

An Innovative Method for Evaluating Strategic Goals in a Public Agency

Conservation Leadership in the U.S. Forest Service

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This article presents an innovative methodology for evaluating strategic planning goals in a public agency. Computer-coded content analysis was used to evaluate attitudes expressed in about 28,000 on-line news media stories about the U.S. Department of Agriculture Forest Service and its strategic goal of conservation leadership. Three dimensions of conservation leadership were distinguished and evaluated separately: stewardship and ethics, use of collaborative planning and decision making, and use of science-based management. Analysis of on-line news media text is a way to quickly and efficiently assess the views of a wide range of stakeholders captured in the news media.

AN INNOVATIVE METHOD FOR EVALUATING STRATEGIC GOALS IN A PUBLIC AGENCY

Conservation Leadership in the U.S. Forest Service

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Evaluating the extent to which goals set forth in strategic plans are accomplished is problematic due to the often intangible nature of the goals and lack of appropriate evaluation methods. This article presents an innovative methodology for evaluating the achievement of strategic planning goals in a public agency. The methodology involves computer content analysis of on-line news media text. Availability of news media text on-line and computer methods for analyzing the text make it possible to evaluate and monitor the changing attitudes of thousands of stakeholders expressed in news stories over a

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period of time. Content analysis of the media has repeatedly been shown to produce results that are remarkably similar to surveys and opinion polls for a wide range of issues (e.g., Fan 1988; Fan and Tims 1989; Fan and Norem 1992; Gamson and Modigliani 1989; Hauss 1993; Lindenmann 1983).¹

The reason is twofold. First, natural resource management issues (and most public policy issues) are debated in a variety of forums in society. As shown in Figure 1, social debates about natural resources and the environment take place in the courts, legislatures, meetings and hearings, confrontations, the media, and other forums. The media play two important roles in these debates, serving as a direct forum for public discourse (through editorials, letters to the editor, etc.) and reporting on debates occurring in all other forums. Pollster George Gallup theorized in 1939 that the media were creating a national town meeting in which issues were debated. "The newspapers and radio conduct the debate on national issues, presenting information and argument on both sides, just as the townsfolk did in person at the old town meeting" (quoted in Smith 1997, 56). Computer content analysis of the news media thus allows us to take the pulse of ongoing debates and discussions about natural resource issues as reflected in tens of thousands of stories.

Second, several studies have shown that for most people the news media are the most important source of information about environmental issues (e.g., Atwater, Salwen, and Anderson 1985; Fortner et al. 1991; Lewis and Ellefson 1993; Ostman and Parker 1987; Shindler, Steel, and List 1996; Wilson 1995). Therefore, because the news media summarize ongoing social debates and are the main source of information for the public about natural resource issues, analysis of the news media is an efficient way to indirectly measure public attitudes.

An evaluation system based on analysis of on-line news media text has the important advantages over traditional methods of being easily and rapidly updated, extending back in time several years to establish time trends from the past, and being expandable to include additional issues or dimensions.

In this study, we used computer content analysis of the news media to evaluate progress toward the accomplishment of one of the strategic goals of the U.S. Department of Agriculture (USDA) Forest Service. The Forest Service is responsible for managing the National Forest System (191 million acres of public land); providing assistance to state, urban, private, and other federal landowners; conducting scientific research; and facilitating international forestry cooperation. A central goal of recent Forest Service strategic plans has been "to make the Forest Service the world's foremost conservation leader for the 21st century" (USDA Forest Service 1994a, 1). For example, the first element in the agency's vision statement is, "We are recognized

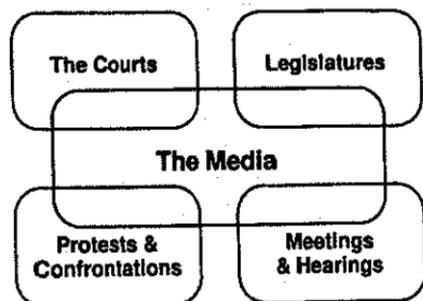


Figure 1: Forums for Public Debates About Natural Resource Policy and Management

nationally and internationally as a leader in caring for the land and serving people" (USDA Forest Service 1993).

The Forest Service measures progress toward its strategic goals in a number of ways, including customer service response cards and on-the-ground measures of performance (e.g., acres of wildlife habitat restored or enhanced, acres reforested, number of landowners enrolled in stewardship programs, etc; see USDA Forest Service 1997, 4). This evaluation focused on the extent to which the Forest Service is perceived by stakeholders and portrayed in the news media as a conservation leader. Data for the evaluation consisted of a nationwide database of text that included almost 10,000 news media stories about the Forest Service, covering the period from 1992 to 1996, and three regional databases of more than 18,000 news media stories covering the period from 1994 to 1996. The three regions—the East, Inter-West (Interior West), and West—were groupings of the Forest Service's nine administrative regions.

The following sections define conservation leadership in the context of the Forest Service, describe the on-line sources of data and search commands, explain the computer content analysis method used in this evaluation, summarize the results, and discuss the implications of this method for evaluation research.

CONSERVATION LEADERSHIP IN THE FOREST SERVICE

Conservation leadership, as conceived by the Forest Service and discussed in the academic and professional literature related to this topic, is a

multidimensional concept (e.g., Conservation Fund 1990; Cornett 1995; Gordon and Berry 1993; Rockwell 1991; Snow 1992; Thomas 1992). Therefore, our first task was to select several key dimensions of this concept for evaluation. We examined Forest Service strategic planning documents, especially the national strategic communication plan (USDA Forest Service 1994b), *The Forest Service Ethics and Course to the Future* (USDA Forest Service 1994a), and the agency's *Mission, Vision, and Guiding Principles* (USDA Forest Service 1993). Four main dimensions of conservation leadership emerged from these documents:

- stewardship of the land,
- ethics (both environmental ethics and professional ethics),
- use of collaborative approaches to land management, and
- use of scientific knowledge in decision making.

Discussion of these four dimensions is interwoven in Forest Service strategic planning documents, but each is distinct and relevant to evaluating conservation leadership.

