7	1.3	3.3
Blue Ridge Parkway map	2.0	1.3	.7	.5
Cigarette butts	1.9	16.0	.3	8.5
Giardia	1.2	.4	.8	0
Wilderness creed	.9	.8	.1	.5
Horseback riding	.8	.4	.4	1.9
Blue Ridge Pkway broch.	.8	.7	.1	0
Mountain photo	.7	.1	.5	.5
Peanuts cartoon	.5	.3	.3	0
Bird photo	.4	.3	.1	1.0
"Mark your gear"	.1	0	.1	1.4
Dog-heat exhaustion	.1	0	.1	1.4

^{1/}This column = % read + % scanned; ^{2/}Read = person spent enough time looking at article to have read it; ^{3/}Scanned= person spent only enough time looking at article to have briefly scanned it.

Source: Sugarlands bulletin board before treatment questionnaire and unobtrusive observation

Table 16. Use of bulletin board articles after design change.

Article	Unobtrusive Observation (N=686)			Oral interview (N=220)
	Total ^{1/}	Read ^{2/}	Scanned ^{3/}	% Recalled article
General park map	36.6	17.6	19	43.2
Safety cartoons	28.4	18.2	10.2	56.4
Park features	24.6	9.3	15.3	45
Activities	21.6	12.1	9.5	45
Area map	11.2	5.7	5.5	22.3
Regional map	9.2	5	4.2	13.6
Plan visit	5.7	2	3.6	6.8
Gatlinburg map	5.1	2.2	2.9	15.4
Kids!	4.8	4.2	.6	8.6
Health and safety	4.5	3.4	1.2	15.9

^{1/}This column = % read + % scanned; ^{2/}Read = person spent enough time looking at article to read it; ^{3/}Scanned = person spent only enough time looking at article to have briefly scanned it.

Source: Sugarlands bulletin board after treatment questionnaire and unobtrusive observation

CONCLUSIONS

The study has demonstrated that the visitors to GRSM are not greatly affected by the media studied. A lot more messages are sent than are received. There is significant room for improvement in the way the media are used and the way they are marketed. All types of media studied have significant but unmet potential to effectively communicate with the visitors. They have the capability of affecting the behavior of a significant portion of the visiting public. All the media applications studied need to be exposed to professional expertise to ensure that their potential is met. The degree of sophistication necessary to maximize their use cannot be expected to be found strictly within park staff.

There needs to be a cohesive and coherent communications strategy developed for respect of visitor management and public relations. A communications plan should be developed for all horizons of public contact, both inside and outside the park and encompassing all media from television and radio to literature and signage. The plan should run the gamut of management concerns, including visitor services, ranger activities, maintenance, science, interpretation, and resources management. The plan needs to balance the information priorities for managers and visitors, which are clearly not the same. The most important principle in developing the communications plan is to define target audiences and priority messages for them and then to create clear images using the most appropriate media. For the in-park visitor, keep in mind their total experience and how each message contact contributes to or distracts from conveying the information needs of those visitors. Effective communication is too often lost by information overload, poor application of media, and poorly structured or uninteresting messages. To put it simply, managers need to think more like visitors if they want to reach out and touch them.

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APPENDIX A.

A GUIDE TO IMPROVING COMMUNICATIONS WITH PARK VISITORS

THE PARK NEWSPAPER

Role in Communications. The park newspaper is the primary vehicle available to managers for conveying detailed information to visitors. No other medium generated at the park level has as great a potential to affect behavior patterns. It is the primary voice of the Superintendent in the park.

Principles of Application. Because the newspaper has the potential to play such a pivotal role in communications to visitors, the design and distribution strategy is most critical to realizing its maximum value. Such a strategy should involve the following elements:

1. Set message priorities. The first and foremost principle driving the design is to set priorities for messages to be conveyed. These messages should reflect both manager and visitor perspectives, as discussed in the previous section. The scope of relevant messages under consideration should be derived from all phases of park operations. Although visitor services have traditionally been the focal point, consideration should also be given to rangers, resources management, maintenance, and science. A message's priority should be reflected by its place in the newspaper layout.

