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A Survey of Bureau of Land Management Employees on Collaboration and Alternative Dispute Resolution

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Executive Summary

The Bureau of Land Management (BLM) has been actively expanding its capacity to work cooperatively with other agencies, Tribes, the public, and other stakeholders using collaborative and alternative dispute resolution (ADR) approaches. In 1997, the BLM created the BLM's Collaboration and Alternative Dispute Resolution Program (Collaboration/ADR Program) to centralize, strengthen, and coordinate these efforts. Specifically, the Collaboration/ADR Program is charged with developing ADR policies; ensuring that statutory and regulatory requirements are met; and providing training, resources, and direct support for collaboration and ADR in the BLM. At the request of the Collaboration/ADR Program, the Policy Analysis and Science Assistance Branch of the U.S. Geological Survey, located in the Fort Collins Science Center, conducted an online survey of BLM employees in early 2013 to address four overarching questions:

1. What information sources and assistance resources are BLM employees currently accessing to fill their conflict/dispute resolution and collaboration needs?
2. What are the perceived information and resource needs of BLM employees associated with conflict/dispute resolution and collaboration? What information and resources can the BLM Collaboration/ADR Program provide to fill BLM employee needs?
3. What is the BLM employee level of knowledge associated with conflict/dispute resolution and collaboration?
4. What are the attitudes and perceptions of BLM employees toward conflict/dispute resolution and collaboration?

This report describes the findings of this online survey and will assist the BLM's Collaboration and ADR Oversight Committee in developing the Strategic Plan for the Collaboration/ADR Program. The purpose of the Strategic Plan is to advance collaboration in the BLM and to increase the capacity of the Collaboration/ADR Program to support collaborative efforts on the ground.

In March 2013, a user-specific link to the online survey was sent via email to all current BLM employees (n = 6,734) that could potentially have had experience in collaboration and conflict resolution based on their job series. The links took the respondents to a webpage where the survey was administered. Email reminders were sent at weekly intervals thereafter. When the survey closed in May 2013, the response rate was 45 percent (3,161 employees). Of these, only 14 percent (427 respondents) indicated that they did not have direct experience with collaboration or ADR, and were unlikely to gain experience in the future. Because these respondents were not the target population of this survey, they were branched to the demographic questions at the end of the survey and were not included in any further analyses. The remaining 86 percent (2,734 respondents) indicated that either they did have direct experience with collaboration and (or) ADR, or that they might gain experience with one or both in the future. Below we highlight some of the key findings from their survey responses (refer to the Results section for a comprehensive report of the survey findings).

Greater Experience with Collaboration than Alternative Dispute Resolution

- Fifty-nine percent of the 2,734 respondents had direct experience with collaboration and not ADR; 1 percent had direct experience with ADR and not collaboration; 25 percent had direct experience with both collaboration and ADR. The remaining 15 percent did not have direct experience with either collaboration or ADR, but might gain experience in the future. Of note, respondents in high-level decision-making positions (Field Manager level or higher) were more than twice as likely as

other respondents to have experience with both collaboration and ADR; a little less than 5 percent of these decision-makers did not have experience with either collaboration or ADR.

- When asked to characterize their experience with collaboration and ADR, 18 percent of respondents indicated that they had been involved in a single collaboration or ADR process, 59 percent had been involved in 2–10 collaborations and ADR processes, and 23 percent had been involved in more than 10 collaborations and ADR processes. The majority (57 percent) of respondents had been involved in a collaboration or ADR process that lasted longer than one year. In addition, the majority (60 percent) had been involved in a collaboration or ADR process that involved a National Environmental Policy Act process. When describing the role of collaboration and(or) ADR in their position responsibilities, 59 percent of respondents with direct experience spent less than 10 percent of their time on these processes. Only 3 percent spent more than 60 percent of their time on these processes. However, participation in collaborations and (or) ADR processes was included in only 39 percent of respondents' performance plans.

Generally Low Level of Training and Skills; Higher for Decision-Makers

- The only two collaboration and ADR skills in which the majority of respondents had received formal training were "communication and active listening" (64 percent) and "internal team building" (61 percent). Not surprisingly, respondents also rated themselves as being more proficient at these skills compared to the other 11 collaborative and ADR skills listed in the survey, for which a majority of respondents (54–93 percent) had not received training. Of note, over three-quarters of respondents had not received training in four of the skills that are most specific to collaboration: "identifying when collaboration is needed," "building tribal and Government-to-Government relationships," "terminating collaborative efforts or partnerships when necessary," and "feasibility assessments." Respondents expressed the most interest in receiving future training in "negotiation and conflict resolution."
- In general, decision-makers had received much more formal training (median = 7 of the 13 skills listed in the survey) than the other respondents (median = 3 of the 13 skills). When asked which professional and personal obstacles had prevented them from taking training in the past, 79 percent of respondents indicated they had encountered "travel ceiling constraints." In addition, 72 percent of respondents had encountered budgetary constraints, and 52 percent indicated that they had lacked the time for training. Surprisingly, almost half of respondents (45 percent) indicated that they had not been aware that training in collaboration was available to them.
- The average respondent rated their own skill at collaboration and ADR as being somewhere between "beginner" and "intermediate." However, the average decision-maker rated themselves as being much more skilled (between "intermediate" and "advanced") than other respondents. This corresponded with the finding that decision-makers had received more training in collaboration and ADR than other respondents, because how much training respondents had received was strongly positively correlated with how they rated their skill level at collaboration and ADR.
- Respondents credited "hands on experience" as contributing 44 percent of their skill on average). This was followed by "innate skill" (20 percent on average), then "mentors and coaches" (15 percent on average), then "formal training" (11 percent on average), and last of all by "reading about collaboration" (9 percent on average).
- Although the majority of respondents indicated that they were interested in receiving some future training in collaboration and ADR skills (median = 8 out of 13 skills listed in the survey), the distribution of responses was U-shaped, with 20 percent of respondents indicating that they had zero interest in future training and 24 percent indicating that they wanted future training in all of

the collaborative and ADR skills listed in the survey. Of note, respondents' overall interest in future training decreased the longer they had worked for the BLM.

Awareness of Resources Increases Their Use

- When comparing among a list of currently available resources for collaboration and ADR, respondents indicated that they were most likely to use "a mentor or coach" in the future, followed by BLM guides and handbooks, and "an online or media search." Respondents were split on whether or not they were likely to use "formal training in collaboration or dispute resolution," "a professional facilitator or mediator," or the "BLM Collaboration and Dispute Resolution SharePoint site." With the exception of the SharePoint site, over three-quarters of respondents (75–91 percent) had been aware of these resources prior to the survey. Only half of respondents (49 percent) had been previously aware of the SharePoint site. The resources that respondents were less likely to use in the future were professional collaboration or ADR specialists and the BLM's Washington Office of Collaboration and Alternative Dispute Resolution. However, smaller majorities (55–64 percent of respondents) had been aware of these resources prior to the survey. Respondents were particularly unlikely to use the Udall Foundation's U.S. Institute for Environmental Conflict Resolution in the future. However, only 36 percent had been aware of this resource prior to the survey. Of note, decision-makers were typically aware of more of these resources than other respondents, and respondents' general level of awareness of these resources and overall likelihood to use these resources in the future were positively correlated with their overall level of training and overall self-rated skill level in collaboration and ADR.
- From those respondents with direct experience with collaboration and(or) ADR, 59 percent indicated that they had been involved in a collaboration or ADR process that used a facilitator, while only 37 percent had been involved in a collaboration or ADR process that used a mediator. The respondents with direct experience indicated that both facilitators and mediators were very useful for these processes.
- In contrast, a large majority of the respondents that had direct experience with collaboration and(or) ADR either (1) did not know about feasibility assessments (60 percent) or (2) had heard of them, but did not have experience with a collaboration or ADR process that had used a feasibility assessment (27 percent). However, the respondents that did have direct experience with feasibility assessments (13 percent) rated feasibility assessments as being very useful for collaborations.

High Priority Resource Needs

- When asked to rate the priority level of a list of potential resources that BLM could provide them in the future, respondents indicated that "in-person training on collaboration and dispute resolution," "support for building collaborative Government-to-Government relationships and Tribal consultation," "additional funding resources for collaborative efforts," and "assistance or coaching in planning for collaboration and setting expectations with the public" should be given the highest priority.
- Even though as a group respondents rated "assistance finding and hiring facilitators" as having lowest priority relative to the other potential resources listed in the survey, respondents with direct experience with the use of a facilitator and those that indicated that they were likely to use one in the future indicated that "assistance finding and hiring facilitators" should be given higher priority than did the rest of the respondents. Similarly, although respondents as a group rated "training in feasibility assessments" and "support for conducting feasibility assessments" as having relatively

low priority, those with direct experience with feasibility assessments and a higher self-rated skill level in feasibility assessments rated the priority level of these potential resources much higher than other respondents.

All BLM Issue Areas Considered to be Suitable for Collaboration

- All BLM issue areas were considered to be at least "somewhat suitable" by over 70 percent of respondents, with "recreation," "land use planning/NEPA," "range management," and "fish and wildlife" rated as "suitable" by the largest majorities (55–66 percent).

