

# Professional Foresters and th

Using a nationwide survey of Forest Service employees, this article compares the land ethic of foresters with that of other natural resource professionals and examines the relationship between one's land ethic and preferred forest policy options. Professional foresters embrace a more utilitarian land ethic than that expressed by biologists and other natural resource scientists in the agency. Because the number of foresters, engineers, and range managers in the Forest Service is declining while the ranks of natural resource scientists are growing, changes in the short-term management of national forest units may be forthcoming.

By Greg Brown and  
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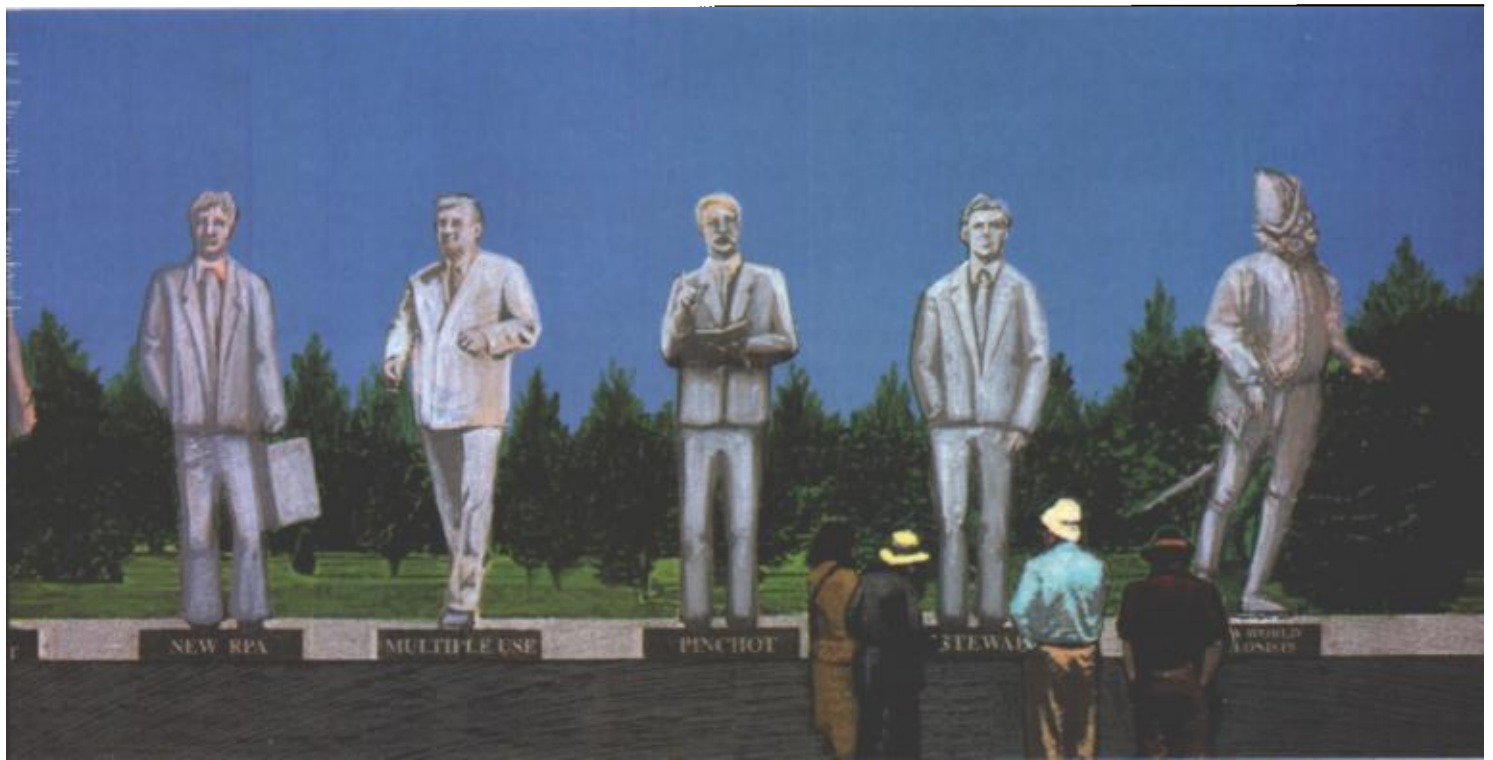
The Society of American Foresters (SAF) long debated whether to include in its Code of Ethics a land ethic based on Aldo Leopold's philosophy. Rolston and Coufal (1991) argued that SAF members' loyalty should go beyond an employer and encompass a "loyalty to the land—to the nation and its residents on their native landscapes" (p. 40). In 1992 SAF members voted to modify the Code of Ethics to express a general concern for the land. The preamble was changed to read, "Stewardship of the land is the cornerstone of the forestry profession," and Canon 1 was added: "A member will advocate and practice land management consistent with ecologically sound principles."

