



Mentoring Relates to Job Satisfaction for Fish Biologists: A Longitudinal Study of the USDA Forest Service

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Electrofishing crew in Lookout Creek at H. J. Andrews Experimental Forest in Oregon.
Electrofishing skills are being taught to new crew members by mentors. Photo credit: Lina DiGregorio

Mentoring has had a recent resurgence as the key to achieving both individual and organizational goals, especially as workforce diversification efforts have led to the hiring of new talent. Few studies have evaluated mentoring within an organization or examined changes in mentoring practices over time. We describe the role and status of mentoring for current fish biologists in the USDA Forest Service, including correlations between participation in mentoring and gender, race/ethnicity, career level, time in career, and job satisfaction based on a survey of agency employees ($n = 136$). Mentoring relates to a more than two-fold increase in job satisfaction. Neither gender, race/ethnicity, career length, nor position are reliable predictors of whether someone has a mentor, evidence that participation in mentoring is consistent across the workforce and, at least superficially, it is equitable. Respondents sought guidance from mentors regarding technical skills, program management, communication, and leadership. Fish biologists of color were more likely than others to look for mentoring to build self-confidence, address conflicts, and inform professional values and ethics. More early-career fish biologist respondents identify as women in 2019 compared to a 1984 assessment. Overall, our results suggest that mentoring plays an important and positive role in career development and job satisfaction for fish biologists in the USDA Forest Service.

INTRODUCTION

Mentoring can play a key role in the career development of professionals, particularly in natural resource organizations and especially for new and diverse employees, as individuals face interrelated and complex natural resource and workplace issues. Mentoring is also an integral part of professional relationships and networks, providing pathways to engage and empower employees, and helps to create an inclusive culture that attracts and retains a high-performing and diverse workforce (Lentz and Allen 2009; Balcarczyk et al. 2015). Mentoring benefits both the mentor and mentee through professional development, job satisfaction (Kennedy and Roper 1990; Lentz and Allen 2009), higher salaries, greater organizational commitment (De Janasz et al. 2003; Allen et al. 2004), and the ability to transition through different phases of one's professional career (Bozionelos et al. 2016). Mentoring relationships that incorporate technical competency, awareness of organizational culture (i.e., how things are done or unwritten operational protocols), leadership development, career-path guidance, personal performance support, confidence building, and the exchange of insights could potentially enhance an employee's career and lead to higher job satisfaction.

The USDA Forest Service (USFS) provides an intriguing context for understanding the interconnected dynamics among professionals, including mentoring, because of the breadth of natural resource employees across the United States, including fish biologists (Bullis and Kennedy 1991; Box 1). The USFS is a hierarchical organization that often has well-defined paths towards leadership (Kaufman 2006). A survey conducted in

1984 evaluating the importance of mentoring to USFS early-career fish biologists revealed that mentoring has a positive effect on career development, is associated with higher job satisfaction, and improves one's ability to transition to the next career stage (Kennedy and Roper 1990). However, a current understanding of the role of mentoring among USFS fish biologists is unknown, especially as the agency actively works to be more inclusive, so that the faces and identities of its employees better reflect the faces and identities of the people of the United States (Box 2). Although there have been efforts to enhance racial/ethnic and gender diversity among fisheries professionals, including within the USFS, women still make up only 26% of the overall workforce, and fish scientists/managers of color occupy less than 12% of positions in federal agencies (Arismendi and Penaluna 2016). Women, women of color, and people of color often report experiences unique to their gender or race/ethnicity with regard to visibility, assimilation, and inclusion in the workplace. However, it is unclear to what extent mentoring plays a role in the current USFS workforce and whether it differs based on a person's gender, race/ethnicity, career level, or time in their career.