Collaboration in BLM Encounters Situational and Organizational Barriers

- Respondents were asked to rate how frequently they thought collaboration in the BLM encountered a list of 12 political and social situational barriers and then to rate the magnitude of effect of each barrier when it was encountered. The situational barrier that was rated by respondents as occurring most frequently and having the greatest effect was that "some participants in collaborations have entrenched positions." Almost two-thirds of respondents (62 percent) indicated that collaborations were "often" or "always" hindered by this barrier, and 88 percent indicated that this was a "moderate" or "major" barrier to collaborations (table 9). Other situational barriers that respondents thought occurred frequently and were of "moderate" to "major" effect were "knowledge imbalances between participants," "high political visibility," and "power imbalances among participants." The three barriers rated the least frequent were "litigation was already ongoing," "collaborations are not undertaken voluntarily by the BLM," and "a perception that collaboration leads to poor quality decisions." Of these three, only "litigation was already ongoing" was considered to be of "moderate" or "major" effect by the majority of respondents (70 percent). In general, respondents' ratings of the overall frequency of situational barriers were positively correlated with how they rated the overall magnitude of effect of situational barriers.
- Respondents were also asked to rate how frequently they thought that collaborations in the BLM encountered each of a list of 12 different organizational barriers and then rate the magnitude of the effect of each barrier to collaboration when it was encountered (table 10). The organizational barrier that was rated as being the most frequent and of greatest effect by respondents was "travel ceilings." Almost two thirds of respondents (61 percent) indicated that collaborations were "often" or "always" hindered by travel ceilings, and 79 percent indicated that this was a "moderate" or "major" barrier to collaboration. The other organizational barrier that the majority of respondents (54 percent) thought occurred "often" or "always" and that 74 percent thought was of "moderate" or "major" effect was "other BLM duties take priority over collaboration." The three organizational barriers rated as occurring the least frequently were "lack of support in the BLM," "the BLM does not implement agreements made by collaborative groups," and "lack of support from your supervisor." All three were rated by over one-third (43–69 percent) of respondents as occurring "seldom" or "never," and the majority of respondents (53–73 percent) rated them as having a "minor" effect when they do occur. Of note, decision-makers typically rated the organizational barriers as occurring less frequently and having a smaller effect than other respondents. In addition, respondents' ratings of the overall frequency of organizational barriers were positively correlated with how they rated the overall magnitude of effect of organizational barriers.

Level of Support for Collaboration from Higher Organizational Levels is often "Unknown"

- Field personnel generally rated the level of support for collaboration in their field office, their State Office, and the Washington D.C. office as being "moderate" to "high." However, almost 40 percent of respondents indicated that they did not know the level of support in their State Office. Furthermore, almost 50 percent did not know the level of support in the Washington Office. Of note, Field Managers generally rated the level of support in their field office and their State Office as much higher than other field personnel.

Generally Positive Attitudes toward the Outcomes of Collaboration

- Respondents were consistent in rating the effect of collaboration on a list of social and political outcomes as between "somewhat improves" to "greatly improves," with "communication among different parties" given the most positive ratings among the list of potential outcomes.
- Finally, respondents generally thought that although collaboration "somewhat increased" short-term costs, it "somewhat reduced" long-term costs.
- In conclusion, the survey confirmed that participation in collaborative and ADR processes is or is likely to be a significant part of many BLM employees' duties. The survey further identified opportunities to increase the BLM's collaborative and dispute-resolution capabilities. Although direct experience appeared to play a major role in how respondents rated their own skill at collaboration and ADR, training was also an important contributor to respondents' skill in collaboration and ADR. One set of skills in which respondents were particularly interested in receiving further training was "negotiation and conflict resolution." In addition, training also appeared to increase respondents' awareness of and likelihood to use the resources that are currently available to assist them in collaborative and ADR processes.
- Finally, the survey confirmed that respondents' access to training and collaborative efforts were oftentimes hampered by organizational or occupational constraints, such as travel ceilings, time, and budgetary constraints. These logistical obstacles could potentially be mitigated or reduced in the future. However, it is important to highlight the fact that even though respondents agreed that attempts at collaboration were often impeded by numerous organizational, social, and political factors, they still considered collaboration to be a worthwhile endeavor for a broad range of BLM activities.

A Survey of Bureau of Land Management Employees on Collaboration and Alternative Dispute Resolution

By Emily W. Ruell,[1] Nina Burkardt,[2] and Ryan M. Donovan[1]

Introduction

Conflict and Collaboration in Federal Land Management

Federal public lands encompass substantial water and wildlife resources and supply users with numerous services, amenities, and commodities (Loomis, 2002; Coggins and others, 2007). Public lands also contain abundant historical and cultural resources (Stern and Slade, 1995). As set forth in the Federal Land Policy and Management Act of 1976 (FLPMA), as amended, the U.S. Bureau of Land Management (BLM) manages a vast network of lands according to a multiple-use mandate, and is often faced with deciding which of the above-mentioned benefits should be prioritized spatially and temporally among users (Loomis, 2002). The BLM administers over 245 million surface acres, primarily across 12 Western states, including Alaska (U.S. Bureau of Land Management, 2013b), which is more land than any other federal land management agency (Loomis, 2002). The BLM is charged to manage for "a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and non-renewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural science, scientific and historical values…without permanent impairment of the productivity of the land and the quality of the environment…" (43 U.S.C. 1702(c)). Managing for these multiple and often competing uses can invite both conflict and opportunities for collaboration as various stakeholders advocate for alternative uses of public lands (Wondolleck, 1988). Even within one class of use, stakeholders often disagree, for example, motorized versus non-motorized recreational activities (Coggins and others, 2007). Furthermore, external drivers such as climate change are altering the landscape of public land management (Archie and others, 2012).

Adding to this complexity, lands administered by the BLM often neighbor or surround Tribal lands; lands administered by other Federal agencies, States, and Counties; or property owned by private entities or individuals. As a result, effective management of BLM-administered lands often requires collaborating across various jurisdictional and geographical boundaries (Loomis, 2002). Certain laws may compel the BLM to cooperate with other federal agencies. For example, the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1536) requires federal agencies to consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service when proposed agency actions may affect threatened or endangered species. Others, such as the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4371 *et seq*.), also require federal agencies to involve the public in actions that "significantly affect the human environment." Decisions made as to management of BLM lands can and do have effects in local communities throughout the West (Congressional Research Service, 1992).

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To address natural-resource and environmental concerns of a large scope, such as climate change, an emphasis on collaboration across traditional jurisdictional boundaries is emerging. A rise in collaborative efforts in the BLM coincides with a string of federal statutes and memoranda encouraging or mandating participatory decision-making within federal agencies. For example, under the Landscape Conservation Cooperatives, established in 2009, Department of the Interior agencies are called on "to work together, and with other federal, state, tribal and local governments, and private landowner partners, to develop landscape-level strategies" (U.S. Department of the Interior, 2009, p. 3). In addition, the Administrative Dispute Resolution Act of 1996 (5 U.S.C. 571 *et seq*.) requires that Federal agencies adopt a policy for alternative dispute resolution (ADR) across agency functions: rulemaking, enforcement, and other agency actions. Alternative Dispute Resolution gained additional traction within federal agencies in 2005, when the Office of Management and Budget and the President's Council on Environmental Quality jointly issued a Memorandum on Environmental Conflict Resolution (ECR). The memorandum directs federal agencies to ensure the effective use of ECR consistent with eight principles: informed commitment, balanced and voluntary representation, group autonomy, informed process, accountability, openness, timeliness, and implementation. A revised memorandum issued in 2012 reinforces these commitments and places greater emphasis on early collaboration.

In order to comply with these mandates, the BLM must identify the opportunities for and barriers to collaboration and conflict resolution in order to more effectively approach future collaborative efforts and disputes. The BLM established the Collaboration and Appropriate Dispute Resolution Program (Collaboration/ADR Program) in 1997 (U.S. Bureau of Land Management, 2013a). The Collaboration/ADR Program has issued policy and guidance encouraging the use of collaboration and ADR processes as "standard operating practice of natural resource projects, plans, and decision-making, except under unusual circumstances" (U.S. Bureau of Land Management, 2009, p. 1). Unusual circumstances include those instances where the BLM may be constrained by law, regulation, or precedent to use more conventional approaches. Particular focus is placed on "upstream" processes, such as public outreach and stakeholder working groups, recognizing that such early involvement can increase the success rates of these processes (U.S. Bureau of Land Management, 2009).

Although much has been learned about collaboration in Federal land-management decisions, questions remain concerning its effectiveness (Innes and Booher, 1999; Conley and Moote, 2003; Koontz and Thomas, 2006), and its ability to provide meaningful opportunities for stakeholder involvement (Bryson, 2004; Walker and others, 2006; Slotterback and Crosby, 2012; Callister, 2013) and to manage power imbalances (Ozawa and Susskind, 1985; Callister, 2013). Past research has focused on defining collaborative capacity at the level of the individual participant (Thomas, 1995; Forester, 1999; Emerson and Smutko, 2011; Morse and Stephens, 2012; and O'Leary and others, 2012), and on identifying organizational and institutional features that may support more robust collaborative processes (Ostrom, 1990; Fung and Wright, 2003; Heikkila and Gerlak, 2005; and Reed, 2008). These topics are salient to natural-resource-management agencies as these agencies attempt to improve their ability to work with stakeholders, uphold their agency mandates, and move toward improved outcomes on the ground.

Defining Collaboration in the BLM

The literature reveals a growing list of terms that seek to capture the essence of collaboration in natural resource management. Many of these processes fall under the umbrella term Environmental Conflict Resolution (ECR) (Dukes, 2004). Different ECR processes take on many names, including "collaborative conservation" (Lauber and Decker, 2011), "community-based collaboratives" (Moote and others, 2000), "community-based conservation" (Western and Wright, 1994), "community-based ecosystem management" (Gray and others, 2001), "community-based environmental protection"

(Environmental Protection Agency, 1997), collaborative resource management (Government Accountability Office, 2008), and "partnerships" (Wondolleck and Yaffe, 1994). Other approaches have been termed "watershed management" (Bonnell and Koontz, 2007), "collaborative integrated water management" (Ferreyra and Beard, 2007), and "community forestry" (Wilson, 2006) to reflect the specific resource focus of the effort.

