

**A Longitudinal Study of Environmental Attitudes of Women and Gender
Diversification in the U.S. Forest Service 1990-1996**

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Abstract

The United States Department of Agriculture Forest Service has been dominated by white, male foresters. Beginning in the mid-1970s, the agency was compelled legally and morally to begin diversifying its workforce by race, gender, and profession. Concurrent with workforce diversification efforts, the agency confronted demands from the courts, Congress, and interests groups to change national forest management by emphasizing national forest preservation over the production of commodities such as timber and livestock forage. This study examines the role of women as potential organizational change agents by analyzing survey data collected from two national studies of the Forest Service in 1990 and 1996. Results from the 1996 study indicate that women continue to exhibit higher levels of general environmental concern than men suggesting their role as potential “saviors” in transitioning the agency to increased emphasis on ecosystem management. Conversely, diversification of the Forest Service workforce continues to be highly contentious with some employees feeling that the recruitment and promotion of women without adequate training and/or experience have left the agency unprepared to meet complex demands placed on the agency. The inability of the Forest Service to satisfy multiple, conflicting constituencies in the face of agency downsizing suggests the role of women as “scapegoats” whose perceived lack of experience is responsible for agency shortcomings. The authors suggest that the historical convergence of workforce diversification with changes in national forest policy inevitably place women in the conflicting roles of both “saviors” and “scapegoats.”

Keywords: Environmental attitudes, organizational change, affirmative action.

"One of my highest priorities, and one of our most important challenges, will be to achieve a civil rights program that is second to none, and one in which we can all be proud."

Michael Dombeck, Forest Service Chief, January 6, 1997

Introduction

In a 1990 nationwide study of U.S. Forest Service employees, Brown and Harris (1993) found statistically significant differences between men and women in environmental attitudes and their opinions about forest-policy preferences. Overall, women expressed greater environmental concern and held stronger resource protection attitudes than men even after accounting for differences in age, experience, education, and profession of the employees. These findings of gender differences in environmental concern were consistent with other empirical measures both inside the Forest Service (Kennedy and Quigley, 1989; Kennedy and Mincolla, 1986) and outside the Forest Service (see e.g., Steger and Witt, 1989; McStay and Dunlap, 1983; Hamilton, 1985).¹ Even stronger differences were found between traditional agency employees (forestry and range professionals) and those in non-traditional resource professions (e.g., wildlife/fisheries biologists and ecologists).

Theoretical support for these empirical findings come from Gilligan (1982) and other researchers who posit that gender may be related to differences in moral orientation where women exhibit an ethic of *care* while men exhibit an ethic of *justice*. Socialization patterns associated with women can produce attitudes and beliefs that are more readily aligned with those expressed by more “liberal” special-interest groups like environmentalists (Steger and Witt, 1989). There “caring”

¹ Other studies have found only negligible differences in environmental concern with respect to gender (Arcury et al., 1987; Lowe et al., 1980; Tognacci et al., 1972). McStay and Dunlap (1983) believe that studies indicating gender is unimportant for understanding differences in environmental concern may suffer from conceptual and methodological deficiencies, such as single measures and nonspecificity of the environmental issue, while Blocker and Eckberg (1989)

concepts are reinforced by one early study of Forest Service employees (Kennedy, 1991) that found twice as many women as men reported that "caring about" or "concern for conservation and/or preservation of resource values" were motives for selecting their natural resource profession. He found that women tended to use more nurturance-related verbs such as "care for," "love of," "concern for" for natural resources, wildlife, or the environment; in contrast, men generally used more utilitarian terms, such as "work in," "work with," or "manage," and they rarely used terms like "care" and "love."

The gender differences in environmental attitudes and policy preferences found in the 1990 study coincided with ongoing efforts in the Forest Service to diversify its workforce by hiring and promoting larger proportions of women and non-traditional resource professionals. While the workforce diversification program sought to advance socially desirable egalitarian principles, comments from employees in the 1990 study indicated that opinions on workforce diversification were quite diverse, if not polarized.

The workforce diversification program was the Forest Service response to a *consent decree* resulting from a California lawsuit that charged gender discrimination in employment and career opportunities for women in the agency. In 1977, for example, women constituted only 21.6 percent of the agency's workforce; even starker was the difference in the gender of agency employees occupying positions as professional foresters: only 1.7 percent of the agency's professional foresters in 1978 were women (Brown and Harris 1993). As part of the consent decree, the court ordered the Forest Service to achieve, to the greatest extent possible, the employment of a sufficient number of women such that the gender composition of the permanent workforce in each General Schedule job

suggest that gender differences in environmental concern may be applicable to local environmental issues but not necessarily to general environmental concern.

series and each grade level would equal the gender composition of the civilian workforce (Winokur, 1986, p. 66).

In light of a rapidly changing political and social environment, a second survey collecting longitudinal data on the resource management values and beliefs of Forest Service employees was conducted in 1996 to assess new agency directions, perceptions and attitudes after a six-year period of significant organizational change (see Brown and Harris, in press)². Although not the primary objective of the Forest Service studies, the 1990 and 1996 surveys provide a unique opportunity to re-examine the differences and similarities in environmental attitudes and forest policy preferences between men and women in the Forest Service and to assess the impact of changes in the workforce on agency resource decisions. In 1990, workforce diversification efforts were still very much a work in progress – an organizational experiment on a large-scale.

Much of the organizational research and analysis of resource agencies like the Forest Service and their policies and management activities has been cross-sectional and non-cumulative. This research approach limits the ability of research to explore and explain organizational change dynamics, given its inability to track organizational perturbations and developments through time. The 1996 survey supplements the original 1990 study with a longitudinal research design and provides an opportunity to better understand workforce diversification efforts within natural resource management agencies.

The present paper examines temporal changes in environmental attitudes and resource policy preferences. The purpose here is not to test theory *per se*. Rather, the paper provides an inductive

² One reviewer suggested that comparisons of the results of the 1990 and 1996 samples could be made, especially with a focus on the effects of agency socialization, given the existence of the panel sample. The authors recognize the value of such analyses, as evidenced by another research article on such a comparison currently in press (see Brown and Harris Forthcoming). The results presented in the forthcoming article are consistent with comparisons between the two samples based on gender reported in the present paper.

exploration of changing agency attitudes, values, beliefs, and perceptions with respect to gender and suggests the implications of these changes for current organizational development theory and future resource management. For example, do environmental attitudes and values and forest policy preferences continue to differ between men and women in the Forest Service? How have these attitudes and values changed since 1990? Does a gender gap in environmental concern and activism persist in the Forest Service?