Although there have been changes in the common acceptance and knowledge around the role of mentors over the past several decades, what distinguishes it from other relationships is that it is a developmental relationship embedded in the workplace setting (Ragins and Kram 2007). In the 1984 USFS survey, a mentor is defined as "a person who has a great positive impact on you as a professional person and on your career." Although it was not stated explicitly in the 1984 survey, at that time mentors were generally older or more experienced, and the intent of the relationship was to help the mentee (Ragins and Kram 2007). In the current survey, we define mentor as "... someone, other than your immediate supervisor, with whom you meet or turn to for career advice, agency knowledge, feedback, technical advice or other assistance." In current mentoring relationships, the relationship is implicitly reciprocal and collaborative, with benefits gained by both individuals. Mutual discussions include career functions of "learning the ropes" for advancement and psychosocial functions of developing trust and interpersonal bonds to help with personal growth, and establishment of self-identity (Ragins and Kram 2007). Failure to participate in effective mentoring relationships could result in the lack of support needed for talented individuals to continue to be engaged and retained in fisheries professions.

Here, we examine the current role and status of mentoring among USFS fish biologists, including differences in mentoring participation and experiences related to gender,

Box 1. USDA Forest Service

Founded in 1905, the USDA Forest Service (USFS) is a lead conservation agency that plays a key role in the stewardship of fish and aquatic resources. The agency oversees protection, management, research, use, and stewardship of natural and cultural resources on 154 national forests and 20 national grasslands, covering over 193 million acres. The USFS plays an important role in managing for healthy watersheds and aquatic habitats that sustain fish and wildlife populations for the ecological, social, and economic benefit and enjoyment of people in the United States. The agency's work is integrated across three mission areas: National Forest System, Research and Development, and State and Private Forestry. The National Forest System mission area is organized into nine regions; the Research and Development mission area is organized into seven research stations (Figure 1).

USFS Mission: The Forest Service is guided by a principle of sustainable multiple use and has an eloquent and progressive mission: "To sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations."