Nonetheless, debate over the role of professional ethics, and especially a land ethic in forestry, continues. Because the ethics of a resource management pro-

fession are value driven, its historically dominant values—whether timber production, mineral extraction, or wildlife protection—may be expected to influence its code of ethics. Coufal has suggested that foresters "find it easier to be heirs of the utilitarian Pinchot than the holistic Leopold" (Coufal 1989, p. 23), and Smyth pointed out the common perception that "foresters are more comfortable with technical expertise, science, production, utilization, and efficiency than philosophy" (Smyth 1995, p. 24). Do such statements correspond to reality?

In May 1991 the *Journal of Forestry* published a "land ethic political test" (p. 38–39) that placed individuals and ideas along a continuum. Positions ranged from Native Americans ("Navajo") on the far left to New World Colonists on the far right. Between them were Muir, Leopold, Multiple

# Land Ethic, *Revisited*



Use, Pinchot, and Stewards. Extreme earth-centered views of nature fell left of Leopold; traditional European-American values were right of Pinchot.

Although this land ethic spectrum was developed as much to encourage discussion as to measure the forestry profession's vision of the human-nature relationship, some social scientists (e.g., Gregg et al. 1992) have suggested that such a scale might actually be used to measure differences in philosophy among resource professionals—thereby testing the validity of Coufal's assertion. When a small, non-random, and clearly unrepresentative sample of 64 foresters voluntarily responded to a questionnaire accompanying the land ethic political test in the May 1991 *Journal of Forestry*, almost half (45 percent) identified with Multiple Use, 22 percent identified with Leopold, and another 27 percent placed

themselves dead center (Gregg 1992).

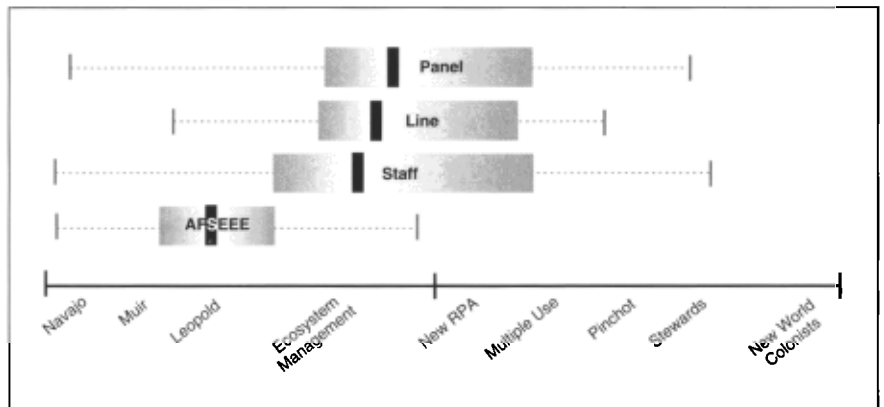
To further stimulate discussion, this article analyzes data from a national survey of public land managers employed by the USDA Forest Service, of whom the largest proportion by far are foresters. This study does not examine the land ethic positions of all professional foresters, many of whom work in the private sector, but it does provide some insight into public-sector foresters compared with other public land managers.

This article also analyzes the relationship between employees' land ethic perspectives and the values of the Association of Forest Service Employees for Environmental Ethics (AFSEEE). In 1992 Brown and Harris suggested that the values and beliefs of these Forest Service employees represented a new paradigm, or set of beliefs and values, for the social, managerial, and biophys-

**A land ethic scale, based on a 1991 *Journal of Forestry* political test. When USDA Forest Service employees are asked to indicate where they would position themselves along this continuum, foresters tend to place themselves farther to the right than do Forest Service biologists, ecologists, and recreation professionals. Agency administrators are most likely to identify with Ecosystem Management and Stewards.**