STEWARDSHIP

Good stewardship of natural resources is at the heart of conservation leadership in all Forest Service strategic planning documents, as shown by the following quotations: "As stewards and guardians of America's natural resources, it is the Forest Service mission to . . ." (USDA Forest Service 1994b, 3); "Our first priority is ensuring ecosystem health in order to provide the foundation for all life" (USDA Forest Service 1994a, 2); and "The phrase, 'Caring for the land and serving people,' captures the Forest Service mission" (USDA Forest Service 1993).

ETHICS

Conservation leadership also includes ethical dimensions. The first of nine elements in the Forest Service's mission statement is, "Advocating a conservation ethic in promoting the health, productivity, diversity, and beauty of forests and associated lands," (USDA Forest Service 1993). The land ethic and service ethic of the agency are defined as follows:

Our land ethic is to: Promote the sustainability of ecosystems by ensuring their health, diversity, and productivity. . . . Our service ethic is to: Tell the truth, obey the law, work

collaboratively, and use appropriate scientific information in caring for the land and serving people. (USDA Forest Service 1994a, 2)

COLLABORATION

A collaborative or participatory approach to land management is a third theme closely tied to conservation leadership in Forest Service strategic planning documents. For example, the key message regarding conservation leadership in the strategic communication plan states that

The American people expect our stewardship to be in partnership with them. . . . Through joint actions involving the Forest Service, our customers and partners, new relationships are created that result in mutual learning, support for evolving land stewardship concepts, and joint management efforts and practices. (USDA Forest Service 1994b, 3)

SCIENCE-BASED MANAGEMENT

The Forest Service has a long tradition of science-based forestry management and conducts an extensive program of forestry research. The link between conservation leadership and the use of scientific information in land management was shown in several of the preceding quotations and in the first 2 of 13 guiding principles for the agency: "We use an ecological approach to the multiple-use management of National Forests and Grasslands; We use the best scientific knowledge in making decisions and select the most appropriate technologies in the management of resources" (USDA Forest Service 1993).

As we began to examine news media text related to these dimensions of conservation leadership, we found that stewardship and ethics were closely related. For example, news media discussion of poor stewardship by the Forest Service often included discussion of negative ethical practices, and discussion of good stewardship frequently mentioned or implied positive ethical practices. The concepts of stewardship and ethics were therefore combined, leaving us with three dimensions of conservation leadership for evaluation.

DATA

Data for this evaluation consisted of news media stories about the USDA Forest Service for the 5-year period from January 1, 1992, through December 31, 1996. This period was selected for evaluation because it brackets the

strategic planning documents—dated 1993 and 1994—that identify conservation leadership as a strategic goal. The reference book *Fulltext Sources On-line* (Orenstein 1996) and the *LEXIS-NEXIS Directory of On-line Services* (Gongla-Coppinger 1995) were used to identify all news sources in the NEXIS database for which the full text of all stories was continuously available on-line during this time period. Twenty-four newspapers, five newswires, and four television and radio news transcripts were identified for inclusion in our nationwide database of text (covering the 5-year period 1992 through 1996). A total of 61 newspapers were included in the three regional databases (covering the 3-year period 1994 through 1996).²

These news sources were then searched on the NEXIS database using the search command ((Forest Service) or (national forest) and not (Texas Forest Service) or (Kaczynski) or (murder) or (homicide)).³ For the period from 1992 to 1996, the NEXIS search yielded 22,634 stories. Out of this total, we retrieved a random sample of 9,995 stories for inclusion in our national database. For the regional databases, a random sample of 18,674 stories out of a total of more than 25,000 available on-line were downloaded.⁴ To minimize the inclusion of irrelevant text, retrievals did not include the full text of stories. Only text within 100 words of the phrase *Forest Service* or *national forest*—50 words on either side—was downloaded. This greatly reduced the amount of irrelevant text that would have been retrieved from stories that mentioned the Forest Service only in passing.

The text used in the analysis includes both straight news stories and opinion articles (editorials and letters to the editor). Past studies have shown that predictions of public opinion based on analysis of the news media are accurate when news and opinion articles are combined. This is not surprising because, for most issues, all opinion material combined only accounts for about 10% of total news coverage. Moreover, the dichotomy between news and opinion is misleading. Straight news stories are often filled with opinions in the form of quotations of various stakeholders expressing their views on the issue at hand.

After an examination of the downloaded stories, we determined that not all the text was relevant to the analysis. We therefore selected paragraphs containing at least one of the following words, which describe the range of activities and benefits associated with national forests:⁵

agency, backpack, biodiversity, blaze, boat, camp, canoe, clear-cut, conflict, ecosystem, environment, fire, fish, forage, forest, grassland, grazing, habitat, hike, hiking, land-owner, livestock, logging, old-growth, plan, management, mineral, mining, mountain,

ranch, range, recreation, river, roadless, salvage, ski area, skier, skiing, smokey, species, stream, timber, tree, water, wetland, wilderness, wildlife, wood.

Paragraphs that did not contain at least one of these words were found to not discuss the Forest Service and its management of the national forests and were therefore discarded. After this second filtration, we retained 81% of the original 14.5 million characters of text in our download of 9,995 national stories. The final database contained only paragraphs that were relevant to and focused on the Forest Service.

CONTENT ANALYSIS METHOD

We developed computer content analysis rules to capture expressions of each of the three dimensions of conservation leadership identified previously. Our goal was to write a set of customized computer instructions that would count the number of paragraphs in our databases of news stories containing favorable and unfavorable information about the Forest Service's stewardship and ethics, use of collaboration, and use of science-based management. This was done with the InfoTrend software using the high-level Filtscor computer language (Fan 1988). Because we were interested in evaluating the extent to which the Forest Service has achieved its strategic goal of being recognized as a conservation leader, we developed content analysis rules to identify both positive and negative—or favorable and unfavorable—expressions relating to each of the three dimensions.

The Filtscor language has two components. One is a dictionary composed of a list of ideas important for the analysis and groups of words and phrases associated with each idea. The other Filtscor language component is a series of idea transition rules that specify how pairs of ideas are combined to give new meanings. Idea transition rules are based on the order of words in the text as well as on the distances between words.

