

OLD-GROWTH FORESTS ON NETWORK NEWS: NEWS SOURCES AND THE FRAMING OF AN ENVIRONMENTAL CONTROVERSY

By Carol M. Liebler and Jacob Bendix

The old-growth forest debate involves two sides ("procut" and "prosave") presenting competing views of the issue. Television news stories may reflect one or the other of these frames through (1) choice of sources, (2) choice of visuals, and (3) reporter's summary remarks. We examined four years of coverage on ABC, CBS, and NBC, and found that while the distribution of visuals was inconclusive, source use and reporter wrap-ups predominantly reflected the procut frame. This may be because the procut frame emphasized an unambiguous conflict that was more amenable to brief explanations.



Americans rely more on television than any other news outlet and roughly a quarter of them cite broadcast news as their primary source for environmental news.¹ Moreover, although television may be perceived as less factual than daily newspapers, viewers still find it more believable.² But when it comes to environmental reporting, how well founded is this trust? How do the networks portray disparate views when covering ecological controversy? This paper explores these issues by examining network framing of the old-growth forest-spotted owl controversy.

The quality of environmental reporting is critical, given its potential impact. Ader documented an agenda-setting effect for environmental pollution,³ and as environmental issues are often unobtrusive – i.e., the public has little first-hand knowledge of or contact with them – the likelihood of a media agenda-setting effect is intensified.⁴ But agenda setting does not imply knowledge gain. In one recent study, students who relied on television news rather than other information sources had "less cognitive knowledge about greenhouse gases and their sources, and the most inaccurate view of predicted effects of possible global warming."⁵ Similar findings have been reported for acid rain – watching television news had a negative effect on environmental knowledge.⁶

Previous studies of media coverage offer some insight as to why Americans are not better informed on this range of environmental issues. This line of research reveals that environmental reporting is often crisis- or event-oriented.⁷ Such an approach may be consistent with traditional news values,⁸ but fails to effectively report on the underlying issues that lead to the crisis.⁹ News coverage often lacks explanation of scientific concepts and processes¹⁰ or fails to accurately explain competing theories of causes of

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environmental degradation.¹¹ And mobilizing information – information that would enable the public to actively respond to environmental problems – is often lacking in news reports.¹²

Journalists' selection and portrayal of news sources is central to this problem. News sources influence reporting as journalists rely on them for story topics and content.¹³ Molotch and Lester argued in their analysis of the 1969 Santa Barbara oil spill that the news was framed by the sources with the most access to journalists.¹⁴ More recent studies provide evidence that environmental sources, like those found in other types of news,¹⁵ are most frequently government representatives.¹⁶ The dominance of any one type of source, governmental or otherwise, may in turn affect how the media frame environmental issues.

Source selection, in turn, may reflect individual journalist judgment or organizational factors. Where the latter is the case, the framing of issues may be indirectly determined by the networks. If, as some have suggested,¹⁷ the major networks have indistinguishable approaches to the news, the result would be a near-monolithic frame.

The concept of framing is central to an understanding of the media role in shaping environmental debate. According to Entman, "to frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation."¹⁸ Frames are actual characteristics of news texts, as well as strategies for journalistic construction and audience processing. In their effort to provide a systematic theoretical framework of framing, Pan and Kosicki propose several framing devices, among them syntactical, and thematic and rhetorical structures. Syntactical structures include the sequential elements of a story, as well as strategies such as "expert" source attribution. Thematic structures, which consist of a main body and summary, represent the central idea running throughout the story. These may be evidenced in elements such as background information or quotes. Choices made by journalists reflect rhetorical structures, which help promote the supposed factual nature of the news story.¹⁹ The concept of salience is, therefore, key to framing of news texts – the idea that certain elements of the story may be played up in such a way as to convey a dominant meaning. Salience may be achieved through placement, repetition, and association.²⁰

Frames found in the news media may have their roots elsewhere. The information campaigns of environmentalists and the timber industry have produced frames, i.e., competing social realities of the old-growth controversy. Each side has engaged in rhetorical strategies creating frames which are then "...reframed, by the other group, with an antithetical or oppositional context."²¹

