

**INTERPRETATION OF RESOURCE MANAGEMENT
IN REDWOOD NATIONAL AND STATE PARKS**

by

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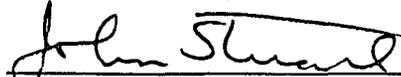
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ABSTRACT

INTERPRETATION OF RESOURCE MANAGEMENT IN REDWOOD NATIONAL AND STATE PARKS

by Christie L. Johnson

Park managers would like increased interpretation of resource management in Redwood National and State Parks because an informed public leads to greater protection of the parks' resources and more support for park policies and management practices. Improved communication between the Interpretation Division and Resource Management and Science Division would allow interpreters to stay current on resource management issues and activities so they can pass this information on to the public. Interviews with park interpreters and resource managers revealed communication barriers between the divisions, the most significant being the spread-out geography of the park and a lack of understanding between the divisions. One recommendation for improving communication is to increase face-to-face interactions between interpreters and resource managers during annual seasonal training and cross-training activities throughout the year. In addition, a monthly or bimonthly newsletter concerning resource management issues should be produced and distributed to all park employees.

Results from the interviews and a questionnaire showed that interpreters consider interpretive programs, visitor participation in resource management projects, and field seminars to be the most effective ways to interpret resource management to the public. Thus, it is recommended that at least 50% of future campfire programs focus on resource management issues and that the parks increase opportunities for visitors to observe or participate in resource management projects. In addition, the parks should consider reinstating the field seminar program in an improved form.

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TABLE OF CONTENTS

	Page
ABSTRACT.....	iii
ACKNOWLEDGEMENTS.....	iv
LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
INTRODUCTION.....	1
Statement of Problem.....	1
Statement of Purpose.....	2
Review of Past and Current Work.....	3
<u>Organizational Communication</u>	3
<u>Interpretation as a Management Tool</u>	6
<u>Interpretation for Gaining Public Support</u>	7
<u>Integrating Interpretation and Resource Management</u>	8
<u>Examples from Other Parks</u>	10
METHODS.....	13
Study Area.....	13
Design of Study.....	15
Data Collection Procedures.....	17
Data Analysis Procedures.....	19
RESULTS AND DISCUSSION.....	22
<u>Communication between the Divisions</u>	22
Formal and Informal Communications.....	22
Direction of Communication.....	23
Media of Communication.....	26
<u>Face-to-face</u>	26
<u>Telephone</u>	29

<u>Electronic Mail</u>	29
<u>Written</u>	31
<u>Mixed Media</u>	33
<u>Communication Media: Use verses Preferences</u>	35
<u>Effectiveness of Media</u>	36
<u>Effectiveness of the Liaison System</u>	38
Communication Barriers.....	41
<u>Interpretation of Resource Management Issues</u>	44
Interpretive Methods.....	44
<u>Programs</u>	45
<u>Publications</u>	46
<u>Exhibits</u>	49
<u>Wayside Signs/ Exhibits</u>	50
<u>Visitor Center Contacts</u>	51
<u>Roving</u>	52
<u>Computers</u>	53
<u>Field Seminars</u>	55
<u>Visitor Participation in Resource Management Projects</u>	57
Effectiveness of Interpretive Methods.....	57
Support for Interpreting Resource Management Issues.....	61
<u>Support by State Parks</u>	61
<u>Support by Interpreters</u>	63
<u>Encouragement by Management</u>	64
<u>Accessibility of Information</u>	66
Limitations of the Interviews.....	68
Problems with the Questionnaire.....	68
Conclusions about Methodology.....	70

RECOMMENDATIONS.....	71
<u>Communication between the Divisions</u>	71
Formal and Informal Channels.....	71
Direction of Communication.....	71
Media of Communication.....	71
<u>Face-to-face</u>	71
<u>Telephone</u>	76
<u>Electronic Mail</u>	76
<u>Written</u>	77
<u>Liaison System</u>	79
<u>Interpretation of Resource Management Issues</u>	80
Interpretive Methods.....	80
<u>Programs</u>	80
<u>Publications</u>	82
<u>Exhibits</u>	84
<u>Wayside Signs/ Exhibits</u>	85
<u>Visitor Center Contacts</u>	86
<u>Roving</u>	87
<u>Computers</u>	88
<u>Field Seminars</u>	89
<u>Visitor Participation in Resource Management Projects</u>	90
<u>Other Method</u>	90
Support for Interpreting Resource Management Issues.....	91
<u>Support by State Parks</u>	91
<u>Support by Interpreters</u>	92
<u>Encouragement by Management</u>	93
<u>Information Accessibility</u>	94

Conclusion.....	95
LITERATURE CITED.....	97
APPENDICES.....	99
A. Interview Questions.....	99
B. Questionnaire.....	102
C. Park Documents Reviewed.....	105
D. Category Codes for Interviews.....	106
E. Evening Program Topics (Summers 1995 and 1996).....	108
F. Primary Interpretive Themes from 1996 RN&SP Interpretive Prospectus	110
G. Visitor Experience Goals from 1996 RN&SP Interpretive Prospectus....	111
H. Resource Management Interpretation Topics.....	112
I. Recommendations Summarized.....	113

LIST OF TABLES

	Page
Table 1. Interpretive methods ranked by average effectiveness rating given by interpreters.....	58
Table 2. Interpretive methods ranked by order of effectiveness using the number of times it was chosen by an interpreter as the first, second, or third most effective method.....	59

LIST OF FIGURES

	Page
Figure 1. Map of the study area showing District boundaries, State and National Park boundaries, and work areas of interpreters and resource managers.....	14
Figure 2. Current use of communication media based on rankings made by surveyed interpreters.....	35
Figure 3. Preferences for communication media based on rankings made by surveyed interpreters.....	36

INTRODUCTION

Statement of Problem

Redwood National and State Parks are located in northwestern California and are cooperatively managed by the National Park Service and the California Department of Parks and Recreation. Encompassing approximately 110,000 acres, these parks boast a great variety of natural and cultural resources including ancient redwood groves, wild rivers, diverse wildlife, rugged coastline, and rich Native American and pioneer history. In order to study and manage this diversity of resources, the National Park Service has a large Resource Management and Science Division (formerly called the Research and Resource Management Division, and hereafter called the Resource Management Division). Within this Division, specialists such as wildlife biologists, geologists, botanists, and archaeologists implement and monitor projects that preserve, maintain, and restore the native ecosystems, natural processes, and cultural resources of the parks.

One of the main focuses of the Resource Management Division is the restoration of the logged slopes of Redwood Creek Basin. When this land was acquired by the Federal Government (original purchase in 1968, additional acreage in 1978), funds were authorized to return this highly disturbed area to its natural condition over a period of 10-15 years. This watershed restoration project has gained worldwide renown among scientists and engineers for the innovative techniques being used by the parks' resource team. However, most visitors to the parks, including members of the local community, know very little about the project and its significance. Since these and other activities of the resource management teams usually occur "behind the scenes," visitors to the park are often unaware that these projects exist.

Park managers would like the public to be more educated about resource management in the park because informed visitors may help achieve management goals and

are more likely to support park policies and management practices. These potential benefits are discussed further in the review section.

Since employees in the Division of Interpretation have the most interaction with visitors and members of the community, they are in the best position to inform the public about resource management issues. Through guided walks, children's programs, campfire talks, exhibits, publications, and informal interpretation in visitor centers, interpreters can instill an understanding of and appreciation for the activities that are being conducted to preserve the parks' valuable resources.

In order for interpreters to share research and resource management information with the public, they need to be knowledgeable about project activities and be regularly updated. Thus, it will be necessary to establish timely, consistent methods of communication between the Resource Management Division and the Interpretation Division. Once this communication is established, interpreters will be able to use this information to develop new interpretive programs or update previously developed programs that highlight activities of the Resource Management Division.

Statement of Purpose

In summary, there were two goals for this project:

- 1) to recommend methods for improved communication between the Resource Management Division and the Interpretation Division, and
- 2) to recommend methods for increased interpretation of resource management issues to the public.

Review of Past and Current Work

Organizational Communication

For Redwood National and State Park interpreters to remain current on resource management issues, timely and consistent methods of inter-divisional communication are necessary. In order to analyze the current communication process and recommend further methods, literature on organizational communication was reviewed. Most of the literature discusses organizational communication within non-governmental businesses and corporations. However, much of this information can be applied to the National Park Service organization, in particular the information that refers to formal, bureaucratic organizations.

Organizational communication can be defined as the process of creating and exchanging messages within a network of interdependent relationships (Goldhaber 1983). There are two general types of organizational communication--formal and informal. Formal channels of communication are the official paths prescribed by management. Usually, formal channels follow the organization's chain of command. Informal channels of communication, also called "the grapevine," cut across formal channels of communication. Although the grapevine moves faster than formal channels, it may contain information that is based on opinions and rumors rather than facts. Managers can reduce the spread of inaccurate information through the grapevine by maintaining and cultivating formal channels of communication that are fast, open, and go in many directions (Ivancevich and others 1994).

There are three main directions of formal communication. Downward communication flows from superiors to subordinates; upward communication flows from subordinates to superiors; and horizontal communication flows between persons at the same level in the organization.

Since the Interpretation Division and the Resource Management Division are on the same level of the organizational chart, information that flows between these divisions would be considered horizontal communication. In the past, organizations have not emphasized horizontal communication as much as downward and upward communication. However, managers are placing increased emphasis on horizontal communication as they realize its potential benefit to the organization. Opening these lines of communication allows members of one division to get information, support, and assistance from members of other divisions (Ivancevich and others 1994).

Traditionally, horizontal communication was limited to the managers of each division. However, some organizations today facilitate formal communication between non-managerial employees in separate divisions. With this type of communication, everyone can use everyone else as a resource and learn from each other (Ivancevich and others 1994).

There are two potential problems with such open horizontal communication: authority and message overload. If employees were allowed to cross whatever organizational boundaries they wanted, eventually authority could lose its meaning. With no authority structure, confusion and conflict would ensue and anarchy would emerge. Another potential problem associated with horizontal communication is message overload. If too many messages were being sent in all directions with no screening or filtering, the system could be slowed down or stopped under the burden of too many messages. In order to avoid these pitfalls, horizontal communication should be limited to necessary functions only (Goldhaber 1983). Horizontal communication is used for four main functions: task coordination, problem solving, information sharing, and conflict resolution (Goldhaber 1983).

The channel through which data and meaning are conveyed is called the communication medium. Communication media include face-to-face, telephone, electronic

and written communications. Media selection is a critical aspect of effective communication. The best medium for each communication depends on many factors including the purpose, the extent to which interaction is necessary, and the sender's and receiver's capabilities. When choosing a medium, cost and speed of the medium must also be considered (Ivancevich and others 1994). Specific media of communication that have been traditionally used in organizations like the National Park Service are as follows: personal visits, telephone calls, personal letters, open letters or memoranda, meetings, leaflets, posters, and bulletin board postings. New communication technology now allows members of an organization to communicate via computer networks and electronic mail.

There are many potential barriers to communication within an organization. In bureaucratic organizations like the National Park Service, hierarchical organizational charts may restrict who communicates with whom (Graber 1992). "The extreme formality or cumbersome size... of some structures can act as a communication block, filtering and distorting potentially useful information" (Goldhaber 1983, p.55). Another potential barrier is competition. In the Park Service, each division must compete for a limited amount of funding, so one division may be hesitant to cooperate with a competing division (NPCA 1988). Other barriers to communication may include doubt about the source's credibility, differing frames of reference, and resistance to change (Ivancevich and others 1994).

In order to diagnose communication problems within an organization, one may conduct a communication audit. A communication audit is "a systematic method of collecting and evaluating information about an organization's communication efforts" (Ivancevich and others 1994, p. 432). Although many examples of audits are provided in the literature, there are no standard guidelines for conducting a communication audit. Information can be collected by conducting surveys or interviews of managers and workers, by observing operations, and/or by reviewing formal and informal reports of

communication procedures (Ivancevich and others 1994). In this particular study, all of these methods were utilized to analyze communication between the two divisions and determine the communication barriers that exist between them.

Interpretation as a Management Tool

The Division of Interpretation operates at the interface of the public and the National Park Service. Thus, interpretive programs are a significant means by which management can communicate with the public (Dame 1985).

In *Interpreting the Environment* (1982), Grant Sharpe stated that one of the main objectives of interpretation should be to accomplish management goals. He called this objective "Interpretation as a Management Tool" and discussed how interpretation can help achieve management goals such as visitor protection, law enforcement, and resource protection. To assist with visitor protection, interpreters warn visitors of dangerous situations. For example, a campfire talk about bear management would instruct visitors on how to avoid conflict with bears. Interpretation also helps with law enforcement because education about the resource often influences visitors to follow rules and regulations. "Most transgressions against rules, such as picking wildflowers, collecting rock or animal specimens, and short-cutting trails are done in ignorance rather than malice" (Sharpe 1982, p. 16). Finally, interpretation plays an important role in resource protection. This role is described by the commonly quoted phrase, "Through interpretation comes understanding, through understanding comes appreciation, and from appreciation comes protection."

Several studies have shown that visitors who receive interpretation are less likely to impact resources than those who do not. For example, Sharpe and Gensler (1978) describe a meadow rehabilitation project at Mt. Rainier National Park in which managers tried two methods to stop visitors from making random trails through the meadow. When they placed signs at the start of the impromptu trails saying "Trail Closed," the visitors

continued to walk on the closed trails because they did not understand why the signs were there. Since the first attempt failed to protect the meadows, the managers changed the signs to say "Closed for Meadow Rehabilitation," and distributed brochures to the public describing the delicate nature of meadows. In addition, a self-guided nature trail was constructed to draw impact away from the meadows and educate the visitors. In this second attempt, the use of interpretation stopped the visitors from walking on the closed trails and successfully protected the meadow. Joel Christensen (1994), a Canadian provincial park manager wrote, "Interpretive education is the preventive maintenance program that will protect park lands and facilities over the long-term for future generations."

Interpretation for Gaining Public Support

Interpretation of resource management issues also helps gain public support for park policies and management practices (Mullins and others 1991). "People are more likely to accept and support a sound yet controversial policy when they understand its rationale, the research on which it was based, and the possible consequences of not adopting it" (Dame 1985). An example of a controversial policy is prescribed burning in national parks. In parks like Yosemite, Yellowstone, and Sequoia-Kings Canyon, interpretation has been successfully used to alleviate visitors' concerns and assure them that fire contributes to the overall health of a forest (Sharpe 1982). In Hawaii Volcanoes National Park, potential controversy about hunting non-native wild pigs within the park has been successfully prevented by aggressive interpretation of endangered species and biodiversity issues. Martha Lane (1989) found that "an enlightened visitor more aptly supports active management for environmental quality." In Great Smoky Mountains National Park, the Interpretation Division developed a "Strategic Education Plan" in preparation for the controversial reintroduction of the Red Wolf. According to Park Ranger Karen Ballantine

(pers. comm. 1997), the educational programs targeted a variety of audiences including the local community, and successfully relieved public concerns before the wolves were even released.

Cable and others (1987) conducted a study to provide empirical evidence that interpretation can positively affect attitudes about management policies. They found that visitors' attitudes toward the management policies of the Canadian Forestry Service were more favorable after being exposed to interpretive messages in a visitor center. At Grand Canyon National Park, a study was conducted to determine the effect of interpretation on visitors' attitudes about forest defoliation caused by Pandora moths (Krisiko 1988). Survey results showed that visitors who received interpretation tended to agree more strongly with the park's policy (allowing natural processes to run their course) than those who did not receive interpretation.

Many managers are concerned that the public understand the importance of research and resource management programs to the preservation of parks. "Public understanding of the issues and public support for management decisions are critical if management efforts are to be successful" (Spears 1989a). Park scientists are conducting research on the effects of natural and human-caused disturbances, air and water quality degradation, acid rain, alien species, endangered species, and biological diversity--all critical issues concerning the survival of park resources (Spears 1989b). "Without an informed clientele, resource management programs and necessary legislation to support them are threatened" (Canter and others 1989).

Integrating Interpretation and Resource Management

Over the past decade, the National Park Service has come to recognize the potential of interpretation as a management tool and a means of gaining public support. Point 3 of the Service's 12-point Plan (as cited in Whatley 1995) states that parks must communicate

information on critical resource issues to the public and motivate them to help with solutions. The Plan recommends that interpreters implement this initiative through the integration of research, resource management, interpretation, and public information. A series of workshops addressing "Critical Natural Resource Issues Interpretation" was initiated in late 1987. The goal of the workshops was "to increase the awareness of critical natural resource issues among interpreters, improve communication between interpreters and resource management personnel, and increase support for, and attention to, park science efforts" (Whatley and Springer 1989). In a commentary called the Future of Interpretation (Mott 1991), former National Park Service Director William Penn Mott, Jr., stressed the importance of scientists, resource managers, and interpreters working together as a team.

In 1994, a Natural Resources Interpretation Committee was formed to make recommendations on "how to promote better understanding of, and support for, National Park Service natural resource management and research programs through interpretation." The Committee issued a report which primarily focused on integrating resource management and interpretation by improving communication and cooperation among resource managers and interpreters (USNPS 1994). In 1996, this Committee created an "Action Plan" that recommends responsibilities and time frames for accomplishing the strategies suggested in the report (USNPS 1996).