**■ Do foresters really identify more with Pinchot than with Leopold?**

**Figure 1. Box plot of four groups of respondents from a nationwide survey of Forest Service employees. A box plot visually represents the distribution of a continuous variable that shows the median and interquartile range of the measurements taken. Each box contains 50 percent of the responses; the remaining 50 percent lie outside the box but within the range represented by the dashed lines; the median response on the variable is represented by the vertical band within the box.**



ical elements of a natural resource system. Preferences for public participation (versus expert determination), economic equity through benefit distribution (versus efficiency through benefit maximization), and social values of forest amenities (versus production of commodities) apparently differentiate AFSEEE members from nonmembers in the agency (see Brown and Harris 1992a). AFSEEE, founded in 1989, seeks the reform of national forest land management from within the agency to promote practices that emphasize ecological integrity over commodity production. Brown and Harris concluded that the attitudes of employees within the agency had indeed shifted since 1981 (Brown and Harris 1992b).

## Methods

To measure the magnitude and directional change in Forest Service employees' attitudes and values over the past six years, we developed, tested, and then sent a questionnaire to four groups of

full-time Forest Service employees:

1. *Panel.* These Forest Service employees participated in the 1990 nationwide study of the Forest Service and were still employed by that agency in 1996. A survey panel provides a basis for assessing the extent to which the attitudes and behaviors of a population of individuals have changed over time. The panel group consisted of 704 individuals, both line officers ( $n = 216$ ) and staff employees ( $n = 488$ ). Line officers, such as district rangers and forest supervisors, have formal decisionmaking responsibility for Forest Service management units; staff employees have no formal position of line authority within the agency and represent a broad range of resource professions.

2. *Line officers.* We surveyed a new random sample of 246 line officers in the Forest Service.

3. *Staff.* A new random sample of 495 staff employees was drawn from a comprehensive list of full-time agency employees. This sampling ensured a

representative survey of all Forest Service land management professionals.

4. *AFSEEE members.* These employees belong to the Association of Forest Service Employees for Environmental Ethics.

The old panel group could have been split into its line officer and staff components and combined with the new line and staff groups to increase the number of cases, but we took a conservative approach by keeping them separate to avoid biasing the new random samples of Forest Service employees with an oversampling of employees known to have at least six more years of experience.

Questionnaires with cover letters were mailed to the total sample of 1,895 agency employees, following the mail-survey techniques developed by Dillman (1978). The questions were designed to determine relationships between personal land ethic positions and other variables, including age, sex, years of experience with the Forest Ser-

**Table 1. Sampling group by land ethic categories.**

Sampling group	Land ethic categories, by name									Land ethic scale		
	Navajo	Muir	Leopold	Ecosystem Management	New RPA	Multiple Use	Pinchot	Stewards	New World Colonists	Total	Mean	Standard deviation
Panel	2.3% 6	1.1% 4	13.5% 47	39.8% 139	8.9% 31	27.5% 96	3.4% 12	3.4% 12	— —	340	2.53	.93
Line	.8% 1	—	3.8% 18	44.6% 58	10.8% 14	26.2% 34	3.1% 4	.8% 1	—	130	2.49	.80
Staff	2.2% 5	5.2% 12	18.3% 42	38.0% 87	4.8% 11	22.7% 52	5.7% 13	2.2% 5	9% 2	229	2.36	1.04
AFSEEE	12.6% 29	16.5% 38	9.4% 114	19.5% 45	10.6% 28	.9% 2	.4% 1	.4% 1	.4% 1	231	1.23	.69

vice, level of education, current position, job title, professional affiliation, political orientation, and attitudes toward natural resource utilization and preservation. Responses from the four analysis groups were compared cross-sectionally across multiple questionnaire items.

One section of the questionnaire focused on characteristics hypothesized to represent the new paradigm. The scale used in the 1990 analysis consisted of five items (Brown and Harris 1992a). In the portion of the 1996 questionnaire replicating this scale, one item was dropped and two were added, for a total of six. Respondents read, "The following are contrasting statements about emphases or directions the Forest Service could be taking. Please circle the number indicating (1) the strength of your preference and (2) what you believe to be the current position of the agency." A response in the middle of the scale indicated a neutral or balanced value position.