Background: Spotted Owls and the Old-Growth Forests

The Northern Spotted Owl (*Strix occidentalis caurina*, henceforth referred to as "spotted owl") lives in old-growth conifer forests in western Oregon and Washington, and northwestern California. The exact definitions of old-growth forests vary,²² but there is general agreement that they are closed canopy forests dominated by large trees greater than 150 years old, and contain numerous dead snags and fallen logs. These environmental characteristics are apparently crucial to the owls because they provide suitable nesting sites, contain thriving populations of the owl's prey species, and are structurally suited to the hunting techniques used by the owl.²³ The

linkage between spotted owl habitat and old-growth forests suggests that for the spotted owl to survive, the old-growth forest must be preserved. The implications of this are not "just" ecological and biological, but economic and social as well. Logging (primarily of old-growth forests) has long been an economic mainstay of the Pacific Northwest, and in much of the region it has cultural importance going beyond employment and income generation.²⁴

In 1989, the U.S. Fish and Wildlife Service (with prompting by a Federal Court) announced that it considered the spotted owl a threatened species. This invoked the provisions of the Endangered Species Act, requiring that large areas of old-growth forest be set aside and protected from logging, although there was disagreement over how much room the owls needed. Any substantial logging limitation represented an economic shock for both the logging industry and the rural communities that depend on logging and milling old-growth timber. The story was not about an obscure ecological debate; there was the immediate prospect of job losses, mill closures, disrupted tax bases, and the loss of a way of life for the people involved. With these elements, the story became one of national interest.

The debate that followed centered on three related questions: What does the actual scientific evidence show regarding the status of the spotted owl?; What actions were necessary to protect it?; And could those actions be justified in terms of the human cost? The debate was punctuated by the release of governmental reports²⁵ addressing the first two questions, each of which was challenged by procut interests in the public and the Congress because of the third question.²⁶ Research on the first two questions has generally suggested that the owl is indeed threatened, and requires significant limitation of timber harvest to survive;²⁷ research on economic impacts of such reduction is more ambiguous, with the cost-benefit balance depending on how benefits are defined, and whether the scale of study is regional or national.²⁸ The debate became particularly visible when politicians involved themselves, as with the "God Squad" activity during the Bush Administration and the "Timber Summit" early in the Clinton Administration.

In supporting their positions, both procut and prosave proponents have depended more on basic imagery than on citing research.²⁹ For the procut side, the key has been to show how devastated communities would be by job losses resulting from reduced harvests. They have backed these images with arguments that the owls couldn't possibly need so much land, and weren't worth the cost if they did. For the prosave side, the key images contrasted lush old-growth forest with the ugly scars of recent clearcutting. They spoke less of the specific requirements of the spotted owl than of the irreplaceable forest (much of it thousands of years old) in which the owl lived, and argued that timber industry job losses were due more to timber exports and mechanization than harvest limits. In short, environmentalists thematically framed loggers as destroyers of the forest and the timber industry responded with economic and human impact frames: owls versus people. These frames were then offered to the media, where they were rarely challenged for their scientific or economic validity,³⁰ although strengths and weaknesses of these arguments have been discussed at length elsewhere.³¹

This study applied elements of framing theory in a primarily quantitative examination of network coverage of the old-growth forest/spotted owl controversy. Specifically, the study assessed:

Framing and the Spotted Owl Controversy

Study Objectives

(1) the extent to which on-air sources and other elements of stories reflected the rhetoric of loggers and environmentalists;

(2) the nature and expertise of the news sources quoted, and the implications for story framing;

(3) the extent to which the story framing reflected the broader ecological and economic issues discussed within the research community.

Method

We examined all stories on the old-growth forest/spotted owl controversy that ran on ABC, CBS, and NBC over a four-year period. April 1989 when the FWS proposed listing the spotted owl as a threatened species was our starting point. The ending point (April 1993) was the most recent month for which tapes of news stories were available. All relevant stories listed in the Vanderbilt Television Archives Index were coded from videotapes of the stories at the Vanderbilt Archives in Nashville, Tennessee.