In the development stage of the analysis, the coding decisions made by the still-evolving computer instructions are written to screen, and the analyst makes modifications to the dictionaries and rules until computer coding of the text agrees with the analyst's interpretations at least 80% of the time. The following sections briefly explain the content analysis rules developed for coding positive and negative expressions of each dimension of conservation leadership.

STEWARDSHIP AND ETHICS CONTENT ANALYSIS RULES

The dictionaries we developed to capture positive and negative attitudes toward the Forest Service's stewardship of land and ethical practices contained four main groups of words.

1. Forest Service words (words and phrases that refer to the agency, e.g., Forest Service, national forest, district ranger, forest supervisor, and federal forester),
2. positive stewardship words (words and phrases with favorable connotations for the Forest Service's stewardship and ethics, e.g., caretakers, committed, dedicated, forward-thinking, guardians, innovative, praised, preserved, protect, restore, sustaining, wisely, etc.),
3. negative stewardship words (words and phrases with unfavorable connotations for the Forest Service's stewardship and ethics, e.g., abomination, betrayal, capricious, decimate, deforest, despoil, disgraceful, flagrant, hinder, illegal, irresponsible, mismanage, pretense, public outcry, rapacious, scandalous, unsound, unsustainable, unwise, whistle-blower, etc.), and
4. negation words (words that change the sense of the positive and negative words, e.g., failed, lacking, never, no, not, can't, won't, etc.).

The words in each of these groups were truncated where appropriate, to include variations such as illegal, illegally, illegality, and so on.

Using these main groups of words, we then developed idea transition rules for stewardship and ethics that specified how ideas associated with the words were related to each other. For example, one idea transition rule specified that a negative stewardship word within 50 characters of a Forest Service word be coded as a negative stewardship and ethics message. For example, the phrase

"the national forests have been mismanaged"
Forest Service word negative stewardship word

would be counted as one expression of negative stewardship and ethics. Similarly, positive stewardship words appearing within 50 characters of Forest Service words were coded as a positive stewardship and ethics message. Another idea transition rule specified that a negation word appearing up to 30 characters ahead of a negative stewardship message should be coded as a positive stewardship message. For example, the phrase

"the national forests have not been mismanaged"
Forest Service word negation negative stewardship word

would be counted as a positive stewardship and ethics message. In addition to the main word groups and sets of rules, several other word groups and idea

TABLE 1: Examples of News Media Text Coded for Dimensions of Conservation Leadership

A. Stewardship and ethics messages

Positive stewardship and ethics

"Few in Congress on either side of the logging issue could have predicted that federal judge Michael Hogan's (sp) ruling would open up more tracts of old-forest logging. Patches of virgin forest the Forest Service says deserve protection" (Cable News Network, February 12, 1996).

Negative stewardship and ethics

"He profiles loggers, scientists, mill owners, politicians and ecological activists, and documents the shameful record of the national Forest Service" (Los Angeles Times, July 4, 1993).

B. Collaboration messages

Positive collaboration

"The Forest Service says it is working with the state government, conservation organizations, and woodcrafters to help ensure the health of butternut trees" (Associated Press, March 30, 1993).

Negative collaboration

"Kevin Kirchner, an attorney with the Sierra Club Legal Defense Fund . . . said the Forest Service's more restrictive proposal reinforces the agency's credo: to minimize citizen input" (Gannett News Service, April 20, 1993).

C. Science-based management

Positive science-based management

"An author of one of the studies, Forest Service biologist Barry Noon, concluded that the findings 'suggest that interim measures to retain spotted owl habitat should at least be maintained, and possibly expanded'" (Houston Chronicle, August 22, 1996).

Negative science-based management

"One environmental group, the Superior Wilderness Action Network, contends that the U.S. Forest Service has not adequately studied the potential consequences of logging" (Star Tribune-Minneapolis, October 11, 1996).

transition rules were developed to capture expressions related to stewardship and ethics. For example, rules were developed to capture descriptions of tree-planting activities by the Forest Service, which were counted as expressions of positive stewardship, and to capture expressions of harvesting timber on steep slopes in national forests (causing erosion), which were counted as expressions of negative stewardship. Table 1 (Section A) presents examples of news media text that was coded as positive and negative expressions of Forest Service stewardship and ethics using these rules.

COLLABORATION CONTENT ANALYSIS RULES

The computer instructions we developed to identify favorable and unfavorable attitudes toward the Forest Service's use of collaborative and participatory approaches to forest management contained five main categories of words.

1. Forest Service words (same as the stewardship and ethics rules),
2. positive collaboration words (words and phrases that describe or connote collaborative or participatory approaches, e.g., broad-based, citizens planning, coalition, collaboration, consensus, dialogue, interagency, joint effort, open house, partnership, willing to listen, win-win, etc.),
3. negative collaboration words (words and phrases that describe or connote the opposite of collaborative or participatory approaches, e.g., bureaucratic, centralized, dictatorial, entrenched, heavy-handed, in bed with, in cahoots, non-accountable, out of touch, unaccountable, etc.),
4. political words (words that refer to the political process, e.g., bipartisan, congressional, democrat, legislation, political, senate, subcommittee, etc.), and
5. negation words (similar to the negation words used in the stewardship and ethics rules).

Idea transition rules for positive and negative collaboration were developed using these main word groups. For example, a positive collaboration word appearing in the same paragraph as a Forest Service word was coded as a positive collaboration message, a negative collaboration word appearing in the same paragraph as a Forest Service word was coded as a negative collaboration message, and a positive collaboration word appearing in the same paragraph as a political word was deleted from the analysis. This last rule was designed to eliminate messages such as

"the subcommittee reached consensus about the Forest Service budget"

political word

positive collaboration word

Forest Service word

that refer to political actions affecting the Forest Service but not taken by the agency. Several other word groups and idea transition rules were developed to identify additional, specialized aspects of collaboration. For example, computer rules were developed to capture expressions of common goals and common vision, which were then included with the positive collaboration words. Another rule was developed to identify expressions related to limiting the appeals process for timber sales on national forests, which were then included with the negative collaboration words. Table 1 (Section B) presents examples of news media text that were coded as positive and negative messages about the Forest Service's use of collaboration in planning and management.