Though differences may exist among these collaborative approaches, they share many commonalities. These processes are all multi-party, participatory approaches to address natural resource management. The BLM Land Use Planning Handbook (BLM. 2005) defines collaboration as "A cooperative process in which interested parties, often with widely varied interests, work together to seek solutions with broad support for managing public and other lands (p. 3)." For purposes of this report, we use the term "collaboration" or "collaborative process" to encompass the range of activities that fall within this definition. These activities may or may not include a third-party mediator or facilitator.

Previous Survey Findings

A 2002 study used an online survey to examine perceptions of BLM Field Office Managers and Planners regarding the role of collaborative planning within the BLM (Laninga, 2004). Surveys were sent to 147 Field Office Managers and Planners, and 126 responded from 84 field offices. That survey sought responses on three topics related to collaborative planning in the BLM: (1) intergovernmental coordination, (2) characteristics of collaborative arrangements, and (3) general questions on collaborative planning (Laninga, 2004).

The results demonstrated that the BLM field offices coordinate numerous collaborative activities with other governmental entities, including State, County, and local governments, other Federal agencies, and Tribes (Laninga, 2004).

Data from that survey also indicated that collaborative planning among field offices varies in both structure and process. Structural characteristics of collaborative planning evaluated in the survey included the initiator of the planning effort, the lifespan, the type (community-based, intergovernmental, or mediated negotiation), the number of participants, and membership-type (self-selected, assigned, or elected [Laninga, 2004]). Respondents were also asked to respond to questions regarding procedural characteristics of collaborative planning processes, including decision-making criteria, goals, issue-focus, data types and sources, meeting frequency, and participant representation (Laninga, 2004).

The survey also elicited perceptions of the benefits and weaknesses of collaboration from field office personnel through the use of open-ended questions.

When asked what additional resources they believed would increase their capacity to use collaborative planning, the most frequent response of respondents was a need for additional financial resources, followed by additional time to engage in collaborative processes. Other frequently cited potential resources were additional staffing and education for current staff. Finally, respondents to this question indicated a lack of material support from the BLM state offices and the BLM's Washington Office (Laninga, 2004).

Although these responses were illuminating, the small and narrow sample of respondents to this question prevented its extrapolation to the entire BLM. As will be described in the next section of this resport, researchers at the U.S. Geological Survey (USGS) created and administered a survey in 2012 to provide additional information to the BLM. One objective for the 2012 survey was to determine whether field-office perceptions of support from state offices and the Washington Office had changed in the 10 years (yr) since the Laninga survey. A more comprehensive objective was to learn about topics beyond those covered in the 2002 survey from a broader group of BLM employees. The impetus for this survey was the upcoming development of a BLM strategic plan for collaboration and ADR, and the need to learn

more about BLM employee knowledge, attitudes, and support needs in order to craft a robust and relevant plan.

Study Objectives and Survey Methods

Survey Objectives and Design

In 2012, the BLM's Collaboration/ADR Program began a strategic planning process to further define the services and support it can deliver to the field. To inform this ongoing strategic planning process, scientists at the USGS Policy Analysis and Science Assistance Branch, in cooperation with the BLM Collaboration/ADR Program, designed and administered an online survey of current BLM employees. The survey was designed to address four questions:

1. What information sources and assistance resources are BLM employees currently accessing to fill their conflict/dispute resolution and collaboration needs?
2. What are the perceived information and resource needs of BLM employees associated with conflict/dispute resolution and collaboration? What information and resources can the BLM Collaboration/ADR Program provide to fill BLM employee needs?
3. What is the BLM employee level of knowledge associated with conflict/dispute resolution and collaboration?
4. What are the attitudes and perceptions of BLM employees toward conflict/dispute resolution and collaboration?

The USGS researchers and members of the BLM Collaboration/ADR Program worked together in an iterative process to design the survey questions. The questions were based, where appropriate, on existing literature regarding collaboration and dispute resolution in the area of natural resources and public lands. Other questions reflected the existing and potential resources and services offered by the BLM Collaboration/ADR Program. A representative version of the full survey is included in Appendix 2.

The majority of the questions were closed-ended questions, which are the preferred format in surveys because they make responses comparable, and thus easier to analyze using statistical analyses (Dillman and others, 2009). However, we included a few general open-ended questions that allowed the respondents to provide additional comments or suggestions at the end of the survey. Responses to the two open-ended questions were reviewed and categorized but were not subject to in-depth analysis for this report. The comments were edited to preserve anonymity and shared with the BLM Collaboration/ADR Program to help inform their strategic planning process. We report summaries of the comments in this report.

Survey Administration

The BLM Collaboration/ADR Program provided a list of current BLM employees in job categories that were likely to have or to gain future experience in collaboration and conflict resolution. This list included the job title and email address of 6,734 current BLM employees who were selected to receive the survey. Survey respondents were selected to receive the survey based on their job titles in early March 2013. Employees were excluded from the survey only if their job title indicated they were in a strictly clerical or maintenance-type position, and thus were unlikely to be directly involved in natural resource management activities, including collaboration and ADR. This approach was designed so that the survey sampled and was representative of all BLM employees with direct experience with collaboration and(or) ADR, or those that were likely to gain experience in the future. The survey was constructed in and

administered using the program Key Survey™ version 7.1 (WorldAPP, Braintree, Massachusetts). On March 19, 2013, survey recipients were emailed a unique URL that took them to a webpage that administered their survey. Approximately one week before receiving their survey link, recipients were notified of the survey in an email sent from Ed Roberson, BLM Assistant Director of Renewable Resources and Planning. Because email links were user-specific, respondents were allowed to re-enter, view, or modify previous responses prior to finally submitting their survey responses. Five follow-up reminder emails were sent on March 27, 2013; April 3, 2013; April 17, 2013; April 24, 2013; and May 5, 2013. After nearly seven weeks, the survey was closed on May 6, 2013.

Survey Unit Topics

Initial Branching Questions

Upon entering the survey, BLM employees were asked to answer four background questions, including identifying and specifying their duty station, the program area in which they primarily work, and whether their job description includes managing or supervising others (Appendix 2, survey page 1). Respondents were then navigated through the remainder of the survey based on their responses to two questions: (1) whether or not they had direct experience with collaboration (as defined above and in the BLM Land Use Planning Handbook) or may gain experience in the future as part of their job duties for the BLM, and (2) whether or not they had direct experience with ADR (defined as "managing, mitigating, or resolving an existing dispute, sometimes with the assistance of a neutral third-part (for example, a mediator)" or may gain experience in the future as part of their job duties for the BLM (Appendix 2, survey page 2). Respondents that indicated they had experience with collaboration and (or) ADR were directed to the full survey and were asked a series of questions about their experiences (Appendix 2, survey pages 3–11). Those that indicated they did not have prior experience in either collaboration and ADR, but that they anticipated they may have such experience in the future, were directed past those questions that related to specific experiences to the survey questions involving their collaboration and ADR skills and training (Appendix 2, survey page 12). Finally, employees that indicated they had no prior experience in either collaboration or ADR, nor expected to gain any in the future, were directed to the end of the survey where they were asked their gender and how long they had worked for the BLM (Appendix 2, survey page 23).

Experience with Collaboration and Alternative Dispute Resolution Processes

Respondents that indicated that they had direct experience with collaboration and(or) ADR were asked a series of questions about this experience, including the number and duration of collaborative and(or) ADR processes (Appendix 2, survey page 4), the proportion of their time spent on these processes in the last year, and whether or not participation in these processes was part of their performance plan or was part of a NEPA process (Appendix 2, survey page 5).

Collaboration and Alternative Dispute Resolution Skills and Training

Respondents were asked to rate their skill level for a list of 13 skills that are often used in collaborative and ADR processes (Appendix 2, survey page 12). In addition, they were asked whether or not they had received training in any of these skills and whether or not they would like to receive training or additional training in these skills in the future. Next, respondents were asked to indicate where they thought they had acquired their skill in collaboration and ADR (Appendix 2, survey page 13). Finally, respondents were asked to select which (if any) barriers they had encountered to taking training in

collaboration from a list of 11 potential barriers, including time, resources, and personality factors (Appendix 2, survey page 15).

Resources for Collaboration and Alternative Dispute Resolution

Respondents were asked whether or not they had been previously aware of a list of 11 resources currently available to them for assistance with collaborative and ADR processes, and how likely they were to make use of these resources in the future (Appendix 2, survey page 14). They were then asked to prioritize among a list of 11 resources that could potentially be provided to them in the future by the BLM (Appendix 2, survey page 16). Respondents were also asked if they had direct experience with the use of a facilitator, mediator, or a feasibility assessment conducted prior to a collaboration (also known as a situation assessment), and if so, how useful they thought they were for the process (Appendix 2, survey pages 6–11).

Suitability of BLM Issue Areas for Collaboration

Respondents were asked to rate the suitability of 11 different program areas in the BLM for collaboration (Appendix 2, survey page 20).

Perceptions of Barriers to Collaboration

Respondents were asked to rate the frequency and the severity (hereafter referred to as the magnitude of effect) of a list of 12 potential situational and 12 potential organizational barriers to collaboration (Appendix 2, survey pages 18 and 19). Those respondents that indicated at the beginning of the survey that their duty station was a field office (Appendix 2, survey page 1), were asked an additional question that mimicked a question in the survey administered in 2002 (Laninga, 2004) about how they perceived the level of support for collaboration in their field office, their State Office, and the Washington Office (Appendix 2, survey page 17).

Perceptions of How Collaboration Affects Outcomes

Respondents were asked to rate whether collaboration improved or worsened a list of 13 social and political outcomes of natural resource decision-making and whether or not it increased or decreased the BLM's short- and long-term costs (Appendix 2, survey page 21).

Final Professional and Demographic Background Questions

Finally, respondents were asked whether they had any suggestions for modifying the BLM Land Use Planning Handbook's definition of collaboration (Appendix 2, survey page 24), their gender, and how long they had worked for the BLM (Appendix 2, survey page 25) before they were asked to submit their surveys.