The coding scheme focused on variables designed to quantify the syntactical and rhetorical frame elements discussed by Pan and Kosicki.³² These included characteristics of the story itself and of each source appearing in the story. Both of these (story and source characteristics) contribute to the frame elements discussed above, and thus to the overall construction of the story frame.

Story characteristics measured were: network (ABC, CBS, or NBC); reporter (name); peg (e.g., timber summit, issue analysis, policy decision); type of visuals (owls, forest, logging, shipping etc.); and number of sources in the story. We also noted the text of the reporter wrap-up. Sources within a story may emphasize a "prosave" ecological perspective, but a reporter's concluding remarks about job loss may cast doubt on the morality of that stance. Alternatively, the reporter's remarks may reinforce prior imagery and comment.

Source characteristics were also measured: name, fonted identification, perspective on the issue (prosave or procut) and its basis (economic, scientific, legal, tradition, etc.), and source setting (professional or non-professional). Because sources are central to the story, the construction of a frame may further be related to source expertise and how it is portrayed: Downplaying one source's credentials while highlighting another's reinforces a particular frame. To assess the appropriateness of source portrayals, we derived "objective" measures of source expertise from resumes that we solicited from all sources who were cast as experts on the issue (e.g., sources fonted as "biologist" or "logging expert"). Variables coded from resumes included number of years of experience, highest degree attained, major, and job title. Sources who appeared in stories to discuss their own situations (e.g., unemployed mill workers) rather than as broader experts were assumed to have the knowledge to support their statements and were therefore omitted from this part of the analysis.

In short, we operationalized rhetorical structures by type of visuals, source setting, and reporter wrap-up, and syntactical structures by the remaining source characteristics. Complete coder reliability was attained on the most manifest of content (e.g., source name). On all other variables, including those of a more interpretive nature (e.g., perspective on the issue), the two coders achieved at least .80 intercoder reliability.

The three networks ran 46 stories during the four-year period studied. Of these, 54.4% or 25 stories were reporter packages, with nearly the same number of these stories appearing on each network (ABC and NBC each ran eight stories, CBS ran nine). The remaining 21 stories were anchor reads, again rather evenly split across networks.

Policy was the news peg for 50% of the 46 stories, followed by President Clinton's 1993 timber conference (19.6%), issue analysis (8.7%), court rulings (6.5%), protest (6.5%), "God Squad" hearings (4.3%), and other (4.3%). The number of stories varied across time, with more stories appearing in 1990 and 1992 than in other years. Due to the absences of sources in the anchor reads, analyses that include source data are limited to the reporter packages. The average number of sources used per packaged story was 4.5, although this number is skewed by one story with 13 sources. Overall, there were 113 source appearances in the packaged stories, representing 84 individuals.³³

Viewpoints of Sources and Stories. To the extent that the views expressed by news sources influence the framing of the issue, the result was sympathetic to the procut side. More than half of the sources emphasized procut views, while less than a third were prosave (the remainder being neutral). As Table 1 shows, this was due to imbalance on CBS and ABC, as NBC managed an even division between the opposing viewpoints.

Not surprisingly, the views of sources reflected their occupations (Table 2). Timber industry employees and lobbyists – the most frequently quoted sources – were generally supportive of continued cutting, whereas representatives of environmental groups almost uniformly opposed it. The private citizens appearing in the stories were not a classic "person on the street" cross-section, as most of them were interviewed at prologging demonstrations or cafes in logging towns. The inclusion of separate classifications for "Forest Service" and the more general "Government Official" reflects the former's direct involvement in forest management, whereas the latter were politically interested officials such as congresspersons, county supervisors, and high level administrators (including two presidents). The latter group was clearly more prone to support logging than the Forest Service sources. This finding reveals the need to distinguish among official sources, as they may vary in their viewpoints. It also suggests that assumptions that the oft-cited prominence of government sources³⁴ will result in