2. Choose a format which best displays the nature of your priority messages. The tabloid format (usually 11-1/2 x 14-1/2 inches) is easily departmentalized. It assists in clear and coherent organization of contents. The individual pages are easier to design. Tabloids can also exploit a center spread (Evans 1974).

A broadsheet format (14-1/2 x 23-1/2 inches) can carry more text without continuing to another page. It can project a wide range of news at one time in an obvious order of priority. It also allows bigger pictures and better graphics (Evans 1974). This format might lend itself better if management wants substantive articles on a variety of management issues.

3. Take maximum advantage of the front page. The front page is the most critical design concern because it is the primary point of attention for the reader. The highest priority messages should appear here. If a Superintendent wants to communicate in depth with the visitor, this is his or her most effective forum.

The upper left-hand corner is the primary optical area. Fill it with an attention getter. A picture is best, but the layout should not always be the same. Next, place the main story, if it didn't go in the top left. Traditionally, this goes in the top right. Arrange secondary stories on the page to lead down to the lower right corner, following the reading diagonal. Finally, anchor the lower left corner with a strong item; the beginning of a softer feature, a secondary picture, or the like (Harvard Post 1978).

The signal-and-text front page is the classical modern front page, where a selection of the items judged most important in the spot news category is signaled by both headlines and positioning in a clear scale of priority and supported with text. Items of less importance are placed inside. The poster front page puts as many headlines as possible on the front page without supporting text. This style displays as much as possible to attract reader interest. A summary index combines posters and signal and text front page styles. It contains capsules of news which are fully treated inside. It provides a useful summary for the busy reader. This style is most appropriate for a larger paper covering many topics (Evans 1974).

4. Don't be afraid to use attention-getting headlines. Their purpose is to distill the news. They must be specific. The editor must decide on the basic point of the story before writing the headline (Evans 1974).

5. If you have plenty of space, a two-page spread has advantages. It allows the clear display of complex events, schedules, or maps. Starting at the top left corner of a two-page spread, the eye moves to the lower right corner on the reading diagonal. In order to attract the eye to the copy not directly in that line, the layout editor must position "magnets" in the form of headlines or other display elements (Harvard Post 1978). The eye must not be drawn immediately into center of the page. It is against "reading gravity" to go from the center to the top of the page (Arnold 1981).

6. Select a masthead which clearly identifies the tabloid as the official park newspaper. Fig. A-1 illustrates the difficulty of picking out the official GRSM park newspaper from a pile of tourist information newspapers and brochures. Can you identify the park newspaper?

7. Aggressively market the paper. Get it in the hands of the visitors. This is much easier in parks with entrance gates where visitors must stop. At GRSM, it will require a variety of techniques to raise awareness of its availability.

8. Assess the text readability. The Fog index is a simple way to assess readability. The following is taken from Van Dersal (1962).

To use the Fog index, count off 100 words in the material. Then figure the average sentence length of the sample, stopping with the sentence ending nearest the 100-word mark. Do this by dividing the number of words by the number of sentences. Then figure the percentage of hard words. Hard words are those of three syllables or more. Do not count capitalized words such as Paris or President. Do not count words that have a third syllable when -ed or -es are added to them (like "expected" or "refuses"). The index is figured in the following way: In a 100-word sample, the number of hard words can be used directly as the percentage. Add the percentage of hard words to the average sentence length. Then multiply the sum by .4 to get the grade level at which the sample is written.

In our example, we took the two articles on the front page of the summer newspaper. In the first, "Just Listen," there were 106 words in five sentences for an average sentence length of 21.1. There was one hard word. So, $(21.1 + 1) \times .4 = 8.8$. The article was written on approximately a 9th grade level. The second article, "Barns," had 103 words in five sentences for an average sentence length of 20.6. There were 8 hard words. So, $(20.6 + 8) \times .4 = 11.4$. The article was written on approximately an 11th grade level. A study of big city newspapers and wire services revealed these media to be written on approximately a 12th grade level (Wilkens 1981). However, a study of big city newspapers and wire services revealed these media to be written on approximately a 12th grade level (Wilkens 1981). However, a study of the Worcester (Mass.) Evening Gazette showed it to be written on a 9th grade level, on average (Porter 1982).



Fig. A-1. Official Great Smoky Mountains National Park newspaper amid pile of tourist publications.