A special category of collaboration was also created and coded for: expressions of the Forest Service working with citizen volunteers to accomplish various tasks such as maintaining or rebuilding hiking trails. In fiscal year 1996, the Forest Service had more than 80,000 volunteers who contributed work valued at almost \$35 million. This is a form of collaborative management, but because it is limited in scope and there are virtually no negative expressions related to working with volunteers, a separate category was created for volunteer collaboration.

SCIENCE-BASED MANAGEMENT CONTENT ANALYSIS RULES

Finally, we developed computer instructions to identify favorable and unfavorable attitudes toward the Forest Service's use of science-based management. These rules involved four main categories of words.

1. Forest Service words (same as the stewardship and ethics rules),
2. science words (words and phrases that relate to science or research, e.g., analysis, experimental forest, findings, laboratory, research, scientific, studying, etc.),
3. negative science words (words and phrases that connote the opposite of science or poor science, e.g., junk science, pseudo-science, nonscientific, unscientific, voodoo, etc.), and
4. negation words (similar to the negation words used in the stewardship and ethics rules).

As before, relationships between these word groups were specified in idea transition rules. For example, a science word appearing in the same paragraph as a Forest Service word was coded as a positive science-based management message, a negative science word appearing in the same paragraph as a Forest Service word was coded as a negative science-based message, and

a negation word appearing within 30 characters ahead of a science word became a negative science word. Table 1 (Section C) presents examples of text that was coded as positive and negative messages regarding the Forest Service's use of science-based management.

As with collaboration, a special category of messages related to science-based management was created: expressions of the scientific expertise of Forest Service employees. Identification of Forest Service employees as scientific experts in media text is a message about the agency's use of science-based management, but we coded separately for this category because there are essentially only positive expressions of this idea. The scientific expertise word group included the wide range of scientific disciplines employed by the Forest Service, such as archaeologist, botanist, ecologist, entomologist, hydrologist, ornithologist, plant physiologist, silviculturalist, social scientist, and so on. An idea transition rule specified that these scientific specialties had to appear within 60 characters of a Forest Service word to be counted as a scientific expertise message.

VALIDITY AND RELIABILITY

Following development and refinement of the content analysis dictionaries and rules, a validity analysis was carried out. Weber (1990, 15) notes that "a content analysis variable is valid to the extent that it measures the construct the investigator intends it to measure." We examined random samples of paragraphs that were coded using our content analysis rules to determine whether the rules were able to identify positive and negative expressions of the dimensions of conservation leadership with a sufficient level of accuracy. As mentioned earlier, a sufficient level of accuracy was defined as correct coding at least 80% of the time—a rule of thumb sometimes used in content analysis. After final refinements in the dictionaries and rules, they accurately identified expressions of the dimensions of conservation leadership with a minimum of 81% accuracy (for negative collaboration) and up to 90% accuracy (for scientific expertise).

In addition to concerns about validity in content analysis, the reliability or consistency of text classification is a concern when multiple human coders are used. Human coders inevitably introduce variability in how they interpret and apply category definitions or other coding rules. In this study, the use of computer coding eliminates problems with intercoder reliability—the computer always applies the coding rules consistently.

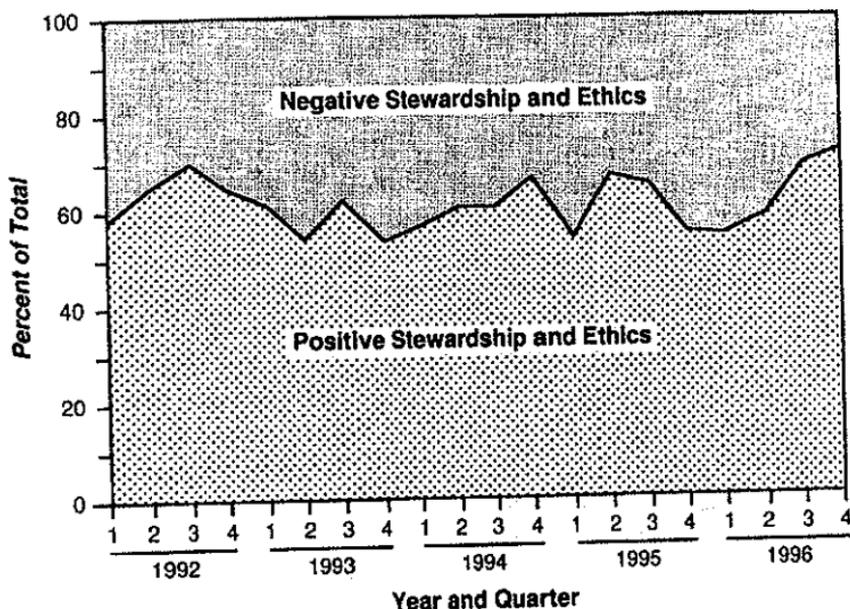


Figure 2: Percentage of Positive and Negative Attitudes Toward the Forest Service's Stewardship and Ethics Expressed in the News Media, Plotted Quarterly

DISCUSSION OF FINDINGS

STEWARDSHIP AND ETHICS FINDINGS

Figure 2 shows the percentage of positive and negative attitudes toward the Forest Service's stewardship and ethical practices.⁶ Expressions of positive stewardship and ethics attitudes consistently outweigh negative attitudes. Over the 5-year time period, about 60% of the coded paragraphs portray the Forest Service as a good steward or with positive ethics and about 40% as a poor steward or with questionable ethics. The total number of expressions of both positive and negative stewardship and ethics messages declined by about 20% over the 5-year period. This trend may be influenced by the peak of the spotted owl debate in the early 1990s and the gradual fading of this dominant issue since then.