In integrating research, resource management, and interpretation, there are several levels of cooperation that can occur (Spears 1989b). At the very least, park scientists and resource managers must share information about research and resource management projects with interpreters so they can interpret this information to the public. In return, the public becomes aware of the scientists' and managers' work and will hopefully support their projects. Occasionally, interpreters and sometimes visitor volunteers assist scientists in the collection of data or participate in resource management projects. The value of this

type of cooperation is that it gives the participants first-hand experience with the research or project. For the interpreter, this experience enriches future interpretive programs by increasing knowledge, accuracy, and enthusiasm for the interpretive topic. For the visitor volunteer, the experience provides deeper understanding and appreciation of the resource issue.

Examples from other Parks

There are many examples of interpretive programs that are using cooperation between divisions to interpret resource management issues to the public. At Gulf Islands National Seashore, scientists and resource managers were reintroducing Southern Bald Eagles on Horn Island, one of four Mississippi barrier islands in the Gulf of Mexico. Interpreters helped with the project by recording behavior at the hack site, setting gill nets, feeding and caring for the young eagles, and collecting data as part of the post-fledgling telemetry study. After their "first-hand" experience, the interpreters "demonstrated confidence in talking about the project, a new knowledge resulting from personal observations, a renewed concern for Bald Eagles, and a feeling of being part of the project. In addition, the interpreters were inspired to inform park visitors about the project and to convey optimism that Southern Bald Eagles will nest again on the barrier islands of the Gulf Coast" (Bishop 1989).

Another example of an integrated park project is the Underwater Video Program at Channel Islands National Park. During the program, "visitors to Anacapa Island view the often unseen world of kelp forest and rocky reef through the use of an underwater video camera, a two-way audio communication system, and surface video monitors" (Nielson 1989). Visitors are able to watch the video monitor as divers move around filming what they see forty feet below the surface. The visitors can ask questions of the divers and receive immediate answers. Research scientists, resource managers, interpreters and other

park staff work together as a team to make each program happen. In addition, interpreters assist the resource management staff as divers in collecting and recording data for a long-term kelp-forest monitoring project. Benefits to the park from this cooperative effort include not only an innovative and exciting interpretive program for park visitors, but increased publicity for kelp-forest research, additional donations to the park for diving and research equipment, and increased feeling of unity among park staff in every division (Nielson 1989).

At Cuyahoga Valley National Recreation Area, interpreters often use first-hand experience to interpret research and resource management projects. For example, programs have involved visitors setting out and collecting gypsy moth traps, conducting resource inventories on newly-acquired land, visiting restoration sites while work is in progress, participating in water-quality monitoring and clean-ups of the river, and learning about integrated pest management (Spears 1989b). In 1989, visitors to Cuyahoga Valley NRA participated in a Monarch Migration Tagging Program as part of a nationwide effort to interpret biological diversity in national parks (Spears 1989a).

At several national parks, a liaison position has been created to increase communication and cooperation between the interpreters and resource managers and researchers. Due to limited budgets, the liaison positions are often funded by pooling resources from both divisions, or with help from administrative funds. At both Acadia National Park and Yosemite National Park, the responsibilities of the liaisons are to attend Resource Management meetings and keep interpreters up-to-date on current resource issues through short reports and regular training. In addition, the liaison at Yosemite edits a monthly newsletter called "Resource Connection" which is distributed to all park employees. At Acadia, the liaison coordinates an off-season seminar program called "Resource Acadia" which attracts mostly local people to learn about the park's resource issues in depth. At Great Smoky Mountains National Park, a position was created

primarily to communicate critical resource issues to the public through outreach programs to schools and communities (Canter and others 1989).

At Grand Canyon National Park, the Division of Visitor Services and Interpretation has created an entity separate from both divisions called the Center for Resource Interpretation. According to a 1995 park memo, the purpose of the Center is "to deliver a strong resource management message and keep the public informed of critical issues." A full-time, permanent interpreter coordinates the Center and serves as a liaison with Resource Management. In addition, this interpreter produces publications that discuss current information regarding the park's critical resource issues. These publications include a quarterly journal called "Nature Notes" which is distributed to all park personnel, natural history association members, and other interested parties. A biweekly publication called "Field Notes" is a shorter, more technical paper that discusses new research findings and other current topics, and is distributed only to Interpretation and Resource Management staffs. In addition, the Center has produced several new publications for the public covering topics such as exotic plants, air quality, and protection of archeological sites. Another full-time interpreter who works at the Center serves as the Research Liaison and coordinates seminars and training on research and resource management issues. According to Greer Chesher, the coordinator of the Center, the efforts of the Center have greatly improved the quality and accuracy of the interpretive programs presented on research and resource management issues (pers. comm. 1996).

Due to budget constraints, it may not be possible to implement programs at Redwood National and State Parks that are as extensive as the programs in these parks. However, these examples can provide ideas and serve as benchmarks as Redwood strives toward successful integration of interpretation and resource management.

METHODS

Study Area

The subjects of study are primarily the interpreters and resource managers of Redwood National and State Parks. To comprehend the results of the study, one must understand the organization's structure which is complicated by the unusual geography of the Parks (Figure 1) and the State and National Park Cooperative Agreement.

The Interpretation Division is divided into two districts, the North District and the South District (officially called the Del Norte District and the Humboldt District because they are divided by county lines). The field area for North District interpreters includes the Crescent City Information Center (at Park Headquarters), the Hiouchi Information Center, Howland Hill Outdoor School, Jedediah Smith Redwoods State Park, Del Norte Redwoods State Park, and the Crescent Beach Area. Offices for the North District interpreters are at Crescent Beach Education Center near Crescent City. The field area for South District interpreters includes Redwood Information Center, Wolf Creek Outdoor School, Prairie Creek Redwoods State Park, Gold Bluffs Beach, the Bald Hills, and the Redwood Creek Basin. The offices for the South District interpreters are within the Redwood Information Center near Orick.

Unlike Interpretation, the Resource Management Division is not divided into districts. The field area for resource managers includes all of Redwood National and State Parks; however, the majority of resource management projects are in the southern portion of the Parks, mostly in the Bald Hills and Redwood Creek Basin. Therefore, most of the resource managers have offices at the South Operations Center near Orick. Some resource managers have offices in Arcata, a town about 30 miles south of the Parks' boundary.

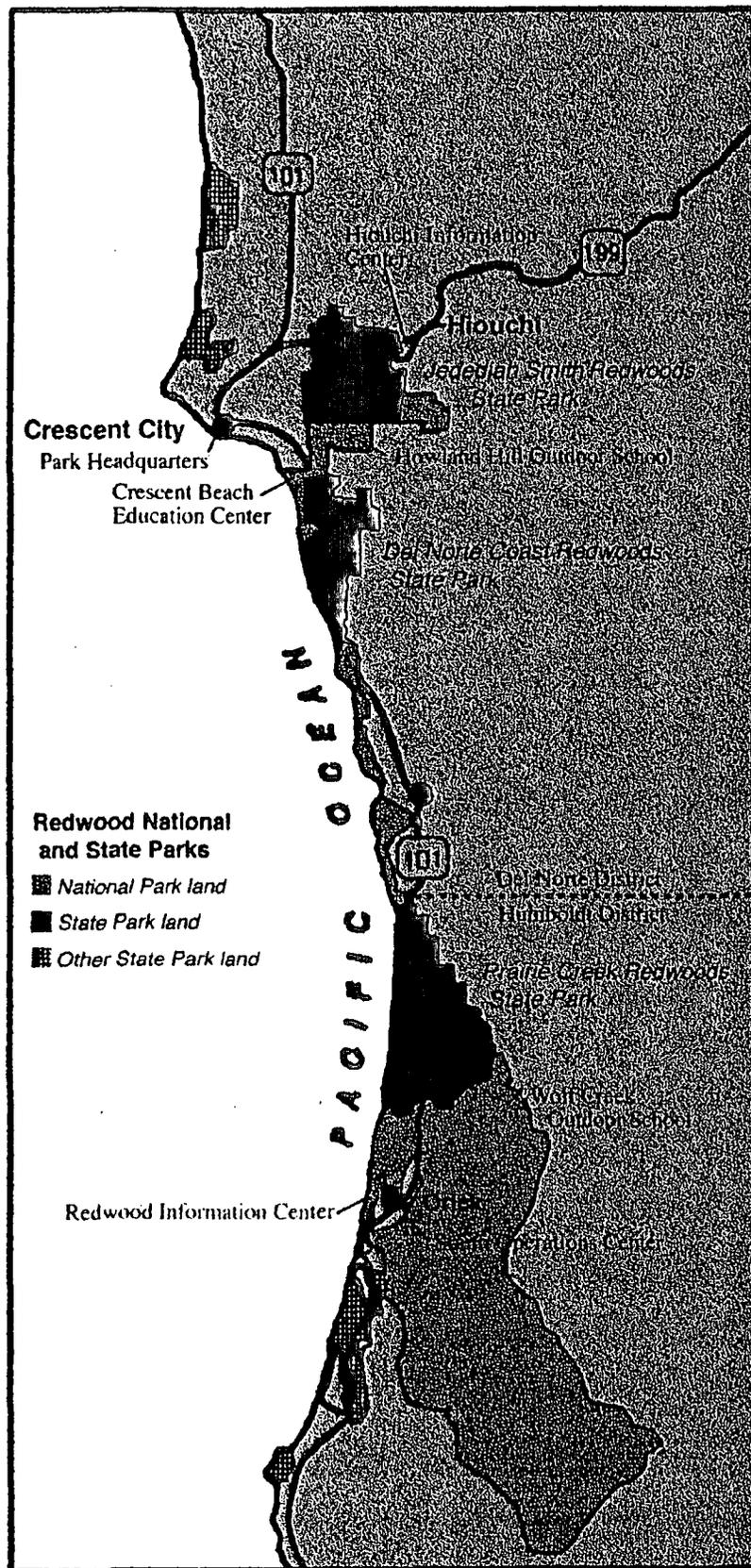


Figure 1. Map of the study area showing State and National Park boundaries, District boundaries, and work areas of interpreters and resource managers.

As mentioned earlier, Redwood National and State Parks are cooperatively managed by the National Park Service and the California Department of Parks and Recreation. This unique situation creates some organizational differences relative to other national parks. First, there are two superintendents (one for the National Park and one for State Parks); they work in next-door offices at Crescent City Headquarters and, in general, make joint decisions for the Parks. Also, during the summer, three members of the Interpretation staff are seasonal State Park employees called Interpretive Specialists. They are supervised by National Park interpreters and scheduled with the same duties as the National Park interpreters; essentially the only differences are the uniforms they wear and who writes their paychecks. Along with the State Park Interpretive Specialists, State Park Rangers assist with interpretation during the summer. Unlike the national park system where Park Rangers are either Interpretive Rangers or Protection Rangers, State Park Rangers present interpretive programs along with their duties of visitor and resource protection. The large Resource Management Division in the parks is made up entirely of National Park employees except for one part-time State Park Resource Ecologist who is consulted for resource management projects that involve State Park lands.

Design of Study

In order to fully explore the current condition of interdivisional communication and resource management interpretation at Redwood National and State Parks, a combination of qualitative and quantitative methods were used. Using multiple data-gathering techniques to investigate the same issue is called triangulation, and is the preferred mode for communication audits (Hamilton 1987). Reichardt and Cook (1979) also state that combining qualitative and quantitative methods is beneficial in evaluation (applied) research for two reasons: 1) the method-types can build upon each other to offer insights that neither

one alone could provide, and 2) since each method has a different bias, combining methods will give more valid and reliable information.

In-depth interviews were chosen as the primary research method because detailed, descriptive and contextual data were necessary to obtain the most accurate understanding of the Parks' current situation. "Interviews are an effective method when investigators are interested in understanding the perceptions of the participants and how they came to attach certain meaning to certain events" (Berg 1995, p. 35). The interviews were designed and analyzed using a qualitative approach. Since some readers may not be familiar with the process of qualitative research, the following paragraphs will summarize this approach as described in the literature. The qualitative approach is inductive rather than deductive. The research design is flexible, and no specific hypotheses or preconceptions are formulated before the research begins. As the research progresses, theories emerge directly from the data; thus, this approach is often referred to as the "grounded theory approach." Data analysis begins shortly after the research begins and is an ongoing activity throughout the research (Taylor and Bogdan 1984).

Unlike quantitative researchers who have a set study sample, qualitative researchers typically define their sample as the study progresses (Taylor and Bogdan 1984). Whereas the quantitative strategy gathers data from large, random samples, the qualitative strategy relies on theoretical sampling. Theoretical sampling refers to procedures where researchers consciously select additional cases to be studied according to the potential for developing new insights or expanding and refining those already gained (Glaser and Strauss 1967). "The researcher stops collecting data when no new situations exist from which to collect data, when redundancy is reached, and/or when s/he feels the data can be integrated and interpreted accurately" (Henderson 1991). Unlike quantitative researchers who emphasize reliability and replicability, qualitative researchers focus on validity, meaning they try to fit the data as close to reality as possible. In addition, qualitative researchers do not try to

determine cause and effect; the focus is on understanding the meaning attached to the phenomena being studied (Henderson 1991). The complete data analysis process includes discovery of repeated themes and concepts, coding and sorting data, and interpreting the data in context (Taylor and Bogdan 1984). Qualitative analysis has been criticized by some scientists for lacking the precision of quantitative analysis. However, "good qualitative research, like good quantitative research, is based on calculated strategies and methodological rigor" (Berg 1995, p. 59).

Since the in-depth interviews were very time-consuming to conduct, transcribe, and analyze, the interview sample had to be kept fairly small and thus, could not include all members of both staffs. In addition, since the interviews were conducted and analyzed by a single researcher, the data may be biased by some subjectivity. To counter these possible weaknesses and help validate the interview findings, quantitative data was collected using a questionnaire. The questionnaires were distributed to all field interpreters from the past two seasons (not resource managers) because the responses of this select group are the most critical to the study. This group included some interpreters who were interviewed and some who were not interviewed. Thus, the questionnaire expanded the sample size of the research and introduced some objective quantifiable data to compare with the more subjective qualitative data.

Data Collection Procedures

As mentioned, qualitative data were collected through personal in-depth interviews. Although the interviews were held in a variety of locations (including the South Operations Center, Arcata Office, Humboldt State campus, Crescent Beach Education Center, and subject's homes), all the interviews were in a quiet, private setting. The interviews were taped with a microcassette recorder, and lasted 1- 1 1/2 hours each.

The issue of informed consent was addressed with a confidentiality waiver. Before the interview, each subject was told that their comments could be quoted by name and context in this paper. Although all the interview subjects signed the waiver, some interview subjects still discussed issues of a sensitive nature that could be harmful if associated with their name. In these cases, the identity of the interview subjects were protected as much as possible within the paper.

Twelve interpreters and ten resource managers were interviewed. The interpreters included the Chief and Assistant Chief of Interpretation, five South District field interpreters, and five North District field interpreters. The resource managers included the Chief of Resource Management, the six Branch Chiefs, and four other permanent employees of the Division.

A semi-standardized interview format as defined by Berg (1995) was used for the interviews. In this format, there is a predetermined set of questions that are asked in a systematic and consistent order. However, unlike the standardized interview format, the interviewer is allowed to probe beyond the answers to the prepared questions to gain additional information. In this study, a standard set of questions about inter-divisional communication was presented to both interpreters and resource managers. Questions about interpreting resource management were standard within each group, but slightly different between the two groups because of their differing backgrounds (Appendix A).

Additional face-to-face interviews were conducted with the National Park Superintendent and State Park Superintendent of Redwood National and State Parks, two State Park Resource Ecologists, and the State Park Interpretive Specialist for the North Coast Redwoods District. Shorter phone interviews were conducted with three State Park Rangers, the Executive Director of the Redwood Natural History Association, and a representative of the North Coast Redwoods Interpretive Association. Although many of

the same questions were asked during these interviews, they did not fit the standard format of the interviews previously described.

To gain further information from a larger number of interpreters, quantitative data were collected by a mailed questionnaire (Appendix B). The questionnaire was sent to eighteen interpreters, and seventeen were returned. Ten of the interpreters who filled out a questionnaire were also interview subjects. The survey contained questions regarding inter-divisional communication and resource management interpretation. The subjects indicated their answers to questions by either ranking a given list of items or circling numbered choices.

Additional information was obtained from reviewing park documents. Upon request, the Chief of Interpretation and Chief of Resource Management provided documents that included information on communication between divisions and/or interpretation of research and resource management. During the interviews, several other people offered helpful documents as well. A list of all the documents reviewed is found in Appendix C. In addition, interpretive program schedules and seasonal training schedules from the last two seasons were collected.

Next, the interpretive exhibits, wayside signs, and publications found in Redwood National and State Parks were inventoried. This inventory was conducted primarily by personal observation; however, the texts of the waysides were thoroughly reviewed using a notebook which contains close-up photographs of each sign.