THE PARK RADIO

Role in Communications. The GRSM system of short range radio stations has the potential to reach a greater percentage of park visitors (particularly first-timers) than any other medium available to park management. This is particularly true at Great Smoky Mountains National Park, since there are no mandatory entrance stations from which to contact visitors as they enter the park. The radio provides the means to penetrate the sanctity of the visitor's private environment where most of the park visit is likely to take place--inside the vehicle. Unlike the newspaper, the radio message can convey only a limited quantity of information. The signal range is about one mile, and only major messages are likely to be retained. Careful consideration of message content is needed to achieve the greatest benefit from the radios within the context of the entire communications strategy for the park visitor. The radio cannot be "all things to all people." A diluted message is much less likely to be received and retained.

Principles of Application. Several good publications are available concerning production of radio commercials (Dygart 1938, Seehafer 1959, Murphy 1980). Certainly, the park radio message need not be hard sell, but the tricks of the trade are most helpful in getting the message through. Probably the greatest constraint of the park application is that the message runs continuously, so that most users will not start listening at the beginning of the message. The following radio message produced for this study is used here to demonstrate principles of radio advertising relevant to park radio messages:

You're now on the Cherokee Orchard Road. Soon, you'll see the homesites of the mountain families who first settled here. Stop your car and use your senses. Listen to a red squirrel chattering or a wood thrush singing. Feel the cool air or the spray from a waterfall.

There are many places to stop here. Three of the most popular are the Bud Ogle Farm, the Roaring Fork Motor Nature Trail, and Grotto Falls. Make your first stop the Bud Ogle Farm, just ahead on the right. Walk the trail there. Explore a typical mountain farmstead and experience feelings or kinship with these mountain farmers. This short trail takes you into a cool old-growth forest with ghostlike remnants of the once might chestnut trees. It leads to a secluded tub mill once powered by water tumbling from Mount LeConte.

Next, drive the five-mile Roaring Fork Motor Nature Trail. This one-way road begins halfway around the Cherokee Orchard Loop and ends in Gatlinburg. At the trail entrance, pick up a guidebook that highlights what you will find here. Stop at the Grotto Falls trailhead along the Roaring Fork Motor Nature Trail. It's an easy 1-1/2 mile walk to a unique waterfall. Stroll along a path shaded by giant virgin hemlocks. Walk behind a waterfall's curtain of water without getting wet.

The Bud Ogle Farm, the Roaring Fork Motor Nature Trail, and Grotto Falls are only three of the many enjoyable stops you may make. Stop often at the farms and mills of the early mountain people. Get out of your car. Use all your senses to experience the magic of Cherokee Orchard and the Roaring Fork.

The following principles for developing radio messages in parks are illustrated by the above message:

1. Establish a major theme. A central idea must be clearly defined. What main thought do you want to leave with the audience? (Seehafer 1950). Example: "Stop your car and use your senses."
2. Keep the dialogue simple and to the point. Stress a single big idea. Eliminate any tongue-twisters, unnecessary multisyllabic words, and flowery adjectives (Murphy 1980).
3. Establish an appropriate tempo and length. A typical range of speed is 120 to 135 words per minute. Maximum rate of speed should not exceed 135 words per minute (Seehafer 1959). Maximum length should not exceed two minutes. A shorter period is better. Example: The message written for this study contained 272 words, taking one minute, 55 seconds.
4. Anticipate what your audience wants to know. This is not difficult, since they made a conscious effort to see out your message at a particular place in the park. Example: Information on what to do in the vicinity of Cherokee Orchard Road.
5. Start by getting the listener's attention. Lead with something useful for him to know. Example: "You're now on the Cherokee Orchard Road." Zero in on the target audience (Murphy 1980).
6. Secure the interest of the visitor (Seehafer 1959). Follow up the lead attention grabber with additional points of interest. Example: "Soon you'll see the homesites of the mountain families who first settled here."
7. Develop an appreciation of rhythmic prose. Translate "eye" pictures to "ear" pictures (Dygert 1938). Example:

"Ghostlike remnants of ... chestnut trees"
"Listen to red squirrels chattering or wood thrushes singing"
"Water tumbling from Mount LeConte"
"Walk behind the ... curtain of water"
8. Be specific. The audience is usually more impressed with specific facts than with generalities (Seehafer 1959). Example: Three of the most popular (places to stop) are ..."
9. Utilize repetition (Seehafer 1959, Murphy 1980). Example: Three references to Ogle Farm, Roaring Fork Trail, and Grotto Falls.
10. Write for the individual (Seehafer 1959, Murphy 1980). Example: "You're now on the Cherokee Orchard Road."
11. Appreciate mental limitations to listening. Present thoughts in small parcels that can be readily apprehended. Example: "Walk the trail there."
12. Finish with a request for action (Seehafer 1959, Murphy 1980). Example: "Get out of your car. Use all your senses..."
13. Finally, and most importantly, seek professional advice in writing copy and have it professionally produced.

PARK BULLETIN BOARDS

Role in Communications. The often neglected bulletin board can be a powerful communication tool. More visitors are likely to look at bulletin boards than to read a newspaper or listen to a radio message. Locations are more widely distributed throughout the park. They are usable 24 hours a day. Although not often used in such a way, they have the potential for visitors to communicate with each other via a message board.

The most common use of bulletin boards in national parks is at visitor centers and campgrounds. They play a slightly different role in each setting. At visitor centers, the bulletin board plays a supplementary role. Regulations are often posted, along with information on health, safety, and emergency service which should be available 24 hours a day. Activity schedules, suggestions for good citizenship, and resource information are also frequently included. A very useful function not usually addressed is to display the key publications available in the visitor center which can best answer that perennial question, "What's the best way to see the park in a limited amount of time?" In the campgrounds, the bulletin boards are often the primary means of communication. Regulations are posted, along with a schedule of local interpretive programs and messages on health, safety, emergency services, and good citizenship.

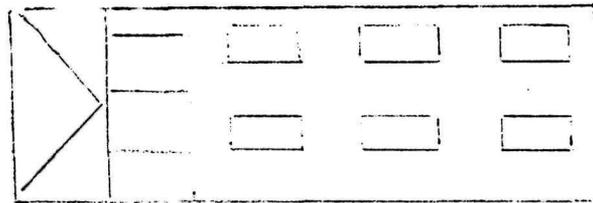
Principles of Application. It is most difficult to isolate a few key principles which will enhance the communicative effectiveness of bulletin boards under all circumstances. This is primarily due to their diverse applications in a park setting and to the large quantity of material that managers want to include in the small space available. Having offered this caveat, a list of design principles follows. Organized into three major categories, their effectiveness is dependent upon a design rationale based on a clear set of message priorities. Principles of design focus attention. If your intended use of the space lacks focus, the design application will serve little purpose.

Arrangements:

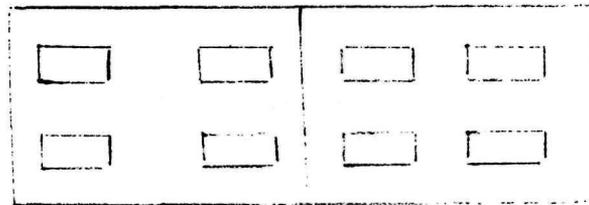
1. Do not crowd too much material into one space (Randall and Haines 1961).
2. Avoid being overly ornate, which involves decoration without reason. Material should be presented with emphasis on organization, color, and texture, and not on "cuteness" (Randall and Haines 1961).
3. Surrounding the displays with empty space secures attention and conveys the message more effectively (Randall and Haines 1961).
4. Avoid distracting patchy subject headings. Relate labels. Place informational captions in limited areas or units inside the display area, not at the edges (Randall and Haines 1961).
5. Dominance of similar shapes, lines, and space helps to maintain a family relationship. Disunity is distracting (Randall and Haines 1961).
6. Utilize low space for children (Machlis 1974).

7. A well-organized board design should generate a feeling of systematic movement from one point to another (Horn 1962). Some examples follow:

- a. Informal balance creates more interest than formal balance (Randall and Haines 1961).