TABLE 1
Views Expressed in Source Appearances, by Network

Viewpoint	% of ABC sources	% of CBS sources	% of NBC sources
Prosave	33.33	25.45	41.94
Procut	55.56	60.00	41.94
Neutral	11.11	14.55	16.13
Total	100% (n=27)	100% (n=55)	100% (n=31)

TABLE 2
Views Expressed in Source Appearances, by Occupation

Viewpoint	Logger or mill worker (%)	Timber Lobbyist (%)	Private Citizen (%)	Environmental (%)	Government Official (%)	Forest Service (%)	Businessperson (%)	"Other" (%)
Prosave	2.63	0.00	30.00	95.00	19.05	100.00	0.00	62.50
Procut	81.58	90.00	70.00	0.00	57.14	0.00	50.00	12.50
Neutral	15.79	10.00	0.00	5.00	23.81	0.00	50.00	25.00
Total	100% (n=38)	100% (n=10)	100% (n=10)	100% (n=20)	100% (n=21)	100% (n=4)	100% (n=2)	100% (n=8)

dominance of a single perspective may oversimplify reality. Furthermore, in this instance, the "official voice" was somewhat muted by sources directly involved in the conflict: Government officials were quoted less frequently than were timber industry employees and lobbyists (Table 2).

The linkage between source type and viewpoint (Table 2) means that source choices largely influenced story frames, with notable patterns by network (Table 3). On CBS, for example, almost 44% of source appearances were by either timber workers or timber lobbyists and fewer than 11% were affiliated with environmental groups, whereas the ratio on ABC was two to one. These differences do not necessarily reflect an insidious network policy. They may, however, be indicative of routine newsgathering patterns or the tendencies of individual reporters to seek out particular types of sources — there are a variety of reasons why reporters may be consistent in their source choices.³⁵

The cumulative effect of these decisions was that the networks, to varying degree, put more sources on the air that favored cutting the forest than favored saving it. In this instance, the preference in source type may have reflected the fact that timber industry workers seemed more "immedi-

TABLE 3
Occupation of Sources Appearing on Each Network

Occupation	% of ABC sources	% of CBS sources	% of NBC sources
Logger or Mill Worker	33.33	36.36	29.03
Timber Lobbyist	14.81	7.27	6.45
Private Citizen	0.00	12.73	9.68
Environmental	25.93	10.91	22.58
Government Official	18.52	18.18	19.35
Forest Service	0.00	5.45	3.23
Businessperson	0.00	3.64	0.00
"Other"	7.41	5.45	9.68
Total	100% (n=27)	100% (n=55)	100% (n=31)

TABLE 4
Views Expressed in Source Appearances, by Type of Rationale

Viewpoint	Economic	Ethical	Legal	Political	Scientific	Traditional
Prosave	10.53	92.31	57.14	0.00	73.68	0.00
Procut	77.19	7.69	42.86	50.00	21.05	83.33
Neutral	12.28	0.00	0.00	50.00	5.25	16.67
Total	100% (n=57)	100% (n=13)	100% (n=7)	100% (n=2)	100% (n=19)	100% (n=6)

Note: Totals do not sum to 113 because some sources gave more than one rationale, while others gave none.

ate" – they were discussing their own livelihood and their children's' future, while environmentalists seemed to be advocates for a bird most people have never seen, or for even more abstract interests like biodiversity. Reporters may also have been responding to the social environment in which they were working. In the rural communities of the Pacific Northwest from which many of the stories were filed, public opinion generally favored the procut view.³⁶ Finally, the disparity may simply reflect a more effective public relations effort (framing) by the procut side.

Type of source alone does not fully explain the viewpoints expressed. Many of the sources were in occupations that did not have an obvious reason to support one side or the other, and Table 2 shows that even some loggers and environmentalists voiced anomalous views. The stands taken by these sources reflected the criteria they used in attitude formation, which were indicative of particular frames. Table 4 shows the relationship between the views of sources and the type of reason or argument they provided to support those views. Sources whose expressed concerns related to economic conditions or preservation of traditional lifestyles were overwhelmingly supportive of continued timber harvests, while those who discussed scientific evidence or expressed concern for the ethical aspects of human-environment interactions tended to favor forest preservation. This finding indicates that source rhetoric remained within the debate as it was framed by the procut and prosave positions.