Data Analysis Procedures

The interviews were transcribed using a dictation machine which allows one to listen to a tape and control the recorder with a foot pedal. Over thirty hours of tape were transcribed word-for-word, typed into a word-processing program, and printed. As the interviews were transcribed, emerging themes, concepts, and repeated conversation topics

were noted. Once all the interviews were transcribed and printed, a coding category was developed for each theme, concept, or topic. Codes were also given to sub-topics or sub-themes. The list of coded categories included 12 major topics and 17 repeated themes (Appendix D). Next, all the interviews were read carefully and comments were coded if they fit into one of the categories. If relevant data did not fit into any category, new categories were created. Once all the transcribed interviews were coded, the pieces of data were cut apart using an exacto knife. The data were then sorted by code and filed in labeled file folders. Finally, the contents of each file folder was analyzed by comparing the comments within each category and drawing conclusions based on the data.

Results of the interviews will be presented both qualitatively and quantitatively. However, the proportions and frequencies presented are only descriptive statistics that help reveal the magnitude of each observation. They should not be taken out of context and further conclusions should not be drawn from them. For example, if two interview subjects identify "x" as a certain problem and no other interview subjects mention "x," one cannot assume that all the others would disagree that "x" is a problem. In addition, the numbers generated from the interviews should not be directly compared to the numbers gained from the questionnaire because the subject samples were different for the two methods and the questions and responses for the two methods were in a different form. Results of the two methods should be compared only to see if they agree on the major trends.

The data from the questionnaires were entered into a spreadsheet to be analyzed. Although averages were calculated for every numerical answer, frequency of occurrence was more revealing in most cases because of the relatively small sample size. Comparisons were made between answers of North and South District interpreters and between permanent and seasonal employees. For some questions, a chi-square analysis was conducted to determine if differences between these groups were significant.

Each of the collected documents was read thoroughly. The relevant information was then summarized and any connections to the interview or questionnaire findings were noted. Using the program schedules, the number of program topics which focused on resource management was determined and the percentage that had this focus was calculated for each season and each district. Similarly, with the interpretive signs, exhibits, and publications, the items that interpreted resource management were noted and counted.

RESULTS AND DISCUSSION

Communication between the Divisions

Formal and Informal Communications

When asked about formal and informal channels of communication, all the interview subjects stated that both channels are used to communicate between the Divisions. There was disagreement about whether more information flowed through formal or informal channels. Ten subjects said they believe formal channels are used more, and five felt that informal channels are used more. Of those who believed formal is used more, five explained that the distance between the work areas of resource management staff and interpretation staff makes opportunities for informal communication less likely.

In general, formal channels are regularly used to communicate the most essential information such as visitor safety issues. Informal channels are more often used to gain "out of the ordinary" information that only a specialist might know.

The types of information passed from resource management to interpretation through formal channels include locations of prescribed burns, non-compliance reports for bear management violations, and wildlife information through a branch newsletter. Information passed formally from interpretation to resource management includes wildlife sighting reports, requests for review of resource publications, and requests for presenters during planning of seasonal training.

Two years ago, a liaison system was set up as a formal channel of communication between the Interpretation Division and the Resource Management Division. In this system, several South District interpreters were assigned to communicate on a regular basis with different branches of Resource Management. Through this channel, interpreters can gain current information about resource management projects and issues.

Informal communication channels include telephone calls to exchange informal information and "chatting" when they see each other around the park. Since Resource Management staff rarely spend time in the north part of the park, North District interpreters mostly use telephone calls for informal communication. On the other hand, South District interpreters often see resource management staff at the South Operations Center offices when they are picking up mail or a government vehicle or using the South District Interpretation library. Therefore, South District interpreters in general have more informal contact with resource managers because they can call them on the telephone and see them face-to-face.

Direction of Communication

All interview subjects agreed that horizontal communication is commonly used between divisions and is generally encouraged by supervisors and management. The staff members from both divisions said that, in most cases, they are able to communicate directly with anyone in the other division no matter what level either person is in the organization. The Chiefs of both divisions, as well as the supervisors within the divisions, said that they trust their staff and are comfortable allowing them to communicate directly without their prior approval. Therefore, in most cases, basic information can be exchanged directly between people of different divisions without having to go up and down the organizational chart.

However, many interview subjects gave examples of situations where upward and downward communication (vertical communication) was more appropriate or even necessary. The following examples were cited during the interviews:

1) *When one division wants input from staff of the other division on a plan or publication.*

In this case, they have found that it is more efficient to give the document to the Chief of the Division and have him or her pass this on to the appropriate staff members in the division to get comments. (Also, anything that will be printed for the public must be approved by the Chiefs anyway.)

2) *When a particular issue cannot be solved through horizontal communication.* When an interpreter and resource manager cannot agree on something and/or a communication breakdown occurs, staff members will often go to higher levels of the organization to resolve the issue. Sometimes the supervisors of each division will then communicate, or even the Chiefs may get involved.

3) *When a staff member needs to put some authority behind a particular request.* If a person wants a quick and complete response from the other division, he or she may ask a higher staff member, usually the Chief, to participate in the communication process (usually just by signing his/her name on the message.)

4) *When an issue is politically sensitive, (or "hot" as one seasonal interpreter described it).* In this situation, people in the lower levels of the organization are encouraged to communicate through their supervisors instead of talking directly with the other division.

5) *When a large commitment of time is being required for a staff member to communicate with the other division.* When staff members are asked to help in training activities, cooperative projects, etc., staff members are expected to talk with their supervisors before going ahead with it.

During the interviews, several people expressed that, except for in the above situations, horizontal communication is the preferred mode of communication and is most effective. One of the advantages of horizontal communication is its speed and efficiency. Subjects indicated that communicating up and down the organizational chart can be very slow, and information is often lost in the process. If one person along the link is very busy or out of the office for a while, the information does not get passed on quickly.

A specific example of communication breakdown (cited by two interview subjects) concerned a new standard operating procedure for mountain lion report forms. In the summer of 1996, the Wildlife Branch Chief sent new report forms and instructions to the Chiefs of each division to distribute to the rest of the staff. Later, when the Wildlife Branch received a mountain lion report on an old form from an interpretive ranger stationed at a distant information center, they realized that the new forms had not been distributed to all the field units. After that experience, they decided the most efficient and effective way to get the information to the interpreters was by sending it directly to each Information Center rather than through the Chief. Other interview subjects described similar examples.

Most of the interview subjects were not overly concerned with the idea of supervisors and upper management being left "out of the loop" due to horizontal communication. However, a few people indicated that, when communicating horizontally, it is a good idea for staff to keep their supervisor informed about the communication. For example, one supervisory interpreter pointed out that when a seasonal interpreter gets useful information directly from a resource management person, if he or she does not pass it on to the permanent interpreters, that information does not stay with the Interpretation Division when the seasonal interpreter leaves at the end of the summer. So, in such cases, upward communication could have some definite benefits.

Sometimes a combination of horizontal and vertical communication is used so lower level staff of different divisions can communicate directly while keeping their supervisors

informed. With the common use of e-mail in the park, it is easy to send an electronic message directly to a person and forward copies of the message to supervisors at the same time.

Media of Communication

At Redwood National and State Parks, staff of the Interpretation and Resource Management Divisions use face-to-face, telephone, electronic, and written media to communicate with each other. However, each medium is used to a different degree depending on the purpose of the communication, the type of information being communicated, the preferences of the people involved in the communication, and the limitations of the particular media.

Face-to-face

For most interpreters, the primary face-to-face communication with Resource Management staff occurs during seasonal training. Each year in early summer, seasonal interpreters at Redwood National and State Parks receive a two week training in which they are oriented to the park resources, taught interpretive techniques, and presented with other useful information. Each year, staff of the Resource Management Division help with the training by giving slide presentations about the park's natural and cultural resources and their management. In addition, resource managers are often invited to serve as resource experts on field trips during training.

The amount of training devoted to Resource Management information has varied over the past three years, with consecutively less time devoted to resource managers each year. In 1994, half of the two week seasonal training was spent with resource managers teaching about the park's natural and cultural resources. In 1995, three days were spent with resource managers (one day of slide presentations and two in the field.) In 1996, only

one hour was given for presentations by resource managers, and much of the second week was spent at a Redwood Ecology Conference at Humboldt State University.

All new seasonal and volunteer interpreters attend every day of seasonal training. Returning seasonals and permanent interpreters usually miss several days of the training to cover the information desks. Long time permanent interpreters usually assist with the interpretive parts of the training but rarely attend the resource management presentations or field trips.

Also, every interpreter I interviewed from the North District said face-to-face meetings (besides training) are few and far between. One interpreter explained, "Resource Management staff rarely work or visit the North District, and the North District interpreters rarely have time to go south." Another long term interpreter said that in the past she has been able to arrange personal visits by resource management staff members to the North and would like to continue doing that in the future. Although North District seasonal interpreters are given program preparation days which they could use to drive to South Operations Center and meet with resource managers, they rarely do so.

Because of the closer proximity of their work areas, interpreters in the South District have many more opportunities for meetings with resource management staff. The South District interpreters' duty station, Redwood Information Center (RIC), and the resource management offices at the South Operations Center (SOC) are less than 10 minutes drive away from each other. The interpreters receive their mail at SOC, and the vehicles they use to travel around the parks are stored there. In addition, the South District Interpretation library (which contains, books, files, and slides used for developing interpretive programs) is located at SOC. Therefore, when the interpreters go to SOC to pick up mail and vehicles or use the library, they often see resource managers and sometimes converse with them about resource management topics or issues. Although the conversation is often limited to casual greetings, these interactions develop a familiarity

between the interpreters and resource managers which makes future communications easier.

When an interpreter is developing an interpretive program on a topic that requires specialized resource information, they may arrange a face-to-face meeting with a resource manager to provide them with this information. Only one of the interpreters I interviewed mentioned having arranged this type of meeting recently. However, two resource managers said they have been visited by interpreters for this type of information at some time or another. One of them indicated that only the most "inspired" interpreters make this effort.

The interpreters who served as liaisons between the divisions were encouraged to use face-to-face communication with the resource management branch to which they were assigned. However, I found that face-to-face communication was used by only two of the five liaisons, and only a few times over the summer. The liaisons were more likely to communicate with their branch over the telephone. Further discussion of the liaison system will occur in a later section.

Another type of face-to-face communication that was mentioned in the interviews was formal meetings where permanent interpreters and resource managers were working together in planning, policy-making or problem-solving. Examples mentioned included Bear Subcommittee meetings, Human Resources Committee meetings, Sign Committee meetings, Management Team meetings, and Interpretive Prospectus planning meetings. Note that formal meetings are a limited medium of communication because usually only permanent interpreters attend them and in many cases, these permanent interpreters do very little field interpretation (such as the Chief of Interpretation and Assistant Chief of Interpretation.)

Telephone

Telephone is commonly used by interpreters and resource managers to communicate with each other. However, three of the interpreters interviewed mentioned the frustration they have experienced trying to reach members of the Resource Management staff by phone. Resource managers spend a lot of time working in the field and are rarely in their offices to answer their phones. Before Fall of 1996, interpreters had to leave messages for resource management staff with a receptionist, so the contact was very indirect. Recently, a new voice mail system was installed throughout the park, so every staff member has his or her own extension. Now, one can leave a voice message directly for the person he or she is trying to reach. Five interpreters mentioned that the voice mail system has improved communications considerably.

Most of the communications that occur on the telephone are exchanges of factual information that only a member of the other staff is able to provide. Both interpreters and resource managers call each other for this type of information. Resource managers also use the telephone to inform interpreters about visitor safety issues such as prescribed burns. This type of communication is usually followed by an e-mail message or written memo.

One South District seasonal interpreter said he is less likely to use the telephone to contact resource managers because he is uncomfortable calling up someone he does not know. He said he prefers to go over to SOC and seek out the person for a face-to-face meeting.

One resource manager said she usually uses the telephone to contact seasonal interpreters because she is aware that e-mail is not as accessible to seasonals.

Electronic mail

In the National Park Service, the internal electronic communication system is called "cc mail," but it will be referred to as "e-mail" to avoid confusion.

According to the former Chief of Interpretation Kim Sikoryak, "e-mail is certainly becoming by far the most important method of communication" at Redwood National and State Parks. Three people I interviewed said they liked communicating with e-mail because it is easy, efficient, and you are almost sure to get a quick response back from somebody. In addition, several people mentioned that e-mail is a good medium when you want a written record of your exchange.

Although people are using e-mail more and more, not all employees of the park have totally embraced this system. Reasons cited for not using e-mail included discomfort with the new technology, inaccessibility, lack of training with the system, or a combination of the above.

For example, all of the seasonal interpreters that I interviewed said that they never use e-mail. One of the seasonals said he doesn't know how to use it, and even if he did, he is out in the field or in the information centers so much that he would rarely have time to access the computer. Another said, "I could use e-mail, but I am just not an e-mail person. When I think of communicating, I just don't think of sitting down at a computer. That change has not happened to me yet, and maybe it won't." In addition, seasonal interpreters do not have individual e-mail addresses, are not trained how to use e-mail, and are not encouraged to use it.

Although the permanent interpreters are trained in the use of e-mail, some of them do not have personal e-mail addresses either. The North District's three permanent and one term interpreter share a single e-mail address at the Crescent Beach Education Center (CBEC). This situation creates a privacy problem because the interpreters must go through each other's mail to find their own. In addition, they must make sure everyone has read all the non-personal mail before the messages are erased.

In the North District, no one person is in charge of e-mail communications. According to one permanent interpreter, e-mail is "left until someone has time to do it."

Eventually, someone goes through the messages and prints all the items that he or she feels the other interpreters need to read. Once they are printed, they are given to the information center coordinator who puts them into the message binders in the two information centers. (The message binder system will be explained later in the mixed media section.)

In the South District, one of the interpreters is assigned to the e-mail system as one of his duties. Each day, he is responsible for reading all the messages, printing the pertinent ones, and putting them in the message binder. This interpreter said that when he is not there, another interpreter is assigned to do this job, "but it does not always get done."

One resource manager said that e-mail is not an effective method for him because he sometimes gets so many e-mail messages that it is overwhelming.

Written

This category was confusing to discuss with interview subjects because so much written material is now sent electronically. During the interviews, this category had to be clarified by saying that written communications would only include information that they received from the original source on paper, not electronically.

Perhaps because of the more extensive use of e-mail for sending messages, written is the least used media of communication between the Divisions of Interpretation and Resource Management. During the interviews, only a few examples of written communications were mentioned.

Since they are often too lengthy to send over e-mail, documents such as reports or draft plans may be given to the Division of Interpretation in paper form. During Summer 1996, drafts of the new Bear Management Plan and a Threatened and Endangered Species Plan were provided to interpreters through the wildlife branch liaison. A few interpreters mentioned seeing these plans around, but none of them found time to read them. In general, when draft plans are produced by Resource Management, a copy is sent to the

Chief of Interpretation to comment on. Depending on whether there are time constraints or other restrictions, the draft may or may not be circulated to the rest of the Interpretation staff. In addition, the Chief of Interpretation must sign a Project Clearance Form for every Resource Management project that occurs in the park (e.g. prescribed burns, forest thinning). These Project Clearances include a statement of the problem, a description of the proposed project, alternatives actions, and justification for the project. Currently, field interpreters are not provided with copies of these Project Clearances.

Occasionally, documents will also be sent from the Interpretation Division to the Resource Management Division for review and to be checked for factual accuracy. Usually, the Chief of Resource Management will send the document to members of his staff who specialize in the particular topics covered in the document. Example documents mentioned in the interviews included drafts of the Wayside Exhibit Plan, the new Park Handbook, and various interpretive publications.

Summer interpretive program schedules are also communicated to Resource Management in written form. Schedules are delivered to SOC and posted on the bulletin board in the central office. However, from my interviews, it seemed that most of the resource managers are not aware that the schedule is there or do not look at it regularly. Only the South District Interpretation schedules are sent to the Resource Management offices in Arcata.

Another important written communication is the Wildlife Observation/Incident Card. These cards are used by park employees and visitors to report noteworthy sightings of wildlife in the park. The cards can provide important information for the Wildlife Branch, especially concerning mountain lions or bears. Due to the increased concern about mountain lions in recent years, a special form for mountain lion sightings is now required. Since interpreters are out in the field a lot, they are very likely to see wildlife and can report

it. In addition, since they have a lot of contact with the public, they can encourage visitors to report their wildlife sightings as well.

One popular written communication is the newsletter called "On the Wildside" produced by the Wildlife Branch of the Resource Management Division. The newsletter idea was originated by a wildlife biologist several years ago to communicate each month's wildlife sightings to employees throughout the park. In the past, the newsletter was a single-spaced, one page narrative listing the wildlife sightings, the people who made the observations, and a few tidbits of wildlife facts. When that biologist left the park, the new wildlife biologist decided to continue the newsletter, but in a different format. Along with a paragraph on the most interesting wildlife sightings of the month, the new newsletter also has a couple of short articles highlighting certain wildlife issues. The layout of the newsletter has also been changed to two columns for easier readability. The interpreters who were interviewed said they enjoy reading the newsletter, but have seen fewer of the issues over the past year. I found two reasons why they have seen fewer issues: 1) it is being printed every other month instead of monthly as it was before, and 2) the distribution of the newsletter has not been reaching as many people as before. Since the interviews ended, I have learned that the newsletter has dropped to lowest priority for the Wildlife branch and has been printed only once in 6 months.

One of the high priorities of the Wildlife Branch has been bear management at the park's Outdoor Schools. The wildlife biologists often check the outdoor schools for bear management violations (such as trash being left out). If a bear violation is observed, a written memo is sent to the Chief and Assistant Chief of Interpretation.