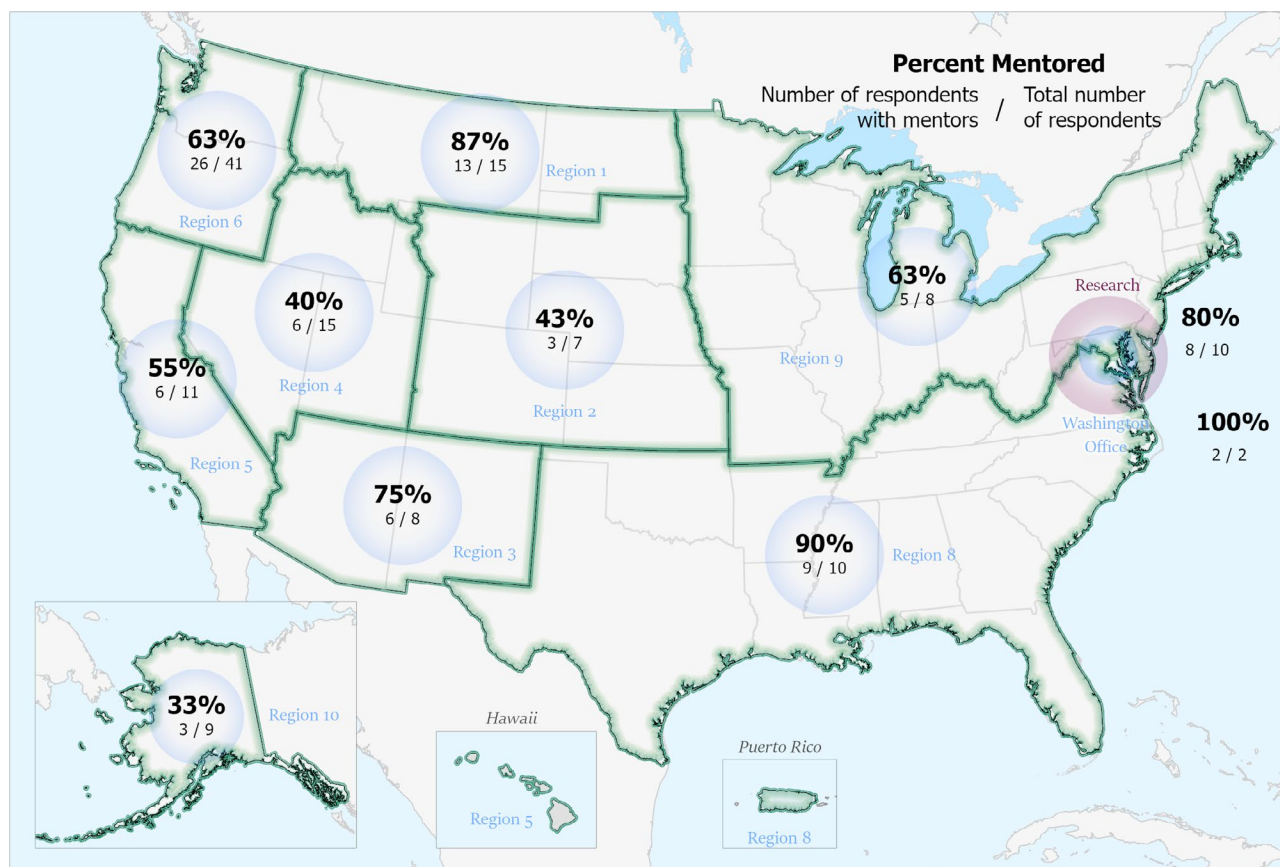


Figure 1. Percent of fish biologists with mentors mapped by region for the National Forest System, but also shown for research, including number of respondents with mentors and total number of respondents. Currently, there are nine USFS regions and seven USFS research stations

Box 2. Diversity and Inclusion in USFS

The Civil Service Reform Act of 1978 requires that the federal workforce be representative of the diversity in the United States (Dolan 2004). This Act expanded noncompliance liability, developed instructions for determining underrepresentation, and created a numerical reporting mechanism (Dolan 2004). A major hiring push, beginning in the late 1980s, added over 2,000 women to the agency ranks (Thomas and Mohai 1995; Sinclair 2015). Meanwhile, the agency made multiple efforts to address diversity and discrimination. In 1987, the Work Force 1995: Strength through Diversity program was developed to promote workforce diversification (Thomas and Mohai 1995). This program focused on recruitment, retention, promotion, agency culture, and public awareness (Brown and Harris 1993; Thomas and Mohai 1995). Hiring of women and people of color occurred at the same time that the agency diversified its professional cadre in response to a shift towards ecosystem management and biodiversity. This resulted in an increase of upper level professionals with diverse backgrounds, including recreation, biology, ecology, and landscape architecture, and a relative decrease in traditional occupations in engineering, forestry, and range management (Thomas and Mohai 1995; Lewis 2005). These new positions offered opportunities for women and people of color trained in these fields (Thomas and Mohai 1995). In 1991, the Toward a Multicultural Organization initiative and report emphasized that a culturally diverse workforce in the Forest Service should include employees of varying race, age, sex, national origin, religion, marital status, and ability (USFS 1991). The initiative reinforced that all employees should have equal opportunities for advancement and development, and that the agency should embrace the benefits provided by a diverse workforce (USFS 1991). In 2011, Executive Order 13583 encouraged an effort to promote diversity and inclusion in the federal workforce and emphasized the creation of a culture in the federal government that supports “collaboration, flexibility, and fairness to enable individuals to participate to their full potential” in federal agencies. This Executive Order called for a government-wide strategic plan for diversity and inclusion and directed agencies to create more widely applicable strategies in human resources (U.S. Office of the President 2011).

race/ethnicity, career level, and time in career; and how those identities or characteristics and participation in mentoring relate to job satisfaction. When the updated strategy for the USFS fish and aquatic program (Rise to the Future: National Fish and Aquatic Strategy; Shively et al. 2018) called for improving internal organizational capacity through mentoring (USFS 2020), we were motivated to understand the current state of mentoring for USFS fish biologists. Mentoring may be particularly influential in the USFS because agency fish biologists may face challenges resulting from the dispersed and sometimes remote nature of their duty stations. Some fish

biologists, including early-career fish biologists (Kennedy and Roper 1990) and especially those who are women and people of color, may struggle to identify with the agency’s culture or to develop the relationships with peers needed to navigate within a large natural resource agency with a multiple-use mandate within which they represent a very small portion of the total permanent workforce. Similarly, more experienced fish biologists may be challenged to maintain professional networks (especially if located in a remote location or faced with limited networking opportunities), identify growth opportunities, and sustain both a high level of engagement and job

satisfaction. We hypothesize that mentoring experiences may differ based on a person's demographic characteristics. We also investigate whether mentoring and the role of mentors have changed over time by incorporating the survey questions and categories from the 1984 Kennedy and Roper (1990) survey of USFS early-career fish biologists in our current survey effort so that we can compare results over time.