Another section offered a modified version of the *Journal of Forestry's* 1991 land ethic political test. While the benchmarks along the scale had been reduced from 12 to 9 (by eliminating the less familiar ones) and New Forestry was replaced with Ecosystem Management, the relative positions of the continuum's various land ethic categories were maintained. Respondents were asked to mark where they would position themselves along the continuum. Based on the actual length of the line in the questionnaire, scores ranged from 0 to 5.5, with 2.75 the midpoint. Thus, a score of 0 on the scale would indicate value identification with the left extreme, or Nature's Children, as described in the *Journal of Forestry*; a score of 5.5 would indicate identification with values associated with Nature's Masters.

Respondents were also asked how they felt about management objectives and policy issues, such as increased production of wood, development of national forest lands for recreation purposes, and other goals of national forest management; responses on the five-point bipolar scale ranged from favorable (1) to unfavorable (5).

Another question posed three general environmental statements used by Lou Harris and Associates (1980) in a national opinion poll, which presented opposing opinions about national goals: protecting the environment or spurring economic growth, using resources for present generations or saving them for future generations, and preserving nature or using nature to produce goods. Respondents' attitudes were elicited with a seven-point bipolar scale with opposing statements at each end.

A third set of questions elicited opinions about the current situation of national forests and their management. Here, seven-point Likert scales ranged from "strongly disagree" (1) to "strongly agree" (7).

To compare the positions of foresters and other resource management professionals with their land ethic perspective, the data were analyzed with three techniques. First, the land ethic results were portrayed with graphic displays of the employees' responses using both the scale's interval form, as marked by the respondent, and its nominal form, that is, with the responses placed into one of the nine categories. For the latter analysis, respondents' positions were analyzed with correspondence analysis, an exploratory multivariate technique that transforms a frequency table into a graphic display of row and column variables (profession and land ethic category) in the same space; rows and columns from the frequency table appear as points in the graphic. Correspondence analysis decomposes the chi-square measure of association of the table's nominal data into components in a mathematical approach much like that of principal component analysis of continuous data (Greenacre 1989, 1994).

In the second analysis, variation in responses to the land ethic scale attributable to the respondent's profession was examined by treating the scale responses as interval-level data; multiple comparisons were analyzed to indicate statistically significant relationships between land ethic position and professional identification.

The third analysis tested the rela-

## ■ Is there a connection between political orientation and one's views on the human-nature relationship?

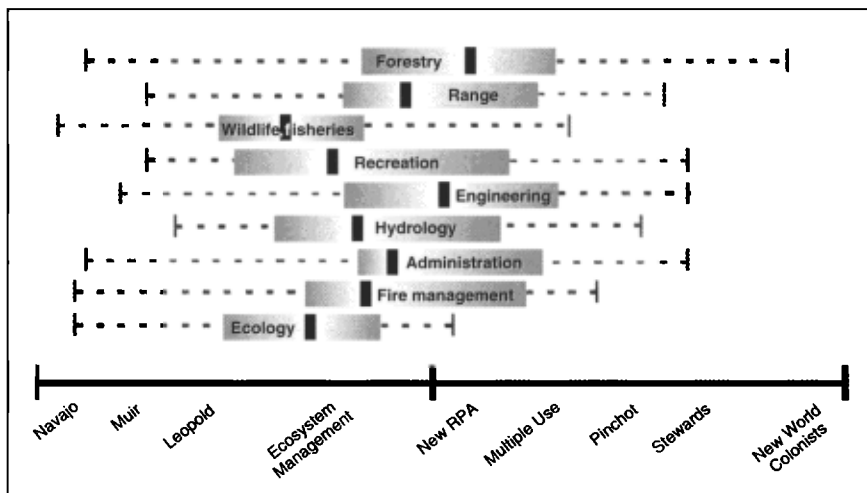
tionship between responses to the land ethic scale and other interval-level variables, including employees' opinions on natural resource production versus preservation, their beliefs about ecosystem resiliency, their personal political identification, and their general environmental values.

### Results

*Response rate.* The overall survey response rate was 62 percent; the AFSEEE response rate was estimated at 60 percent. Responses were eliminated if the returned questionnaire contained invalid responses or nonresponses on either the professional identification or the land ethic questions, and if respondents were in professions with fewer than 20 individuals reporting. The resulting data set included 939 cases: 231 AFSEEE members, 349 panel respondents, 229 staff employees, and 130 line officers. The sample was proportional to Forest Service employment levels by region.