Mixed Media

Although the message binder is primarily a medium used to communicate between staff members within the Interpretation Division, it often contains information gained from

Resource Management and other divisions. The binder includes messages that have come to the Interpretation Division through all four media. Usually, they have been printed from e-mail or sent to the interpreters in written form. Occasionally, an interpreter receives pertinent information over the telephone or in a face-to-face interaction, and he or she writes this item in the message binder for other interpreters to read.

Ideally, the interpreters read through the message binder when they begin each shift, so they will be up-to-date on any new items placed in the binder. The message binder usually informs interpreters of road closures, mountain lion safety problems, prescribed burns and other important items that should be passed on to the visitor. In the South District, the staff has a red message binder for the most critical items to be communicated, and a black message binder for less important items and lengthier documents that require more time to read. In the North District, there is only one binder containing both types of material. The interpreters feel the message binder is a very good method for regularly communicating current resource management information to interpreters, as long as the information is clearly written and concise. However, a few interpreters expressed concern that not all the interpreters and volunteers read the binder as diligently as they should.

The liaison system is also a mixed media type of communication. Although the liaisons are encouraged to do most of their communications face-to-face, they also may communicate with their resource management contact over the telephone, through e-mail, or written intra-park mail. Face-to-face is considered the best method for liaisons because the two people can talk while looking at maps, pictures, etc. However, some of the liaisons' resource management contacts are located in the Arcata offices, a 35 minute drive from RIC; these liaisons mostly used the telephone for their contacts. Further discussion of the effectiveness of the liaison system will be included in a later section.

Communication Media: Use verses Preferences

In the questionnaire, interpreters were asked "If you wanted to communicate with a resource manager or scientist, which media of communication you would probably use?" They were asked to rank (from most likely to least likely) the following media : face-to-face, telephone, written, and cc mail. The results showed that 62.5% of South District interpreters are most likely to use face-to-face, and 37.5% are most likely to use the telephone. In the North District, 14% of the interpreters are most likely to use face-to-face, and 71% are most likely to use the telephone (Figure 2). The majority of South District interpreters (62.5%) indicated that they are least likely to use written. The North District interpreters' rankings of the other three media varied with no discernible trend.

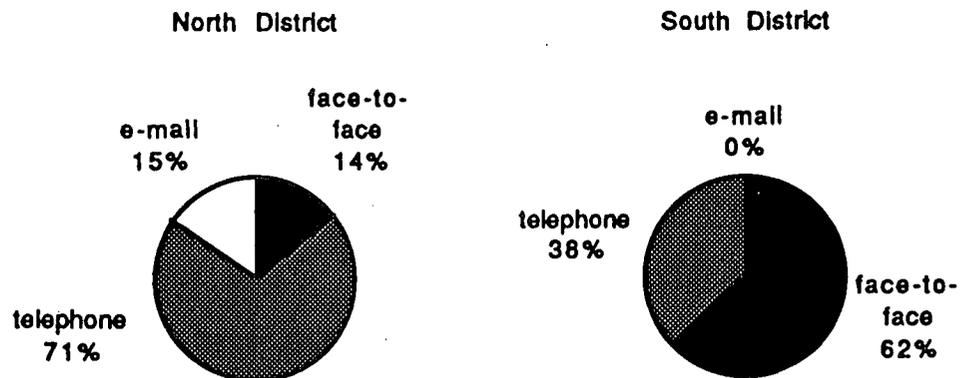


Figure 2. Current use of communication media based on rankings made by surveyed interpreters

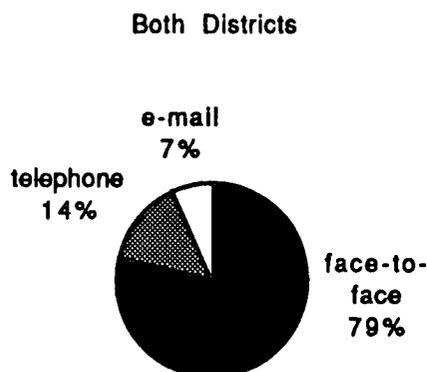


Figure 3. Preferences for communication media based on rankings made by surveyed interpreters.

The questionnaire also asked which medium interpreters would "prefer to use" if they wanted to communicate with a resource manager or scientist. Combining all responses, 79% of interpreters most prefer to use face-to-face to communicate with resource managers (Figure 3). Although only 14% of interpreters prefer the telephone first, 71% ranked the telephone as second choice. All permanent and term employees (100%) ranked written as least preferred. The seasonal employees split their lowest preference between cc mail (50%), written (37.5%), and telephone (12.5%).

Effectiveness of Media

When asked which of the communication media are most effective, 13 of the 20 interview subjects said "face-to-face." Several people explained that face-to-face communications are the most productive because they can exchange questions and answers and "get everything worked out." Also, people seemed to prefer the "personal touch" of face-to-face communications.

One interpreter said that for him, telephone and face-to-face are equally effective. Three of the interview subjects said they think e-mail is the most effective medium, claiming it is most efficient of the media.

Other interview subjects said the most effective medium depends on who they are communicating with and/or what they are communicating. One resource management person said she recognizes that "interpreters are usually more oriented to personal communication," so she tries to use face-to-face or telephone with interpreters, and e-mail or written for other people. Also, two people mentioned that, with joint projects such as an interpretive exhibit or planning document, face-to-face is the best medium because working together is more efficient than sending messages back and forth. Another person said that face-to-face is the most effective when a pressing issue is being discussed, but e-mail is most effective when simple information is being exchanged. One person said face-to-face is definitely best for getting information to one person, but written is better for getting information to a lot of people (referring especially to the use of the message binder). In addition, one person said that written (paper or e-mail) is usually the best medium when the information is detailed or technical.

Some interview subjects felt that a combination of two media resulted in the most effective communication. Two subjects stated that they prefer to meet face-to-face, but will follow up the meeting with an e-mail message in order to put the communication in writing. One interpreter said she likes to use e-mail for initial communication, then use the telephone for further discussion and clarification.

As stated earlier, most of the interpreters feel the message binders are a very effective method for combining messages received through all media and making them available to all interpreters. Of course, some noted that this method works only if the interpreters read the message binders regularly.

Effectiveness of the Liaison System

During most of the interviews, the effectiveness of the current liaison system was discussed. Almost every interview subject said the liaison system was a good idea, but did not seem to be working well in its present form. One interpreter said, "I don't think the liaison system, as it is now, has reached its potential."

One of the problems articulated was that the liaison system was never formally announced to the entire staffs of both divisions. The purpose and duties of the liaisons were not clear to many of the interpreters and resource managers interviewed. Even some of the liaisons themselves were not clear what was expected of them. The resource managers who were not regularly being contacted by a liaison were not even aware that the liaisons existed.

Also, most of the liaisons who were interviewed admitted that the liaison duties were low priority for them compared to their many other pressing duties. One liaison said that if he had a choice of preparing for an evening program he was doing that night or contacting a resource manager, being prepared for the program seemed much more important to him. Also, two of the liaisons did not feel that their supervisor stressed the importance of the liaison duties enough, so they were not as motivated to do them.

The former Assistant Chief of Interpretation Smitty Parratt, who developed and implemented the liaison system, said the liaisons were expected to spend 5-10% of their time doing liaison duties. From interviews and phone conversations, it was determined that two of the liaisons spent 1% or less of their time doing liaison duties. Two others said that the time they spent varied between 1% and 5% depending on the time of year. Only the cultural resources liaison spent 10% or more of his time on liaison duties because he was organizing Native American cultural demonstrations and attending Yurok tribal meetings.

The main duty of the liaison is to contact a staff member of their assigned Resource Management Branch once per week to discuss the current activities of the particular branch and get information about the resources the branch specializes in. Once the liaisons received information from the Resource Management Division, they were supposed to report their findings to the rest of the Interpretation staff using several steps. Since all the liaisons worked in the South District, they were expected to present the information at the South District staff meetings (held weekly during the summer.) Next, the information was put into Staff Meeting Notes which were made available for anyone who missed the meeting. Then, the South District Staff Meeting Notes were sent by e-mail to the North District where they were printed and routed through the interpreters' mailboxes. Finally, the liaisons were expected to regularly submit a written liaison report containing information they had learned from their Resource Management Branch.

An examination of the South District Staff Meeting Notes from the summer of 1996 revealed that resource management issues were mentioned at only two of the eight staff meetings. In addition, one of the liaisons was not listed as an attendee at any of the meetings, and another attended only one meeting the whole summer. One interpreter explained that since staff meetings were made optional by their supervisor, many of the South District interpreters, especially those that had been at Redwood many seasons, chose not to attend the meetings. Formal liaison reports (which were attached to the Staff Meeting Notes) were submitted by only two of the five liaisons, and only a few were submitted all summer. The lack of reports was partly explained by two liaisons who said that when they contacted their resource managers, they usually did not gain any new information worth reporting back to the staff. Also, two of the liaisons said they had difficulty reaching their contact person because resource managers are in the field so much. In addition, the resource managers' days off generally did not correspond with the

interpreters' days off, so there were only a few days in a week where contact could be made.

The success of the liaison system partly depended on the people involved on both sides of the relationship. For the system to work to its potential, both the interpreter and the corresponding resource manager needed to commit time and energy to the relationship. Two of the liaisons felt the resource managers with whom they were communicating were willing to give information, but were not interested in spending time working on cooperative projects. On the other hand, a couple of resource managers said the liaisons with whom they were working seemed like they were not totally dedicated to their liaison duties because they were too busy with other things. The one liaison/resource manager relationship that seemed to work most effectively was due to the enthusiasm of both participants toward resource management interpretation.

Every North District interpreter who was interviewed said they have not noted any real benefits to them from the liaison system. Most of them were not aware that they were supposed to be receiving information from the liaisons, let alone how. Although they read the South District Staff Meeting Notes, they said they did not notice any resource management information contained in them. They did not receive any liaison reports.

Many of the interview subjects feel that a major weakness of the current liaison system is having seasonal interpreters act as liaisons. (Three of the five liaisons during summer 1996 were seasonals). The subjects said that since seasonals are in the park for only about three months, there is not enough time to develop a rapport with a resource manager and establish regular communication. Also, when the seasonal interpreter leaves at the end of the summer, the communication link is broken. Smitty Parratt, the designer of the present system, said that when the seasonals leave, the liaisons' duties are delegated to another interpreter. However, several other interview subjects felt that this inconsistency would impair the communication.

Although the liaison system was imperfect as a communication link, some accomplishments were made since the system was established. Over the past two years, liaisons have worked with resource managers to produce two new temporary resource management exhibits, and to program resource management information into the interactive computers.

Communication Barriers

During the interviews, many people mentioned general reasons why communication between the Interpretation and Resource Management Divisions does not happen smoothly or does not happen enough. These reasons have been combined into a category called "Communication Barriers."

The most obvious and most frequently mentioned communication barrier is the geography of the parks and the arrangement of the employees throughout the parks. Redwood National and State Parks is linear, so the North District and South District duty stations are about 40 miles apart (about one hour's driving distance.) Even within the South District, the Redwood Information Center (which also houses the interpreters' offices) is separated from the Resource Management offices by the main highway and a few miles of gravel road. In addition, some of the resource managers work in offices in Arcata, a town about 30 miles south of the park boundary. Some of the geologists as well as the entire staff of the Archeology/Cultural Resources Branch are located at these offices. Clearly, face-to-face communication with these staff specialists presents a challenge for interpreters.

Over half of the people interviewed said that communication would be much easier if the two divisions had better access to each other. The interpreters working in the North District feel totally isolated from the Resource Management Division and their activities in

the South. Though the South District interpreters are closer, many of them still feel communication with Resource Management would be improved if they worked in a common building or at least were within walking distance of each other. One interpreter gave an example of another national park in which he worked where the interpreters had only to go next door to talk to a resource manager. He said that this easy access allowed for day-to-day contact and made communication between the divisions much better.

The next communication barrier between the divisions, which was categorized as "Lack of Understanding," may partly result from not having enough regular contact with each other. During the interviews, four interpreters and a former interpreter (who is now a resource manager) said they believe that many of the resource management staff do not understand what the visitors to the park are like, and don't fully understand the functions of the interpreters. During the interviews, resource managers were asked if they had attended interpretive programs in the parks. Although several of them said they have attended interpretive programs in other parks, only one said he had attended an interpretive program at Redwood National and State Parks. Most of them said they do not attend the evening programs because the locations are too far from their homes.

Regarding the lack of understanding about visitors, one interpreter said that resource managers do not realize "what kind of questions the public is asking and what level of understanding they come to the park with regarding resources." As examples, the interview subjects related situations where resource managers created text for an exhibit or publication that was too wordy or technical and resisted Interpretation's efforts to simplify it. One interpreter said that she has actually had arguments with certain people "who refuse to believe that visitors won't read that kind of stuff." During two interviews, resource managers asked (without any prompt) what the reading level is supposed to be for written interpretive materials because they couldn't believe what they had heard from interpreters.

In addition to a lack of understanding about visitors, several interview subjects felt that most resource managers don't understand the amount of preparation required for an interpretive program and the special techniques needed to inspire and educate diverse audiences that include children and adults of various educational backgrounds. Also, they said that some resource managers do not realize how much time and staffing is required to keep the information centers open and to do interpretive programs all seven days of the week.

During the interviews, it was apparent that the resource managers' general lack of understanding about visitors and the responsibilities of interpreters causes them to be frustrated with the Interpretation Division. They don't like the fact that the scientific information they want presented to the public must be "watered down." They don't understand why doing a program on watershed management presents such a challenge for an interpreter. They don't comprehend why the Interpretation Division has so little time to devote to the projects resource managers would like done. This lack of understanding and frustration has been a significant communication barrier at Redwood and has spawned several specific communication problems between the two divisions.

Another communication barrier that again results from lack of contact with the other division is what a seasonal interpreter called "the intimidation factor." During the interviews, one permanent interpreter said that it is common for the new seasonals to be intimidated about calling on resource management people to answer their questions. Interpreters may be intimidated because they don't know people on the resource management staff and/or they feel that the scientists are too busy doing more important things than talking with an interpreter. A couple of seasonal interpreters verbalized their intimidation during the interviews. One of these seasonals told me that if he had a resource question, he would rather just ask a permanent interpreter than a resource manager. These seasonals used the words "elitist," "pulled back," and "aloof" to describe the Resource

Management staff. They explained that they have this impression because resource managers work in their own part of the park and rarely come into the interpreters' world. From the rest of their interviews, it was clear that these two particular interpreters have had very limited contact with resource managers during their employment in the parks. The other interpreters, who have had more contact with the Resource Management Division, did not mention being intimidated by resource managers.

For the last barrier to communication, the two categories "Sensitivity" and "Personalities" have been combined. Two subjects said in their interviews that the people in this park are more sensitive than in any other park they have worked. One of them said, "Some people describe this park as a political minefield." The other one described several examples where people's feelings got hurt and nasty letters were written for fairly trivial reasons. In addition, two subjects told me that personality clashes have created communication problems. One subject said, "There are personalities in this park that definitely work in opposition to building partnerships with Resource Management..." Another subject made the general statement, "there are probably natural personality conflicts between the type of people that go into resource management and the type of people that go into interpretation."

Interpretation of Resource Management Issues

Interpretive Methods

At Redwood National and State Parks, resource management issues are interpreted through a variety of methods including formal programs, publications, exhibits, wayside signs, visitor center contacts, roving interpreters, and interactive computers. In the past, field seminars and visitor participation in resource management projects have also been

used to interpret resource management issues. The following sections describe in detail how each of these methods is or once was used in the parks.

Programs

Almost every interviewed interpreter said that evening programs in the campgrounds always contain at least one resource management message at the beginning of the program. During training, interpreters are told they should use "warm-up" time to discuss bear and mountain lion issues, especially focusing on visitor safety. In addition, during warm-up, interpreters often talk informally about other resource management issues that visitors ask questions about. However, less than half of the surveyed interpreters have chosen to do an entire evening program focusing on a resource management issue or topic. Evening program topics for the last two years are shown in Appendix E. In the North District, during the summer of 1996, 3 out of 11 regularly scheduled evening programs (27%) were resource management focused. During 1995, 2 out of 11 programs (18%) had this focus. In the South District, the number of resource management-focused programs was 4 out of 13 (31%) in 1996 and 3 out of 16 (19%) in 1995. Therefore, the average percentage of evening programs focused on resource management issues during the past two seasons is about 24% for both Districts.

Some of the guided walks that are presented during the summer contain resource management messages. During tidepool walks, most interpreters discuss the fragility of the tidepool ecosystem and how the visitors can avoid harming the creatures during the walk. A few of the interpreters may also mention the tidepool impacts research that is being conducted by a Humboldt State graduate student. During the prairie walk at Prairie Creek State Park, interpreters usually mention the use of prescribed fire to manage the prairie and preserve elk habitat. Finally, during redwood walks interpreters will usually discuss the importance of preserving old growth redwood groves. Only one interpreter

said she has used a redwood walk to discuss in depth the restoration techniques being used on the logged-over lands in the South end of the park. In general, guided walks usually include resource management messages, but rarely have a resource management focused theme.