Additional Survey Coding

In order to group responses by geographic region, survey respondents from field offices, district offices, and state offices were coded for their particular BLM State Office or BLM Center using the respondents' response to the open-ended question that asked respondents to specify the name of their duty station (Appendix 2, survey page 1). Respondents that left this open-ended comment blank were

considered missing data for this variable. Respondents that specified the Washington Office were left in this category.

In addition, in order to compare the responses of high-level decision-makers versus other respondents, we coded survey responses as either a "decision-maker" or not using the respondents' job title generated in the initial email list. Field Managers, District Managers, State Directors, Division Chiefs, Assistant Directors, and the Director were all categorized as decision-makers and all other job titles were categorized as other for this variable. The rationale behind this classification was that although supervisors may have the authority to make administrative or program-related decisions, almost all substantive decisions over natural resource management that influence collaborative and alternative dispute resolution -processes would have to be made and(or) approved by the respondents classified as high-level decision-makers above.

Finally, survey responses from the two initial branching questions that asked whether or not respondents had direct experience with collaboration and ADR were combined into one variable. Respondents were categorized as either (1) experienced with both collaboration and ADR, (2) experienced with only collaboration, (3) experienced with only ADR, or (4) not experienced with either collaboration or ADR, but may gain experience with one or both in the future. Respondents that indicated that they did not have experience with either collaboration or ADR and were unlikely to in the future were coded as missing data for this variable, and were not included in any of the survey analyses beyond the descriptive statistics describing respondents' professional characteristics and gender.

Statistical Analyses

The survey's minimum response rate (also called Response Rate 1 under Standard Definitions: Final Dispositions of Case Codes and Outcomes Rates for Surveys, 7th Edition; American Association for Public Opinion Research, 2011a) was calculated using the Response Rate Calculator V3.1 (American Association for Public Opinion Research, 2011b).

All subsequent analyses were completed using IBM® SPSS® Statistics Desktop V20.0.0 (IBM Corporation, Armonk, New York, U.S.A.). Detailed descriptions of all statistical terms are provided in Appendix 1, and descriptions of all statistical tests and models performed are provided in Appendix 3. We used nonparametric statistical analyses, because they do not assume an underlying distribution (for example, a normal distribution) to the data, and therefore, do not specify the model structure and parameters *a priori*, which sometimes comes at the cost of slightly reduced power to detect significant effects. Nonparametric statistics are also robust to outliers and small sample sizes. As a result, they have broad applications in the social sciences where data often do not conform to the assumptions of parametric statistics (reviewed in Leach and Onwuegbuzie, 2002). Examples of social-science data that typically warrant non-parametric statistics are rank order, count data, and ordinal response data, such as data derived from survey rating scales. These types of data often have no real-world numerical interpretation, and the difference between each successive rating scale category is not truly equidistant. Nonparametric statistical analyses test whether there are differences among groups, items, along scales, etc. in the measure of central tendency (for example, median), and(or) distributional differences in shape or dispersion. In the following section, we present the results of all statistical tests and models that were performed, but only the main effects of multivariate models that were statistically significant (α less than 0.05). Model parameters for non-significant main effects (p greater than 0.05) are not presented for the sake of brevity.

We chose not to include post-hoc statistical tests on differences between categories for each significant main effect in this report because the large majority of predictor variables were categorical or ordinal variables with a large number (over five) of categories. Therefore, differences between categories

would be difficult to present and interpret, and the large number of post hoc analyses that would be required would have an inflated Type I error rate or require an overly conservative Bonferroni correction, which would inflate the Type II error. Calculations of standardized effect sizes were also not included in this report, because paired category post hoc tests were not performed and omnibus effect sizes (across all categories) are either not available or are difficult to interpret for nonparametric statistics. Furthermore, it is unclear what size ranges of effect sizes are important in the real world for many of these topics and for BLM employees. In other words, even very small effect sizes can still result in serious or large real-world implications and should not be discounted in certain situations. Instead, we present descriptive statistics (proportions, medians, or boxplots) for all statistically significant tests or fixed effects in tabular or graphical form. This allows readers to view absolute or unstandardized effect sizes between groups and consistency (or lack thereof) of trends or patterns for Likert scales and count data, and to independently determine whether or not these group differences could potentially have real-world significance or importance. Small differences may be important for some readers or purposes, but only large differences may be important to others. However, it is important to remember that some of the apparent differences between groups or items in these tables and figures were not all statistically different from one another. The omnibus model only showed that one or more groups or items were significantly different from one or more of the others.

A more fine-grained, hypothesis-driven approach to analyzing these data that includes post-hoc analyses will be reserved for future investigations with subsets of the survey data. This report should be viewed only as a broad-brush analysis of the survey, which covers a wide range of topics related to collaboration and alternative dispute resolution in the BLM that are of interest to the BLM's Collaboration/ADR Program and that can potentially help inform the strategic planning process.

Survey Results

There were 3,161 BLM employees that responded to a sufficient number of survey questions to be included in subsequent statistical analyses (3,035 complete and 126 incomplete surveys), leaving us with a survey minimum response rate of 45 percent. From these, 83 percent (2,612 respondents) indicated their gender; 61 percent were men and 39 percent were women. The professional characteristics of respondents are described below in table 1. Again, "decision-makers" were those respondents that we considered to be in high-level decision-making positions (Field Manager, District Manager, State Director, Division Chief, Assistant Director, or Director) at the time of the survey. This category was not self-selected by respondents, but was coded by us. The category "supervisor or manager of multiple programs" was self-selected by respondents. Because supervisors and managers were not necessarily high-level decision-makers in collaborative or ADR processes, this variable was not used in subsequent survey analyses.

Table 1. Professional characteristics of respondents. (BLM, Bureau of Land Management; less than or equal to, less than;%, percent)

Professional characteristics	*n*	Percent
Number of years working for the Bureau of Land Management (BLM)		
Less than 1 year	142	5%
1–5 years	693	23%
6–10 years	554	19%
11–20 years	700	24%
21–30 years	580	20%
Greater than 30 years	298	10%
High-level decision-maker in the BLM[1]		
Yes	110	4%
No	3,051	97%
BLM duty station		
Field office	1,567	50%
District office	636	20%
State office	653	21%
Washington office	181	6%
BLM Center or other	104	3%
Primary program area in the BLM		
Other	758	24%
Energy, minerals, and mining	476	15%
Fire management	349	11%
Supervisor or manager of multiple programs	315	10%
Lands and realty	261	8%
Range management	187	6%
Fish and wildlife	169	5%
Recreation	152	5%
Land use planning/NEPA	140	4%
Cultural resources	138	4%
Forestry and timber	126	4%

Table 1. Professional characteristics of respondents. (BLM, Bureau of Land Management; less than or equal to, less than;%, percent)—Continued.

Professional characteristics	*n*	Percent
Species of concern	42	1%
Wild horses and burros	39	1%
BLM State office or BLM Center[2]		
Washington D.C.	181	6%
Arizona	129	4%
Alaska	159	5%
California	245	8%
Colorado	213	7%
Eastern States	55	2%
Idaho	263	9%
Montana-North Dakota-South Dakota	166	6%
Nevada	248	8%
New Mexico-Oklahoma	262	9%
Oregon-Washington	431	15%
Utah	201	7%
Wyoming	284	10%
National Operations Center	52	2%
National Training Center	17	1%
National Interagency Fire Center	25	1%

[1]Decision-makers were categorized as those respondents with the position title of Field Manager, District Manager, State Director, Division Chief, Assistant Director, or Director.

[2]Respondents were asked to specify the name of their duty station in an open-ended comment box. These responses were used to code the BLM State Director's Office or BLM Center to which they reported.

Experience with Collaboration and Alternative Dispute Resolution Processes

Almost three quarters (72 percent) of the 3,161 survey respondents indicated that they had direct experience with collaboration as part of their job duties at the BLM. Thirteen percent indicated that they did not have experience with collaboration, but might gain experience in the future, and 15 percent indicated that they did not have experience with collaboration, and would not gain experience in the future. Roughly a quarter (23 percent) of respondents indicated that they had experience with Alternative Dispute Resolution (ADR) as part of their job duties at the BLM. Forty percent indicated that they did not have experience with ADR, but might gain experience in the future, and 38 percent indicated that they did not have experience with ADR, and would not gain experience in the future.

After combining respondents' levels of direct experience with both collaboration and ADR, 427 respondents (13 percent) did not have experience with either collaboration or ADR and were unlikely to gain experience with either in the future. This subset of respondents was not the target population for this survey. These respondents were branched to the end of the survey, where they were asked to respond to questions about their professional background and gender before they submitted their survey responses.

The remaining 2,734 respondents were categorized under a new "experience" variable with four categories: (1) respondents that did not have direct experience in either collaboration or ADR, but that might gain experience with one or both in the future (15 percent), (2) respondents with direct experience with collaboration only (59 percent), (3) respondents with direct experience with ADR only (1 percent), and (4) respondents with direct experience with both collaboration and ADR (25 percent).

Respondents in decision-making positions (respondents whose job title was Field Manager, District Manager, State Director, Division Chief, Assistant Director, or Director at the time of the survey; hereafter referred to as "decision-makers") were more likely than the other respondents to have direct experience with both collaboration and ADR and less likely to have no experience with either (Wald $\chi^2(1, n = 2{,}223) = 17.66$, p less than 0.001; fig. 1). In general, the longer that respondents had worked for the BLM, the more likely they were to have experience with both collaboration and ADR (Wald $\chi^2(5, n = 2{,}223) = 99.75$, p less than 0.001; fig. 2). Finally, the proportion of respondents with experience differed among the BLM State Offices and BLM Centers (Wald $\chi^2(12, n = 2{,}223) = 25.95$, $p = 0.011$; fig. 3).