The framing of a news story extends beyond source appearances and statements, however. We therefore also concentrated on the visuals in the story, and on the reporters' concluding remarks. Visuals may override what is being said,³⁷ and the concluding statement (typically showing the reporter him/herself) has the potential both to represent what has been portrayed in the story and to set the final tone for it.

The visuals appearing most frequently in anchor reads and packaged stories were of owls (76% of stories) and logging (65%). Of note, a visual of active logging can convey two possible messages: to some it may represent the employment that may soon be lost, while to others it may be a shocking view of environmental destruction. Other visuals used consistently were those of undamaged forests (46%), lumber mills (37%), and antiowl protests (33%). Visuals of forests were typically consistent with a prosave message, while mills and protest tended to support a procut perspective. Interestingly, shipping was shown in only 4 (8.7%) stories, which may indicate that the

TABLE 5
Reporter Wrap-ups, by Frame with Which They Coincide

Matching frame	Number of wrap-ups	Example of wrap-up
Matches prosave frame	3	"What gets lost in the politics is the argument made by some scientists that the owl, even though it's only one species, is a possible signal of the country's well-being." (Ned Potter, ABC, 5/14/92)
Matches procut frame	12	"Jobs, owls, the environment, the economy. Today it was up to the God Squad, ultimately it's up to the voters to decide." (Robert Hager, NBC, 5/14/92)
Matches neither frame	10	"Clinton will order his cabinet to come up with a new policy, but said there are no easy answers. Today's summit made that very clear." (Andrea Mitchell, NBC, 4/2/93)

prosave side was unsuccessful in arguing that job loss was largely due to timber exports.³⁸

We assessed reporter wrap-ups not for overt bias, but rather for whether their summary of the conflict paralleled the frames of one side or the other. Table 5 provides both numerical results and examples of wrap-ups that typified one frame or the other. As these numbers show, the wrap-ups, like the source usage, were more likely to favor the procut than the prosave perspective, although many cases matched neither frame.

Source Expertise. Of the 84 individuals appearing across the stories, 34 of them were clearly cast as economic, timber, or scientific experts. We were able to contact 22 of these individuals, 20 of whom responded favorably to our request for a resume. The sample size is clearly limited here, which is largely a function of the networks' (or reporters') choice not to rely on a broader array of expertise—we had a limited population with which to work.

We found no real variation in the manner in which sources were portrayed on air—background visuals were fairly evenly professional and nonprofessional for all types of sources. Fonted identification was comparably ambiguous for all expert types (e.g., "Wilderness Society," "American Forest Resource Alliance," "Forest Service Worker"). In short, these experts were portrayed as equally expert. But were they?

The education levels of representatives of the environmental groups, timber industry, and Forest Service—the affiliations of the experts—varied only slightly, although environmental group members were most likely to hold advanced degrees (three master's, two J.D.'s, one Ph.D.). For all of the groups, college degrees were largely from relevant fields (e.g., natural science, planning and resource policy, economics and business). Differences are evident, however, in amount of experience. Sources representing the forest service ($n=4$) had an average of 9.75 years of experience in their fonted position. Members of environmental groups ($n=8$) averaged 7.13 years and timber industry representatives ($n=5$) averaged 4.0 years.³⁹

Comparison of fonting patterns with source qualifications showed that the frequently ambiguous fonting served to obscure the differences in expertise among sources. Widely published scientists with years of experience were juxtaposed with timber lobbyists with minimal professional qualifications.⁴⁰ Since all of the scientists were environmentalists or Forest Service employees (groups that tended to be prosave, see Table 2), this diminished the strength of the prosave perspective. The credibility of truly expert sources was understated by this ambiguous fonting, the effect being conducive to a procut frame.