*Land ethic identification by sampling group.* Forest Service employees see themselves, in the aggregate, as being slightly left of center on the land ethic scale (fig. 1, table 1); they embrace the concepts of Ecosystem Management, the New RPA, and Multiple Use. Many AFSEEE members strongly identify with a Muir or Leopold land ethic or perspectives to the extreme left. Analysis of percentages of the respondent groups identifying with each category confirms that AFSEEE members hold the most preservationist views: 13 percent identify with the extreme position of biocentric preservationism (Navajo), and another 17 percent with the Muir position, or anthropocentric preservationism. In contrast, only 2 percent of nonmembers identify with those ethical positions. The largest segment (49 percent) of AFSEEE members

**Figure 2. Box plot of selected professions from a nationwide survey of Forest Service employees.**



identify with Aldo Leopold's land ethic position, compared with 15 percent of nonmembers.

Only 2 percent of AFSEEE respondents indicate positions at the other end of the scale: Multiple Use, Pinchot, Stewards, or New World Colonists. In contrast, 26 percent of the nonmember agency employees selected Multiple Use, and another 7 percent identify with the Pinchot position or one to its right.

AFSEEE members are a minority within the Forest Service—current, full-time membership is estimated at 450 (Stahl, pers. commun). To avoid potential bias, their responses on the land ethic scale are excluded from the following analyses of professional identity; all other groups were combined.

The staff and panel groups show the greatest variability in their positions, largely because of their diverse

professional composition. Of staff employees, 26 percent identify with Leopold or positions farther left, compared with only half that proportion (15 percent) of line officers; about 30 percent of both line officers and staff hold the Multiple Use perspective or one to its right. The largest proportions of both groups—47 percent of line officers and 38 per-

cent of staff—identify with Ecosystem Management.

*Land ethic perspectives by profession.* Among the Forest Service specializations for which there were at least 20 respondents, professional foresters generally place themselves to the right and identify most closely with the Forest Service's New RPA program (the agency's recent proposed management

**Table 2. Professional identification by land ethic categories.**

Sampling group	Land ethic categories, by name									Land ethic scale		
	Navajo	Muir	Leopold	Ecosystem Management	New RPA	Multiple Use	Pinchot	Stewards	New World Colonists	Total	Mean	Standard deviation
Ecology	—	2.9%	34.3%	51.4%	2.9%	—	—	2.9%	—	80	1.75	.78
Wildlife, fisheries	1.3%	2.5%	40.0%	48.8%	1.3%	3.8%	2.5%	—	—	80	1.80	.71
Geology	—	—	15.8%	82.0%	—	18.8%	2.5%	—	—	19	2.07	.93
Recreation	—	6.8%	27.3%	34.1%	6.8%	20.5%	—	4.5%	—	44	2.18	.98
Fire management	—	—	—	—	—	37.0%	67%	—	—	—	2.33	.97
Hydrology	—	—	30.0%	33.3%	13.3%	13.3%	10.0%	—	—	30	2.36	.93
Administration	—	2.1%	12.8%	36.3%	6.6%	27.7%	2.1%	6.4%	—	47	2.60	.92
Range	—	2.4%	14.6%	36.6%	4.9%	34.1%	4.9%	2.4%	—	41	2.62	.88
Forestry	—	—	2.0%	33.7%	16.8%	35.8%	3.5%	2.3%	5%	264	2.80	.84
Engineering	2.9%	—	2.9%	41.2%	14.7%	20.6%	8.8%	8.8%	—	34	2.80	.91

direction) and multiple-use philosophy (fig. 2, table 2). The positions of Ecosystem Management, Leopold, and Navajo attracted a total of 43 percent of professional foresters. Similarly low totals for those categories were found for range management professionals (53 percent) and engineers (47 percent). Engineers indicated positions even farther to the right, with comparatively large proportions identifying with Pinchot and Stewards (18 percent), and some of the smallest proportions with Navajo (3 percent) and Muir (0).

There is little overlap between the land ethic perspectives embraced by the agency's professional foresters and those of natural science professionals. Wildlife and fisheries professionals and ecologists identified in comparatively large proportions with Navajo, Leopold, and Ecosystem Management (totals of 93 percent and 95 percent, respectively); only a few respondents in the biological professions identified with the Multiple Use category and perspectives to its right (6 percent and 3 percent). Cultural resource professionals in the Forest Service reflect a similar pattern.