METHODS

Survey Design

During the spring of 2019, we administered an online survey through Survey Monkey to evaluate the status of mentoring for individuals who were currently USFS fish biologists (General Series GS-0482). The survey included a combination of fixed-response questions, Likert scale agreement questions, and open-ended responses (see survey in supplementary material). As we intended to compare a subset of current results to Kennedy and Roper (1990), several questions in the current survey replicated those from this earlier survey. We also incorporated additional questions and opportunities for responses in the current survey to reflect our evolving understanding of mentoring. We beta-tested an earlier version of the survey with 16 USFS fish biologists from a variety of regions and stations and, based on their feedback, we refined the survey, reordered and reworded a few questions, emphasized the confidentiality of responses, and designed it to take 15 to 20 minutes to complete.

In anticipation of the survey, we sent introductory alerts via email informing all USFS aquatic and fish biologists about the survey to encourage participation. We initially sent the survey out from March 2019 to May 2019, giving people 12 weeks to respond. We then reopened the survey to collect more responses for an additional 10 weeks from June 2019 to August 2019. We received 175 respondents in the initial survey and 76 additional respondents from the subsequent survey for a total of 251, of which only 136 were USFS fish biologists and thus considered in this study. Our ability to contact respondents was influenced by the quality of our agency email lists, which are frequently updated to include all USFS aquatic and fish biologists, regardless of job series. We allowed respondents to define their gender, race/ethnicity, and time in career in the survey, but we defined an early-career fish biologist as someone who has been in the agency in the capacity of a fish biologist for ≤ 6 years, based on the length of service for this category specified in Kennedy and Roper (1990).

Statistical Analyses

The responses to the survey were categorical, continuous, ordinal, and qualitative. Categorical data included mentoring status, the roles of the mentor, and work location. Questions rated on an ordinal scale used values from 1 to 5. Our scoring systems went from a low of 1, which indicated that attribute was either not important or that the individual was not satisfied, depending on the question. On this scale, a response of a 3 was either neutral or somewhat important, whereas a response of a 5 signified the respondent was highly satisfied or the attribute was extremely important.

We used two statistical approaches to evaluate the significance of our results, including t-tests for comparisons of means and a chi-square test for count data. In determining differences due to career length, gender, and people of color, t-tests were used to evaluate differences between an individual within a specific group and the remaining respondents. An overall

comparison among the groups was not possible because the membership of individuals to these groups overlapped (e.g., an early career fish biologist is also a woman of color, thereby overlapping with three groups), and consequently, we did not have sufficient sample size. To limit the chance of Type II error (failing to reject the null hypothesis when it is false), we report significant differences when $P < 0.1$, but we also discuss the potential implications of large differences between means. We limited comparisons among groups to three comparisons, so as not to inflate overall error rate. All analyses were completed in R (version 3.5).

RESULTS

Of the 251 survey responses, 136 were USFS fish biologists, including individuals in the National Forest System ($n = 126$) and Research and Development ($n = 10$; hereafter Research) mission areas of the agency, representing an overall response rate of 51% (out of 269 fish biologists in 2018). Forty percent of the respondents identified as women and 14% identified as having a race/ethnicity other than white. There is an overrepresentation of women as fish biologists relative to all women employed by USFS (37% in 2018), but a slight underrepresentation compared to the U.S. labor force (47% in 2018). There are fewer fisheries biologists of color in the USFS compared to the available talent pool, with people of color comprising 20% of USFS employees and 22% of the U.S. labor force. The average career length of a USFS fish biologist was 15.6 years ($SD = 9.8$), with men (16.0 years) and women (14.8 years) having similar career lengths. Comparing findings with the 1984 study, we found a substantial increase in the number of early career-fish biologists (≤ 6 years of service) who identify as a woman (i.e., 44% in 2019 versus 13% in 1984; Roper and Kennedy 1990; Table 1).