Coverage of Ecological and Economic Issues. Expertise on the ecology of the spotted owl and the old-growth forest, and understanding of the long-term economic impacts of reduced timber harvests are the result of ongoing research by scholars in the public and private sectors. Throughout the period for which we examined network coverage there was ongoing scholarly discussion, and sometimes debate⁴¹ about the amount and type of habitat required by owls, innovative approaches to forestry that might favor their preservation, population dynamics of the species, key structural characteristics of old-growth forests, and more.⁴² This growing body of information was ignored in the network coverage, where actual knowledge about the subject of debate (owls and forests) was obscured by the debate (whether to preserve them) itself. The scientists who arguably know the most about spotted owls and old-growth forests⁴³ were entirely absent from the network news.

Similarly, the economic questions being researched included not only the costs and benefits of timber harvest reduction,⁴⁴ but also the economic ripple effects by which those reductions might have adverse environmental effects elsewhere.⁴⁵ None of this research was cited in the newscasts, and the economic researchers were unused as sources. A total of four stories included mention of economic factors (mechanization and whole-log exports) in addition to owl preservation as contributing to job losses in the industry, but none explored the economic subtleties in any detail.

Again, the failure to provide more sophisticated coverage may well reflect the difficulty of encapsulating complex issues in brief news stories, rather than a disinclination to provide the whole story. Ironically, Peter Jennings did conclude one report by noting "It is not a simple debate about saving jobs or preserving trees" (ABC, 4/2/93). Most viewers would have had to take his word for it had they been depending on network news for their information.

In the controversy over the preservation of spotted owls and old-growth forests, both sides endeavored to frame the issue in ways that they perceived would foster public sympathy.⁴⁶ For the procut side, this meant defining it as a narrow conflict between an obscure bird and a way of life that supports thousands of people. Seen in those terms, the people losing their jobs seem more sympathetic than the owl, no matter how cute the latter may be. For the prosave side, the goal was to widen the terms of debate, framing it as an unfortunate collision between the need to preserve the ancient and magnificent public resources of the old-growth forest and an industry that was shrinking for a wide range of reasons.

It is beyond the scope of this paper to judge their overall success, but the coverage we studied generally accorded with the procut frame, as indicated by the rhetorical and syntactical structures we addressed. Source usage, visuals, and reporter wrap-ups all contribute to the overall framing

Conclusion

impact of a news story. Of these three elements, only visuals lacked a notable preference for the procut frame. The majority of sources were procut, reflecting a tendency to use sources from occupations that favored that viewpoint. That imbalance was reinforced by the ways in which sources were portrayed, as vague identification often obscured the more "expert" qualifications of prosave sources. Similarly, where reporter wrap-ups reflected one frame or the other, the favored frame was usually procut. The absence of coverage of ongoing research and debate on the ecological and economic aspects of the story also allowed the more simple frame favored by the procut side to come through.

These findings neither suggest nor refute any idea of network bias, rather they indicate that the relatively concise arguments of the procut side were more readily amenable to encapsulation in news stories. Lack of enterprise is a more likely culprit than bias, as there were certainly many aspects of the debate that went unexplored.

Vale has argued that societal values are as crucial as scientific knowledge in deciding environmental policy issues,⁴⁷ a view endorsed by Thomas et al.⁴⁸ Values are not, however, clearly distinct from knowledge, as people use the knowledge available to them in deciding what is valuable. The framing of this environmental controversy (or any other) thus reflects a significant success or failure for one advocacy group or another.

NOTES

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27. Thomas et al., *A Conservation Strategy*; U.S. Department of Agriculture, Forest Service and cooperating agencies, *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl*, vols. 1 and 2 (1994); Frances C. James, "Joint ESA/AIBS Review of President Clinton's Plan for the Management of Forests in the Pacific Northwest," *Bulletin of the Ecological Society of America* 75 (June 1994): 69-75.

28. Daniel A. Hagen, James W. Vincent, and Patrick G. Welle, "Benefits of Preserving Old-Growth Forests and the Spotted Owl," *Contemporary Policy Issues* 10 (April 1992): 13-22; Claire Montgomery and Gardner M. Brown, Jr., "Economics of Species Preservation: the Spotted Owl Case," *Contemporary Policy Issues* 10 (April 1992): 1-12.