In correspondence analysis plots, the more one variable is associated with another, the closer they lie—liter-

ally. In this case wildlife and fisheries biologists are closely associated with a Leopold land ethic, whereas foresters are closest to Multiple Use and New RPA (fig. 3). Individuals who identify with the profession of administration—primarily Forest Service line officers—are closest to the Ecosystem Management and Stewards categories.

The correspondence analysis also shows that forestry, engineering, range management, and administration tend to be closest to one another, suggesting that these professionals have similar perspectives. Similarly, the New RPA and Multiple Use categories cluster together in the plot, with Stewards to a certain extent, suggesting that respondents did not perceive a sharp distinction between them. In contrast, the categories of New World Colonists, Navajo, Muir, and Leopold show considerable spatial separation and thus potentially greater distinction among survey respondents. Ecosystem Management is closest to the center, as are the professions of range management and administration.

The left-of-midpoint trend of the overall responses, combined with the low numbers of respondents selecting New RPA, suggests that either (1) the midpoint needs a different name or (2)

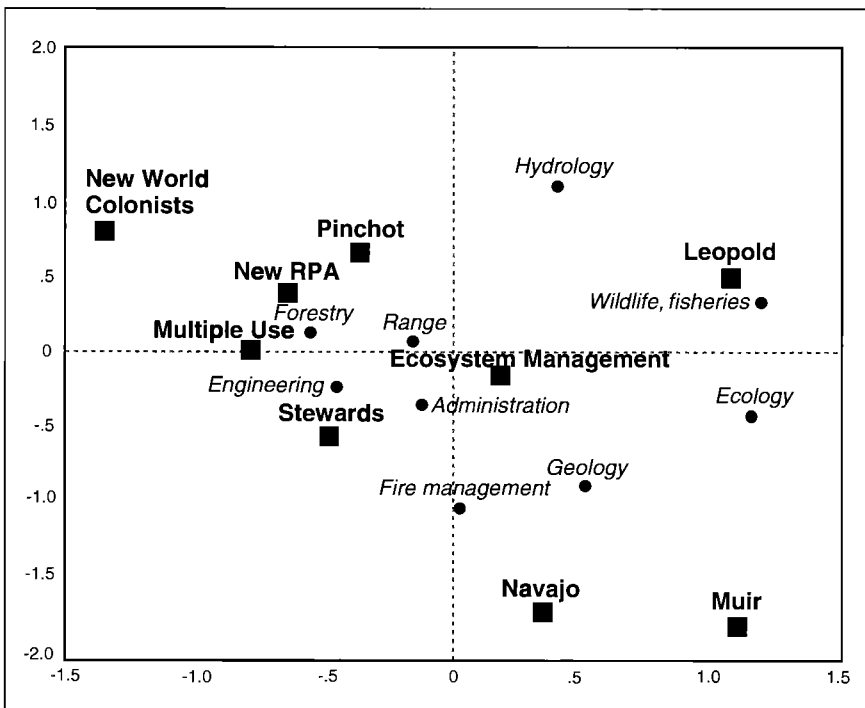
## ■ To what extent does one's land ethic translate into preferred forest policy options?

this category is not the true middle. The correspondence analysis plot shows that Ecosystem Management is the more likely midpoint; it is also the position chosen by the highest proportions of the non-AFSEEE groups.

In sum, Forest Service resource-management professions associated with commodity uses of the forest (forestry, range, and engineering) generally tend to be right of center on the land ethic continuum, and agency professionals associated with the natural and social sciences and recreation tend to be left of center. Except for members of AFSEEE, most resource professionals in the Forest Service avoid identifying with the extremes.

*Relationships between land ethic perspective and profession.* Relationships between professional identification and land ethic perspective were also tested for statistical significance with a one-way analysis of variance of employees' responses to the land ethic question—the dependent variable—and profession as the independent variable. Pairwise multiple comparisons were performed using least significant difference (LSD) and Tukey's honestly significant difference (HSD) tests. The LSD test is equivalent to multiple t-tests between all pairs of groups but does not adjust the observed significance level for multiple comparisons. Tukey's HSD test uses the Studentized-range statistic to make all pairwise comparisons between groups, setting the experimentwise error rate to the error rate for the collection for all pairwise comparisons; the result is that the HSD test is more conservative because it requires a larger difference between means for a finding of statistical significance.