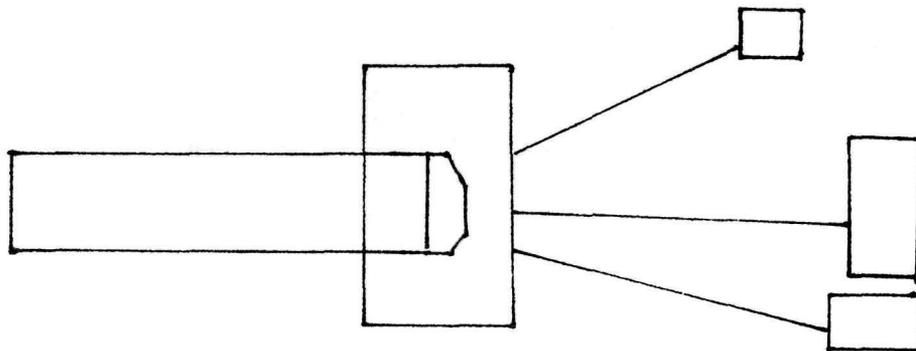


Informal balance

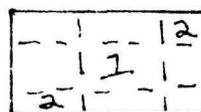
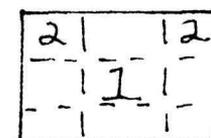
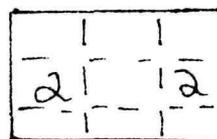
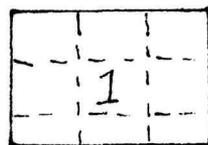


Formal balance

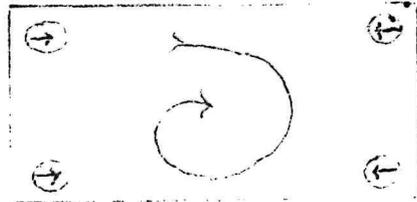
- b. Informal arrangement of materials tends to stimulate, excite, and raise interest. The strictly formal arrangement of a bulletin board is monotonous, restful, ineffective (Horn 1962).



- c. Have a maximum of three focal points per bulletin board (Gibert 1983).

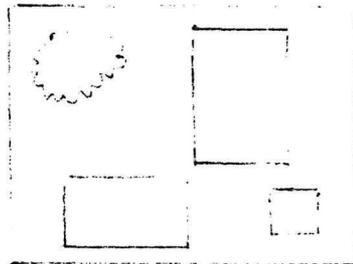


- d. The natural movement of the eye is a reverse six. Therefore, all corner information should draw the eye back into the body area. If edge photos face outward, the eye bleeds off the surface. Though the corner spots are important for eye movement, they are the least effective spots for verbal messages. They are weak communications areas (Gibert 1983).



Reverse six

- e. Line up units within a cluster by matching edges or imaginary lines. Centering is not effective (Gibert 1983). Modular design layout allows for dividing subjects into broad headings (Machlis 1974).



Emphasis:

1. To focus attention on any important item, set it apart with isolating space or contrasts in color, texture, or values (Randall and Haines 1961).
2. Utilize cartoons to convey difficult messages. An example demonstrating the proper method of dealing with a visitor-bear interaction is displayed in Fig. A-2.
3. Use three-dimensional objects.
4. Point out an important area with a directional device such as an arrow or line (Randall and Haines 1961).
5. Choose a catchy caption (Randall and Haines 1961).
6. Control eye movement with lines (Horn 1961):

Diagonal lines for action

Zig-zag lines for excitement

Slow-moving, undulating curves for a lazy feeling (Horn 1962)