At Redwood National and State Parks, children's programs seem to have more resource management messages than those presented to mixed age groups. Junior Ranger Programs presented in State Park campgrounds often include strong messages about park stewardship, protecting biodiversity, and saving energy resources. The coordinator of Howland Hill Outdoor School (located in the North District of the park) said that the programs they present to the visiting school groups are usually resource management based. Example topics include bears, endangered species, non-native species, stream study, and managing for the future. The coordinator of the Wolf Creek Outdoor School in the South District said that on the children's first night at the school, they are given an orientation that includes a skit and a discussion concerning bears, mountain lion, and elk. Although the main purpose of the orientation is to teach safety, there are several resource management messages tied into it. Another resource management related activity done at Wolf Creek Outdoor School is having the children assess the quality of salmon habitat in a nearby stream. Sometimes they will also discuss the impacts of development on that habitat.

Publications

Redwood National and State Parks' information and visitor centers have a variety of publications available for the visitor, and many of them discuss resource management issues.

The publication distributed to almost all visitors who come into the centers is the Redwood National and State Parks Official Map and Guide. One side of this publication

has a map of the parks and orientation information for each area. The other side contains a great deal of information on natural and cultural history and a little information on resource management. The resource management issues that are mentioned include the diminishing salmon and steelhead resources in Redwood Creek due to logging activities, the restoration of logged forest lands in the Redwood Creek watershed, and the prevention of bear problems due to human food.

Another publication that visitors usually take is the Visitor Guide, the parks' newspaper. For many years, the Visitor Guide served primarily as an orientation tool for the visitor, listing scenic drives, hiking trails, points of interest, and other useful information. In addition, there were always articles that highlighted certain resources in the park and occasionally discussed resource management issues. In the summer of 1996, the park produced a newspaper that had very little orientation material and many resource articles. Four of the eight articles specifically discussed resource management issues. The topics were marbled murrelets, migratory birds, steelhead, and prescribed burning. In addition, the article on the front page discussed the Parks' "global responsibility" to manage the parks' resources for highest environmental quality.

Despite the increased focus on resource articles in the Visitor Guide, most interpreters who were interviewed felt that the Guide was still not getting the message out. Several interpreters said that the lack of orientation information made the Guide less desirable to the visitors, so many didn't take the Guide with them. One interpreter admitted that he didn't encourage visitors to take the Guide as much as he would if there was more useful information in it. Most interpreters felt that for the Visitor Guide to be effective, there needed to be more of a balance between orientation information and resource articles. In addition, three subjects felt that the resource management related articles needed more depth to be effective.

Site bulletins are probably the best publication for interpreting resource management issues because they contain the most in-depth information on particular topics. Site bulletins are one-page folded publications that fit a format design standard in all national parks. At Redwood, site bulletins covering resource management topics include "Mountain Lions in the Redwood Forest," "The Bear Facts," and "Smoke Management." Interpreters in the South District said that they give bear and mountain lion bulletins to every visitor who plans to go backpacking into the Redwood Creek Basin. In addition, these two brochures are kept out on the desk for visitors to easily pick up. One interpreter said that having them on the desk causes them to run out too quickly (because every visitor takes one) and then they do not have any for backcountry users who really need them.

Two more resource management handouts are kept under the desk at Redwood Information Center. One of them was called "Rare Wildlife Species Found in Redwood National and State Parks." This handout would be useful if a visitor wanted a simple list of names and status codes, but it provides no interpretation of the animals. The other handout answered the question, "What is the purpose of the electric fence on the former Davison Property within Redwood National Park?" by explaining the riparian habitat restoration program. None of the interpreters interviewed mentioned having given either of these handouts to a visitor.

Years ago, a publication called "Redwood Renaissance" was created to interpret the watershed restoration project in the Redwood Creek Basin. Copies of this old publication can be found buried on shelves in interpreters' offices. However, a long time interpreter said that the park stopped printing and distributing this publication years ago because it was politically sensitive. Apparently, park managers felt that the publication portrayed the timber industry too negatively and wanted to avoid bad relations with the local community.

An examination of four of the parks' self-guided trail brochures revealed that only one contained resource management messages. The "Tall Trees Trail Guide" describes

how extensive logging has affected Redwood Creek and reduced the salmon and trout habitat. Later, it discusses how logging changes the microclimate of an area.

Exhibits

The main comments interpreters had about exhibits was that they wish the parks had more of them. Since the national park information centers are supposed to provide only basic orientation information, there are few permanent exhibits in these centers, and they do not discuss resource management. The two small visitor centers located in State Park campgrounds also contain only natural history exhibits.

However, over the past two summers, interpreters and resource managers have been working together to develop temporary exhibits on various resource management issues. Most of the exhibits began as poster presentations at scientific conferences. The interpreters then helped the resource managers convert the presentations into exhibits more appropriate for park visitors. So far, they have completed exhibits on watershed restoration, migratory birds, stream erosion, and prescribed fire. Exhibits on bears and exotic plants management are also in the works. Only one exhibit at a time is shown in each information center because they are put up on portable panels and changed every three months. The exhibits are supposed to rotate between Redwood Information Center in the South and the Hiouchi Information Center in the North. (In actuality, none of the exhibits have been rotated to the North because of lack of time, resources, and personnel support).

Interpreters have a variety of feelings about the temporary exhibits. Some believe that it is a good way to get the message out and should be continued. Others feel that some of the exhibits are still too technical for a general audience and that the presentation style does not attract visitors. One interpreter thinks it is inappropriate to have interpreters with no exhibit training put together these displays. The former Chief of Interpretation Kim Sikoryak said that doing exhibits is a "good learning experience for interpreters" and that

the exhibits are "sound." He prefers the exhibits to be made "in-house" (rather than professionally) because it saves money and the exhibits can be easily kept current.

Wayside Signs/Exhibits

During the interviews, every interpreter agreed that the current wayside signs are in great need of replacement. The 44 signs have been in place since 1982, and both appearance and interpretation style are outdated. In addition, the signs tend to have very little in-depth information and are often not specific to the sites where they are located. An inventory of the current wayside signs was taken and each sign was classified by educational value (whether they taught the visitor anything about the resources): 18 of them were considered educational, 10 were considered somewhat educational, and the remaining 10 were considered to have no educational value whatsoever. The "non-educational" signs are either of an inspirational, poetic nature or are purely orientational signs. Even the educational signs contain little information; they mainly provide identification of plants and animals using pictures. Three signs discuss Native American history. None of the signs discusses resource protection, and only one of the signs discusses resource management. However, this sign, called "Healing A Watershed," is no longer displayed in the Parks because it was considered "anti-logging" and was removed for political reasons.

For years, a new Wayside Exhibit Plan has been in the works. The project has been delayed many times, and two outside contracts have been terminated before completion. The Wayside Exhibit Plan that was begun in 1996 included interpretation of resource management topics such as marine mammal protection, tidepool ethics, human-caused effects on anadromous fish, dune protection, rehabilitation of logged lands, and the story of the creation and expansion of the park. Although this plan was recently rejected because of dissatisfaction with the designs, it is clear that the Interpretation Division intends to include more resource management interpretation in the new waysides signs compared to

the current wayside signs. Each time a wayside plan has been drafted, members of the resource management staff have assisted with text editing and have shared their ideas with the Interpretation Division.

Recently, Prairie Creek Redwoods State Park installed new wayside signs along the Newton Drury Scenic Parkway. According to the State Park District Interpretive Specialist, the signs were funded by the California Department of Transportation and the primary purpose of the signs was to provide information at trailheads for hikers. Therefore, at each site, one panel provides a trail map for the visitors to plan their hike, and the other panel gives them "a little bit of inspiration... and a little bit of education towards the environment they are going into." The primary focus of the interpretation panels is natural history of the redwood environment, but they also approach the issues of respecting resources and treading lightly on the land. Since the trail map panels are "visually overloading," the companion panels were designed to be simple and therefore do not go into much depth. Also, due to budget concerns, the panels were designed so they could apply to more than one site.

One other Wayside Exhibit in the parks is found on the C-Line road which leads to the popular Tall Trees Grove. This exhibit was put together by staff of the Resource Management Division to interpret the watershed restoration project that was completed at that site. The glass-enclosed display case holds "before and after" pictures of the site, as well as text explaining the road removal process. Over time, the display materials have become faded and outdated. Also, the site where the restoration occurred has grown over with vegetation, so it is difficult for the visitor to visualize the project's effects without further interpretation. Both Resource Management and Interpretation staff members are aware that the display needs renovation, but no one has committed time to revise it yet.

Visitor Center Contacts

All the interpreters said that they occasionally talk with visitors about resource management issues in the information centers. Normally, the topics are brought up by visitors because they have a question about what they have seen. According to the interpreters interviewed, visitors usually ask about bears, mountain lions, and elk. Sometimes visitors also ask about logged-over lands or areas that have recently been burned.

However, the majority of visitors come to the information center to get a basic orientation to the park. The information centers get very busy during the summer, and people are often lined up at the information desk to get their questions answered. In the North District, interpreters are also responsible for ringing up sales items from the bookstore. (In the South District, the Redwood Natural History Association staff runs the cash register during the summer). When there are people waiting for help, interpreters cannot spend much time talking with visitors about specialized information. So, during the summer, interpreters will usually just give out publications or recommend books to people who request in-depth information, then move on to help the next visitor. During the off-season, interpreters are able to spend more time talking to visitors, and they will often discuss resource management issues. One exception to this general rule is that, during the summer, South District interpreters will usually spend a little more time talking about bears and mountain lions while issuing backcountry camping permits.

Roving

In the North District, the interpreters are not assigned roving time on their schedules. The only time a North District interpreter has roving contacts is if they choose to use program preparation time for roving, or when they are contacting visitors before a program. One seasonal interpreter said that almost all of his roving contacts are when he is

walking around the campground inviting people to come to his evening program. He said that resource management topics sometimes come up, but he cannot spend a lot of time talking then because he needs to get around to as many campers as possible and back to the amphitheater in time for his program.

In the South District, the interpreters are given roving time for part of the day, 2-3 times per week. They rove the Big Tree Area, Davison Ranch, Lady Bird Johnson Grove, Tall Trees Grove and Fern Canyon. During the interviews, interpreters said that while roving at Davison Ranch, the majority of questions are about the elk that are in the prairie. Many visitors are curious about how the elk are managed; they ask how many elk there are, if the elk are fed by the rangers, and what the rangers do if the elk get sick. At the Big Tree Area, Lady Bird Johnson Grove, and Tall Trees Grove, interpreters normally talk about redwood ecology and rarely discuss resource management. At Fern Canyon, one seasonal interpreter said he talks about threatened amphibian species. In general, most of the interpreters address a resource management issue while roving only if a visitor asks a question about it.

Computers

Five interactive computers were added to the information centers in August 1996. They use a system called PIX Interactive which, according to the interpreters, was very difficult to program and took numerous hours of staff time. As of April 1997, the computers' programs are still incomplete because the computers ran out of memory before all the information could be loaded. The Interpretation Division will need to purchase additional hard drive space for the computers in order to complete the programs.

Many of the interpreters feel that the interactive computers are not as successful as they had hoped. In the few months since the computers were installed in the information centers, not many people were observed using them. Three interpreters said that they

mostly have seen children playing around with the computers. One interpreter had hoped that the interactive computers would "take some pressure off the desk" because it would answer people's questions for them. Instead, he feels that the computer actually generates more questions because the information in the computer is not in-depth enough or, in some cases, is still incomplete.

Along with some basic orientation information, the interactive computers contain quite a bit of information on natural and cultural resources. The information that relates to resource management includes sections on threatened and endangered wildlife species, mountain lions, exotic plants, and fire management. Sections on bear and elk are still incomplete. A section called "Rules and Reasons" contains messages about protecting plants, animals, and archeological finds.

As the interviewed interpreters suggested, an examination of the computer program reveals many problems. The computer is fairly slow and requires a lot of waiting time from one screen to the next. Also, a significant amount of the program is incomplete, often leading one to a black screen containing only the words "Page in progress." Finally, there is a significant imbalance of information in the program such that some topic areas are covered in great detail while others are barely covered. For example, it seems that a lot of memory was used for the highly detailed geology section and a very lengthy plant section.

In 1996, Redwood National and State Parks also put a site on the World Wide Web. Like the interactive computers, the site contains both orientational information and resource information. From the home page, a user can select the "Electronic Visitor Center," then choose from two categories, "Visiting the Redwoods" or "Science at Redwood." The latter section includes subsections of Natural History, Cultural History, and Resource Management. Within the Natural History section, (among other things) one can learn about cougars, elk, and marbled murrelets, and look at a list of rare wildlife species in the park. Within the Resource Management section one can learn about the

prescribed fire program and the exotic plants management program. Surprisingly, there appears to be no information on the Web site about the world renowned watershed restoration program.

Field Seminars

Beginning in the early 1980's, Redwood National and State Parks had a field seminar program every summer until the program was discontinued in 1995. For a small fee, the field seminars were attended by park staff, members of the local communities, and visitors to the park. Seminars were usually on summer weekends and lasted from a half day to two full days. Teachers of the seminars were park interpreters, park resource management staff, Humboldt State University professors, and other local experts. Field seminars covered topics in natural history, cultural history, and resource management, and always included some kind of first-hand field experience. Specific topics concerning resource management included Black Bear Management, Bird Monitoring, and Watershed Restoration. Staff of the Resource Management Division also presented seminars on Geology, Wildflowers, Bats, Predatory Mammals, Birds of Prey, and Reptiles & Amphibians. Local Native Americans presented seminars on Tolowa life and Basket-making.

The official reason for discontinuing the seminars was that the cost of maintaining the program was too high considering the low number of people who attended the seminars. The Chief of Interpretation at the time said that, with field seminars, the Parks were not getting enough "bang for the buck." Although the Redwood Natural History Association covered the cost of program materials with fees collected from the seminars, the real cost was the enormous amount of time spent by a National Park Service employee to coordinate the program.

Some interview subjects discussed in more detail the problems with the field seminar program. The former field seminar coordinator claimed that almost every year, half of the programs were canceled due to lack of interest. Apparently, there were a few popular programs that filled every year, and the rest had low levels of interest or none at all. The most popular seminar was on watershed restoration, and it was geared more to agency professionals rather than the general public. Several interview subjects pointed out that the seminar program did not have a large population area nearby from which to draw. Also, two interpreters mentioned that the Redwood National and State Parks field seminar program may have been competing for participants with a similar program at Humboldt Redwoods State Park.

Most of the interviewed interpreters said that the field seminars were a great idea and one of the best ways to interpret resource management issues to people who were really interested. However, the North District interpreters in particular felt that canceling the program was justified. Since the program was coordinated by an interpreter stationed in the North District, these interpreters were the most aware of the time, energy, and resources used to coordinate the seminars.

On the other hand, many interpreters in the South District felt the field seminar program was too valuable of an interpretive method to let go. Those who had attended field seminars in the past thought the seminars were very effective and provided excellent experience for all participants. For the interpreters, the seminars also served as valuable training on a specific topic.

During the interviews, almost every resource manager expressed disappointment that the seminars were discontinued. Although they were aware of the reasons for canceling the program, most of them felt the Interpretation Division could have tried harder to save the program. Some thought the programs were not advertised well enough. Many of them were frustrated because they really enjoyed doing the seminars and even gave up

their weekends (unpaid) to teach the seminars. Also, many felt that this was their best opportunity to interact with the public and share the science that is happening in the park. One subject noted that the type of people who will pay money to attend field seminars are the same kinds of people who will support park projects with their money, their votes, and their influence.

Participation in Resource Management Projects

At Redwood National and State Parks, there have never been regularly scheduled programs where visitors participate in resource management projects. However, special groups such as Boy Scout troops and environmental clubs have occasionally helped the Parks with exotic plant removal. Normally, the Interpretation Division has not been involved with these special group programs; usually the Resource Management Division has coordinated and supervised the projects alone.

However, both of the Interpretation Division's Outdoor Schools have worked cooperatively with Resource Management staff to involve students in resource management projects. One year, groups of third graders helped remove exotic Scotch Broom from areas around the Howland Hill Outdoor School. At Wolf Creek Outdoor School, one of the program choices offered to school groups is volunteering with a resource management project. Each year, three or four school groups, usually 7th and 8th graders, help with a project such as pulling exotic Pampas Grass or transplanting ferns from a rehabilitated area. These programs have been cooperatively organized and supervised by staff of both the Interpretation and Resource Management Divisions.

Effectiveness of Interpretive Methods

In the questionnaire, the interpreters were asked to rate the interpretive methods for their potential effectiveness in interpreting resource management issues. Rating choices

ranged from 1-5 with 1 representing "very effective" and 5 representing "completely ineffective." The average ratings for each method are shown in Table 1. *Field Seminars* and *Interpretive Programs* were given the best average ratings by interpreters (about 1.5 for both). *Interactive Computers* received the lowest average rating of 3.2. All the methods that require personal contact with a visitor were rated more effective than any of the non-personal methods.

Table 1. Interpretive methods ranked by average effectiveness rating given by interpreters.