In addition, because workforce diversification was identified by employees as a contentious issue in 1990, several survey questions were added to the 1996 study to better understand the perceived effectiveness of the workforce diversification program 1990-1996. For example, how has the workforce composition of the Forest Service changed since 1990 in terms of recruiting and promoting women? Do employees believe that workforce diversification has increased the breadth and mix of the agency's values, beliefs, and perspectives? Has workforce diversification resulted in a more capable workforce?

Historical Context and Review of Relevant Literature

Since the 1990 study of Forest Service employees, a number of events have occurred that suggest the effects of increasing environmental concerns and societal trends on the Forest Service; these events have had the potential to both support and undermine the agency's workforce-diversification efforts. They include: 1) changes in the Forest Service's leadership with the appointment of Jack Ward Thomas as Chief, a wildlife biologist who gained reputé as lead author of the Northern Spotted Owl recovery plan (he was succeeded in 1997 by Michael Dombeck, also a biologist by training); 2) a significant reduction of over 15 percent in the agency's permanent workforce between 1993 and 1996; 3) the Forest Service's formal embracing of the concept of

Ecosystem Management as a basic land management philosophy, a concept that evolved from its “New Perspectives” program; and 4) the release of a 1997 USDA Department of Agriculture report assessing the department’s civil-rights record; that report found that the department and, in particular, the Forest Service had been ineffective in satisfying diverse external constituents and internal minorities. In fact, the report stated that “abuse of managerial authority was a common theme, expressed most often by employees within the Forest Service” (USDA 1997, p. 9.).

While the Forest Service has experienced significant internal changes since 1990, a significant social trend outside the agency has been declining support for employment and promotion programs to attain affirmative-action goals. Americans generally no longer favor preferences, quotas, or economic aid to minority groups, including women (see, for example, Steeh and Krysan, 1996). Although affirmative-action policies are more favorable for women than minorities such as blacks, recent trends in the results of public-opinion polls suggest that acceptance of affirmative-action programs for women may be declining, all-be-it modestly. For example, a 1995 *CBS/New York Times* national public opinion survey found that a majority of respondents (48 percent) no longer favor hiring and promotion preferences for women where there has been job discrimination in the past. In comparison, 43 percent did report favoring these preferences (Steeh and Krysan, 1996). Consequently, workforce-diversification programs may be raising additional issues for women and minorities in the Forest Service: not only must they “prove” themselves in a traditionally white, “male gendered” agency (Acker, 1990, p. 145), but they also must contend with the tide of adverse public perceptions of affirmative-action employment programs.

For women in the Forest Service, there appears to have been little change in the agency’s “gendered organizational logic” (for a discussion of this concept, see Acker, 1990, and Britton, 1997): purportedly gender-neutral policies and practices actually serve to maintain occupational

segregation based on gender, as well as organizational inequalities. A study of female Forest Service line-officers by Carroll and associates (1996) indicated that important elements of a socialization process that promotes a “willingness to conform” are still present within the agency for female line officers. Despite the urging of alternative career paths for women in the Forest Service, socialization practices such as self-selection, a willingness to relocate, technical competency, mentoring, promotion from within, and “unhindered promotion” are applied to women, just as they are to men.

A complicating factor underlying Forest Service efforts to diversify its workforce has been the concurrent shift in the emphasis in the management of national forests to a more ecosystem-based, rather than timber-based, approach to resource management -- one that focuses on managing for all values of the forest ecosystem, and in a way that considers potentially negative impacts of commodity production on that ecosystem. A number of empirical studies have reported recent changes that reflect this shift: the Forest Service has been increasing its activities in non-commodity resource management over historic levels (Farnham et al., 1995); the amount of timber offered, sold, and harvested since the late 1980s has decreased dramatically (Farnham and Mohai, 1995); the courts and administrative appeals process likely have catalyzed change in Forest Service (Jones and Taylor, 1995); the Forest Service and Congress are shifting program priorities through the budget and appropriations process (Farnham, 1995); and Forest Service interest groups perceive a net shift in direction towards increased emphasis on non-commodity forest uses (Jones and Mohai, 1995).

However, while recent research results suggest a narrowing of the gap in resource orientation between employee preferences/expectations for agency actions and these employees’ perceptions of the agency’s actual performance/activities, a performance gap continues to persist between the

agency's current resource orientation and that which employees perceive to be appropriate (Brown and Harris, 1992; Kennedy et al., 1993; Mohai et al., 1994; Brown and Harris, in process;).

How should one view the historical convergence of workforce diversification efforts and broader changes in national forest policy? How should one view the role of women in this process? In their analysis of racial, gender, and professional diversification in the Forest Service from 1983 to 1992, Thomas and Mohai (1995) concluded that any increase in the numbers of women, people of color, and non-traditional professionals was "too small to suggest that workforce diversification has been an important force for change in the collective value orientation within the agency, as some have hypothesized. Rather, it may be more an effect of other 'forces' [such as Congress and the courts] at work on the agency" (p. 308).

Despite these cautionary results, it would be easy to overstate the importance of workforce diversification given the difficulty of specifically linking short-term natural resource decisions to long-range personnel policies. Nonetheless, what is posited here is consistent with Allison's (1971) perspective that the "programmed" character of organizational decisionmaking, which is based on repertoires, routines and standard operating procedures, can be altered (albeit subtly) with large-scale personnel changes in the form of a more diversified workforce. From this perspective, one cannot help but wonder whether forest policy decisions made by the Forest Service would be the same if women held the reins of power in the agency.

Methods

The purpose of the research was to measure the magnitude and direction change in Forest Service employee attitudes and values over a six-year period since 1990, expanding on previous research from that year that focused on the changing values of Forest Service employees (see Brown

and Harris 1992a, 1992b, 1993). An updated questionnaire was developed, pre-tested, and sent to four groups of full-time Forest Service employees in a June, 1996, replication and extension of the 1990 survey.

The first group consisted of a *panel* of Forest Service employees: these are Forest Service employees who participated in the 1990 nationwide study of the Forest Service and who were still employed by that agency in 1996. This panel group consisted of 704 individuals, both “line” officers in 1990 (n=216) and “staff” employees (n=488). “Line officers” are individuals having formal decisionmaking responsibility for management units administered by the Forest Service, such as district rangers and forest supervisors, while “staff” employees are those without a formal position of line authority within the agency, and who represent a broad range of resource professions. The *panel* reflects oversampling of “line” officers relative to “staff” (about 1 line officer per 3 staff) where the actual ratio of line officers to staff is about 1 in 30 (see Mohai et al., 1994)³.