The majority of all fish biologists had mentors (64%), although Research and some regions of the National Forest System had small sample sizes (Figure 1). The vast majority of relationships with mentors were informal (88%), but 8% were considered formal and 4% were seen as coaches, which is a specific type (or task) of a mentor. The result of informal mentoring was primarily driven by results from respondents in the National Forest System ($n = 126$), where 63% of all fish biologists have (or have recently had) mentors. Eight out of 10 of the respondents in Research had mentors, but because of the small sample size, having a mentor was not statistically significant. Only 9% of all respondents thought there should be a formal mentor program.

Gender, race/ethnicity, career length, and position did not play a role in whether a fish biologist had a mentor. There was no difference in the percent of women with mentors (65%) compared to men (64%) or among individuals with mentors

Table 1. Gender and race/ethnicity demographics of early-career fish biologists from surveys of USFS fish biologists in 1984 (Kennedy and Roper 1990) and 2019, showing an increase in women in recent years ($P < 0.1$; chi-square test, people of color were removed from this comparison as no value was reported in 1984). Survey respondents were able to self-identify. In 2019, of the 33 early career fish biologists surveyed, 1 person chose not to identify gender (and there was an option to identify as a gender other than man or woman) and 2 individuals chose not to identify race/ethnicity

Survey year	Men	Women	People of Color
1984	26/30	4/30	Not Reported
2019	18/33	14/33	6/33

Table 2. The relationship between mentoring and job satisfaction for USFS fish biologists ($P = 0.10$; chi-square test). Sixteen individuals were not included in this analyses as they were neutral (neither satisfied nor dissatisfied) in regards to job satisfaction

Mentor	Satisfied, Highly Satisfied	Unsatisfied, Very Unsatisfied
No	77% (33)	23% (10)
Yes	90% (69)	10% (8)

who identified as white (65%) compared to those who identified as a person of color, including Black, Hispanic, Asian, Native American, and mixed race/ethnicity (68%). Career length also did not relate to whether an individual had a mentor. For example, 67% of early-career fish biologists had mentors, whereas 63% of those with over 6 years in the agency also had mentors. There was also little evidence that differences in position level (i.e., USFS general schedule grade) influenced whether an employee had a mentor.

Fish biologists with mentors expressed greater satisfaction with their jobs compared to unmentored fish biologists (Table 2). People without mentors were twice as likely to be dissatisfied with their jobs compared to people with mentors. Individuals with mentors who stated their opinion were more likely to agree or strongly agree that their work was valued (82%) compared to those without mentors (61%; $P = 0.03$; chi-square test). Although few USFS fish biologists found their work to lack importance, 92% of the individuals with mentors either agreed or strongly agreed that their work was important (rather than disagreeing or strongly disagreeing with this statement). This compares to 82% of the fish biologists without mentors who agreed or strongly agreed that their work was important ($P = 0.38$ as most people found their work important).

Mentors were most likely to be supervisors (56%), followed by peers (17%), and coworkers (16%). No mentors from academia were reported, and fewer than 5% of the mentors came from a state or other federal agency. Not surprisingly, early-career fish biologists relied on supervisors as mentors (55%); however, they also had more relationships with coworkers as

mentors (36%) and fewer with peers (5%) compared to fish biologists with longer careers who had more peers as mentors (21%) than coworkers (9%). In 1984, early-career fish biologists were more likely to rely on mentors outside the agency, with 33% of the mentors in academia, 10% in state or other federal agencies, and only 40% of the mentors being supervisors (Kennedy and Roper 1990).

Across all career stages, respondents looked to mentors for guidance related to technical skills, program management, communication, and leadership (Table 3). Other areas where mentees looked for support from their mentors included help in building a career, forming a network, shaping professional values and ethics, and dealing with conflict. Mentees ranked time management and self-confidence the lowest with respect to attributes and skills about which they looked to mentors for assistance. The exception was people of color, who were more likely than other respondents to seek help from mentors regarding self-confidence. Women sought out mentors for primarily the same reasons as men, but differed in some skill preferences, including greater focus on leadership skills and confidence and less on values and ethics, and time management. These differences were not significant relative to the broader group of fish biologists. There was also a shift over three and a half decades in what early-career fish biologists are looking for in mentors, with less of a focus on values and ethics, and more help building their career, except among people of color, who emphasized values and ethics. People of color looked for help from mentors for communication, but they also expressed significantly different reasons for looking for a mentor compared to all other groups, including building self-confidence, addressing conflicts, and shaping values and ethics.