The 60% "approval rating" revealed in Figure 2 is similar to the results of recent surveys of U.S. residents. For example, in a national survey of the

public (Hammond 1994), 50% of respondents agreed or strongly agreed with the statement, "The federal government is an effective caretaker of the public forests and grasslands," 26% disagreed or strongly disagreed, and 24% neither agreed nor disagreed.⁷ Shindler, Steel, and List (1996) found that 57% of the residents of Oregon's Central Cascades have confidence in the Forest Service's ability to contribute to good forest management decisions, and 72% believed the Forest Service should be entrusted with significant influence in federal forest management. In each case, the Forest Service ranked higher than all other organizations and institutions, including the U.S. Fish and Wildlife Service, community residents, the U.S. Bureau of Land Management, university researchers, Oregon public opinion, the Clinton administration, federal courts, national public opinion, and Congress. Steel, Shindler, and Brunson (in press) found similar percentages of confidence in the ability of the Forest Service to "contribute to good forest management decisions" among citizens residing in western Washington, Oregon, and Northern California. Finally, in a national survey conducted in October 1994 for *American Forests* magazine, 74% of the public was found to have favorable attitudes toward the Forest Service (Smith and Clark 1994; Frederick/Schneiders 1994). This was a higher favorable rating than that for environmental groups (64%), state forest agencies (47%), timber companies (36%), or the U.S. Bureau of Land Management (33%).

We also analyzed attitudes toward the Forest Service's stewardship and ethics separately for three regions of the U.S. based on aggregations of the agency's nine administrative regions (East, InterWest, and West). Positive stewardship and ethics attitudes outweighed negative ones for all three regions, but the proportion of positive messages was slightly higher in the East: About 65% of the coded paragraphs were positive in the East, compared with 61% in the InterWest and West. The proportion of positive stewardship and ethics messages was found to be gradually increasing in the East. Although no clear trend was apparent in the InterWest, there appeared to be a slight decline in the percentage of positive messages in the West. The increasing proportion of positive messages in the East and declining proportion in the West suggest a potential split in regional views of the Forest Service that should be monitored in the future.

COLLABORATION FINDINGS

The percentages of positive and negative attitudes toward the Forest Service's use of collaborative approaches to management are shown in Figure 3. We found a substantial difference in the percentage of positive and negative

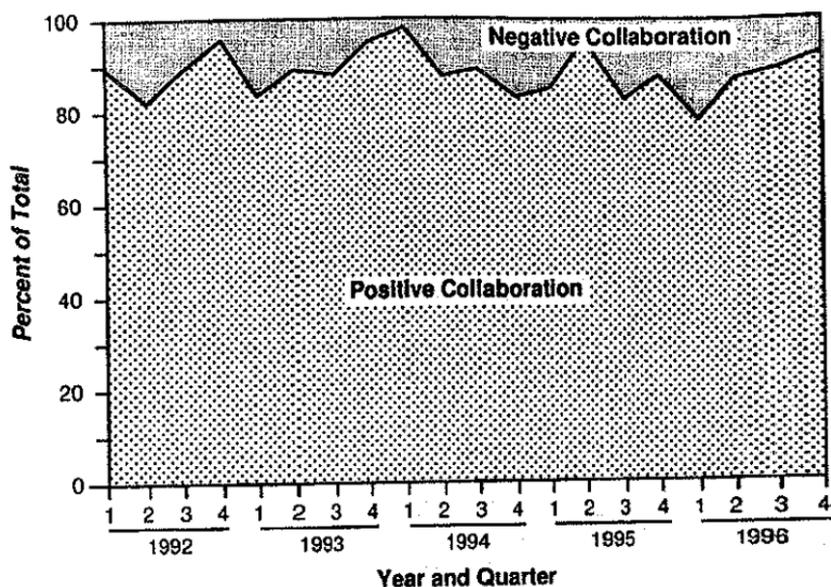


Figure 3: Percentage of Positive and Negative Attitudes Toward the Forest Service's Use of Collaborative and Participatory Approaches to Planning and Management Expressed in the News Media, Plotted Quarterly

attitudes expressed in the news media: Only about 12% of the collaboration messages coded over the 5-year period were negative, whereas 88% portrayed the Forest Service's use of collaboration in a positive light. No trends were evident in the percentage of positive and negative attitudes toward Forest Service collaboration over time.

We were not able to locate any survey findings on attitudes toward the Forest Service's use of collaborative management for comparison with our findings. But the public clearly values collaborative and participatory approaches to forest management: Hammond (1994) found that 88% of the public agreed or strongly agreed with the statement, "It is important for the federal government to inform and interact with the American people about all public forest matters." Shindler, Steel, and List (1996) found that 63% of Central Cascades residents placed moderate to great value on citizen participation in federal forest management, even if it increased government costs.

In a regional analysis, we found the same preponderance of positive collaboration messages that was found in the national analysis. About 92% of the collaboration messages in the East were positive, 91% in the InterWest,

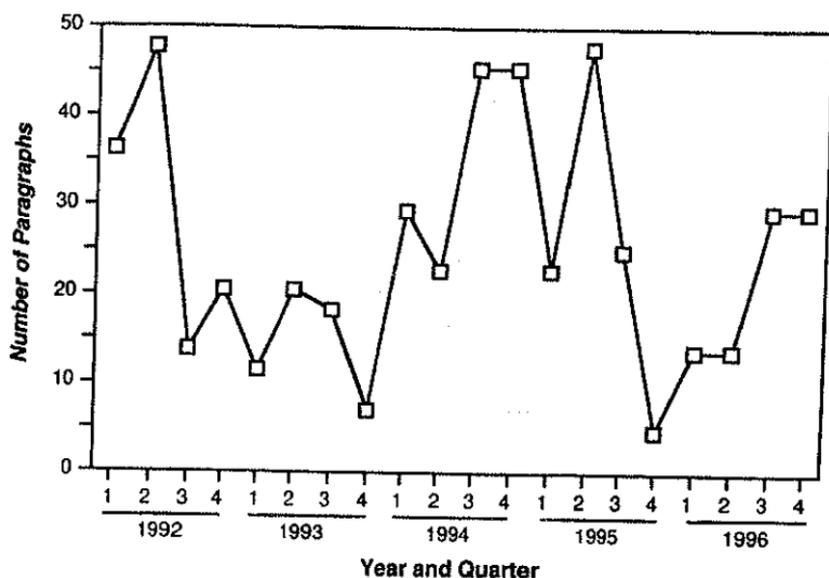


Figure 4: Number of Paragraphs in the News Media Discussing Forest Service Collaboration With Citizen Volunteers, Plotted Quarterly

and 89% in the West. Although we found significant quarter-to-quarter variation in the number of collaboration messages, no clear time trends were revealed for the regions.