³ Because this research focused primarily on the role of gender, profession, and other particular influences on the values and attitudes of agency employees, sampling to maximize external validity (representativeness of the agency of the whole) was not as much a concern as representativeness of major relevant and consequential internal agency publics (e.g., line and staff, and resource-professional employees -- as opposed to clerical, budgetary, legal and other support staff). Groups of employees were identified and classified based on the job series and job title provided by the Washington Office. As there is no definitive job series number for “line” officers, the actual job titles were used to identify line officers (District Ranger, Forest Supervisor, Regional Forests, and Chiefs). Also, there was a relatively small amount of ambiguity in the line/staff distinction: arguably, some “Deputies” or “Assistants” are not technically “line” officers, and yet, on larger forests and districts, these individuals can have considerable “line” responsibility and authority. These individuals were considered part of the “staff” group for sampling purposes after nominal line officer positions (District Ranger, Forest Supervisor, Regional Forester, Chiefs) were segmented from the list of agency employees. Thus, our sampling of staff and line groups was based on reasonable estimates of the desired group sizes, but the actual grouping of the line and staff categories for the present analysis was based on the self-reporting of the respondents in the questionnaire. The line officers were extracted from the entire employee database (30,622 records) provided by the Washington Office and a random sample was drawn from the extracted line officer records. Those employees remaining in the database were considered members of the staff group. Individuals associated with “clerical” or “administrative” job series numbers were deleted from the “staff” database. Finally, a random sample of the “staff” group was selected from the remaining 25,580 records (the probability of the first individual’s selection thus was approximately 1 in 25,000, with each additional selection a slightly lower probability). This number is approximate, because before random selection from the 1996 extracted line and staff databases, the 1990 panel records had to be compared with the 1996 databases so that individuals still employed in 1996 could be filtered from random selection. Thus, the probability of staff selection in 1996 was approximately 1 in 25,000, while that of line selection was approximately 1 in 750. Given the importance of having a sufficiently large subsample of women for the analyses conducted (which is an issue for the very reasons the topic of gender in resource-management agencies continues to be a

A second group receiving the 1996 updated questionnaire consisted of a newly selected, random sample of 246 *line officers* in the Forest Service, and a third group was a newly selected random sample of 495 *staff employees* drawn from a comprehensive list of full-time agency employees (30,622 in 1996) provided by the Forest Service's Washington Office. The 1996 sampling also reflects oversampling of line officers relative to staff employees.

The fourth group of employees consisted of *members of the Association of Forest Service Employees for Environmental Ethics (AFSEEE)*. The mission of this organization of Forest Service employees, which was founded in 1989 by Jeff DeBonis, is the reform of national forest land management practices from within the agency to promote practices that reflect a greater emphasis on ecological integrity over commodity production. Its membership of full-time Forest Service employees was estimated to be around 400 (Stahl, 1996).

Questionnaires with cover letters were mailed to each individual in this sample of 1895 agency employees, following the mail-survey techniques developed by Dillman (1978). The questionnaire solicited responses to a wide range of questions. Sections of the questionnaire examined for this analysis gathered information on: (1) the socio-demographic characteristics of respondents, including each respondent's age, gender, level of formal education completed (7 nominal categories ranging from High School/G.E.D. to Ph.D. Degree), years of experience with the Forest Service, job title, current position (job series number and GS grade), and self-defined

relevant one), the research design entailed an oversampling of line employees to ensure an adequately large sample of the female subpopulation of employees. We would add that there were several other important reasons for oversampling line officers in 1996: 1) to have a larger sample of line officers consistent with the 1990 survey that also oversampled line officers relative to staff, 2) to increase the potential pool of line officers for potential longitudinal studies in the future, 3) to have enough respondents in the "District Ranger" and "Forest Supervisor" subgroups to allow statistical comparison. The actual number of staff (approximately 500) and line (approximately 250) sampled were constrained by the project budget—we wanted as large sample sizes as the project budget would allow. Nonetheless, if one was interested in providing a precise portrait of the agency workforce in terms of all employees, one could simply properly weight the responses of, say, the subsamples of line and staff employees, based on the 1:30 ratio of numbers of line to

professional affiliation (e.g., forestry, range, wildlife/fisheries biology, etc.); (2) respondents' opinions concerning Resources Planning Act (RPA) policy issues as measured by six attitude scales focusing on the favorability of various natural-resource-policy issues and management actions (see Table 3); (3) respondents' opinions about the direction toward which the country should be moving *vis a vis* the natural environment (Harris and Associates, 1980), as measured by a set of three statements (bipolar scales) from the Lou Harris Environmental Scale (see Table 1); (4) respondents' perceived positions on a land-ethic spectrum, as measured with a scale adapted from the Journal of Forestry (1991) and reported by Brown and Harris (1998); (5) respondents' positions on a set of six statements (bipolar scales) measuring the New Resource Management Paradigm (NRMP) Scale (see Table 2), which poses contrasting directions the Forest Service could be taking in its resource-management activities (Brown and Harris, 1992b); (6) the extent of respondents' agreement with statements about the Forest Service's management activities and directions, as measured with a set of twenty-nine attitudinal scales; and (7) the comparative importance of various Forest Service organizational change agents in the last 5 years. Thus, the questionnaire contained multiple measures of environmental concern (New Resource Management Paradigm Scale, Land Ethic Spectrum, and the Lou Harris environmental questions), multiple measures of individuals' attitudes toward specific resource issues (RPA questions and the set of thirty resource-related items), and a set of questions designed to evaluate the importance of the workforce-diversification program relative to other potential sources of change in the Forest Service.

staff employees. However, because we did not believe that representativeness of the agency's overall workforce was germane to the analysis presented here, this weighting was not done for the present analysis.

A variety of statistical analyses were conducted for this paper. In the first analysis, independent t-tests conducted with combined groups of "panel," "staff" and "line" employees⁴ ascertained the statistical significance between the responses of men and women across 65 questionnaire items that measured attitudes, values, and beliefs toward the environment, natural resource issues, and agency conditions. This analysis determined basic similarities and differences in the responses of men and women without controlling for other potentially confounding variables such as age, years of experience, educational level and professional identification. Members of AFSEEE were excluded from the analyses in reported in this paper because they were found to hold values and beliefs significantly different from Forest Service employees in general (Brown and Harris, in process; Brown and Harris, 1992a); also, these individuals represent a very small proportion (only about 1%) of all full-time Forest Service employees. The composition and characteristics of AFSEEE members, however, are relevant to this study and will be discussed below.