Interpretive Method	Average Effectiveness Rating
Field Seminars	1.47
Interpretive Programs	1.50
Visitor Participation	1.63
Informal Interpretation	1.69
Publications	1.94
Wayside Signs	2.12
Exhibits	2.31
Interactive Computers	3.20

In the second part of the same question, the interpreters were also asked to choose the three most effective interpretive methods from the list and rank them in order of effectiveness. Eight of the seventeen interpreters (47%) ranked Interpretive Programs as the most effective method. *Visitor Participation in Resource Management Projects* and *Informal Interpretation (roving and visitor center contacts)* were also ranked first by three interpreters each. A score was calculated for each method by giving 3 points each time a method was ranked first, 2 points each time it was ranked 2nd, and 1 point each time it was ranked 3rd. The final scores are shown in Table 2 with the methods ordered from highest to lowest score. Note that this ranking is slightly different from the rating results, but all the methods that require personal contact with a visitor are still ranked as more effective than the non-personal methods.

Table 2: Interpretive methods ranked by order of effectiveness using the number of times it was chosen by an interpreter as the first, second, or third most effective method.

Interpretive Method	Number of Times Chosen			Weighted Score
	1st	2nd	3rd	
Interpretive programs	8	1	3	29
Visitor Participation	3	4	3	20
Informal Interpretation	3	4	1	18
Field Seminars	1	3	3	15
Publications	2	4	1	12
Wayside Signs	0	0	5	5
Exhibits	0	1	1	3
Interactive Computers	0	0	0	0

During the interviews, 8 out of the 12 interpreters (67%) said that interpretive programs are the most effective method of interpreting resource management information. They said that an evening program is effective because it reaches the most people and uses an approach that stimulates several senses. Evening programs usually include an audio component (talking) and a visual component (slide show and/or props), and most interpreters try to involve the audience in activities such as singing, participating in a skit, or doing some other kind of body movement. One interview subject said an interpretive walk may be the most effective method because an interpreter can point out the actual resources in the park as he/she talks about them. However, the interpreter admitted that many of the resource management activities are currently not in places where interpretive walks are given.

During the interviews, interpreters said that both visitor participation in resource management projects and field seminars are effective methods because the visitor experiences first-hand how and why resource management is done. Also, one interpreter pointed out that these activities give members of the local community an opportunity to get to know park employees and therefore develop better relationships with the parks. However, during the interviews, several interpreters expressed concern that there would not be enough visitor participation in these types of program to justify the amount of staff

time spent. Also, four interpreters commented that these programs may be just "preaching to the choir" (three people used these exact words), and therefore may not be worth the effort.

Informal interpretation which includes roving and visitor center contacts is also considered very effective by interpreters. Informal contacts are especially effective in the winter when the information centers are less busy and an interpreter has time to talk to the visitors at length about various issues.

Three interpreters said that publications are one of the more effective methods because they reach a lot of people and allow a visitor to learn more in-depth about a subject they are genuinely interested in. Also, the visitor can take their own personal time to read the material instead of being rushed through it by an interpreter at the desk. However, three interview subjects expressed concern that publications can be a wasteful method because some people just grab everything that is printed and never read all of it.

Three interpreters expressed that if the interpretive exhibits and wayside signs in the park were better, they could be effective methods. One interpreter pointed out that since a lot of visitors just pass through the park, wayside signs may be the only interpretation that reaches them. Several interpreters said that wayside signs are very effective for explaining to the visitor what they are looking at when the story is not immediately obvious. For example, a sign about watershed restoration is greatly needed at the Redwood Creek Overlook now that the logged over lands are covered with trees. A photograph of how the area looked in 1978 when the land was first acquired would show the web of logging roads that are now concealed by greenery.

Support for Interpreting Resource Management Issues

Support by the State Parks

Five of the National Park Service interview subjects stated that the support of State Parks will be necessary to improve interpretation of resource management issues in Redwood National and State Parks. As mentioned earlier, the seasonal interpreters hired by the State Parks are scheduled and supervised by the National Park Service. Also, all evening interpretive programs are presented in State Park campgrounds and many of the guided walks are conducted on State Park lands. Therefore, State Parks have a great deal of interest in decisions regarding Interpretation. During the interviews, the National Park Service employees expressed two major concerns: 1) Since the State Parks' major goal is to have as many interpretive programs as possible with as many people attending as possible, they might disagree with taking interpreters' time away from doing programs to do other resource management related activities, and 2) since State Parks traditionally emphasize entertainment more in their interpretive programs, they may not want interpreters to present a lot of serious educational programs about resource management issues.

Interviews with the State Park District Interpretive Specialist and the State Park Superintendent addressed the first concern. Both agreed that many people involved with State Parks are concerned with the number of interpretive programs being presented in the State Parks. Recently, there has been pressure from the State Legislature to report statistics on quantity and quality of interpretive programs in all State Parks. Also, the number of programs and attendance at programs in the State Parks within Redwood National and State Parks have dropped since the National Park Service and State Parks combined their interpretive efforts three years ago. No one is sure why this drop in numbers occurred, but it is possible that having State Park interpretive specialists working in National Park information centers and doing programs on National Park land has taken away from State Park interpretation. On the other hand, there are now more National Park Service

interpreters doing interpretive programs in the State Parks, so these efforts should have balanced out. Although the State Park District Interpretive Specialist supports interpretation of resource management issues, he is very concerned about any changes in interpretive programming that would lower the number of visitors contacted in the State Parks. The State Park Superintendent suggested that all interpretive efforts, whether they be on State Park or National Park land, be included in the statistics given to the State Legislature because separating the two efforts causes divisiveness between the cooperating agencies.

Interviews with State Park Rangers, the District Interpretive Specialist, the State Park Superintendent, and a representative of the North Coast Redwoods Interpretive Association addressed the entertainment verses education issue. All the State Park interview subjects stated that the interpretive goals of the State Parks are basically the same as the National Parks--education and inspiration. One subject stated that some National Park interpreters may have a misconception about State Park interpretation based on certain programs being done by State Park rangers in this area. He said that although a few of the rangers may be focusing more on entertainment than education, that is not what is taught in State Park interpretive training. In training, State Park Rangers are told they should use skits and songs during their warm-up "to establish an intimate rapport with the audience." This informal approach may also be used throughout the program, but State Park training teaches rangers that all programs should have an interpretive message. Several of the State Park interview subjects said that if a program is entertaining, the audience may be more receptive to that message. One subject also pointed out that the most memorable campfire programs are usually those that are the most creative and fun.

Two interview subjects stated that regular State Park visitors have grown to expect some entertainment in State Park programs. One subject said that although she thinks resource issues need to be interpreted, interpreters need to realize that the visitors are a non-captive audience and can get up and leave at any time. She said, "You don't want to lose

your audience or they won't keep coming, and you lose your chance to get the message out."

In 1986, a study was conducted in the campgrounds of Jedediah Smith Redwoods State Park and Del Norte Redwoods State Park to determine the visitors' preference for interpretive methods. Survey results showed that 95.3% of the respondents agreed that campfire programs should be a way to learn about nature or history, and 92.1% agreed that campfire programs should be entertaining (Irving 1986). This study confirms that the State Park audiences desire both education and entertainment in interpretive programs.

Support by Interpreters

In the questionnaire, interpreters were asked for their level of agreement with the following statement: "Redwood National and State Parks should make interpretation of resource management topics and issues an important priority." Results show that 3 out of 17 strongly agreed (18%), 12 out of 17 agreed (71%), and 2 out of 17 were unsure (12%). None of the respondents disagreed or strongly disagreed with this statement. There was no significant difference between the responses of North District versus South District interpreters ($X^2 = 0.61$, $df = 2$, $sig. = 0.737$) or permanent interpreters versus seasonal interpreters ($X^2 = 1.86$, $df = 2$, $sig. = 0.394$).

Although the survey results show that the majority of interpreters support making interpretation of resource management issues a priority, some interpreters expressed reservations during the interviews. One permanent interpreter said there should be more interpretation of resource management, "but not to the exclusion of everything else." He said that interpreters must also do programs that simply provoke people's sense of wonder. Four other interpreters stated that many visitors to the park are not interested in learning about watershed rehabilitation, prescribed burning, or other resource management topics. "They want to hear about redwoods, elk, and tidepools." One of these interpreters

questioned the logic of making exhibits for the visitor center on specific resource management issues when there are not even exhibits on the most basic resources people are interested in. Some interpreters expressed concern that a campfire program on a resource management topic would be boring to the visitors. In addition, one seasonal interpreter said that if he were asked to do a whole program on a resource management issue, he would feel like he was presenting Park Service "propaganda." Another interpreter said that he has difficulty talking about the management of the prairies because he does not totally agree with the Parks' prescribed burning policy. One seasonal interpreter said that when she first came to the park, she was told by another interpreter that she should be careful talking about or even using the word "logging" in her programs to keep from offending people in the timber industry. Although this seasonal still developed a program on watershed restoration, those interpreters who are uncomfortable discussing politically sensitive issues may avoid interpreting resource management topics all together.

Encouragement by Management

In the questionnaire, interpreters were asked for their level of agreement with the following statement: "At Redwood National and State Parks, interpreters are encouraged by supervisors and upper management to develop interpretive programs that have a resource management issue as a focus." The response to this statement varied greatly. Out of 17 respondents, none strongly agreed, seven agreed (41%), three were unsure (18%), six disagreed (35%), and one strongly disagreed (6%). There was no significant difference between the responses of North District versus South District interpreters ($X^2 = 5.25$, $df = 3$, $sig. = 0.155$) or permanent interpreters versus seasonal interpreters ($X^2 = 3.73$, $df = 3$, $sig. = 0.292$).

During the interviews, the interpreters were also asked whether they are encouraged by management to interpret resource management information in their formal programs. As

mentioned earlier, interpreters said they are definitely encouraged to include a resource management message in the warm-up of their campfire programs. During training, resource management people often encourage interpreters to give programs on the special topics that they are studying or managing. In the past two seasons, a list of primary interpretive themes that was generated for the new Interpretive Prospectus (Appendix F) has been given to interpreters during training. The interpretive themes include references to the park as an important refuge for threatened and endangered species, to the watershed restoration program, and to the use of resources by humans over time.

Nevertheless, when it comes to choosing their program topics, interpreters are given total freedom as long as the topic is relevant to the park. Supervisors do not ask interpreters to cover certain issues because they want the interpreters to choose topics of personal interest. However, three of the permanent interpreters said that seasonals may not choose a resource management topic, not due to lack of interest, but because they do not know enough about the issue. One long-time interpreter said that in the mid-1980's, interpreters were pushed much more to cover resource management issues, but that training on resource management was also more extensive then.

Today, most of the pressure to interpret resource management issues is coming from the Resource Management Division. The former Assistant Chief of Interpretation Smitty Parratt believed that interpretation of resource management was very important, and he emphasized this by establishing the liaison system and the rotating resource management exhibits in the South District. At the higher levels, the Superintendent and Chief of Interpretation of recent years have not made a clear statement to the interpreters that interpreting resource management issues is a high priority.

Accessibility of Information

In the questionnaire, the interpreters were asked for their level of agreement with the following statement: "At Redwood National and State Parks, the information I need to interpret resource management topics or issues is readily available." Again, the results varied. Out of seventeen respondents, four strongly agreed (24%), seven agreed (41%), one was unsure (6%), five disagreed (29%), and none strongly disagreed. In this case, there was a noticeable difference in the responses of permanent and seasonal. Four of the ten seasonal respondents disagreed (40%), while only one out of seven permanent interpreters disagreed (14%). However, this difference was not statistically significant ($\chi^2 = 3.52$, $df = 3$, $sig. = 0.318$), perhaps because of the small sample size. There was no significant difference between the responses of North District and South District interpreters ($\chi^2 = 1.29$, $df = 3$, $sig. = 0.732$).

Although the questionnaire results show the majority of interpreters agreed that information about resource management issues is readily available, in the interviews, many people made comments indicating that this information is sometimes hard to obtain. For example, one seasonal interpreter in the North District said he was really happy when he received a memo explaining second-growth management from the Park's Public Information Officer because "we were so accustomed to not knowing what is going on down there." Also, a seasonal interpreter in the South District said that he is not sure what resource management reports or plans are available in the South District interpreters' library and that he usually just calls a resource management person for the information he needs. This interpreter also said that the South District interpreters recently cleaned out their library and threw out many old resource management reports. In the North District, the interpreter in charge of maintaining their library said that they haven't received any reports or plans from Resource Management in years; also, she said that the reports that are in the library are not really organized for easy reference. Although there are files of articles and other

resource information kept in both the South and the North District's libraries, the files are not regularly updated and few interpreters make use of them or contribute to them. Each season, the new interpreters usually gather their own information to develop their interpretive programs, even if interpreters have researched the same subject many times before.

Unknown to the interpreters, this situation has caused resource management interview subjects a great deal of frustration. Five different resource managers complained that interpreters seem to request the same information year after year. One resource manager said, "Over the years, I have provided lots of reports and articles and other information, and it all seems to go into a black hole!" Apparently, seasonal interpreters borrow these materials, and either take them away when they leave the park, or store them in a place where no one knows to access them. The Chief of Resource Management has recognized this problem, saying that there seems to be no "longevity of information" within the Interpretation Division. This situation not only frustrates resource managers, but requires interpreters to "reinvent the wheel" every season.

One under-utilized source of resource management information that is available to interpreters is the Redwood Interpreters' Handbook. Although this handbook is given to all interpreters when they are first hired, none of the interpreters I interviewed mentioned using this resource. Among other useful pages of information, the Handbook contains the following items regarding resource management issues: two articles concerning the watershed restoration program, a list of federal and state listed wildlife species, a summary of the Parks' Bear Management Plan, summaries of the natural histories and protected status of marbled murrelets and northern spotted owls, and several essays on local Native American culture and local Pioneer History.

Limitations of the Interviews

As mentioned in the methods section, there were two main weaknesses in collecting data through personal in-depth interviews. The first weakness was that the in-depth interview method--including time spent interviewing, transcribing, and analyzing--is extremely time consuming. Over thirty hours of interviews were recorded and each hour of tape took four hours to transcribe. Coding, sorting, and analyzing about 250 pages of transcribed interviews was also time consuming. For this reason, it was necessary to keep the sample size to a minimum. Although an attempt was made to interview people representing as many views as possible, it is likely that some perspectives were left out.

In addition, the interview data may be biased because a single researcher conducted all the interviews. Since the interviewer was a seasonal interpreter at Redwood National and State Parks for two seasons, her familiarity with the Parks may have influenced the way questions were asked and/or the way the interviewees responded to the questions. Occasionally, interviewees would make open-ended statements such as, "Well, you know how it was...", assuming the interviewer's understanding of a situation was the same as theirs. Although great effort was made to be impartial, the researcher's personal opinions may have also had some effect on the data and data analysis.

Problems with the Questionnaire

In order to counter the possible weaknesses of the interview method, the questionnaire collected more objective data from a larger sample size of interpreters. However, this method also had several problems.

First, some interpreters did not answer the questions in the expected way. For example, questions 2, 3 and 4 asked the interpreters to rank items from 1-4 (most to least, best to worst, etc.). Although the instructions were fairly clear, some respondents still rated the items instead of ranking them (i.e. one person gave the value of "1" to three of the

items and the value "4" to the fourth item). When these errors were made, the values were not included in the reported results.

There was also some confusion about the wording of Question 3, which asked the respondent to rank sources of information in order of the quality of the information received. One interpreter left her answers blank and wrote "quality or usability?" Later, in a telephone conversation, this interpreter said that she was not sure what the questionnaire meant by "quality." She said that a 50 page document on mountain lions may be high "quality" information, but if she does not have time to read it, it is not "usable" information. She said that other interpreters who were filling out the questionnaire had expressed the same concerns.

Another common problem was that interpreters who had difficulty generalizing about certain items gave more than one answer and/or wrote out an answer. In most cases, these interpreters felt their answers would be different depending on certain factors. For example, on Questions 2 and 3, one interpreter responded with two sets of rankings labeled "first year" and "third year." Apparently, the quantity and quality of information from different sources varied from year to year (most notably in seasonal training). Another example involves Question 9, which asks the respondent to rate the potential effectiveness of interpretive methods. One interpreter wrote that the effectiveness of a method depends on whether one is in the North or South District and depends on the topic being presented.

Another possible problem with Question 9 is that some subjects may have rated the interpretive methods based on their current effectiveness in the parks rather than their potential effectiveness as the question requests. It is possible that interpreters may have rated wayside signs, exhibits, and interactive computers low because these methods are not currently very effective at Redwood National and State Parks. An indication this error may have occurred is where one interpreter circled two responses for some methods, with the

higher rated responses noted with the words, "If they are well done." Other interpreters may have given low ratings without considering the method's potential at all.

On Question 5, two interpreters wrote that they disagreed with the questionnaire's example which says that "Redwoods have many methods for survival" is not a resource management theme. The example was supposed to clarify the difference between a natural history focused talk and a resource management focused talk. Apparently, these interpreters believe that when talking about old growth redwoods, the issue of humans' role in conserving redwoods is always a major focus. Although the intention of the example was to clarify, it may have caused confusion for some respondents.

Results from Questions 2 and 3 were not reported because there were too many problems with the data. The ranking system and the wording of the questions caused too much difficulty for the respondents. Fortunately, data collected from these questions do not directly relate to any of the interview questions, and would have contributed only supplemental information to this report.

Pre-testing the questionnaire on one or two interpreters may have resolved some of its problems before it was distributed. However, even with the problems, most of the data were useful to validate information gained from the interviews.

Conclusions about Methodology

It is clear from this study that the in-depth interview is the best method to collect data on the complex topics of communication and interpretation. Questionnaires force subjects to generalize when their answer may depend on several different conditions. Interviews allows subjects to describe these different conditions, as well as explain their opinions and the reasons behind them. In general, interviews provide richer data because the information is presented in context.