Fish biologists were satisfied overall with the help they received from their mentors (Table 4). There was less difference among fish biologists based on their career length, gender, or race/ethnicity in their satisfaction with mentors than with skills that mentees were seeking in mentors. Although not significant ($P \approx 0.15$), the responses suggest that women with mentors were more satisfied that they were improving their technical skills than early-career fish biologists or people of color with mentors. Early-career fish biologists were

Table 3. Skills that USFS fish biologist mentees look for in their mentors, by respondents, including all, early-career, women, and people of color. Each skill had the possibility of being ranked from 1 to 5, with 1 being "not at all important" and 5 being "extremely important." Skills are ordered based on their highest rank to all. Statistical significance was represented for specific skills for people of color compared to white fish biologists with * representing $P < 0.10$ and ** representing $P < 0.05$. Results reflect three independent t-tests that compared responses of early-career, women, and people of color to the respondents not associated that group. Only comparisons between people of color and the remaining respondents were significant

	All	Early career	Women	People of color
Enhance technical skills	4.03	3.91	3.95	4.27
Help develop program management skills	3.97	3.78	3.97	4.33
Help with communication skills	3.93	3.91	4.00	4.43 **
Help build leadership skills	3.85	3.78	3.90	4.00
Help build career	3.77	3.95	3.82	3.86
Help build network	3.72	3.65	3.62	3.92
Help build informal skills	3.61	3.78	3.54	3.71
Help address conflicts	3.61	3.83	3.58	4.13 **
Help shape values and ethics	3.58	3.83	3.43	4.38 **
Provide motivation	3.55	3.78	3.65	4.07 *
Help with time management	3.46	3.52	3.24	3.87
Help self-confidence	3.41	3.57	3.59	3.86 *

Table 4. Satisfaction of USFS fish biologist mentees with the help that they receive from their mentors overall and for each skill by respondents, including all, early career, women, and people of color. Each skill had the possibility of being ranked from 1 to 5, with 1 being “very unsatisfied” and 5 being “very satisfied.” Although there are significant differences among skills within a group (all, early-career, women, and people of color), but there were no significant differences among groups for any skill. Based on three independent t-test, none of the comparisons between early-career, women, and people of color to the other respondents not associated that group were significant. None of these comparisons were significant at $P < 0.1$

	All	Early Career	Women	People of color
Satisfied with Overall Experience	4.11	4.16	4.22	4.07
Enhance technical skills	3.92	3.75	4.12	3.87
Help with communication skills	3.85	3.75	4.03	3.87
Help shape values and ethics	3.85	3.75	3.88	3.79
Help develop program management skills	3.81	3.68	3.97	3.67
Help build leadership skills	3.81	3.79	3.82	3.67
Help build career	3.71	3.53	3.91	3.57
Help build informal skills	3.77	3.79	3.79	3.79
Help build network	3.70	3.65	3.72	3.60
Help self-confidence	3.75	3.50	3.75	3.79
Help address conflicts	3.70	3.63	3.70	3.73
Provide motivation	3.66	3.89	3.77	3.80
Help with time management	3.56	3.79	3.68	3.60

the least satisfied of all fish biologists in what they received from their mentors, but were still satisfied with the overall experience. In general, there was congruence ($r^2 = 0.41$, $P = 0.02$) between what was needed from a mentor and their satisfaction with the mentor relationship, which was especially true for skills deemed to be most important (Figure 2). Respondents ranked technical skills, communication skills, program management, and leadership high in both need from a mentor and satisfaction in receiving this help from a mentor. The two skills for which mentees expressed greater satisfaction than they expressed need were values and ethics and self-confidence.