In a second analysis, an analysis of variance (ANOVA) was conducted in which potentially confounding variables, including age, years of experience, educational level and professional identification, were statistically controlled. This approach was deemed necessary, given that significant differences due to gender were found in the mean age of the respondents (men: 44 years of age; women: 34 years of age), mean years of experience (men: 20 years; women: 9 years), and

⁴ As one reviewer commented, combining the panel sample with the 1996 line and staff samples should only be done after verifying that there are no systematic differences between the panel and new samples because the panel differs in length of service, having at least 6 more years of service. The panel, does in fact, express less environmental concern and has a stronger commodity orientation than the 1996 samples--as might be expected from a longer agency socialization period. Some of these differences are statistically significant ($p < .05$). Nonetheless, the overall results in this paper change very little with or without the panel sample included in the analyses. Given the greater similarity than differences between the panel and new samples, and the importance of having a sufficiently large subsample of women for the analyses conducted (which is an issue for the very reasons the topic of gender in resource-management agencies is a relevant one), we combined the panel with the 1996 line and staff samples.

professional identification (proportionately fewer foresters are women and more wildlife biologists are women). To control for profession, the analysis was limited to individuals identifying themselves as foresters -- the dominant profession in the Forest Service and the largest professional category of respondents. The ANOVA was performed with gender as the main effect and the potentially confounding variables—educational level, years of experience in the Forest Service, and the respondent's age—as covariates.

The third analysis focused on female line officers (i.e., women with formal decision-making authority in the agency) and contrasted their attitudes with those of male line officers and other female "staff" employees. Independent t-tests were conducted to identify statistically significant differences in the responses of these three groups to various questionnaire items, and then these responses were analyzed using ANOVA controlling for age, experience, and level of education.

In the fourth analysis, we compared the views of line officers by gender to determine whether gender differences in attitudes tend to persist in light of agency socialization practices and increasing organizational identification. Because line officers have formal decision-making authority, this analysis would shed light on the potential influences of gender differences in discretionary resource decision-making within the Forest Service.

In the fifth analysis, changes in the attitudes, beliefs, and values of Forest Service employees between 1990 and 1996 were examined to determine if the changes were the same for both men and women. The direction and extent of these changes, as reflected in responses of the *same* men and women in 1990 and 1996, were assessed by using paired t-tests to analyze the responses of the panel of respondents participating in both the 1990 and 1996 studies.

The sixth and final analysis applied discriminant analysis to assess the relative importance of the questionnaire items in describing attitude differences between men and women. The responses

of men and women to two specific questions about workforce diversification in the Forest Service were also compared, and differences in their responses to an open-ended question about changes in the Forest Service in the last five years were qualitatively analyzed.

The following sections of the paper present the results of these analyses and their discussion. The paper builds on previous research, both theoretical and empirical as presented extensively in a previous article (Brown and Harris, 1993). The reader is referred to that article for additional details on the theoretical issues of gender and its relation to environmental values and organizational change. Rather than repeating in-depth the discussions and explanations from that article, the present paper focuses on examining the ramifications of analyses of the rather unique longitudinal data afforded by the 1996 survey of Forest Service employees, along with the empirical changes they depict from the 1990 survey⁵. These results suggest important implications for future inquiry.

Results

The overall rate of response to the survey for the combined 3 groups (staff, line, panel) was 62 percent: a total of 901 Forest Service employees returned completed questionnaires suitable for analysis.⁶ In addition, approximately 60 percent of AFSEEE members who are full-time agency employees also responded.

⁵ The survey instruments used in this comparison were not designed specifically to test gender theory *per se*, and we are reluctant to force-fit the results into an as-yet poorly defined theoretical area of women in resource management agencies. Nonetheless, the results presented here are suggestive, provocative, and provide an inductively based starting point for developing this theoretical area, and thus they are useful for future research on this topic of public-agency change.

⁶ A mistake made in the survey tracking system resulted in 101 responses out of 901 having to be classified as "indeterminate" as per the panel, line, and staff groupings. The estimated response rates based on allocation of the indeterminate responses are as follows: staff--59%, line--53%, panel--68%.

The 1990 research estimated that 40 percent of AFSEEE members were female, and this proportion remained virtually unchanged in the sample surveyed in 1996 (see Brown and Harris, Forthcoming). In contrast, the proportion of women who occupied staff positions in the Forest Service increased from 20 to 41 percent, based on the samples of staff employees who responded to the surveys of agency employees in 1990 and 1996; significantly, those proportions of women indicating they held line positions also increased, from 10 percent to 23 -- with both of these increases approximating 100 percent.

Overall, responses of these women were characterized by a stronger environmental or preservationist orientation than were the men's: the initial analysis indicated statistically significant differences (t-test, $P < .05$) between men and women on 51 of 65 questionnaire items. These statistically significant differences were found for responses to 12 items after statistically controlling for profession, age, experience, and level of education, as discussed below.

Women in the Forest Service continued to exhibit greater general environmental concern as measured by their responses to the Lou Harris environmental questions, just as was found from the 1990 study results. For example, women felt more strongly that the country should be saving its resources to benefit future generations, rather than using resources to benefit the present generation. These gender differences ($P < .05$) were found in two of the three Lou Harris questions, even after controlling for profession, experience, age, and education (see Table 1).

Differences in general environmental concern among men and women in the Forest Service also are reflected in attitudes toward national forest management. The New Resource Management Paradigm (NRMP) Scale is comprised of six items asking respondents to select between two contrasting outcomes for national forest management (see Table 2); measurement with that scale is most reliable for all respondents including AFSEEE members (Cronbach's alpha = .76), and it is

somewhat less reliable when the responses of AFSEEE members are excluded (Cronbach's alpha = .67). Responses to four of six scale items significantly differed (t-test, $P < .05$) based on the respondents' gender, and the variation in responses to one item, managing national forests for current as opposed to future generations, was statistically significant after controlling for profession, age, experience, and level of education. The cumulative NRMP Scale scores of men and women also differed significantly ($P < .05$) and remained so ($P < .05$) after statistically controlling for profession, age, experience, and education level.

Attitudes toward the provision of specific national-forest outputs differed between men and women (see Table 3). For example, female employees did not as strongly favor increased wood production, the use of herbicides and pesticides, grazing livestock, and development of energy and minerals as did male employees (t-test, $P < .05$). In addition, women employed in the agency had more positive attitudes toward wilderness designation and the protection of threatened and endangered species than did their male counterparts (t-test, $P < .05$). Differences in attitudes on three of these issues (energy and mineral development, wilderness designation, threatened and endangered species) persisted, even after controlling for profession (forestry), age, experience, and level of education.

Analyses of the responses of male and female line-officers (men, $n=203$; women, $n=46$; see Table 4) indicated statistically significant differences ($P < .05$) on measures of general environmental concern (Lou Harris environmental questions), general attitudes toward national-forest management as measured with the NRMP scale, position on the land-ethic scale, and attitudes toward some resource management issues (e.g., use of pesticides, wilderness, concern for threatened and endangered species) -- these differences in line-officer values and attitudes were consistent with those reported for all Forest Service employees. Some of these differences, such as ones in

responses to questions about threatened and endangered species, the NRMP scale items, and the Lou Harris questions, persisted even after controlling for age, experience and education level.