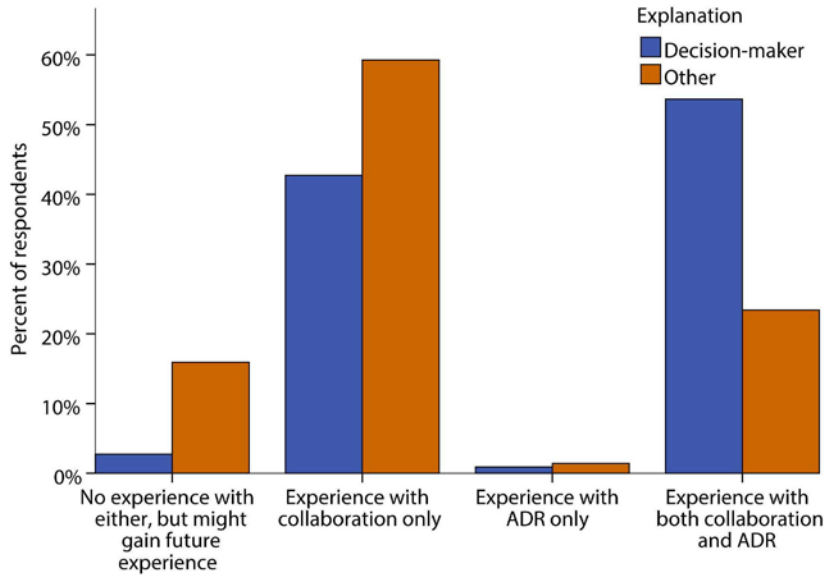

Figure 1. Respondents' experience with collaboration and (or) Alternative Dispute Resolution (ADR), comparing decision-makers to other respondents.

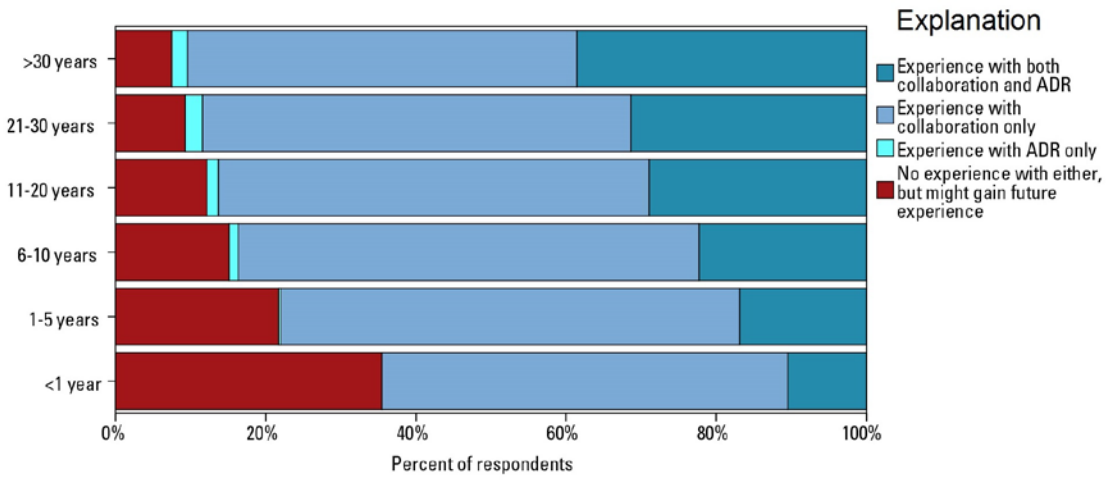

Figure 2. Respondents' experience with collaboration and (or) Alternative Dispute Resolution (ADR) versus the number of years they had worked for the Bureau of Land Management.

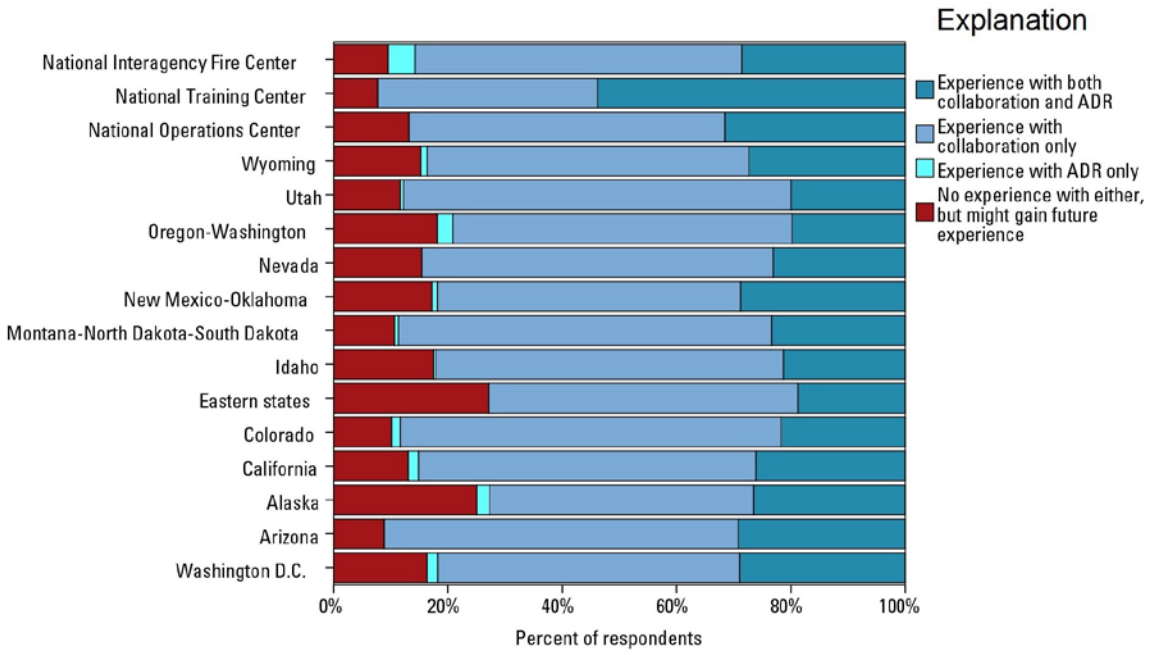

Figure 3. Respondents' experience with collaboration and (or) Alternative Dispute Resolution (ADR), comparing Bureau of Land Management (BLM) State Offices and BLM Centers.

Of those respondents with direct experience with either collaboration or ADR, roughly one fifth (18 percent) had been involved in a single collaboration or ADR process. A majority (59 percent) had been involved in 2–10 collaborations and ADR processes, and almost a quarter (23 percent) had been involved in 11 or more collaborations and ADR processes (table 2).

A majority of respondents (57 percent) indicated that one or more of the collaborations or ADR processes had lasted longer than 1 year (table 2). A majority of respondents (60 percent) also indicated that one or more collaborations or ADR processes had also involved a National Environmental Policy Act (NEPA) process (table 2). In addition, a majority of respondents (59 percent) spent less than 10 percent of their time on collaborative and ADR processes, and only 3 percent spent greater than 60 percent of their time on these processes (table 2). Finally, a majority of respondents (61 percent) indicated that participation in collaborations and(or) ADR processes was not included in their performance plans (table 2).

Table 2. Respondents' level of experience with collaboration and (or) Alternative Dispute Resolution (ADR). (%, percent)

Experience with Collaboration and/or Alternative Dispute Resolution (ADR)	*n*	Percent
Number of collaborations/ADR processes in which they had been directly involved		
1	395	18%
2–3	594	27%
4–6	419	19%
7–10	259	12%
11–20	184	8%
Greater than 20	320	15%
One or more of these collaborations/ADR processes lasted longer than 1 year		
Yes	1,266	57%
No	943	43%
One or more of these collaborations/ADR processes also involved a NEPA process		
Yes	1,369	60%
No	922	40%
Percentage of time spent on collaborative/ADR processes in the last year		
Less than 10%	1,328	59%
10–20%	545	24%
21–40%	213	10%
41–60%	80	4%
Greater than 60%	74	3%
Participation in collaborative/ADR processes is part of their performance plan		
Yes	823	39%
No	1,282	61%

In general, men indicated that they had been directly involved in a slightly larger number of collaborations and (or) ADR processes than women (Wald $\chi^2(1, n = 2{,}581) = 13.20$, p less than 0.001; fig. 4). High level decision-makers typically had been involved in a substantially larger number of collaborations and (or) ADR processes than other respondents (Wald $\chi^2(1, n = 2{,}581) = 27.56$, p less than 0.001; fig. 5). The number of collaborations and(or) ADR processes in which respondents had been directly involved over their career varied based on how many years they had worked for the BLM (Wald $\chi^2(5, n = 2{,}581) = 12.15$, $p = 0.033$; fig. 6). A surprisingly large proportion of respondents that had worked at the BLM for only a short period of time had been involved in a large number of collaborations, so this experience was likely gained during previous employment. Finally, the number of processes that respondents had been involved in varied among the BLM State Offices and BLM Centers (Wald χ^2 (14, $n = 2{,}581) = 802{,}255{,}686.30$, p less than 0.001; fig. 7).