Figure 4 shows the number of paragraphs discussing the Forest Service working with citizen volunteers. Note that this is simply the quantity of discussion of Forest Service collaboration with volunteers, not positive and negative attitudes regarding that form of collaboration. Therefore, Figure 4 shows the number of paragraphs rather than the percentage of attitudes expressed as shown in Figures 2 and 3. We found relatively little discussion of collaboration with volunteers (fewer than 50 paragraphs per quarter) and significant variability from quarter to quarter. A cycle of alternating high and low discussion of this topic is evident in Figure 4. Collaboration with volunteers dropped off in mid-1992, remained low through 1993, increased in 1994 and the first half of 1995, and declined again in late 1995. This variability may be driven in part by major collaborative efforts involving large numbers of citizen volunteers that receive significant but short-lived local media coverage, such as the Midewin National Tallgrass Prairie restoration project in Illinois.

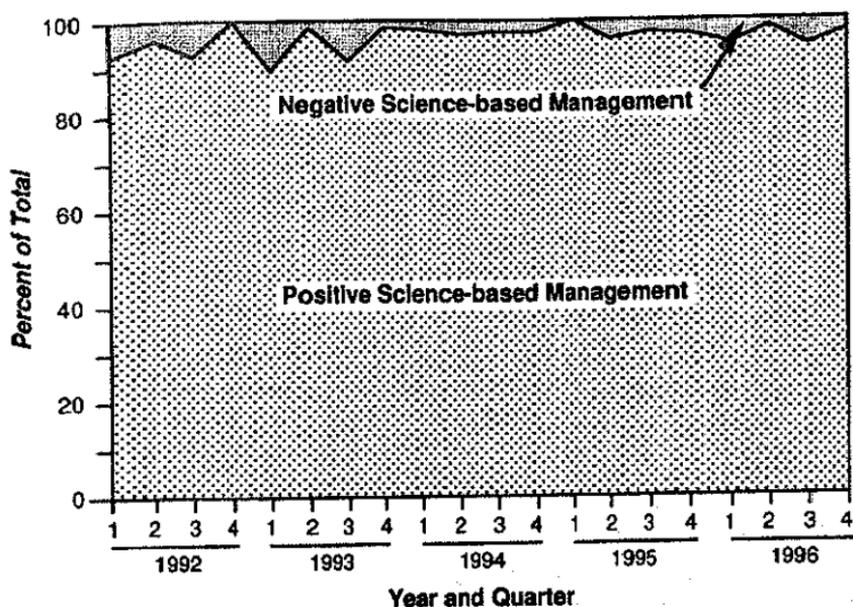


Figure 5: Percentage of Positive and Negative Attitudes Toward the Forest Service's Use of Science-Based Management Expressed in the News Media, Plotted Quarterly

There may be significant opportunities to increase this type of collaborative management in the Forest Service. The 1993 Times Mirror National Environmental Forum Survey reported that more than half of the country is interested in volunteer activities related to the environment, but the 1994 Times Mirror survey found that 56% of Americans say they are unaware of volunteer opportunities (Roper Starch Worldwide 1994).

SCIENCE-BASED MANAGEMENT FINDINGS

Figure 5 shows the percentages of positive and negative attitudes toward the Forest Service's use of science-based management. The Forest Service's long commitment to scientific research and science-based management is reflected in news media discussion. Nationally and regionally, messages that portray the Forest Service as using science in national forest planning and management overwhelm messages suggesting that the agency uses insufficient, unreliable, or otherwise inadequate scientific information. About 96% of all science-based management messages in our national database were

positive, with similar percentages in the regions (96% in the East, 94% in the InterWest, and 95% in the West).

These findings point to an important strength of the Forest Service because a strong commitment to scientific research is important in establishing claims of legitimacy and credibility in the media (Hansen 1993; Anderson 1993). Hammond (1994) found that 81% of the public agrees or strongly agrees with the statement, "It is important to take a scientific approach to the management of the public forests and grasslands."

We also found a gradual decline in the total number of positive and negative science-based management messages at the national level. Once again, this is likely due to the gradual winding down of the spotted owl debate, in which scientific studies conducted by the Forest Service or involving Forest Service scientists were frequently cited. No clear trends were evident at the regional level.

Trends in the quantity of discussion of scientific expertise in the Forest Service are shown in Figure 6. This figure shows number of paragraphs rather than percentage of positive and negative attitudes expressed, as in Figure 5. The relatively high level of scientific expertise messages in 1993 is likely due to President Clinton's 1993 Northwest Forest Conference, which was preceded by several high-level interagency scientific working groups and followed by the creation of the Forest Ecosystem Management Assessment Team (FEMAT 1993), two other interagency working groups, and the resulting Northwest Forest Plan. Large numbers of Forest Service scientists were involved in these high-profile activities. No clear trends in scientific expertise messages were evident at the regional level.

CONCLUSIONS AND IMPLICATIONS

This evaluation focused on the extent to which the USDA Forest Service has achieved its strategic goal of being recognized as a conservation leader. Three dimensions of conservation leadership were distinguished: stewardship and ethics, the use of collaborative approaches in management of the national forests, and the use of science-based management. We found that about 60% of the messages in the news media over the 5-year period from 1992 to 1996 portrayed the agency in a positive light with respect to its stewardship and ethical practices. This is comparable to the findings of several recent surveys of the public that included questions about people's attitudes toward the Forest Service (Hammond 1994; Shindler, Steel, and List 1996; Steel, Shindler, and Brunson (in press); Frederick/Schneiders 1994). Our