Differences were found in the respondent characteristics of male and female line-officers compared in this analysis: male line officers reported an average of 25 years of service in the Forest Service, as compared to the 17 years, on average, reported by women⁷. In addition, the age of the men averaged 49 years, while women were an average 42 years old, and also more men tended to identify with the profession of forestry than women, while women had higher representation in the wildlife/fisheries and ecology professions. Education levels were similar between male and female line-officers.

Analyses of responses from the panel of male and female agency employees who participated in both the 1990 and 1996 studies indicated that, when the attitudes and values of the two groups changed, they changed in the same direction (see Table 5)⁸. Changes in the attitudes of women, however, were less frequent than the changes reported by men. Furthermore, in several instances, the actual positions of responses from men on the scale items, as represented by mean

⁷ One reviewer commented that “*It is interesting to note that male line officers reported an average of 25 years of service in the agency compared to only 17 years reported by women. This fact alone strongly suggests that many of the apparent gender differences in attitudes may be a function of differences in length of service (an indicator of socialization).*” We would note that the analyses presented in Tables 1, 3 and 4 do not indicate that “experience” contributes significantly to the differences in attitudes and values. Nonetheless, even if one were to accept that gender effects on attitudes are really socialization affects, this would not discount the importance of the gender variable because women, in fact, have shorter socialization periods before promotion into positions of greater decision authority. This is the Forest Service organizational reality. The effects of gender and socialization needn’t be mutually exclusive, and their relationship is a complex one whose examination is beyond the scope of this paper. Nonetheless, we would note that, although socialization can dampen the effect of gender, it does not eliminate it, and our analysis of the data indicates that gender – the focus of this article – still matters.

⁸ An examination of Table 5 underscores the similarity – not the differences – in responses between the panel respondents and the 1996 cross-sectional random samples. A differential “socialization” effect, if any, is not apparent in the results. Stated another way, whatever forces were shaping the values and attitudes of men and women between 1990 and 1996, they affected both the panel respondents and the cross sectional respondents in similar ways. While one reviewer (and theory) suggests that agency socialization does affect employee attitudes and values, we find no evidence in our data that agency socialization affects women differently from men, other than that women are subject to less socialization because of a generally faster career track to promote diversity at all levels in the agency. Clearly, both

scale scores, changed substantively between 1990 and 1996. For example, the majority of men panelists in 1996 favored *increased* rather than *decreased* production of wood, the use of herbicides, more livestock forage, commodities in general over non-commodities, production of goods/services over ecological integrity, and reservation of decision-making authority over shared decision-making. In contrast, women on average held the opposite position, or viewed these actions unfavorably, in 1996.

A discriminant analysis was conducted with gender as the independent variable to assess the comparative importance of 65 questionnaire items from the 1996 survey (the dependent variables) in discriminating between the two gender-based groups. This analysis found that the questionnaire item with the greatest discriminating power was one asking about the effectiveness of workforce diversification (indicated by the discriminant function's standardized coefficient of 0.52).

This result is supported by the finding that 69 percent of the female employees agreed that workforce diversification had resulted in a more capable work force, in comparison to only 35 percent of male employees (see Table 6). The respondents' gender accounts for most of the variation in these responses, although a small but statistically significant, positive correlation ($r = .12, P < .1$) exists between GS grade level and agreement with this statement.

Another question also addressed the effects of workforce diversification, with the finding that a majority of both men and women agreed that workforce diversification had increased the breadth and mix of the agency's values, beliefs, and perspectives; but the responses on this variable had low discriminatory power in the overall discriminant analysis. Other relatively important variables for discriminating between male and female employees included attitudes toward salvage

men and women are influenced by agency socialization. A differential effect of socialization based on gender is, of course, possible, but this issue is a separate one beyond the focus and scope of this paper.

logging (.35), protection of ecological integrity (.32), the importance of AFSEEE as a change agent (.32), and the use of pesticides (.29).

The gender-based differences in perspectives on the extent to which workforce diversification had resulted in a more capable workforce also were reflected in open-ended comments about changes in the Forest Service in the last 5 years. Although none of these comments were clearly associated with a positive evaluation of workforce diversification -- many simply noted the program as a change they perceived in the agency -- numerous ones that were provided predominantly by male respondents indicated a negative evaluation of workforce diversification. For example, male employees commented that, "people have been put into management positions because of their gender or race, not because of their skill. This has made the FS a weaker agency" and "personnel practices hire and promote less qualified people to attain diversity goals." Significantly, a number of responses directly associated workforce diversification with a decline in the agency's ability to direct its programs: "there are too many people currently working in positions that do not have the necessary breadth of experience and knowledge to guide their departments or programs through these challenging times" and "we've gone from a 'can do' conservation agency to a multi-cultural 'can't do' process agency."

While the results of the 1996 research suggest a significant range of differences in the perceptions, attitudes, and beliefs of male and female agency employees, the two groups were similar in some ways in 1996. Both men and women in 1996 favored development of national forest lands for recreation, agreed that agency employees are comfortable getting involved in local community issues, and agreed that the value system that presently dominates the agency is in need of immediate change (though perhaps for different reasons). Also, both men and women disagreed that the reduction in workforce between 1993 and 1996 had been more positive than negative. While

both men and women did not report a strong belief that the Forest Service has successfully operationalized ecosystem management in its on-the-ground activities, they did not differ in their perception that ecosystem management is significantly affecting one or more national forests. Finally, both men and women held similar perceptions about the effectiveness of the Forest Service in achieving its mission (a “6” on a scale of 1 to 10).

Discussion

The 1996 survey results, like those from 1990, continue to indicate small but statistically significant differences in the attitudes and values of men and women in the Forest Service. All else being equal, women express greater general environmental concern than their male counterparts, with this difference reflected by their opinions on resource-management issues such as wilderness designation and threatened and endangered species.

These differences between men and women tend to be modest. Nonetheless, the data reported here indicate that female line-officers tend to express slightly more preservationist values than their male colleagues. These results suggest that women’s caring ethic, which may have been an important motivation for their selection of a Forest Service career, may be modified but not extinguished through traditional agency socialization practices. Future research could examine in greater detail the role of agency socialization and its effects on employee values and attitudes, a complex phenomenon in its own right; but this examination is beyond the focus and scope of this paper, which is concerned with the influence of gender above and in addition to other influences on the values and attitudes of the agency’s workforce⁹. Nonetheless, a key assumption underlying an

⁹ As a reviewer has suggested, changes in the agency’s workforce, and thus the make-up of its employees’ values and attitudes, are ongoing and complex, given changes in agency personnel that have occurred since 1990 due to new hires,

effective workforce diversification program—that the values of women do indeed differ significantly from the values of traditional agency personnel—appears to be confirmed by the 1996 survey results.