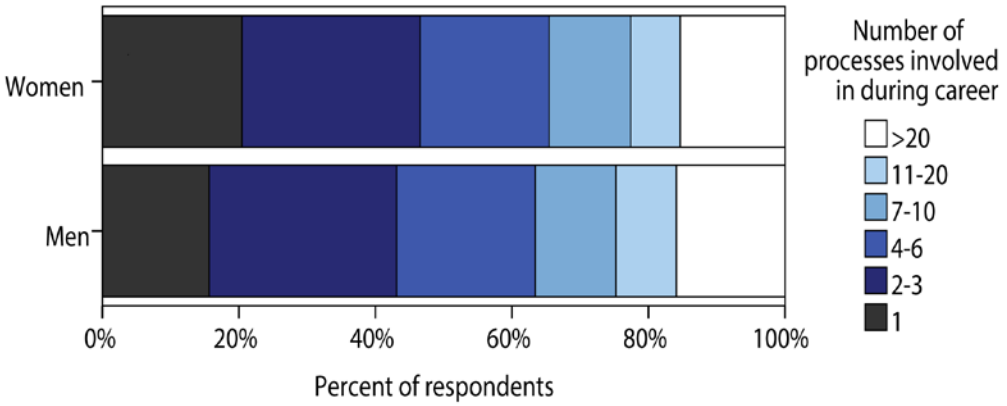

Figure 4. The number of collaborations and Alternative Dispute Resolution processes in which respondents had been directly involved, comparing women to men. (>, greater than)

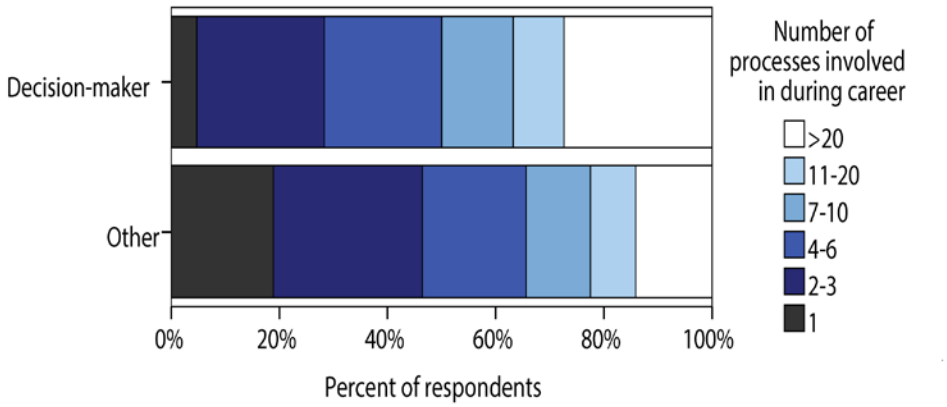

Figure 5. The number of collaborations and Alternative Dispute Resolution processes in which respondents had been directly involved, comparing decision-makers to other respondents. (>, greater than)

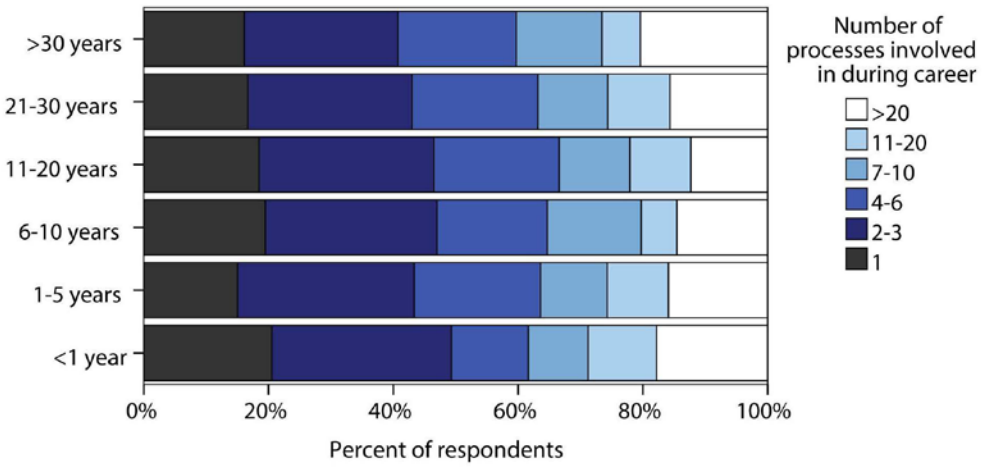

Figure 6. The number of collaborations and Alternative Dispute Resolution processes in which respondents had been directly involved versus the number of years they had worked for the Bureau of Land Management. (>, greater than)

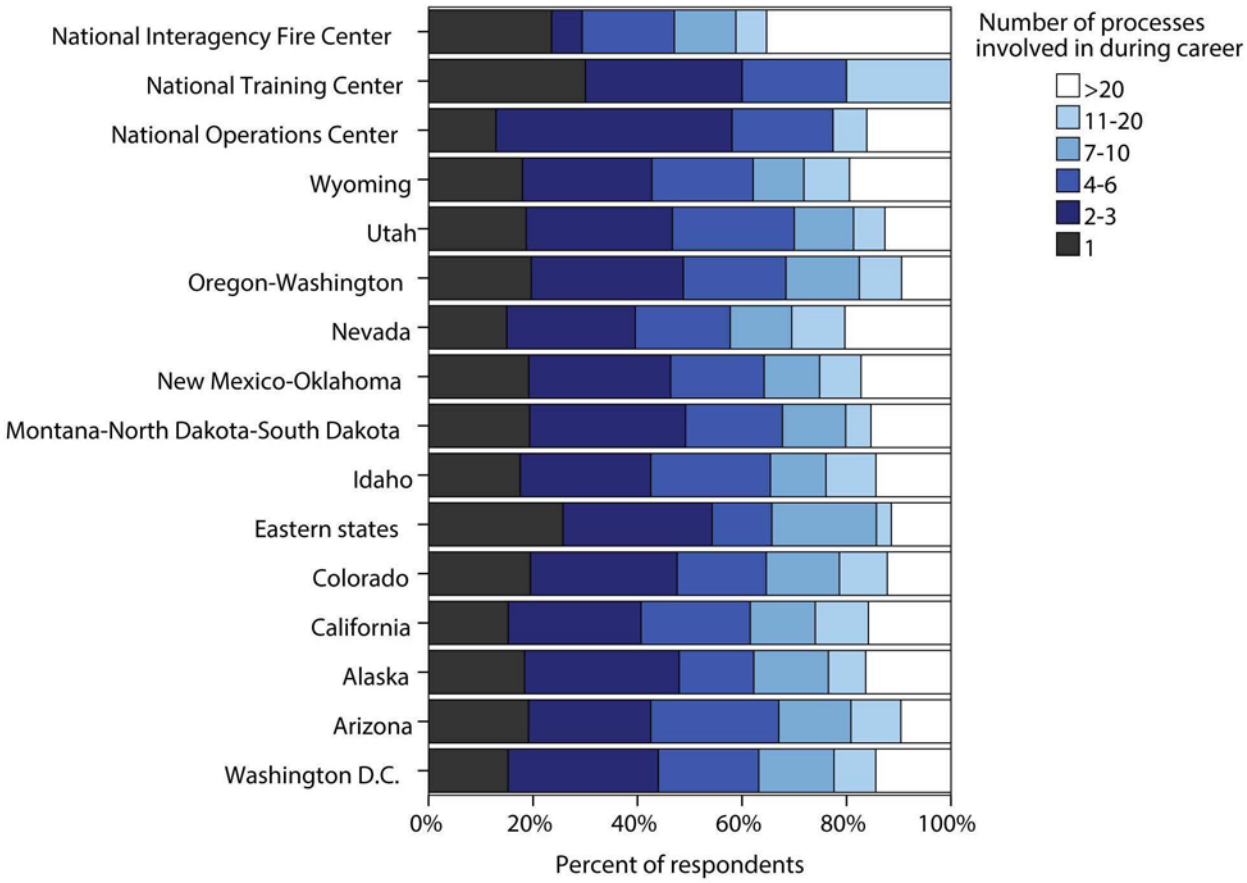

Figure 7. The number of collaborations and Alternative Dispute Resolution processes in which respondents had been directly involved, comparing Bureau of Land Management (BLM) State Offices and BLM Centers. (>, greater than)

Almost three quarters of decision-makers had been involved with one or more processes that lasted longer than a year compared to a little more than half of the other respondents (Wald $\chi^2(1, n = 1{,}817) = 12.94$, p less than 0.001; fig. 8). In addition, respondents' experiences with processes that lasted longer than a year varied among the BLM State Offices and BLM Centers (Wald $\chi^2(13, n = 1{,}817) = 29.30$, $p = 0.006$; fig. 9).

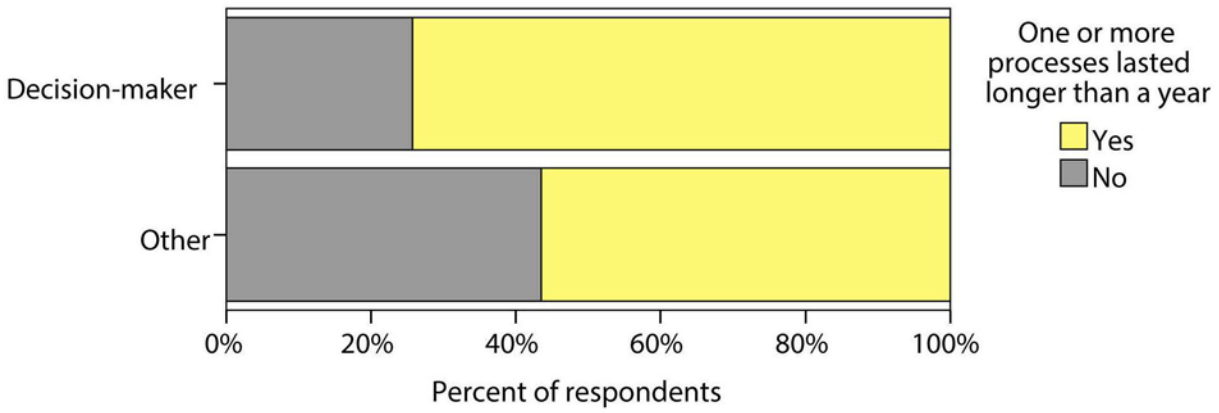

Figure 8. Respondents' experience with one or more collaboration or Alternative Dispute Resolution process that lasted longer than a year, comparing decision-makers to other respondents.