The results show that professional



**Figure 3.** The relationship between professional identification and land ethic position.

**Table 3. Results of analysis of variance with land ethic by professional identification. Statistically significant pairwise comparisons ( $p < .05$ ) are shown in lower triangle of the table.**

	Mean score	Ecology	Wildlife, fisheries	Geology	Recreation	Fire management	Hydrology	Administration	Range	Forestry	Engineering
Ecology	1.75										
Wildlife, fisheries	1.80										
Geology	2.07										
Recreation	2.18	†	†								
Fire management	2.33	†	†								
Hydrology	2.36	†	†								
Administration	2.60	*†	*†	†	†						
Range	2.62	*†	*†	†	†						
Forestry	2.80	*†	*†	*†	*†	†	†				
Engineering	2.80	*†	*†	†	*†	†	†				

\* Significant differences ( $p < .05$ ) with Tukey's Studentized Range (HSD).

† Significant differences ( $p < .05$ ) with Least Significant Difference (LSD).

foresters hold significantly different land ethic positions compared with ecologists, wildlife and fisheries biologists, geologists, and recreation professionals (table 3). Ecologists and wildlife and fisheries biologists hold significantly different positions from those in forestry, engineering, range, and administration. Thus, the differences described above are, in fact, statistically significant ( $p < .05$ ).

*Land ethic perspectives and attitudes toward resource production versus preservation.* A correlational analysis of bivariate relationships based on Pearson's  $r$  (where  $p < .05$ ) indicates that relationships between agency employees' land ethic and attitudes toward resource production and preservation are statistically significant. The more a Forest Service employee's land ethic leans toward the right, the more he or she favors production of commodities from national forest lands ( $r = 0.53$ ), timber production ( $r = 0.53$ ) in particular. The relationships between agency employees' ethical perspectives and the extent of their support for livestock grazing and mining are less strong but statistically significant ( $r = 0.37$  and  $0.34$ ).

Also, the extent to which an employee's land ethic is oriented toward the right is fairly strongly related to beliefs about specific policies and management activities and their effects on ecosystems—in particular, less support for additional wilderness designation

( $r = 0.50$ ) and less concern for threatened and endangered species ( $r = 0.47$ ). Relationships are weaker yet still statistically significant ( $r = 0.41$ ,  $0.38$ , and  $0.36$ ) between agency employees' ethical perspectives favoring resource production and the extent to which they agree that (1) salvage logging is an effective approach to restoring forest health, (2) timber harvesting currently has little negative effect on forests' water quality, and (3) forestlands where livestock graze are in good ecological condition.

The cumulative measure of the values of Forest Service employees provided by the new paradigm scale (Brown and Harris 1993) was assessed in terms of the land ethic scale. Consistent with the above relationships, Forest Service employees favoring a more preservationist land ethic are much more likely to favor a new land-management paradigm—one based on shared decisionmaking, preservation of ecological integrity, and emphasis on forest amenities—over the dominant management paradigm of the past, which emphasized unilateral decision-making and production of commodity outputs ( $r = 0.65$ ).

*Land ethic perspectives and the resilience of ecosystems.* A bipolar scale solicited agency employees' beliefs about the extent to which ecosystems are "fragile and resource managers need to err on the side of caution in the use of ecosystem resources," as opposed to the

belief that ecosystems are "highly resilient and ecosystem resource use will not affect sustainability over the long run." A correlational analysis shows a relatively strong, statistically significant relationship ( $r = 0.54$ ): the more that respondents lean toward the Leopold position, the more they believe that ecosystems are fragile and warrant cautious management; the closer their ethic is to Pinchot, the more they believe ecosystems are resilient and relatively unaffected by resource uses.

Nearly one third of the respondents reported that their perception of ecosystem resilience had changed during their professional careers. Of these employees, the vast majority (81 percent, and thus more than 25 percent of the total sample of agency workers) said they now perceived the fragility of ecosystems and the need to manage them cautiously. Only 6 percent of the entire sample said their perspective had changed and that they now believed ecosystems to be more resilient.

*Land ethic perspectives and general environmental values.* Correlations between the land ethic scale and three general environmental questions used by Lou Harris and Associates (1980) were statistically significant but only moderately strong, ranging from 0.46 to 0.51. A land ethic position on the left was moderately related to greater environmental concern, as evidenced by preferences for "a country that believes protecting the environment is more im-

portant than economic growth," "a country that saves its resources for future generations," and "a country that emphasizes preserving nature."