29. James D. Proctor, "The Owl, the Forest, and the Trees: Eco-Ideological Conflict in the Pacific Northwest" (Ph.D. diss., University of California, Berkeley, 1992).

30. Mark P. Moore, *Constructing Irreconcilable Conflict: the Function of Synecdoche in the Spotted Owl Controversy*, Communication Monographs, no. 60 (Falls Church, VA: Speech Communication Association, 1993), 258-74.

31. See, for example, Mary H. Cooper, "Jobs vs. Environment," *CQ Researcher* 2 (May 1992): 411-18; Moore, *Constructing Irreconcilable Conflict*; James D. Proctor, "Environmental Ethics, Eco-ideologies, and the Possibility of Moral Realism" (paper presented at the annual meeting of the Association of American Geographers, Atlanta, GA, 1993).

32. Pan and Kosicki, "Framing Analysis."

33. In the discussion of quantitative results, "Sources" is used to represent "source appearances"; for example, one individual who was interviewed in two stories would be counted as two sources.

34. Leon V. Sigal, *Reporters and Officials* (Lexington, MA: D.C. Heath, 1973); Brown et al., "Invisible Power"; Whitney et al., "Source and Geographic Bias."

35. Herbert J. Gans, *Deciding What's News* (NY: Random House, 1979).

36. Proctor, "Environmental Ethics."

37. Doris A. Graber, *Processing the News: How People Tame the Information Tide*, 2d ed. (White Plains, NY: Longman Inc., 1988).

38. Our examination of visuals also revealed that the networks tended to use the same stock footage across the four-year time period. While this is not inherently problematic, it was troubling when on at least one occasion the forest shown was recognizably located in the Rocky Mountains rather than the Pacific Northwest.

39. Resumes for three members of these latter groups did not provide this information.

40. For example, when he was sourced, David Wilcove was Senior Ecologist for The Wilderness Society, held a Ph.D. from Princeton University in biology, and had authored or coauthored twenty-six articles on conservation biology. He was fonted only as "The Wilderness Society." Similarly, Jack Ward Thomas was fonted as "Biologist U.S. Forest Service." Thomas, the lead author of the interagency report on conservation of the spotted owl, held a Ph.D. in Forestry and had written more than 250 publications on wildlife biology. The other "expert" source appearing in the story was fonted as "Oregon Lands Coalition." The latter source was indeed an officer of the Oregon Lands Coalition, and the qualifications listed in that individual's bio include a high school diploma and descent from "three generations of lumbermen." Despite the apparently major differences in the expertise of these sources, they were all fonted in a comparable manner - there was no way for an audience member to distinguish among their qualifications, as NBC portrayed them as equally expert.

41. Anna M. Gillis, "The New Forestry," *BioScience* 40 (September 1990): 558-63.

42. See, for example, William Booth, "New Thinking on Old Growth," *Science* 244 (April 1989): 141-43; Frederick J. Swanson and Jerry F. Franklin, "New Forestry Principles from Ecosystem Analysis of Pacific Northwest Forests," *Ecological Applications* 2 (August 1992): 262-74.

43. For example, widely published experts such as Eric Forsman of the Forest Service, Jerry Franklin of the Forest Service and the University of Washington, and Charles Meslow of the Fish and Wildlife Service and Oregon State University.

44. See, for example, Hagen et al., "Benefits of Preserving"; Montgomery and Brown, "Economics of Species Preservation."

45. Peter Koch, "Wood Versus Nonwood Materials in U.S. Residential Construction: Some Energy-Related Global Implications," *Forest Products Journal* 42 (May 1992): 31-42.

46. Dietrich, *The Final Forest*; Lange, *The Logic of Competing Information Campaigns*; Moore, *Constructing Irreconcilable Conflict*; Proctor, "The Owl, the Forest."

47. Thomas R. Vale, "Objectivity, Values and the Redwoods," *Landscape* 19 (winter 1970): 30-33; Thomas R. Vale, "Clearcut Logging, Vegetation Dynamics, and Human Wisdom," *Geographical Review* 78 (October 1988): 375-86.

48. Thomas et al., *A Conservation Strategy*.

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