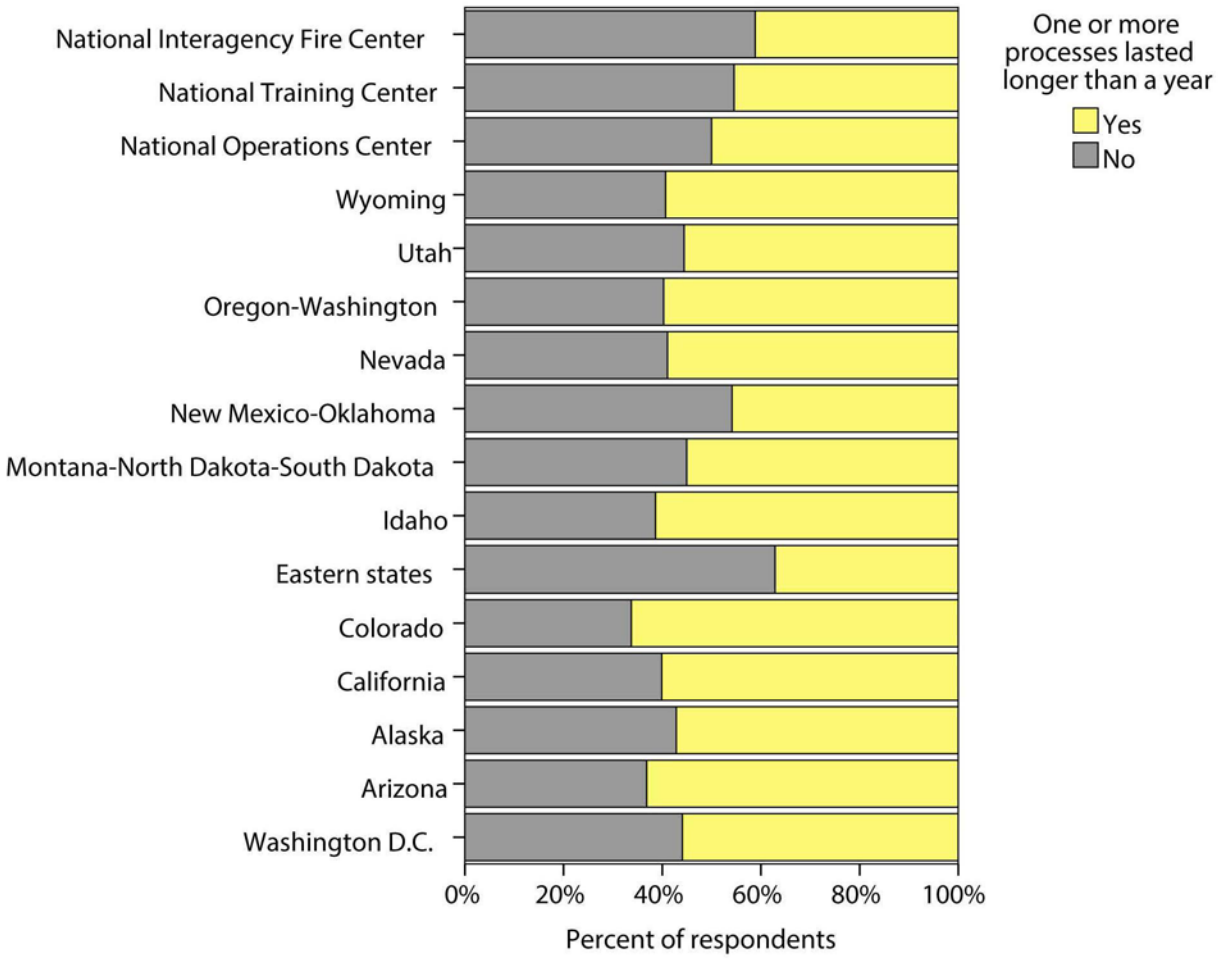

Figure 9. Respondents' experience with one or more collaboration or Alternative Dispute Resolution process that lasted longer than a year, comparing Bureau of Land Management (BLM) State Offices and BLM Centers.

Decision-makers were much more likely than the other respondents to have been involved in one or more collaboration or ADR process that also involved a NEPA process (Wald $\chi^2(1, n = 1{,}878) = 15.54$, p less than 0.001; fig. 10). In general, respondents from higher organizational levels or BLM Centers were less likely to have been involved in one or more collaboration or ADR process that also involved a NEPA process (Wald $\chi^2(3, n = 1{,}878) = 29{,}694.18$, p less than 0.001; fig. 11). Finally, respondents' experiences with one or more collaboration or ADR process that also involved a NEPA process varied among the BLM State Offices and BLM Centers (Wald $\chi^2(13, n = 1{,}878) = 3{,}065.11$, p less than 0.001; fig. 12).

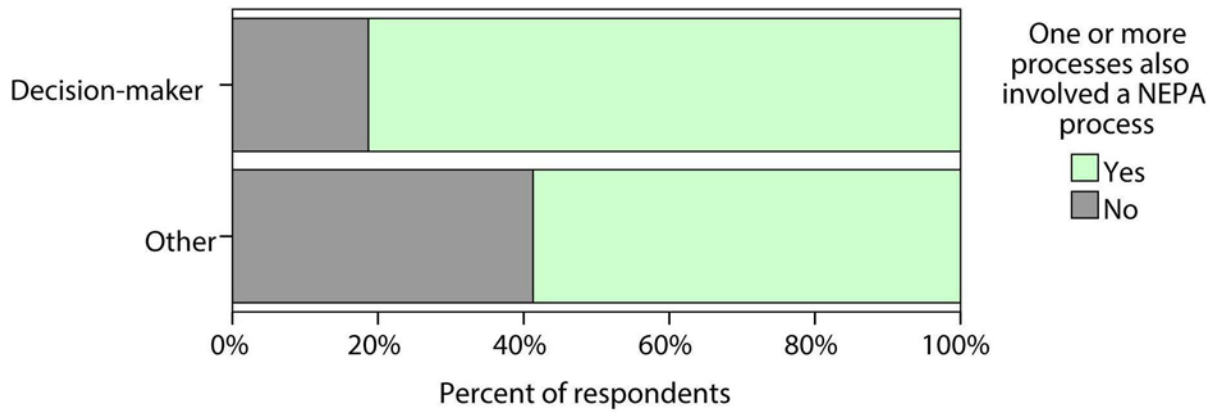

Figure 10. Respondents' experience with one or more collaboration or Alternative Dispute Resolution process that also involved a National Environmental Policy Act (NEPA) process, comparing decision-makers to other respondents.

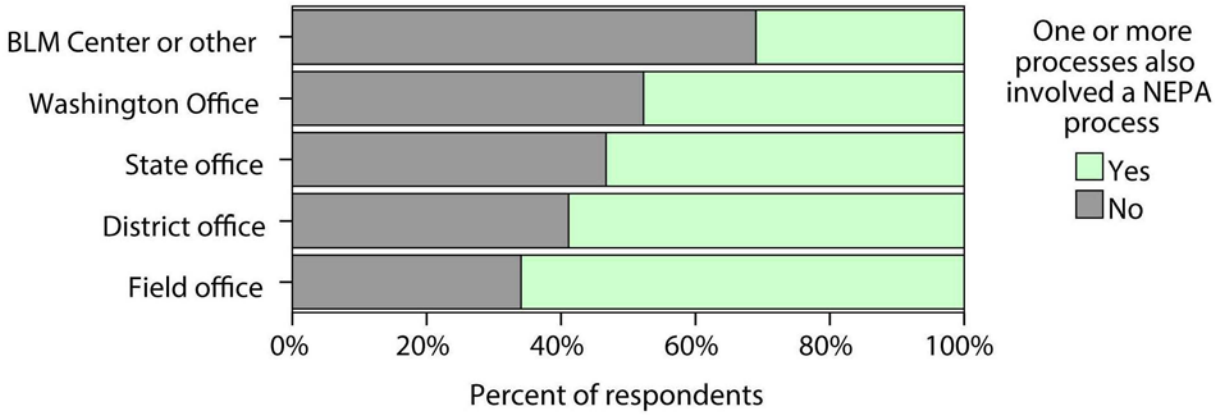

Figure 11. Respondents' experience with one or more collaboration or Alternative Dispute Resolution process that also involved a National Environmental Policy Act (NEPA) process, comparing duty station levels. (BLM, Bureau of Land Management)