*Land ethic and political identification.* Respondents were asked to rate themselves politically on a bipolar seven-point scale ranging from liberal to conservative. The strength of relationship between land ethic position and political identification was moderately strong ( $r = 0.48$ ), indicating that individuals who identify with the left side of the land ethic continuum tend to identify themselves as more politically left, too.

*Land ethic and respondent characteristics.* Land ethic identifications were statistically significantly related, although very weakly, to age ( $r = 0.18$ ), years of experience ( $r = 0.24$ ), and educational attainment ( $r = -0.17$ ). A *t*-test of respondents' scores on the land ethic scale based on sex indicates a statistically significant difference (*t*-statistic = 6.32;  $p < .05$ ); female employees, on average, rated themselves half a point closer to the left than did the average male employee. No significant relationship is evident between land ethic perspective and GS-grade level. Thus, employees who are male, older, have more work experience in the Forest Service, and are less educated are somewhat more likely to identify with traditional agency values represented by positions on the right, but level of job experience and responsibility do not make a difference.

## Discussion

Analysis of the 1996 questionnaire confirms that differences on the human-nature philosophical continuum do indeed reflect the dominant resource use values associated with professional foresters in the Forest Service. As a group, the professional foresters and traditional commodity managers and staff embrace a more utilitarian land ethic than do the agency's natural scientists and noncommodity managers and staff; Forest Service biologists, ecologists, and recreation and cultural resource professionals have more biocentric views that place less importance on the commodity outputs.

Such differences are important because, as the Forest Service has employed

more natural and social scientists, the agency's land ethic has changed. Between 1985 and 1993 (when the last Forest Service Factbook was published), the proportion of the agency's professionals who are foresters, engineers, and range managers declined from 66 to 51 percent, while the proportion of Forest Service biologists, hydrologists, and landscape architects increased from 10 to 15 percent (USDA 1994).

Nonforesters are also rising to higher levels in the agency. Four years ago 28 percent of district rangers and 25 percent of forest supervisors identified with a profession other than forestry, range, or administration (Brown and Harris 1993), and the data from our 1996 updated survey suggest that the combined figure for both managers and supervisors is now closer to 29 percent. Although no comparable data exist on the professional backgrounds of line officers in the past, the number of employees in the nontraditional professions probably represents a dramatic increase over what would have been found in the agency even a decade ago.

Past research has shown significant differences between researchers (scientists) and managers in their acceptance of the status quo and the political acceptability of decisions (Deshpande and Zaltman 1984). While natural scientists in the Forest Service focus on building better descriptive models that incorporate more scientific information for more effective ecosystem management, managers want better sociopolitical information that will enable them to make better management decisions—and predict the consequences (USDA 1990).

The results of the present research affirm that newer employees whose backgrounds are often outside the forestry profession are infusing the agency with noncommodity values based on environmental and ecological concerns. The increasing proportion of these groups should result in an evolving organizational culture. One indication of the impact on resource decisions may be seen in the boxplot (*fig. 1*) for the agency's staff and line officers in 1996. Compared with that for the 1989 and 1996 panel, it shows a slight

shift toward the Ecosystem Management end; this result is supported by the findings of statistically significant differences in age and experience, since the panel is older and has more years of agency experience.

Will these differences in attitudes and values between traditional and nontraditional resource professions find voice in management decisions and programs? Or are employee perceptions that promotion depends largely on supporting traditional Forest Service commodity programs true (Kennedy and Quigley 1989)? As more nontraditional professionals advance through the organization's hierarchy, the noncommodity resource values supported by these individuals may gain greater credibility (Brown and Harris 1993). Greater impact on decisions might be expected as these individuals—including fisheries biologist Michael Dombeck and wildlife biologist Jack Ward Thomas—rise to positions of greater authority. Chief Dombeck appears to be staying the course, set by former Chief Thomas, to implement ecosystem management. This approach to resource management is committed not only to producing traditional goods and services but also to protecting and restoring the components, functions, and structures of ecosystems, managing on larger spatial and longer temporal scales, and making decisions after open communication and collaborative planning (Wallace et al. 1994).

The fact remains, however, that many Forest Service line officers continue to identify with traditional RPA and Multiple Use positions on the land ethic scale, and major changes in the short-term management of many national forests may not be forthcoming. Our research suggests that values and attitudes vary among different groups and disciplines, but will these differences find expression in management decisions? Brown and Harris (1993) believe that that is the question for future research.

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