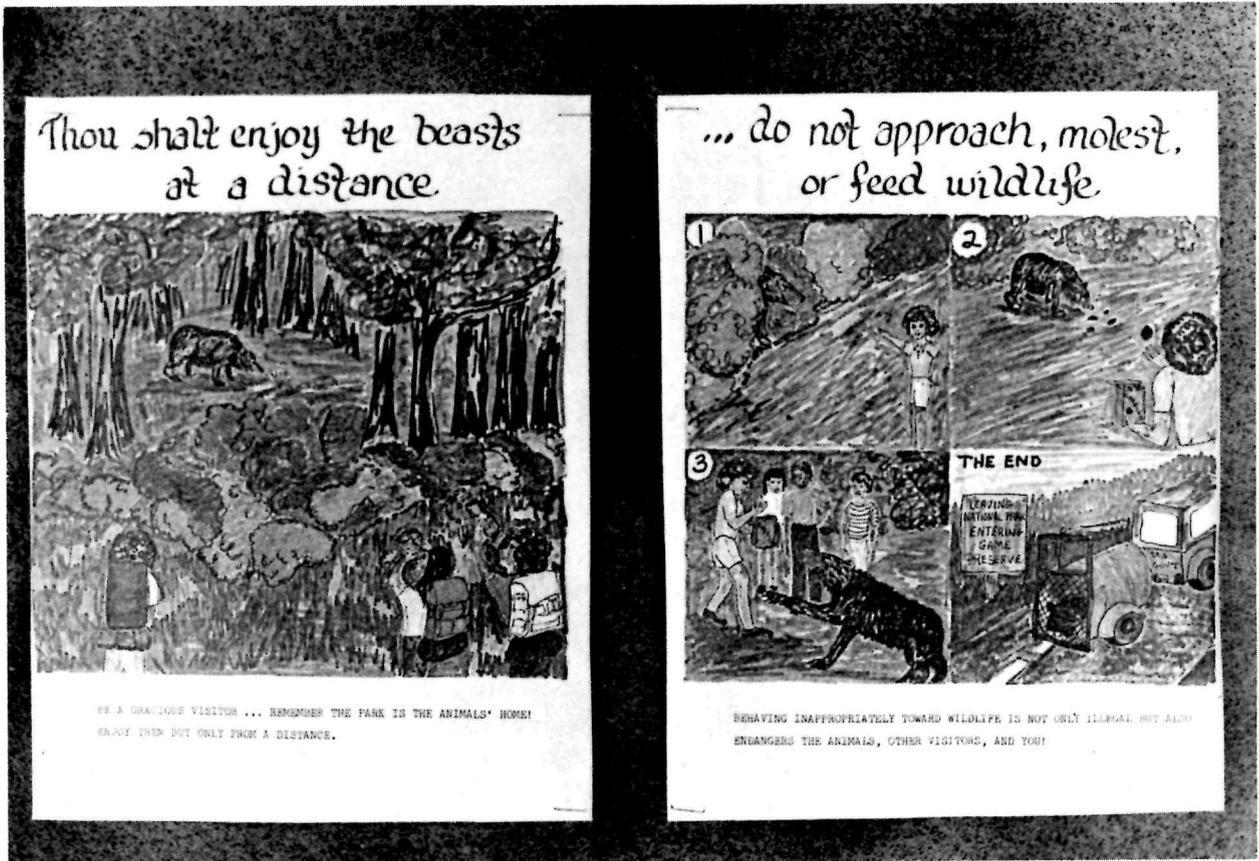


Fig. A-2. Cartoon illustrating appropriate and inappropriate visitor behavior toward bears.

7. A limited use of two or three different kinds of display material usually leads to more successful design (Horn 1962).
8. By introducing unusual, uninteresting, largely abstract shapes behind static visual material, viewer attention can be tremendously increased. An unusual shape behind one illustration leads the eye into the display, but too many unusual shapes cause confusion. Similar or related shapes tend to unify. Angles and triangles are fast moving. Circles spin (Horn 1962).
9. Shape may be used to point into the illustration or to lead the eye from it to another part of the design (Horn 1962).
10. Adding a contrasting border or edge line defines the space and draws the eye inward to the message. Don't overuse this technique, as it will make the space seem choppy, and the reader will only see those doubly highlit messages (Gibert 1983).

Great
Smoky
Mountains
Nat'l Park

Great Smoky Mountains Nat'l Park

Color:

To be effective, the use of color in bulletin board design must be carefully related to the visual material to be displayed. Color should reflect the theme. The colors used in a design should neither overpower the material or display nor fight with it. The whole color scheme should complement the idea being presented (Horn 1962).