RECOMMENDATIONS

Communication between the Divisions

Formal and Informal Channels

The results showed that both formal and informal channels are used to communicate between the divisions. However, South District interpreters have more opportunity for informal communication with resource managers than North District interpreters. Also, the current liaison system is a formal channel of communication that flows only between South District interpreters and resource managers. Clearly, more formal and informal channels of communication need to be established between the North District interpreters and resource managers. Recommendations in the "Media of Communication section" address this necessity.

Direction of Communication

The results showed that horizontal communication is the most effective mode for communicating between the divisions in most cases. The potential problems of authority and message overload mentioned in the literature do not seem to have materialized in these Parks. It seems these problems have been avoided because employees are aware of cases where vertical communication is more appropriate than horizontal communication. No changes are recommended in this area.

Media of Communication

Face-to-face

Since face-to-face is the most effective and most preferred medium of communication, this medium should be used as much as possible between the divisions.

Currently, South District interpreters have more opportunities to have face-to-face contact with resource managers than North District interpreters because of the closer proximity of their work areas. To increase face-to-face communication between the North District interpreters and resource managers, members of both staffs will have to travel more into each other's areas. Many North District interpreters hope that resource managers will start work projects in their area so the two groups can have more face-to-face interaction. Recommendations made later in this section may also increase face-to-face communication between North District interpreters and resource managers.

As stated earlier, training is the primary face-to-face communication that most interpreters have with resource managers. In the past few years, the amount of time devoted to resource management topics during training has decreased steadily. Since training is such an important medium for imparting resource management information, more time needs to be given to resource managers. I recommend that training include several days of resource management information. At the very minimum, there should be one day of slide presentations by every branch covering all major issues and at least two full days in the field with representatives of each branch along.

In addition, three resource managers commented that several trainings they have been invited to were disorganized. In two cases, the training had fallen behind schedule, so the resource managers had to wait about an hour beyond their scheduled times; in the third case, the schedule had been changed without the resource manager being notified. In all cases, the resource managers were frustrated because their presentations were consequently rushed and they did not get to present all the information they had prepared. To avoid these types of problems in the future, seasonal training should be well-planned and strictly facilitated each day.

Another issue that was discussed was whether permanent interpreters need to attend training. Some of the permanent interpreters have been working in the park for many years

and do not feel they would learn much from attending training. However, several of the resource managers who were interviewed felt that the permanent interpreters could benefit from attending training since resource management issues and techniques can change from year to year. Since this may be the case, I recommend that permanent interpreters at least attend the resource management portions of the training so they can remain current on this information.

During the interviews, many people said there should be more training opportunities beyond seasonal training. They suggested a kind of cross-training where interpreters would go out in the field with resource managers, and resource managers would work in the information centers or help with interpretive programs. By going out in the field with resource managers, interpreters would gain first-hand experience of resource management activities, enhancing their ability to interpret these topics to the public. Also, such cross-training opportunities could help break down communication barriers. Having interpreters work closely with resource managers would relieve any intimidation an interpreter may feel toward resource managers, and having resource managers work in front-line interpretation would increase their understanding about visitors and the work of interpreters.

The idea of cross-training is not new to this park, but in the past, these kinds of opportunities have been limited due to people's busy schedules on both sides. The Superintendent has even made a requirement for all new employees to work at the information desk for several days of their orientation; but this requirement has not been strictly enforced. For cross-training to happen, management and supervisors have to make it a priority and encourage their staff to participate. If the personnel exchange is well-coordinated, the staff members involved could cover each other's absence in the opposite division during the cross-training period. Also, there are certain seasons where one division could use the extra help from the other division. For example, resource managers

could help cover the information desks while interpreters attend seasonal training each summer, and interpreters could help as firefighters or as Public Information Officers (directing traffic) during prescribed burning season.

During the interviews, resource managers suggested several other ideas to increase face-to-face communications with interpreters. One idea was to invite interpreters to "brown bag" presentations. On a semi-regular basis, the Resource Management Division has had "brown bag" presentations during the lunch hour in the South Operations Center Conference Room. During these informal presentations, a resource manager or group of resource managers will present a short talk on a current project they are working on. Sometimes the "brown bag" presentation features a guest speaker from outside the Parks. In the past, these presentations have been advertised with a flyer that is posted at SOC and Headquarters. Also, an e-mail message was usually sent to the Resource Management Branch Chiefs and all the Division Chiefs. However, interpreters rarely (if ever) attended these presentations either because they did not see the limited advertisement or did not have time in their busy schedules. For these presentations to be an effective communication medium between interpreters and resource managers, I recommend they be more widely advertised and that supervisors allow interpreters time in their schedule to attend if they want. In addition, the presentations should be occasionally offered at Crescent Beach Education Center so North District interpreters (or other division employees in the North) could attend more easily.

Another potential communication medium is the "show me" tours, which are regularly scheduled throughout the year. These informal field trips are an opportunity for park employees to observe proposed or completed projects of other park employees. Although some of the tours are of maintenance projects, many of the tours allow observers to learn about resource management efforts such as prescribed burns, tree thinning, and road removal. The "show me" tours are also advertised on a limited basis through flyers

and e-mail. However, with the exception of the Chief or Assistant Chief of Interpretation, most interpreters have never attended one of these field trips. Once again, for "show me" tours to serve as an effective communication medium with interpreters, I recommend they be advertised more widely, and that supervisors allow interpreters time in their schedule to attend.

Six interview subjects suggested that interdivisional meetings may be a good way to learn more about each other's operations and share ideas. One resource manager said he thinks it would be helpful if the two divisions sat down to discuss what the current priorities of resource management are and what should be interpreted to the public. Others said that representatives should at least attend each other's meetings occasionally to keep abreast of the other division's activities. Although meetings can be very time-consuming, management should consider the potential value of having staffs of the two divisions meet formally at least once per year.

Two interview subjects said that social gatherings are a good informal way to bring the two staffs together. A couple of resource managers said they met some of the North District interpreters for the first time at a Park Barbecue sponsored by the Human Resources Committee during the summer of 1996. Interacting socially with people of the other staff can help break down communication barriers, such as the "intimidation factor" discussed earlier. Matching a face with a name can make future communications easier, especially when they are by e-mail or telephone. In addition, at a social gathering, information may be exchanged between an interpreter and resource manager that may help with an interpretive program or lead to more in-depth communication in the future. Management should not overlook the value of social interaction and should sponsor gatherings as much as possible. Along with annual barbecues, I recommend that social time be planned to coincide with park-wide trainings or meetings.

Finally, one interpreter and two resource managers suggested a face-to-face type of communication that would occur during a new employee's orientation to Redwood National and State Parks. They feel it is important that each new permanent employee be introduced to all the key people in the other division so they know where each of them works and how to contact them. Each of the people that made these comments had come to these parks fairly recently and were frustrated the first year or so trying to figure out who and where everybody was. Once one begins working at his or her desk or duty station, the geography of the parks makes it hard to meet people, especially those that are not in the same district. I agree that meeting all the key people during new employee orientation would help communication between the divisions a great deal. I recommend that each division produce a checklist of the key people in each division so no one is forgotten during a new employee's orientation.

Telephone

Although face-to-face communication is preferred, telephone is often considered "the next best thing" if a person wants to make a personal contact over long distance. For this reason, telephone is the primary method used by North District interpreters to communicate with resource managers. The new voice mail system has made it even easier to leave and retrieve messages with the telephone. No changes are recommended in the use of the telephone medium.

E-mail

Since e-mail is becoming an important medium of communication in the parks, using this system should be simple and accessible to all members of the staff. As mentioned earlier, reasons for not using e-mail include discomfort with the new technology, inaccessibility, lack of training with the system, or a combination of the above.

Most of the staff who are experiencing these obstacle are seasonal interpreters. I recommend that seasonals be trained to use e-mail so they can contact resource managers using this method if they desire. To make e-mail more accessible to seasonals, I recommend that the park install networked computers near the information desks at Crescent City Headquarters and Hiouchi Information Center. (Redwood Information Center already has networked computers nearby.) Since interpreters spend much of their time in the information centers, this would allow them to access e-mail during breaks between visitors. I believe that seasonals would become more comfortable with the system the more they used it.

According to one of the computer specialists at Redwood National and State Parks, the privacy problem at Crescent Beach Education Center (CBEC) can be solved fairly simply. He said that separate "in-boxes" can be created for the permanent and term interpreters stationed at CBEC by installing some additional free software. He said he was not sure whether the computer at CBEC would require the additional hardware that also may be needed. I recommend that whatever action is necessary to create private in-boxes for the permanent and term interpreters, it should be done as soon as possible. On the other hand, creating in-boxes for each seasonal would probably be impractical. I recommend that one person in the North District be in charge of printing mail from the general mailbox, so that seasonals will be sure to get their messages.

Written

Although written is the least preferred medium of communication by interpreters, the "On the Wildside" newsletter may be an exception. Interpreters seemed to like to read the newsletter when they see it on a bulletin board or in the message binder. However, both interpreters and resource managers expressed that they would like to see the newsletter expanded to include information from all the branches of resource management. Some

people even suggested a newsletter should be produced containing information from all the divisions.

Currently, the only way other employees hear about what is going on in other divisions is through the Management Team Meeting Notes (sometimes called Squad Notes). The Notes, which are produced after each meeting of the Superintendents and the Division Chiefs, contain brief summaries and updates of all the activities occurring in the parks. Although the Notes are lengthy (and not in an especially interesting format), many people said they scan through it for pertinent information.

Interpretation of resource management issues would be best served by a newsletter exclusively covering research and resource management projects. Such a newsletter should be started immediately, and I recommend the following guidelines:

- 1) Produce the newsletter monthly, if possible (bi-monthly at least).
- 2) Have a catchy title and eye-pleasing format that is standard from issue to issue.
- 3) Keep it brief (Two pages front and back fits on an 11" x 17" page folded.)
- 4) Feature articles on critical resource issues, resource management projects, and research.
- 5) Articles should be no longer than a page and written in a non-technical, interesting style.
- 6) Include announcements of "brown bag" presentations and "show me" tours.

In other national parks with such a newsletter, resource managers, interpreters, and other park staff submit articles to the newsletter, and an editor selects which articles will be included. This seems like the best method for Redwood National and State Parks as well. I think the ideal format for this park would be three pages of articles and one page that contains standard information such as wildlife sightings, announcements, and other interesting tidbits. Over several months, the newsletter should have a good balance of articles on wildlife, fisheries, geology, vegetation management, and archeology. To ensure readability and usefulness of the newsletter, articles must be written in an interesting, provocative manner, free of technical jargon.

The newsletter should be distributed to all divisions, not just Interpretation. Since all park employees have contact with the public in some manner, their knowledge of resource issues is important to "spread the word." Ideally, every park employee would get a printed copy. If that is not possible due to budget constraints, a limited number could be printed and an unformatted form could be e-mailed to all employees. However, I recommend that all interpreters receive their own printed copy so they have time to read it thoroughly and keep it in their personal files for easy reference. The newsletter should be filed in the library as a reference for future interpreters. Eventually it may serve as an historical record of resource management issues and projects.

Liaison System

The current liaison system set up by the former Assistant Chief of Interpretation was designed to help close the communication gap between the divisions. Liaisons were supposed to regularly communicate with Branches of Resource Management, gaining and sharing information between the divisions. However, as mentioned earlier, this system was not totally successful due to unclear expectations, lack of motivation, busy schedules, communication breakdown, use of seasonals as liaisons, and continued isolation of the North District.

Due to the problems with the current liaison system, a different approach should be considered. The ideal solution is to create a full-time liaison position as suggested by the National Park Service Action Plan (1996). As in other national parks who have created this position, the liaison would facilitate communications between the divisions and coordinate all cooperative projects for interpreting resource management issues (such as exhibits, publications, and special programs). I recommend that this position be created as soon as funding is available. The position could be funded by either the Interpretation Division, the Resource Management Division, or both divisions.

As a temporary alternative, I recommend creating a work group whose goal would be to increase communication and cooperation between the divisions and improve interpretation of resource management issues. The work group should include one representative from North District Interpretation, one from South District Interpretation, and one from each branch of Resource Management. All members of the work group should be permanent employees and have responsibility toward resource management interpretation as part of their formal duties. Supervisors should recognize this responsibility as one of the employee's main priorities and allow them to devote at least 10% of their time to the group's tasks. The work group should meet regularly to exchange information, set goals, and discuss cooperative projects. A park-wide memo should be sent out explaining the goals of the work group and listing the names of the representatives who will serve as liaisons for each branch or district.

Interpretation of Resource Management Issues

Interpretive Methods

Programs

Currently, most interpretive programs being presented in Redwood National and State Parks contain at least one resource management message. In addition, 15-30% of campfire programs and most children's programs focus on resource management issues. Since campfire programs reach by far the largest numbers of visitors than all other programs combined each season, I recommend that the Interpretation Division attempt to make 50% of their campfire programs focused on resource management issues. During the interviews, ideas for such topics were collected from staff of the Resource Management Division, State Park Ecologists, and the National and State Park Superintendents. On the

list of these topics (Appendix H), the starred topics were most commonly mentioned and should be made a priority for interpretation. Several of these starred themes are specifically noted as Primary Interpretive Themes in the parks' new Interpretive Prospectus (Appendix F).

Achieving the goal of 50% resource management based programs will be easier as training and other communication media between the divisions improve. However, many interview subjects expressed concern that brand new seasonals would have difficulty developing programs that require an in-depth understanding of the parks' resource issues and detailed knowledge of resource management processes. Even with excellent training, new seasonals are given too little time to develop such programs with both creativity and complete accuracy. Therefore, I recommend that permanent interpreters and returning seasonals take the lead in developing the more difficult programs concerning resource management issues. New seasonals who have interpretation experience in other parks could be encouraged to do programs on issues more general to parks, such as bears or endangered species.

Several resource managers expressed interest in helping with interpretive programs. One interpreter suggested that resource managers could assist as special guests during interpretive programs such as walks and evening programs. Another interpreter suggested that resource managers could present short talks during the day in the amphitheaters at Redwood Information Center and Hiouchi Information Center. At the very least, resource managers could attend interpretive programs to observe how their projects are being interpreted and make sure the information is accurate. I recommend these ideas be explored by the Chiefs of Interpretation and Resource Management.

Publications

Although publications are considered less effective than any of the personal methods of interpretation, the surveyed interpreters ranked publications the highest of the non-personal methods. If an interpreter is unable to interpret a topic to an interested visitor because the information centers are too busy, publications are probably the best way to get the information across quickly and at the level of detail required by the visitor. Another advantage of publications is that, relative to exhibits or wayside signs, they can be updated fairly easily.

The Visitor Guide (park newspaper) is a good medium to discuss resource management issues because visitors usually pick up the Guide in the information and visitor centers. However, as was discovered in the Summer of 1996, when the Guide does not also contain information that can be used to actually guide their visit, fewer visitors are interested in taking the Guide with them. Therefore, I recommend that future Visitor Guides have a good balance of orientation information and resource issue articles so that visitors will take them, use them, and hopefully read the resource articles as well.

Site bulletins are another excellent way to interpret resource management issues because they can provide in-depth information on a subject when visitors request it. Although there are several good site bulletins on resource management issues, I believe that a couple more topics could be effectively interpreted with a site bulletin. First, I recommend the parks develop a site bulletin on Roosevelt elk. Similar to the bear and mountain lion site bulletins, this bulletin should contain a message on how to behave around wild elk, since safety can be an issue with some visitors. Also, along with some natural history information on elk, the bulletin should highlight the populations' recovery from past human impacts and discuss the current management issues surrounding elk.

Second, I recommend that the parks produce a site bulletin specifically on prairie management in Redwood National and State Parks. The current Smoke Management

brochure was developed for use by multiple agencies managing a large diverse area, and I think this approach is too general for effective interpretation. Also, the brochure focuses more on the smoke issue and less on the importance of prairie management. Finally, the brochure does not explain the cutting of trees around the prairie edges which could be a controversial issue for some visitors.

Publications on elk and prairie management would be especially useful in Prairie Creek State Park because these resources are so close to the entrance kiosk, campground, and visitor center. Interpreters, Volunteers, and Park Aides could use the brochures to help answer visitors questions about these resources.

Another publication that is sorely needed in the parks is a brochure on the watershed restoration program. This program, known by scientists world-wide, is practically invisible to the visiting public. I feel that a brochure explaining how logging affects a watershed and how these problems are being fixed in the park should be distributed to as many visitors as are willing to read it. The watershed restoration program really exemplifies what the "National Park" portion of Redwood National and State Parks is all about. In fact, the brochure should include the story of the national park's formation, the expansion, and the money authorized by Congress to rehabilitate the cut-over lands. Fortunately, the "Redwood Renaissance" publication mentioned earlier almost perfectly fits the brochure I have described above and could be easily revived. I recommend that this brochure be revised, updated, and made available to the public again as soon as possible. Regarding the political issues surrounding this brochure, I feel that everything stated in the brochure is based entirely on scientific and historical facts and does not deliberately make the timber industry look bad. If management feels it is necessary, some of the wording can be "toned down" to avoid upsetting the local timber companies.