A second assumption of an effective workforce diversification program is that women will acquire positions of substantive decision authority within the agency. At the time of the 1990 study, the agency had made optimistic projections of the extent to which it would significantly diversify its future workforce: it projected that 47 percent of its workforce would be female by 1996 (USDA, 1990). That estimate was later revised downward to about 43 percent (USDA, 1994), and the actual proportion of women in the Forest Service workforce actually had increased to only 39.5 percent by 1996 (USDA, 1997) -- still well below their proportional representation in the overall U.S. population.

Perhaps more significant, women continued to be underrepresented to a considerable extent at higher levels of management in the Forest Service: only 21 and 17 percent of those occupying the agency's GS13-15 and Senior Executive Service levels are women (USDA, 1997).

retirements, resignations, and the like. Of particular note are the differential influences of agency downsizing, more rapid promotion of female than male employees, and other factors on organizational change in the Forest Service. We would agree with the concerns of the reviewer that the relative importance of gender diversification for effecting organizational change in the agency is a critical issue to address – but we question the extent to which any study can conclusively or even adequately address it, due to the ambiguity in the dependent variable and the difficulty of controlling for the influence of other confounding organizational variables over time. Exactly what is meant by organizational change? Changes in policy? Changes in budgets? Changes in resource allocation? Changes in administrative efficiency? Even if one were to select a sufficiently narrow definition of organizational change, how does one hold constant other organizational variables over time? Our data suggest that gender diversification is only one of many variables contributing to organizational change. For example, previous research has found that profession is the single most important variable in explaining differences in values and attitudes (Brown and Harris, 1993). Nonetheless, gender is one of several variables whose relationship to environmental attitudes is persistent, although not necessarily singularly influential. Moreover, few would deny that the Forest Service would be a radically different organization if it were administered exclusively by women – but this research examines gender changes at the margin in a still male-dominated organization. Actual organizational changes, if related to gender composition, are going to be subtle and difficult to explicate. (See, also, footnotes #2 and 7 above).

A key factor in the lack of changes in the gender composition of the Forest Service workforce was the significant reduction (15%) in that workforce between 1993 and 1996. This sharp reduction in numbers of agency employees significantly curtailed hiring and has rendered any accurate projection of future workforce composition difficult, if not impossible. The greatest turnover of employees (and thus the most frequently vacant positions) has been in positions most typically held by women (e.g., clerical and assistant), and the Forest Service has found it easier to downsize by abolishing vacant positions (Martin, 1997).

Even if the number of women employed by the Forest Service increased to the extent that parity in workforce composition was achieved throughout the agency hierarchy, a critical question would remain: Do differences in attitudes and values between men and women actually lead to different and meaningful decisions and actions in the agency, resulting in its movement in a different direction than it otherwise would have gone? Ironically, one study of the general public indicates that, although women may be somewhat more concerned about the environment than men, they are substantially less likely to be environmentally active (Mohai, 1992, p. 17). One can only speculate on the degree to which it would be appropriate to apply these results to women in the Forest Service. However, one could argue that the greater proportion of female than male employees joining AFSEEE, an overt behavior entailing some professional risk, indicates that women are no less inclined to act upon their values than are men. In fact, this finding suggests that women who self-select for resource-management professions actually may be more inclined to be environmentally active.

Perhaps the most important finding from this longitudinal study is the significant gap between men and women in their perceptions of the actual outcome of workforce-diversification efforts in the Forest Service. While both men and women agree that diversification has increased the

breadth and diversity of the agency's values, strong disagreement exists between the sexes over whether workforce diversification has resulted in a more capable workforce -- with men more likely to report that diversification has resulted in a less capable workforce.

Our results suggest that women in the Forest Service occupied two conflicting roles in the agency during the time covered by this study. With significant downsizing of the agency's workforce and continuing conflicts over future directions for its management of national forests, organizational-change agents such as women were viewed by some employees as organizational "scapegoats" for recent ills befalling the agency. Alternatively, workforce diversification placed women in the role of organizational "saviors," in the sense that they were contributing to ongoing change in the Forest Service as an organization. This change was both in terms of the agency's transition to one having new and different forest-use values that better represent the shifting values of American society, and in terms of the changing composition of the agency's personnel that better reflects America's ethnic and cultural diversity.

Our finding of a gender-based difference in agency employees' perceptions suggests that trends other than actual employee performance and the effects of diversification on Forest Service goals and their attainment are influencing employees' perceptions of the impacts of diversification. These trends represent a complex mix of shifting societal values and changes, changing agency priorities and activities, and an evolving agency workforce. Moreover, the impacts and future ramifications of this mix reaffirm how complicated organizational change at the end of the 20th century can be.

One conclusion from the research reported here seems indisputable: the values, attitudes, beliefs and actions of a new group of Forest Service professionals -- women -- are an important part of a larger sea-change in resource management that currently is working itself out and will continue

to do so for some time. As for the final outcome of this social change and the role of women in it -- only time will tell if female employees of land-management agencies are viewed ultimately as part of the problem or part of the solution -- as having served a role as agency “savior” or agency “scapegoat.”

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Table 2. Responses to New Resource Management Paradigm (NRMP) Scale Items, by gender and controlling for age, experience, profession (foresters), and education (1996 Staff and Line groups).