1. To find good color combinations, choose colors that are neighbors on the color wheel (Fig. 5). Neutral colors can be used with any combination (Machlis 1974).
2. With colorful print backgrounds, use no more than two colors (red on green, blue on orange), except to highlight a special notice temporarily (Gibert 1982).
3. Dark and light colors in combination give the best contrast (Minor 1978).
4. Dark colors next to each other are not recommended (Minor 1978).
5. White letters next to a dark background are highly eligible (Minor 1978).
6. Using one dominant color may prove effective. A good rule to follow is "the smaller the area, the brighter the color should be" (Minor 1978).
7. Color combinations also influence legibility. Here are some suggestions for good legibility: black on yellow, brown on white, green on white, blue on white, black on white, yellow on black, white on red, white on green, red on yellow (Minn 1978).

8. No color works alone; color changes in the neighborhood of another color (Randall and Haines 1961).
9. Unusual color friendships or combinations attract attention (orange and pink) (Randall and Haines 1961).
10. Patterns of colors lead the eye from area to area, giving the sensation of movement (Randall and Haines 1961).

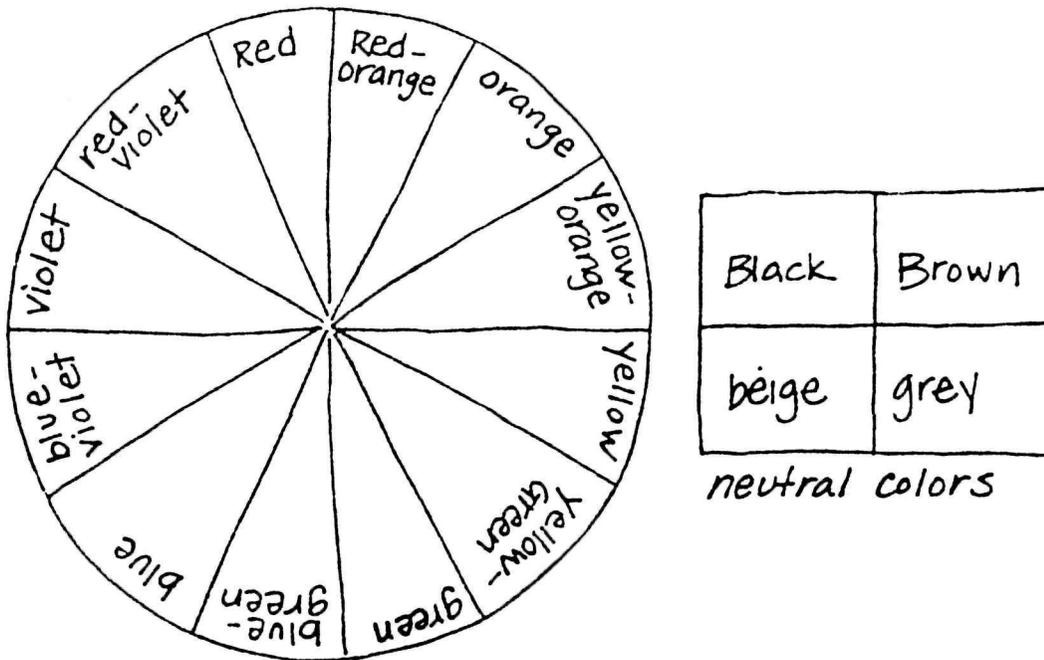


Fig. A-3. The Color Wheel

Table A-1. GRSM populations sampled for park communications study

<u>Instrument</u>	<u>Target Population</u>	<u>Location</u>	<u>Questionnaire/ Observation</u>	<u>Number of Respondents</u>
Messages to convey by management	Managers + service personnel	Parkwide	Questionnaire	92
General Media Survey	Visitors exiting park	Sugarlands Oconaluftee Townsend	Questionnaire	682
Radio message before treatment	Users of Cherokee Orchard Road	Cherokee Orchard Road	Questionnaire	227
Radio message after treatment	Users of Cherokee Orchard Road	Cherokee Orchard Road	Questionnaire	211
Bulletin board before treatment	Visitors in vicinity	Sugarlands Visitor Center	Questionnaire	211
Bulletin board before treatment	Visitors in vicinity	Sugarlands Visitor Center	Unobtrusive observation	995
Bulletin board after treatment	Visitors in vicinity	Sugarlands Visitor Center	Questionnaire	220
Bulletin board after treatment	Visitors in vicinity	Sugarlands Visitor Center	Unobtrusive observation	1012
TOTAL =				3650