DISCUSSION

Around two-thirds of USFS fish biologists who responded to our survey currently have a mentor, which is approximately the same proportion as respondents three and a half decades ago (Kennedy and Roper 1990). Having a mentor did not change based on gender, race/ethnicity, career length, or position; however, gender and race/ethnicity led to differences in an individual's satisfaction with their mentor and skills or characteristics that individuals seek out in mentors. Mentoring relates to overall job satisfaction, which is consistent with other studies (Allen et al. 2004), but begs the question as to whether people who are already satisfied with their

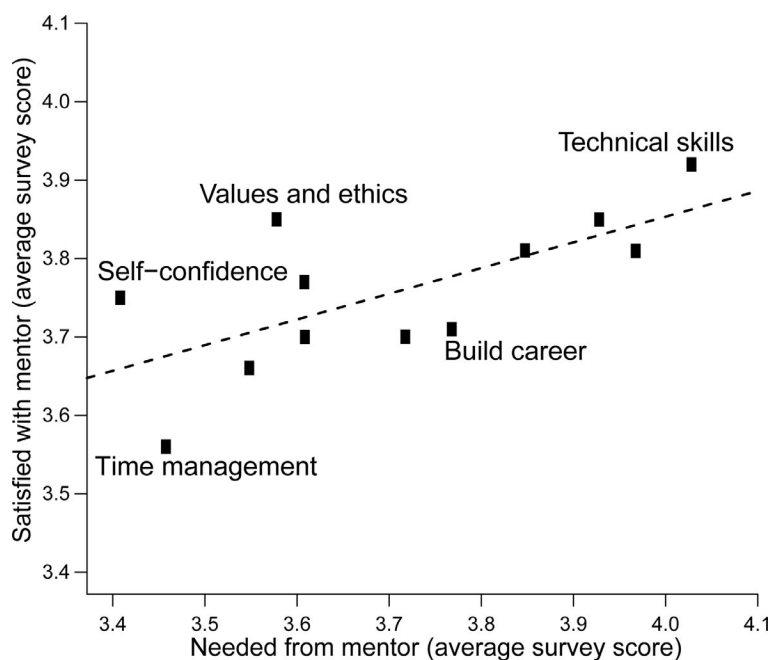


Figure 2. The relationship between what mentees needed from their mentor and their satisfaction with what they received from their mentor ($P < 0.1$)

work seek out mentors, or whether a mentoring relationship plays a role in determining job satisfaction. Mentoring is a key relationship vital to everyone's career because it provides relational support while it also builds skills associated with career advancement (Ragins and Kram 2007).

Gender, race/ethnicity, career length, and position did not play a role in whether someone had a mentor, suggesting that participation in mentoring is consistent across USFS fish biologists and, at least superficially, mentoring participation opportunities are equitable among USFS fish biologists. Although there are no differences in whether someone has a mentor, there may be differences that lie below the surface, such as workplace culture, quality of mentoring, and sponsorship. For example, a sponsor is typically a person in a position of power who publicly advocates for another employee, which can lead to career advancement or enhanced influence or reputation. However, not all mentees are likely to have sponsorship relationships with their mentor, which could lead to inequality in career advancement opportunities.

Women and people of color expressed greater satisfaction with their mentors than did other respondents, suggesting that these two groups may have stronger aspects of psychosocial functions of trust and interpersonal interactions in their mentoring relationships than others. Other studies of mentoring relationships show that greater mentee satisfaction arises from relationships that focus on psychosocial functions, which have been shown to lead to stronger relationships (Allen et al. 2004; Ragins and Kram 2007). However, it is also possible that because women and people of color regularly face micro-aggressions in the workplace, they may need this enhanced relational support from their mentors to manage such interactions. Micro-aggressions, including marginalization and discouragement, that are exhibited towards women and people of color have replaced blatant forms of discrimination that were previously more obvious and documentable (Bernstein et al. 2010). Some studies have shown that mentees often feel that it is important that their mentors are from their same demographic background, because they feel such mentors—especially if they are also women and people of color—intimately understand their situation, even though there are no differences in outcomes (Blake-Beard et al. 2011).

Effective mentor-mentee relationships are dynamic, and they can ebb and flow among topics and areas of focus as either person sees fit. We find that people of color recognized the initial importance of understanding values and ethics, whereas other mentees did not, possibly because others thought they had already acquired that skill. Values and ethics was also the skill that had the greatest departure from the linear relationship, suggesting that the mentor placed a higher value on providing it to the mentee than the mentee thought was necessary (Figure 2). The mentor probably recognized how the mission and values of the USFS are different from other organizations or sectors, and worked to pass that understanding on to their mentee. For example, the USFS has seen a rapid transition from focusing on resource extraction to multiple uses over the past several decades, which changes the focus of the work and differs from the mission of other land-owners. These findings may also support alternative learning structures to acquire important skills on topics that are relevant to the agency.