<i>Items</i>			<i>Mean</i> ^a	<i>Standard Deviation</i>	<i>p-Value</i> ^b
1. An agency that involves the public in its resource management through shared decision-making versus an agency that considers public input but makes resource management decisions itself.	Staff	Men (n=35)	4.26	2.06	.716, .832
		Women (n=12)	4.00	2.22	
	Line	Men (n=36)	3.42	1.86	.081, .296
		Women (n=11)	2.55	1.21	
2. An agency that emphasizes human intervention and intensive management achieve forest health versus an agency that emphasizes a “hands off, nature knows best” approach to achieve forest health.	Staff	Men (n=35)	5.54	1.46	.325, .197
		Women (n=12)	5.08	1.08	
	Line	Men (n=35)	5.77	.77	.479, .736
		Women (n=11)	5.55	1.29	
3. An agency that emphasizes using national forests to benefit future generations versus an agency that emphasizes using national forests to benefit the present generation.	Staff	Men (n=35)	3.14	1.46	.012, .048
		Women (n=12)	2.17	.94	
	Line	Men (n=35)	2.49	1.07	.052, .198
		Women (n=11)	1.73	1.19	
4. An agency that ensures rural community stability through a continuous supply of national forest resources, regardless of other concerns like ecological integrity versus an agency that whose management results in the decline of rural communities if the flow of natural forest resources to support the towns cannot be sustained.	Staff	Men (n=35)	4.31	1.51	.079, .111
		Women (n=12)	3.42	1.44	
	Line	Men (n=36)	3.86	1.42	.659, .706
		Women (n=11)	3.64	1.63	
5. An agency that emphasizes preserving national forests to maintain their ecological integrity versus an agency that emphasizes using national forests to produces goods/services.	Staff	Men (n=35)	4.29	1.92	.455, .315
		Women (n=12)	3.83	1.34	
	Line	Men (n=36)	4.00	1.57	.862, .116
		Women (n=10)	3.90	1.73	
6. An agency that emphasizes commodity resources such as timber and grazing in national forest management versus an agency that emphasizes non-commodity resources such as recreation and wildlife in national forest management.	Staff	Men (n=35)	4.83	1.32	.038, .027
		Women (n=12)	4.08	.90	
	Line	Men (n=36)	4.11	1.01	.964, .246
		Women (n=10)	4.10	.57	
Total New Resource Management Paradigm Scale Score.	Staff	Men (n=35)	26.37	6.10	.046, .040
		Women (n=12)	22.58	5.09	
	Line	Men (n=35)	23.66	3.51	.016, .200
		Women (n=10)	20.70	2.95	

a. Scale values ranged from 1 to 7 with the two contrasting statements located at each end of the scale.

b. Significance levels of differences in response means. The first significance level figure is derived from independent samples t-test. The second number in bold, if present, is the significance level using ANOVA while controlling for respondents' age, years of experience, and education level. Profession was controlled by limiting analysis to respondents who identify with the forestry profession.

Table 3. Attitudes of Forest Service employees toward resource issues by gender using t-tests and ANOVA's, controlling for experience, age, and education among professional foresters.

<i>Items</i>			<i>Mean^a</i>	<i>Standard Deviation</i>	<i>p-Value^c</i>
Increased production of wood from National Forest System lands ^a	Staff	Men (n=35)	2.17	1.07	.048, .012
		Women (n=12)	2.92	1.16	
	Line	Men (n=35)	2.91	.82	.374, .190
		Women (n=11)	2.64	1.12	
Use of herbicides on brush in National Forest management. ^a	Staff	Men (n=35)	2.57	1.20	.374, .256
		Women (n=12)	2.92	1.00	
	Line	Men (n=36)	2.94	1.17	.073, .406
		Women (n=11)	2.18	1.33	
Use of pesticides to control insect losses in National Forest management. ^a	Staff	Men (n=35)	2.63	1.33	.094, .097
		Women (n=12)	3.25	.97	
	Line	Men (n=36)	2.86	1.07	.087, .180
		Women (n=11)	2.27	.90	
Livestock Forage Development on National Forest lands ^a	Staff	Men (n=35)	2.69	1.05	.394, .262
		Women (n=12)	3.00	1.21	
	Line	Men (n=36)	2.72	.81	.988, .526
		Women (n=11)	2.73	1.27	
Development of Energy and other minerals on National Forest lands ^a	Staff	Men (n=35)	2.54	1.01	.035, .012
		Women (n=12)	3.33	1.30	
	Line	Men (n=36)	2.67	.79	.131, .179
		Women (n=11)	3.09	.83	
There is already enough national forest land set aside for wilderness ^b	Staff	Men (n=35)	5.63	1.96	.047, .043
		Women (n=12)	4.58	1.31	
	Line	Men (n=36)	5.14	1.61	.686, .576
		Women (n=11)	4.91	1.76	
Too much concern for threatened and endangered species generally impedes effective national forest management. ^b	Staff	Men (n=35)	5.46	1.79	.007, .003
		Women (n=12)	3.75	1.82	
	Line	Men (n=35)	4.28	1.73	.102, .201
		Women (n=10)	3.27	1.79	

- a. Scale items ranged from 1 to 5 where 1 = Favorable and 5 = Unfavorable. A score of 3 would be neither favorable nor unfavorable.
- a. Scale items ranged from 1 to 7 where 1 = Strongly Disagree, 2 = Moderately Disagree, 3 = Mildly Disagree, 4 = Neutral, 5 = Mildly Agree, 6 = Moderately Agree, and 7 = Strongly Agree.
- b. Significance levels of differences in mean values. The first significance level figure is derived from independent samples t-test. The second number in bold, if present, is the significance level using ANOVA while controlling for respondents' age, years of experience, and education level. Profession was controlled by limiting the analysis to those respondents who identify with the forestry profession.

Table 4. Resource attitudes of Forest Service 1996 line officers (panel and line groups), by gender: t-tests (men=203, women=46) and ANOVA's controlling for experience, age, and education (as covariates).

Scale or questionnaire item	Mean Score		t-test (p-Value)	ANOVA (p-Value)	
	Men (n=203)	Women (n=46)		Main Effect Gender	Other Significant Covariates (P <= .05)
Increased production of wood from National Forest System lands ^a	2.80	3.07	.095	.335	
Use of herbicides on brush in National Forest management. ^a	2.88	2.70	.334	.190	
Use of pesticides to control insect losses in National Forest management. ^a	2.90	3.30	.035	.389	
Livestock Forage Development on National Forest lands ^a	2.84	2.87	.872	.426	
Development of Energy and other minerals on National Forest lands ^a	2.83	2.93	.500	.596	
There is already enough national forest land set aside for wilderness ^b	4.94	4.02	.002	.086	Education
Too much concern for threatened and endangered species generally impedes effective national forest management. ^b	4.42	3.22	.000	.010	
New Resource Management Paradigm Scale. ^c	23.2	20.1	.000	.006	
Lou Harris Environmental Questions. ^d	10.8	8.4	.000	.000	Education
Land Ethic Scale. ^d	2.64	2.17	.002	.061	

a. Scale items ranged from 1 to 5 where 1 = Favorable and 5 = Unfavorable. A score of 3 would be neither favorable nor unfavorable.

b. Scale items ranged from 1 to 7 where 1 = Strongly Disagree, 2 = Moderately Disagree, 3 = Mildly Disagree, 4 = Neutral, 5 = Mildly Agree, 6 = Moderately Agree, and 7 = Strongly Agree.

c. See table 2.

d. See table 1.

Table 5. Changes in positions on questions asked of the Forest Service employees in both 1990 and 1996 by gender. Panel respondents are the same individuals in both 1990 and 1996. Cross sectional respondents are different individuals randomly selected in 1990 and 1996 and include both Staff and Line.