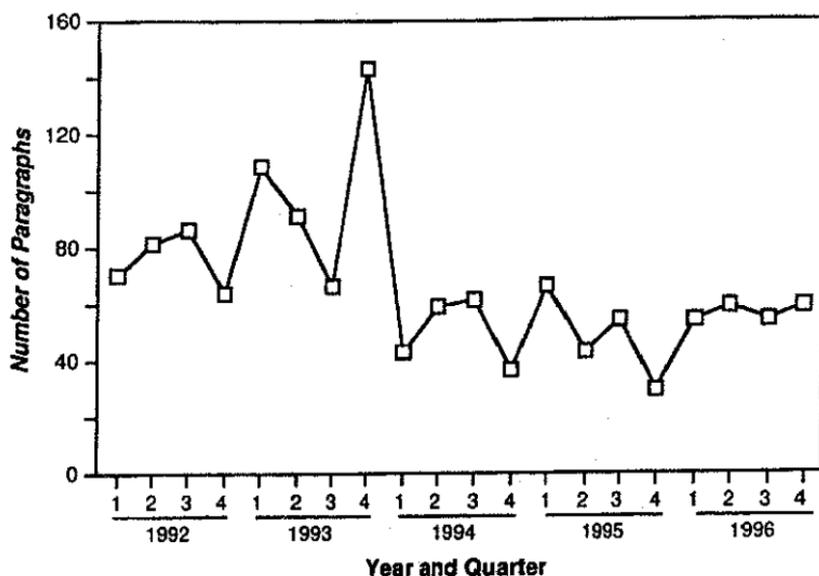


Figure 6: Number of Paragraphs in the News Media Discussing Scientific Expertise in the Forest Service, Plotted Quarterly

finding that most messages in the news media about the Forest Service's stewardship and ethics are positive is contrary to the conventional wisdom within the agency that it is usually portrayed negatively in the media. The conventional wisdom is likely due to the fact that negative news receives a great deal of attention and tends to crowd out positive news.

Does this 60% "approval rating" suggest that the Forest Service is doing a good job with respect to stewardship and ethics? Has the agency achieved its strategic goal with respect to this central aspect of conservation leadership? An optimist would look at these results and say the glass is more than half full; a pessimist would say it is almost half empty. Whether 60% positive messages is "good enough" must be decided by the top administrators in the agency. Certainly, there is room for improvement.

Attitudes expressed in the news media toward the Forest Service's use of collaboration and science in management of the national forests were overwhelmingly positive. Collaborative and science-based approaches appear to be areas of strength and positive image for the agency. The high proportion of positive messages may be due in part to the nature of these two concepts and the fact that measuring the nonexistence of an idea is problematic (i.e., the

nonuse of collaborative and science-based approaches to management is more difficult to measure than the use of these approaches). Positive messages in the news media about collaboration and science-based management included discussion of both the use of these approaches and favorable characterizations of their use, but negative messages included mainly unfavorable characterizations of the agency's efforts. We did find some negative messages declaring that the Forest Service has failed to use collaborative or science-based approaches, but these were relatively rare. Hence, there may be an imbalance built into the concepts that contributed to the strongly positive results.

IMPLICATIONS FOR EVALUATION RESEARCH

Public organizations operate in an increasingly complex environment today because of rapid changes in society, politics, economics, and science. Policy makers and managers need tools to help them navigate this complex and dynamic environment. Computer content analysis of on-line news media text is a new method for evaluating the extent to which a public organization has achieved its strategic goals and for monitoring progress toward those goals over time. This method has repeatedly been shown to produce results remarkably similar to surveys and opinion polls for a variety of topics.

Advantages of this method include the fact that results can be produced much more rapidly than with traditional methods such as surveys, so evaluation results are available when they are needed. Unlike traditional methods that produce a snapshot in time, this evaluation approach produces time trends that extend back several years or more, enabling the evaluator to identify changes in an organization's social environment that may have significant policy implications. Evaluations using this methodology can also be easily and quickly updated by simply downloading news media text from the most recent time period, analyzing it with the same set of computer instructions, and updating the time trends. Thus, evaluations based on analysis of on-line news media text can become a monitoring system to track progress over time.

Another important advantage of this evaluation approach is the ease with which it can be revised and expanded. For example, further refinement of our content analysis rules in a future update of this analysis would allow us to distinguish between different types of collaboration and science-based management messages. A more in-depth analysis could shed light on the motivations of volunteers or on the types of scientific expertise most often associated with

the Forest Service. Additional dimensions of conservation leadership could be added to the analysis.

Finally, as more news sources become available on-line over the next few years, more detailed regional breakdowns will become possible, perhaps even state-level analyses. As more newspapers from smaller communities become available on-line, rural attitudes could be analyzed separately and compared with urban attitudes. Given a sufficient volume of on-line text, the attitudes and perspectives of individual stakeholder groups—such as Native Americans, mainstream environmentalists, radical environmentalists, the timber industry and other commodity-oriented groups, and so on—could also be analyzed separately.

The novelty of this method may slow its acceptance. But the Forest Service policy makers and managers to whom we have presented the results of this evaluation have been quick to appreciate its value and perceive that this type of analysis is not merely a media analysis, that is, an analysis of a single stakeholder group called the news media. Rather, analysis of on-line news media text is a way to quickly and efficiently take the pulse of social debates and discourse involving a wide range of stakeholders captured in the news media. The method holds great promise for many applications in evaluation research.

NOTES

1. Other studies have found that the news media has an influence on agenda setting for environmental issues; that is, there is a relationship between the relative emphasis given by the media to environmental issues and the degree of salience these topics have for the general public (e.g., Ader 1995; Atwater, Salwen, and Anderson 1985).

2. See Fan and Bengston (1997) for a complete listing of all news sources used in this analysis.

3. We initially downloaded a preliminary sample of 1,000 stories using the search command ((Forest Service) and (national forest)). Examination of these stories revealed irrelevant text, so our final search command filtered out irrelevant stories about the Texas Forest Service, Theodore Kaczynski (the "Unabomber," whose cabin was adjacent to a national forest), and various homicide investigations in which bodies were found in remote areas of national forests.

4. Only the last 3 years (1994 through 1996) were analyzed regionally, which allowed us to download text from a much larger set of news sources—additional newspapers become available on-line with each passing year.

5. These filter words were truncated so that all variations would be included; for example, *biodiver* was used to capture biodiversity, biodiversity, and so on, and the word *camp* captured words such as horsecamp, camping, campers, and so on.

6. The figures in this article show only the national findings. Inclusion of figures summarizing the regional findings would have resulted in an excessive number of graphs. Significant regional findings are discussed in the text.

7. When Hammond's (1994) neutral response category is eliminated to make his results more comparable to ours, 66% of his respondents were positive about the federal government as an effective caretaker of public forests, and 34% were negative.