During the interviews, several interpreters expressed concern about the distribution of publications. They said that when the publications are placed on the information desk

easily accessible to visitors, people have a tendency to take everything there, not just things they are particularly interested in. This problem leads to waste of paper and money, and causes the publications to run out too quickly. However, if the publications are placed under the desk, visitors do not know they are available, so they don't ask for them. I recommend that each visitor center and information center design a system in which one copy of each publication can be displayed for the visitors. This way, when visitors are really interested in a publication, they will ask for it. The popular Park Map and Guide and the Visitor Guide newspaper should continue to be kept on the desk for convenience.

Exhibits

As demonstrated in the results section, great improvement is needed in the area of exhibits. Fortunately, plans are in the works to renovate the Redwood Information Center and add new exhibits. The project is being funded by the Redwood Natural History Association, and they hired a private firm last year to design a new layout for the center. The schematic design submitted in July 1996 is based on a "museum-store" concept where the product sales will be incorporated with interpretive modules. According to a description of the plan in the 1996 Interpretive Prospectus, the interpretive modules will briefly address each of the primary interpretive themes of the Parks (Appendix F). Since the new exhibits will probably not discuss any resource management issues in depth, it will probably be necessary to maintain a temporary resource management exhibit at RIC.

Although interpreters' feelings about the temporary exhibits varied, I think there is room for improvement in this area. As mentioned earlier, some of the exhibits still have text that is too detailed and/or technical, and some interpreters think the presentation style does not draw visitors. Some think the visitors are just not interested in the specific topics. I recommend that the Interpretation Division consider having several exhibits on resource management issues produced professionally. Perhaps the park can obtain grants for the

exhibits as has been done by several other national parks who needed resource management issue exhibits. Also, I think the exhibits should take a more holistic approach in interpreting resource management issues. Maybe they could design a multi-paneled exhibit that discusses a different resource issue on each panel, but with the issues all tied together by a single theme.

As suggested by many interpreters in the interviews, the 1996 Interpretive Prospectus proposes converting the auditorium at Hiouchi Information Center into an exhibit room. The Prospectus says that "the exhibits will introduce the natural and cultural resources of the parks, and will interpret them in the context of the resource management efforts underway in the parks to preserve and perpetuate their values." A seasonal interpreter drew up a schematic plan for the auditorium that includes an audio-visual corner, a diorama, display cases for artifacts, and wall exhibits. In order to expedite the conversion of the exhibit room, this interpreter suggests using many interpretive materials that are already available in the parks. I recommend that the Interpretation Division use this plan as a guideline to begin this project as soon as possible. If a grant is obtained to create a multi-paneled exhibit highlighting resource management issues, a copy could be displayed in both the Redwood Information Center and the Hiouchi Auditorium.

Wayside Signs/Exhibits

As mentioned earlier, plans are being generated to replace the old and outdated wayside exhibits on National Park lands. Therefore, I recommend that both the Division of Interpretation and the Division of Resource Management make sure the new Wayside Exhibit Plan incorporates interpretation of resource management issues wherever possible and interprets these issues with reasonable depth. I also recommend that these two divisions be involved in any changes being made in wayside signs on State Park land.

State Parks should be encouraged to interpret resource management issues in their signs wherever possible as well.

Since a trail was recently developed through the Ah-Pah Road Restoration Area in Prairie Creek State Park, the National and State Parks can work together to interpret the rehabilitation project that occurred at that site. According to one of the geologists, this project was the most successful road removal they have ever done. Conveniently, this site is also the most accessible of any such project, so it presents an unparalleled opportunity for visitors to see the effects of rehabilitation. There is a small parking area at the entrance to where Ah-Pah Road once was and where the trail is now. I recommend that a set of interpretive signs be placed at the entrance to the trail showing "before and after" pictures and explaining what happened there. Later, a self-guided trail brochure may be added.

Similarly, a trail is planned for the Whiskey 40 Restoration Area where a tree thinning project took place to restore the forest to a more natural state. The thinning was actually performed as a "Demonstration Project" so people could compare the thinned areas with the untreated areas. Therefore, I recommend that interpretive signs be displayed at the entrance of the trail to explain the project and direct the visitors' attention to the demonstration areas.

As mentioned earlier, the Wayside Exhibit that interprets the watershed restoration project along the C-Line Road is in great need of renovation. Both divisions must evaluate whether there is still interpretive potential in this site. If so, I recommend that the exhibit be changed to reflect the current conditions of the area.

Visitor Center Contacts

As shown in the results, the information desk is an excellent place to interpret resource management issues during the off-season when the centers are less busy. However, during the summer, even short discussions at the desk are nearly impossible. At

the Crescent City and Hiouchi Information Centers, this situation is even worse because interpreters have to run the cash register in addition to answering questions. In order to allow the interpreters to talk with visitors, I recommend that the Redwood Natural History Association either recruit volunteers or hire minimum wage employees to run the cash registers at these information centers during the busy summer months. This kind of help is especially needed during the lunch hours when one interpreter must work at the desk alone while the second interpreter is taking a break. With the cash register covered, interpreters would be more free to speak with visitors at length about resource issues.

Roving

Results showed that the only roving performed by North District interpreters is in the campgrounds before their evening programs. In order to create more opportunities for informal interpretation of resource management issues, I recommend that the North District interpreters be assigned at least a couple of hours of roving time each week.

In the South District, interpreters are assigned roving time in several areas, and they also may choose to rove during their special program time. Since interpreters roving at Davison Ranch and Elk Prairie are constantly asked about the elk in the nearby prairie, I recommend that interpreters take this opportunity to discuss not only elk management, but also prairie management. In addition, one of the park's wildlife biologists suggested that interpreters use this roving time to conduct a little research on elk population dynamics. He suggested that the interpreters have visitors help them count the elk and try to determine their ages and sexes. Thus, the interpreters could teach the visitors about park research while providing valuable information to the Wildlife Branch of Resource Management.

In general, interpreters should use roving time to discuss resource management issues as much as possible. Even if a visitor does not ask a direct question about an issue, interpreters can subtly bring a conversation around to a particular issue. For example,

when identifying a native plant for a visitor, an interpreter can also point out an exotic plant and discuss how it can be harmful in an ecosystem. As another example, if a visitor asks about the burn marks on an old redwood, an interpreter could talk about the effects of fire suppression in the forest and how managers are planning to do prescribed burns in old growth to restore the natural state.

Computers

As stated in the Results section, the interactive computer systems are not very successful in their current state. I believe this is the reason interpreters rated its effectiveness as fairly low compared to the other interpretive methods. However, I think the interactive computers have a lot of potential as an orientational and interpretive tool, as long as the computers' limitations are considered. Although a lot of time and energy was spent programming these computers, the current program needs to be redesigned. Not all the information needs to be removed, but the structure of the menu needs to be reorganized and simplified, and the number of pages need to be reduced for some topics. The idea would be to create a better balance of orientation information and resource information, without having to purchase more memory for the computers. Also, I think the amount of technical detail found on the resource pages should be reduced. Since interpreters have observed mostly children using the computers, the text should be written so it is appropriate for all age levels and backgrounds.

In addition, I recommend that information on the watershed restoration program be added to both the interactive computer and the parks' web site. This program, which is unique to the parks and utilizes a large part of the parks' budget and staff, should have more prominence in the parks' interpretation program.

Finally, I recommend removing the pages on the interactive computer that require constant updating such as summer program schedules and special events. I don't feel these

pages are entirely necessary, and it is apparent that no one has time to keep these pages updated.

Field seminars

As mentioned earlier, many people were disappointed about the cancellation of the field seminar program and felt the Interpretation Division simply "let it die." Further investigation determined that no actual cost-benefit analysis was done on the program before the decision was made. Also, the Board of Directors of the Redwood Natural History Association (RNHA) and the majority of the Parks' staff were not consulted on the decision. In addition, four comments received for the General Management Plan asked to bring back the field seminar program. During the interviews, several people suggested the program could be brought back in a different form, and many suggested that a non-profit association or "Friends Group" could coordinate the program as it is done in many other parks. Asked if the Redwood Natural History Association (RNHA) would be able to coordinate the program, the Executive Director said that several years ago there was a plan for RNHA to take over the program, but it never materialized. When the time came to change over, the Interpretation Division decided to continue coordinating the program. The Association president said that if RNHA brought back the field seminar program, it would be run in a more cost-effective way.

I recommend that a thorough analysis of the past field seminar program be done to determine the reasons why it failed. Using the results of this analysis to make some improvements, I suggest giving the field seminar program another chance under the direction of the RNHA. To increase attendance, the field seminar program should be advertised thoroughly and should offer unique seminars that do not duplicate the seminars offered by Humboldt Redwoods State Park. With the new program, interpreters should still be allowed to attend one free field seminar to serve as additional training.

Visitor Participation in Resource Management Projects

Results showed that interpreters ranked visitor participation as second highest in its potential effectiveness for interpreting resource management. Currently, only special groups and Outdoor School groups have participated in such programs. I recommend that the parks attempt to widen this involvement to regular visitors and individuals from the community. Since Redwood National and State Parks has lower visitation than other parks with regularly scheduled visitor participation programs, I suggest this method be achieved through a series of special programs throughout the summer. First, I recommend planning special programs where visitors can experience research and resource management projects through firsthand observation. The Chief of the Wildlife and Fisheries Branch of Resource Management said he would like to invite visitors to observe biologists mist-netting birds for migratory bird research or seining Redwood Creek Estuary to count juvenile fish. These research activities are conducted during the summer months. Second, I suggest planning special programs where visitors can experience resource management by physically participating in projects such as removing exotic plants. In order to draw interested visitors and community members, I recommend that both types of special programs be advertised in the information and visitor centers, at the campfire programs, and in the local newspapers. In addition, interpreters should be scheduled to be at the sites to explain to the visitors the purpose and process of the research or resource management activity and actually help with the project itself.

Other Method

One last recommendation does not fit into any other category, but would be a good method of interpreting resource management issues. If funding could be found, I suggest that the parks produce a video or slide program about the various resource management

programs in the parks. This program could be shown regularly in the auditoriums at Redwood Information Center and Hiouchi Information Center. If desired, the program could even be used at campfire centers with audio/video capability.

Support for Interpreting Resource Management Issues

Support by State Parks

From the interviews with State Park employees and associates, it is clear that State Parks are supportive of resource management interpretation. However, their concerns about program numbers and attendance should be considered if any program changes are to be made. Since most of the visitation to the State Parks is concentrated between Memorial Day weekend and Labor Day weekend, the number of interpretive programs presented in the State Parks during this time period should be kept as high as possible. In order to add the cross-training activities and special visitor participation programs described in these recommendations, more flexibility will need to be built into the schedule. Summer seasonal interpreters may be able to use assigned roving time or program preparation time to go out in the field with resource managers. However, permanent, term, and long-term seasonals should take advantage of the off-season to go out in the field with resource managers. The very best solution to keep program numbers high is to give interpreters more time away from the information desks. I recommend that more interns and volunteers be used to staff the information desks, as long as they are well-trained and accompanied by one paid interpreter to help answer more in-depth questions.

To address the concern that interpreting resource management issues will not be entertaining enough for State Park audiences, interpreters should keep the audience in mind and make their programs both educational and entertaining.

Support by Interpreters

In order for the improvements described above to be implemented successfully at Redwood National and State Parks, the importance of resource management interpretation must be fully accepted by the interpreters. Therefore, I think the first step in gaining their support is to educate interpreters about the benefits of this kind of interpretation and its relevance to the park mission. Seasonal training should include a segment describing how interpretation can be used to achieve management goals regarding visitor protection, law enforcement, and resource protection. In addition, interpreters need to be reminded that interpreting resource management issues helps gain public support for park policies and management practices.

Secondly, interpreters need to be assured by managers that their audience will be interested in learning about resource management issues. Human dimensions research has found that "lay people are interested in natural resource issues if they are presented with accurate and adequate information" (Wells 1995). Also, interpreters should keep in mind that park visitors tend to be better educated than the nation's population as a whole. A survey of campers in Jedediah Smith and Del Norte Redwoods State Parks found that 75.5% of adult respondents had completed at least one year of college, including 14.6% reporting four years completed and 27.7% reporting five years completed (Irving 1986).

In order to relieve interpreters' concerns that the audience will be bored by their topic, I recommend that some training time be spent brainstorming creative ways to present resource management topics. In addition, interpreters who have presented resource management topics successfully in the past should talk positively about their experience with other interpreters. During the interviews, several interpreters commented that people have had difficulty making certain topics interesting to audiences. For example, three interpreters that I interviewed specifically mentioned a program on the watershed restoration program presented by one of the seasonal interpreters. All three were under the

impression that this interpreter did not feel she was getting through to her audiences. When I personally asked this interpreter how she felt about her program, she said that the audience really enjoyed it and that, after two seasons, she only stopped doing this program because she wanted to try a new topic. This interpreter said that she made the topic of watershed restoration interesting to the audience by involving them in a creative skit and avoiding overly technical explanations.

Thirdly, I recommend that the Superintendents and Chief of Interpretation address the fears of interpretive staff regarding politically sensitive issues. They need to assure interpreters that it is okay to talk about these issues as long as they present both sides of the issue and advocate only the park's policies. In fact, the National Park Service Interpretation Guidelines (USNPS 1988) say that one of the three purposes of interpretation is "to promote public understanding and support of the Service's policies and programs."

Encouragement by Management

For interpreters to make interpretation of resource management issues a priority, there must be more encouragement from supervisors and upper management. Therefore, I recommend that the Superintendents and Chief of Interpretation make a statement (verbal or written) acknowledging that interpretation of resource management issues is a park priority. In addition, they will need to follow their words with action by giving interpreters and resource managers the time necessary to implement the actions described in this paper. On numerous occasions throughout the interviews, subjects stated that if their supervisor said a certain project was a priority and authorized the time needed to work on it, they would be glad to do it.

Another way that management can encourage interpretation of resource management issues is to make it part of the performance standards of field staff, supervisors, and Chiefs

of both the Interpretation and Resource Management Divisions. In addition, management should reward interpreters who make outstanding efforts to research and develop resource management-based programs.

Information Accessibility

Another obstacle to resource management interpretation is difficulty obtaining information. To make developing programs on resource management topics easier for interpreters at Redwood National and State Parks, I recommend that the Interpretation Division work with the Resource Management Division to complete and update the libraries with current research and resource management information. All current resource management reports and planning documents should be put in the libraries and cataloged so they are easily accessible. Also, I suggest creating a permanent file for each major resource topic within each resource management branch. Whenever information is collected from the Resource Management Division or other sources, copies should be made for both North and South Districts and placed in these files. Every few years, these files should be reviewed by resource managers to make sure all the information is current.

Another idea to improve information accessibility came from a resource manager's experience at another national park. He said that resource managers provided "briefing sheets" to the Superintendent and Public Information Officer of the park to keep them updated on current projects. Each briefing sheet is a one page summary that explains the purpose, procedure, size, and location of each project. I recommend that the Resource Management Division produce briefing sheets for all current research and resource management projects at Redwood National and State Parks. Since it is often difficult for an interpreter to remember all the details of resource management projects, these briefing sheets would help interpreters provide accurate interpretation in their formal programs and informal contacts. The briefing sheets could be included in the Redwood Interpreters'

Handbook which is given to interpreters when they are first hired. Also, a notebook of briefing sheets should be made available at all information desks, so interpreters can refer to them when answering visitors' questions. Finally, the briefing sheets should be updated annually to keep the information current.

Finally, one interpreter suggested a method that would help interpreters, especially new seasonals, determine who to contact for information about a particular resource. Currently, the phone list of resource managers can be overwhelming for an interpreter because there are usually several people in each branch with similar titles, and the specialties of each person are not usually clear from these titles. She described her idea as a reference guide that would have short profiles of each permanent resource management employee along with their work phone number. For example, if an interpreter was interested in learning more about the earthquake faults in the area, he or she could look in this reference guide to determine which of the ten geologists may have a special interest in seismology. I recommend that this reference guide be put together as soon as possible to make resource managers and the information they can offer more accessible to interpreters.

Conclusion

Many of the recommendations made above are not new in the field of interpretation. Over the past decade, many articles and reports have been written on how to integrate interpretation and resource management (NPCA 1988; Spears 1989b; Vander Stoep 1990; Whatley 1995; Winter 1993). As described in the Introduction, many parks have already implemented efforts toward this goal. However, in the past few years, the National Park Service has begun an even stronger push for interpretation of resource management issues. An Action Plan containing similar recommendations as this paper was published by a National Park Service Committee at the end of 1996. This Action Plan outlines the steps that need to be taken at all park levels to integrate resource management and interpretation.

For each item, the time frame for action is specified and the position(s) or division(s) responsible for the action are indicated.

It is my hope that the managers of Redwood National and State Parks will create an action plan to implement the recommendations generated from this research project. If such a plan is generated, time frames and responsibilities for implementation should be specified. To assist in creating this plan, I have summarized the recommendations in Appendix H.

Russell Dickinson, Director of the National Park Service from 1980-1995 summed up the importance of interpreting resource management issues with the following words:

The biggest problem has been, and will continue to be, convincing the public of the need for sound management, protection, and preservation. But I believe in complete openness before the public. If we fail to make Americans aware of the problems facing the national parks, and to involve them in choosing the right solutions to these problems, then we are failing in our responsibility as stewards of these public lands.