Table A-2. Sampling periods for GRSM park communications study.^{1/}

<u>Survey Instrument</u>	<u>Number of sampling periods by month</u>												<u>Total</u>
	<u>June</u> ^{2/}			<u>July</u>			<u>August</u>			<u>September</u>			
	<u>M</u>	<u>A</u>	<u>E</u>	<u>M</u>	<u>A</u>	<u>E</u>	<u>M</u>	<u>A</u>	<u>E</u>	<u>M</u>	<u>A</u>	<u>E</u>	
Exit (interview)	7	8	4	4	6	3	3	4	3	0	0	0	42
Radio (interview) ^{3/}	2	2	1	1	1	0	3	3	3	0	0	0	16
Bulletin board (interviews) ^{3/}	4	3	4	2	2	2	3	5	1	1	0	1	28
Bulletin board (observation)	4	4	5	2	2	2	3	4	1	0	0	0	27

^{1/} Each sampling period was 3 hours

^{2/} M = Morning
A = Afternoon
E = Evening

^{3/} Bulletin board & radio messages were changed for testing in mid-July 1983.

Table A-3. Subject content of radio station messages in GRSM.

Subject Category	Station Locations								
	Number of sentences (% of all sentences)								
	Cades Cove	Cataloochee	Cherokee Orchard (pretreatment)	Cherokee Orchard (treatment)	Clingmans Dome	Cosby	Deep Creek	Elkmont (full)	Elkmont (Sites available)
Regulations	1(6)	11(38)	3(12)			9(31)	4(16)	3(12)	4(13)
Road directions	2(12)		2(8)	1(4)					
Facilities (Ranger stations, lodging, visitor centers, etc.)					2(14)		5(12)		
Natural and cultural history interp.	12(70)	16(55)	15(60)	21(91)	7(50)	4(14)	3(12)	7(28)	10(33)
Campground information						5(17)	3(12)	5(20)	6(20)
Interpretive schedule	1(6)					2(7)	4(16)	2(8)	2(7)
Location of trails		1(3)	4(16)	1(4)	4(28)	4(14)	3(12)	2(8)	2(7)
Safety			1(4)		1(7)	1(3)	1(4)	4(16)	4(13)
Where to go for more information						2(7)	1(4)	1(4)	1(3)
Other	1(6)	1(3)				2(7)	3(12)	1(4)	1(3)
Total # sentences	17	29	25	23	14	29	25	25	30
Total # words	380	425	387	272	307	415	409	442	486

Table A-3 (cont.)

Subject Category	Station Locations							
	Number of sentences (% of all sentences)							
	Greenbrier Cove	Look Rock	Newfound Gap	Oconaluftee	Smokemont (Full)	Smokemont (Sites available)	Sugarlands	Townsend
Regulations	2(8)	4(20)		7(23)	10(34)	11(35)	7(25)	
Road directions	3(12)	7(35)		1(3)			2(7)	3(25)
Facilities	3(12)			2(6)			3(11)	3(25)
Natural and cultural history interp.	9(38)	4(20)	27(96)	7(23)	5(17)	5(16)	4(14)	4(33)
Campground information		2(10)		3(10)	7(24)	5(16)		
Interpretive schedule					2(7)	2(6)		1(8)
Location of trails	4(17)			1(3)	1(3)	2(6)	1(4)	
Safety	3(12)		1(4)		2(7)	2(6)		
Where to go for more information		1(5)		2(6)	1(3)	3(10)	5(18)	1(8)
Solicitation by organizations				4(13)			4(14)	
Other		2(10)		4(13)	1(3)	1(3)	2(7)	
Total # sentences	24	20	28	31	29	31	28	12
Total # words	395	303	372	501	430	471	473	232

Table A-4. Use of bulletin boards by location.

<u>Location</u>	<u>% of Total Use</u> ^{1/}
Sugarlands	36
Cades Cove	24
Elkmont	18
Smokemont	7
Abrams Creek	6
Oconaluftee	5
Clingmans Dome	4
Chimneys	2
Balsam Mountain	2
Look Rock	1
Cosby	1
Deep Creek	1
Big Creek	1

^{1/}Total does not equal 100% due to rounding

Source: 1983 General Media questionnaire



As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environment and cultural value of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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