Dimension	Panel Respondents				Cross-sectional Random Samples (1990, 1996)			
	Women (n=64)		Men (n=330)		Women		Men	
	1996 Position	1990 Position ^e	1996 Position	1990 Position ^e	1996 Position (n=137)	1990 Position (n=185)	1996 Position (n=263)	1990 Position (n=893)
Production of Wood ^a	3.29* ^e	4.13	2.74*	3.79	3.58*	4.26	2.90*	3.78
	More Favorable		More Favorable** ^f		More Favorable		More Favorable**	
Use of Herbicides ^a	3.15	3.34	2.80*	3.04	3.42	3.36	2.97	3.00
			More Favorable**					
Use of Pesticides ^a	3.44	3.42	2.81	2.91	3.51	3.30	2.94	2.80
Recreation Development ^a	2.11	2.08	2.19*	1.87	2.16*	1.91	2.17	1.87
			Less Favorable		Less Favorable		Less Favorable	
Livestock Forage ^a	3.32	3.55	2.97*	3.16	3.42	3.42	2.99*	3.17
			More Favorable**				More Favorable**	
Energy Development ^a	3.59	3.61	3.01	2.97	3.49	3.38	2.92	2.97
Benefit Future Generations vs. Present Generation (General Environmental Question) ^b	2.05	2.16	2.98	2.95	2.08	2.27	2.92	2.91
Protect Environment vs. Economic Growth (General Environmental Question) ^b	2.63*	1.82	3.19* Toward Economic Growth	2.63	2.44*	2.05	3.16*	2.61
	Toward Economic Growth				Toward Economic Growth		Toward Economic Growth	
Preserve Nature vs. Use Nature to Produce Goods (General Environmental Question) ^b	3.41*	2.95	4.34*	3.93	3.13	2.91	4.24	4.01
	Toward Produce Goods		Toward Produce Goods**				Toward Produce Goods	
An agency that emphasizes non- commodities vs. commodities ^b	3.41*	2.83	3.97* Toward Commodities	3.26	3.21*	2.81	3.93*	3.21
	Toward Commodities				Toward commodities		Toward Commodities	
An agency that emphasizes preserving ecological integrity vs. using national forests to produce goods/services ^b	3.51	3.20	3.72	3.89	2.89	2.93	3.72	3.84

An agency that emphasizes using forests to benefit future generations vs. present generation ^b	2.22	2.40	2.68	2.67	2.02*	2.35	2.61	2.59
					Toward Future Generations			
An agency that emphasizes shared decision-making vs. making decisions itself ^b	3.54	3.25	4.02*	3.31	3.33	3.20	3.63	3.38
			Toward Making decisions itself**					
Enough land for wilderness ^c	3.81	3.74	4.78	4.69	3.64	3.77	4.69	4.75
Generally meets NEPA, NFMA, ESA ^c	5.66*	4.39	5.60*	4.98	5.06*	4.47	5.59*	4.96
	Greater Agreement		Greater Agreement		Greater Agreement		Greater Agreement	
Harvest levels compatible with ecological integrity ^c	4.40*	2.92	4.53*	3.30	3.64*	2.82	4.29*	3.30
	Greater Agreement**		Greater Agreement**		Greater Agreement		Greater Agreement**	
Value system in need of immediate change ^c	4.03*	5.55	4.51*	4.92	4.42*	5.52	4.30*	4.97
	Less Agreement		Less Agreement		Less Agreement		Less Agreement	
Achieving Mission ^d	6.3	6.0	5.8	6.0	6.03	5.90	6.33	6.18

Table 5 (continued)

- a. Scale items ranged from 1 to 5 where 1 = Favorable and 5 = Unfavorable. A score of 3 would be neither favorable nor unfavorable.
- b. Scale values ranged from 1 to 7 with the two contrasting statements located at each end of the scale.
- c. Scale items ranged from 1 to 7 where 1 = Strongly Disagree, 2 = Moderately Disagree, 3 = Mildly Disagree, 4 = Neutral, 5 = Mildly Agree, 6 = Moderately Agree, and 7 = Strongly Agree.
- d. Scale ranged from 1 to 10 with 1 “Very Poorly” and 10 “Very Well”.
- e. Changes reported with asterisk are significant based on mean scores (t-tests, $P < .05$).
- f. Double asterisks indicates an actual shift in position on bipolar questions based on changes in the mean score reported for the group.

Table 1. An analysis of the variance in measurements of general environmental concern due to gender among professional foresters, while controlling for experience, age, and education. Staff, Line, Panel groups analyzed separately.

	Protecting the environment versus economic growth. ^a			Saving resources to benefit future generations versus using resources to benefit present generation. ^a			Emphasizing preserving nature for its own sake versus using nature to produce the goods we use. ^a			Land Ethic Spectrum. ^b		
ANALYSIS OF VARIANCE	Staff	Line	Panel	Staff	Line	Panel	Staff	Line	Panel	Staff	Line	Panel
	M=34 F=12	M=35 F=11	M=144 F=23	M=34 F=12	M=35 F=11	M=144 F=23	M=34 F=12	M=35 F=11	M=145 F=23	M=32 F=12	M=33 F=9	M=129 F=21
Main Effects Gender	15.38*** ^c	.99	.24	4.58*	19.12***	4.00*	3.88 (p=.056)	1.38	.08	5.60*	.90	1.89
Covariates												
Experience	.53	.44	.30	1.06	9.32**	3.21	.00	.29	.66	1.73	1.11	.03
Age	.05	.50	.58	1.55	1.27	.79	.95	.15	.06	2.71	.08	.02
Education	9.10**	.57	.88	1.41	8.52**	2.61	5.65*	5.99*	6.35*	13.36**	1.52	1.36

- a. These questions were taken from a 1980 Lou Harris poll and included 6 bipolar statements that contrast directions that the country could be moving toward. See Harris & Associates (1980).
- b. The land ethic spectrum was operationalized from the “Land Ethic Political Test” in the *Journal of Forestry* (May 1991) and reported by Brown and Harris (1998).
- c. These figures are F statistics with probability levels indicating statistical significance of: * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

Table 6. Attitudes of Forest Service employees towards the effects of workforce diversification, by gender (percentage of respondents).

Issue		Workforce diversification has increased the breadth and mix of the agency's values, beliefs, and perspectives. (Percentages by Response Category)			Workforce diversification in the Forest Service has resulted in a more capable work force. (Percentages by Response Category)a		
		Agree	Disagree	No Opinion	Agree	Disagree	No Opinion
Staff	Men	68	23	9	30	60	10
	Women	77	16	7	62	30	8
Line	Men	84	13	3	50	43	6
	Women	100	0	0	85	6	9