REFERENCES

- Ader, C. R. 1995. A longitudinal study of agenda setting for the issue of environmental pollution. *Journalism and Mass Communication Quarterly* 72 (2): 300-311.
- Anderson, A. 1993. Source-media relations: The production of the environmental agenda. In *The mass media and environmental issues*, edited by A. Hansen, 51-68. New York: Leicester University Press.
- Atwater, T., M. B. Salwen, and R. B. Anderson. 1985. Media agenda-setting with environmental issues. *Journalism Quarterly* 62:395-97.
- Conservation Fund. 1990. *Conservation leadership project: Final report*. Arlington, VA: Conservation Fund.
- Cornett, Z. J. 1995. Birch seeds, leadership, and a relationship with the land. *Journal of Forestry* 93 (9): 6-11.
- Fan, D. P. 1988. *Predictions of public opinion from the mass media: Computer content analysis and mathematical modeling*. New York: Greenwood.
- Fan, D. P., and D. N. Bengston. 1997. *Public debates shaping forestry's future: An analysis*. Final report prepared for the U.S. Department of Agriculture Forest Service, Office of Communication. St. Paul, MN: InfoTrend and North Central Research Station.
- Fan, D. P., and L. Norem. 1992. The media and the fate of the Medicare Catastrophic Coverage Act. *Journal of Health Politics, Policy, and Law* 17:39-70.
- Fan, D. P., and A. R. Tims 1989. The impact of the news media on public opinion: American presidential election, 1987-1988. *International Journal of Public Opinion Research* 1 (2): 151-63.
- Forest Ecosystem Management Assessment Team (FEMAT). 1993. *Forest ecosystem management: An ecological, economic, and social assessment*. Report of the Forest Ecosystem Management Assessment Team. Washington, DC: U.S. Government Printing Office.
- Fortner, R. W., V. J. Mayer, C. C. Brothers, and F. R. Lichtoppler. 1991. Knowledge about the Great Lakes environment: A comparison of publics. *Journal of Great Lakes Research* 17 (3): 394-402.
- Frederick/Schneiders. 1994. *Results from a nationwide survey on forest management*. Washington, DC: Frederick/Schneiders.
- Gamson, W. A., and A. Modigliani. 1989. Media discourse and public opinion on nuclear power: A constructivist approach. *American Journal of Sociology* 95 (1): 1-37.
- Gongla-Coppinger, L., ed. 1995. *Directory of on-line services, 1995 edition*. Dayton, OH: LEXIS-NEXIS.
- Gordon, J. C., and J. K. Berry. 1993. Environmental leadership: Who and why. In *Environmental leadership: Developing effective skills and styles*, edited by J. K. Berry and J. C. Gordon, 3-12. Washington, DC: Island Press.

- Hammond, B. 1994. *Forest Service Values Poll questions: Results and analysis*. Report prepared for U.S. Department of Agriculture Forest Service. Tampa, FL: Kaset International.
- Hansen, A. 1993. Greenpeace and press coverage of environmental issues. In *The mass media and environmental issues*, edited by A. Hansen, 150-78. New York: Leicester University Press.
- Hauss, D. 1993. Measuring the impact of public relations. *Public Relations Journal* 49 (Feb.): 14-21.
- Lewis, B. J., and P. V. Ellefson. 1993. Staff mediated information flows to forest policy committees in state legislatures: An assessment and evaluation. *Minnesota Agricultural Experiment Station Bulletin*, 601-1993. St. Paul: University of Minnesota.
- Lindenmann, W. K. 1983. Content analysis. *Public Relations Journal* 39 (July): 24-26.
- Orenstein, R. M. 1996. *Fulltext sources on-line*, Vol. 8, Issue 2. Needham Heights, MA: Bibliodata.
- Ostman, R. E., and J. L. Parker. 1987. A public's environmental information sources and evaluations of mass media. *Journal of Environmental Education* 18 (2): 9-17.
- Rockwell, H. W. Jr. 1991. Leadership (commentary). *Journal of Forestry* 89 (2): 3.
- Roper Starch Worldwide. 1994. *From anxiety toward action: A status report on conservation in 1994, The Times Mirror Magazines National Environmental Forum Survey*. New York: Roper Starch Worldwide.
- Shindler, B., B. Steel, and P. List. 1996. Public judgments of adaptive management: A response from forest communities. *Journal of Forestry* 94 (6): 4-12.
- Smith, D., and L. Clark. 1994. Hot views on hot topics: National survey gauges public views on forests, wildfire, and management. *American Forests* 100 (11-12): 3.
- Smith, R. D. 1997. Letting America speak. *Audacity: The Magazine of Business History* 5 (2): 50-61.
- Snow, D. 1992. *Inside the environmental movement: Meeting the leadership challenge*. Washington, DC: Island Press.
- Steel, B., B. Shindler, and M. Brunson. In press. Social acceptability of ecosystem management in the Pacific Northwest. In *Ecosystems management: A social science perspective*, edited by D. L. Soden, B. L. Lamb, and J. R. Tennert. Dubuque, IA: Kendall/Hunt.
- Thomas, J. W. 1992. On being professional: The responsibilities of a worthy vocation. *Journal of Forestry* 90 (2): 12-16.
- U.S. Department of Agriculture Forest Service. 1993. *Mission, vision, and guiding principles*. Poster, Washington, DC: U.S. Department of Agriculture Forest Service.
- U.S. Department of Agriculture Forest Service. 1994a. *The Forest Service ethics and course to the future*. FS-567. Washington, DC: U.S. Government Printing Office.
- U.S. Department of Agriculture Forest Service. 1994b. *A strategic communication plan: Conservation leadership for the 21st century*. Washington, DC: U.S. Department of Agriculture Forest Service.
- U.S. Department of Agriculture Forest Service. 1997. *Report of the Forest Service, fiscal year 1996: Collaborative stewardship*. Washington, DC: U.S. Government Printing Office.
- Weber, R. P. 1990. *Basic content analysis* 2d ed. Newbury Park, CA: Sage.
- Wilson, K. M. 1995. Mass media as sources of global warming knowledge. *Mass Comm Review* 22 (1/2): 75-89.

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