Beyond changes in our cultural and cognitive understandings of mentoring since the previous survey (Ragins and

Kram 2007), we offer three additional findings that contribute to differences in mentoring for early-career fish biologists over time. First, there is a shift towards an increasing reliance on mentors from within the agency. This shift owes, in part, to the growing acceptance of fish biologists in the USFS since the 1980s (Bullis and Kennedy 1991), and because there are now fish biologists at all levels of the agency, including high levels of leadership, as illustrated by former USFS Chief Michael Dombeck (1997–2001). It also owes to the general acceptance of mentoring as important for both mentors and mentees that evolved between the two eras of the surveys. Consequently, current fish biologists who choose a career with the USFS can find appropriate mentors within the agency, with the added benefit that these mentors understand the agency's culture. Second, learning topics that people look for in mentors have changed over time. All current fish biologists rated technical skills as the most important, whereas it fell in the middle of the prioritized skills for fish biologists in the previous survey (Kennedy and Roper 1990). This shift may be tied to the agency's current emphasis on both analyses of big data and responding to the National Environmental Policy Act and Endangered Species Act rather than fundamental fish biology skills (e.g., taxonomy and identification, life-history expertise). Third, we show a shifting demographic in early-career fish biologists over time toward more women (13% in 1984 and 44% in 2019) and potentially for more people of color (14% in 2019), despite race/ethnicity having not been asked of the respondents on the 1984 survey. The changing faces of early-career fish biologists and the different skills they seek out in mentors reflects broader societal changes towards a more diverse workforce with advanced skills.

Although most USFS fish biologists have mentors, they have little interest in the agency implementing a formal mentoring program, suggesting that an informal setting may best facilitate mentoring. Many respondents may feel that they benefit from mentoring being informal, and that making mentoring more formal could lead to the experience becoming more about the process than the outcome. Formal mentoring programs can feel transactional (Cotton et al. 2011), but they may also better assist people who work in isolated conditions, who may face barriers to accessing mentors, or who have not had a mentor recently. It may also be perceived that a formal mentoring program in and of itself creates its own bureaucracy, may facilitate incompatible or less insightful mentoring relationships, or may become a target for reduction or elimination during times of reduced agency budgets. However, in teaching, both formal and informal mentors have been shown to provide compensatory and complementary assistance, especially for new employees (Desimone et al. 2014). The USFS is currently working to energize mentoring efforts in the fisheries and aquatics program in a flexible manner that allows local units to build upon their existing efforts and tailor their current mentoring practices to meet their own unique needs and circumstances. One of the key aspects of this effort is the creation of USFS mentoring business practices for fisheries and aquatics (USFS 2020).

It is important to note that our survey was sponsored by the agency, and results come from fish biologists who are still employed by the agency. Consequently, respondents may have felt pressured to respond in a particular way or may have been concerned about confidentiality. An improved understanding of the impact of mentoring could come from exit interviews that address people who no longer work for the USFS.

CONCLUSIONS

Our evaluation of the mentoring relationships of USFS fish biologists helps to broaden the understanding of mentoring and its relationship to job satisfaction and professional development. We offer a potentially useful starting point for better understanding the needs and activities of the agency's workforce, with important implications for job satisfaction, career development, and diversity and inclusion. Although there is little interest in the USFS for developing a formal mentoring program in fisheries, we suggest there is reason to promote, support, and reward continued informal mentoring. It may also be a benefit to mentors and mentees to have guidelines and recommendations around their mentoring relationship (e.g., USFS 2020) and to facilitate access to networking opportunities. Tracking the demographics of fish biologists over time will be important to understand the current composition of fish biologists and follow how that composition changes. The lessons learned from this survey of USFS fish biologists apply both to professionals in other discipline areas of the USFS and to other organizations. In addition, these perspectives and findings can be used as a research agenda for future areas of focus and to understand the status of mentoring for USFS fish biologists. Future success and job satisfaction of USFS fish biologists depends on continued informal mentoring.

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SUPPORTING INFORMATION

Additional supplemental material may be found online in the Supporting Information section at the end of the article.
Mentoring Survey 