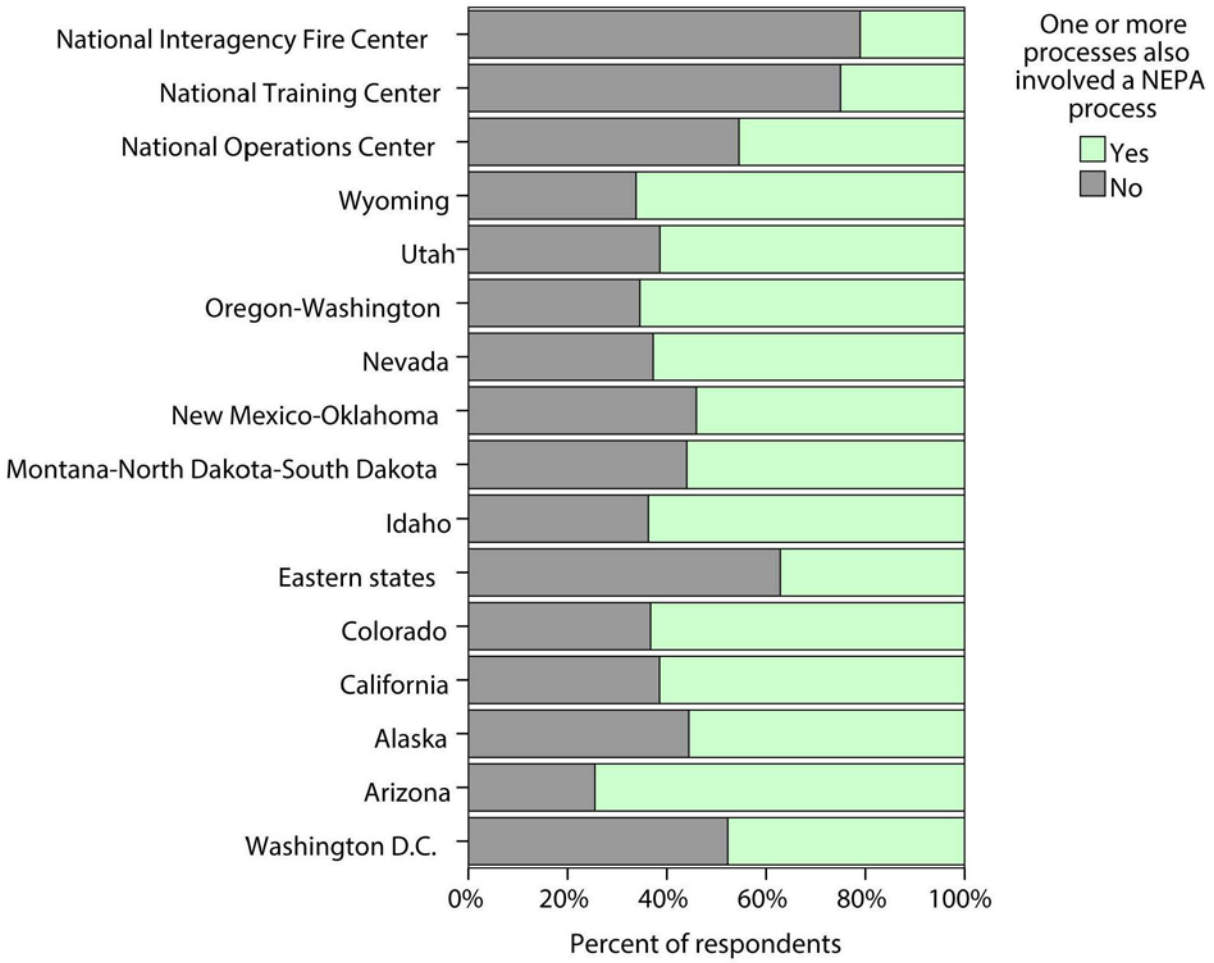

Figure 12. Respondents' experience with one or more collaboration or Alternative Dispute Resolution process that also involved a National Environmental Policy Act (NEPA) process, comparing Bureau of Land Management (BLM) State Offices and BLM Centers.

Decision-makers typically had spent a slightly larger proportion of their time on these processes than the other respondents (Wald $\chi^2(1, n = 1{,}843) = 6.36$, $p = 0.012$; fig. 13). In general, respondents had spent progressively less time on these processes the longer they had worked for the BLM (Wald $\chi^2(5, n = 1{,}843) = 16.64$, $p = 0.005$; fig. 14).

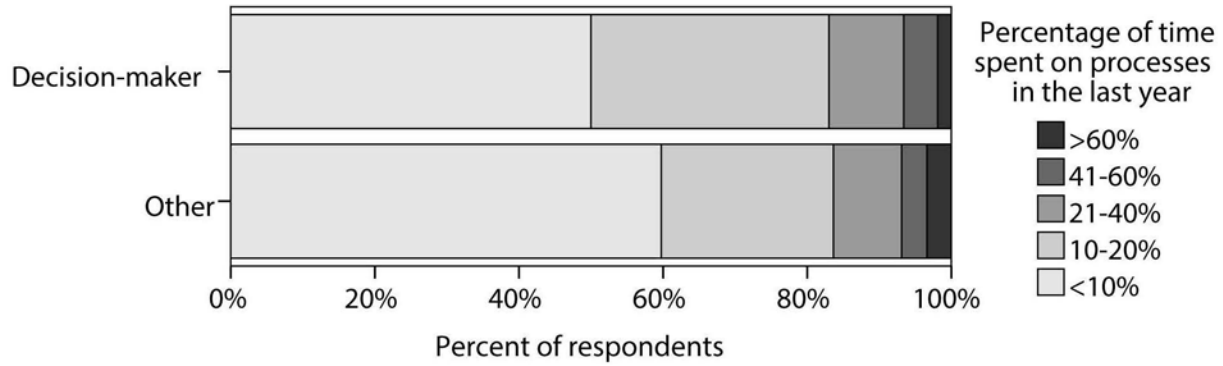

Figure 13. The percentage of time respondents' spent on collaborative and Alternative Dispute Resolution processes over the last year, comparing decision-makers to other respondents. (>, greater than; ≤, less than or equal to; <, less than)

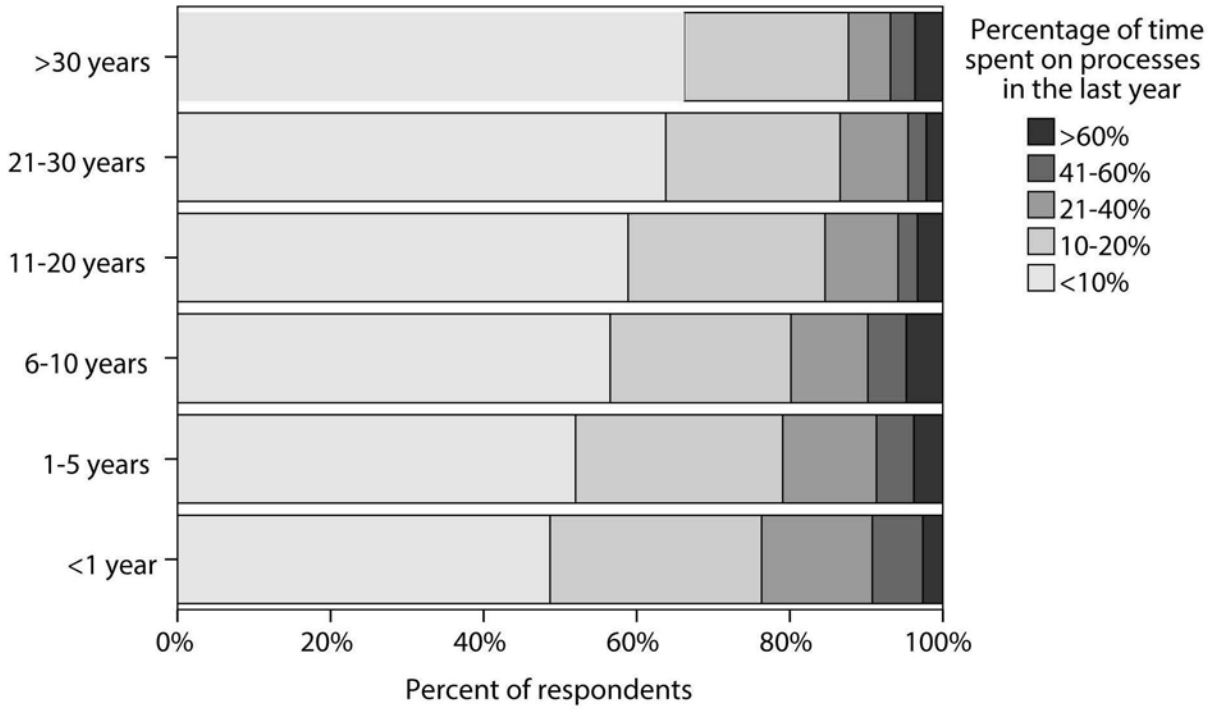

Figure 14. The percentage of time respondents' spent on collaborative and Alternative Dispute Resolution processes over the last year versus the number of years they had worked for the Bureau of Land Management. (>, greater than; ≤, less than or equal to; <, less than)

Participation in collaborative or ADR processes was part of the performance plans of almost two thirds of decision-makers, but only about one third of the other respondents (Wald $\chi^2(1, n = 1{,}732) = 27.34$, p less than 0.001; fig. 15). Also, in general, participation in collaborative and ADR processes was more likely to be part of the performance plan of respondents that had worked for the BLM for less time than those that had worked for the BLM for longer (Wald $\chi^2(5, n = 1{,}732) = 23.03$, p less than 0.001; fig. 16).

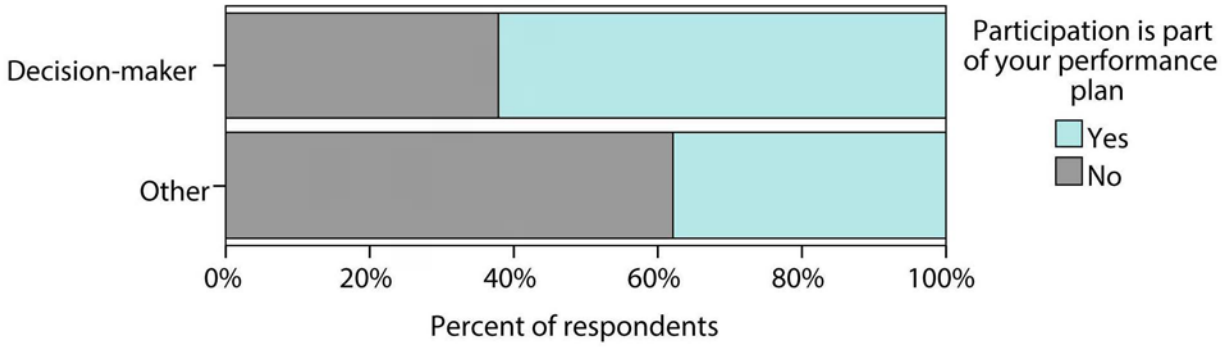

Figure 15. The percentage of decision-makers versus other respondents for which participation in collaborative or Alternative Dispute Resolution processes was part of their performance plan.

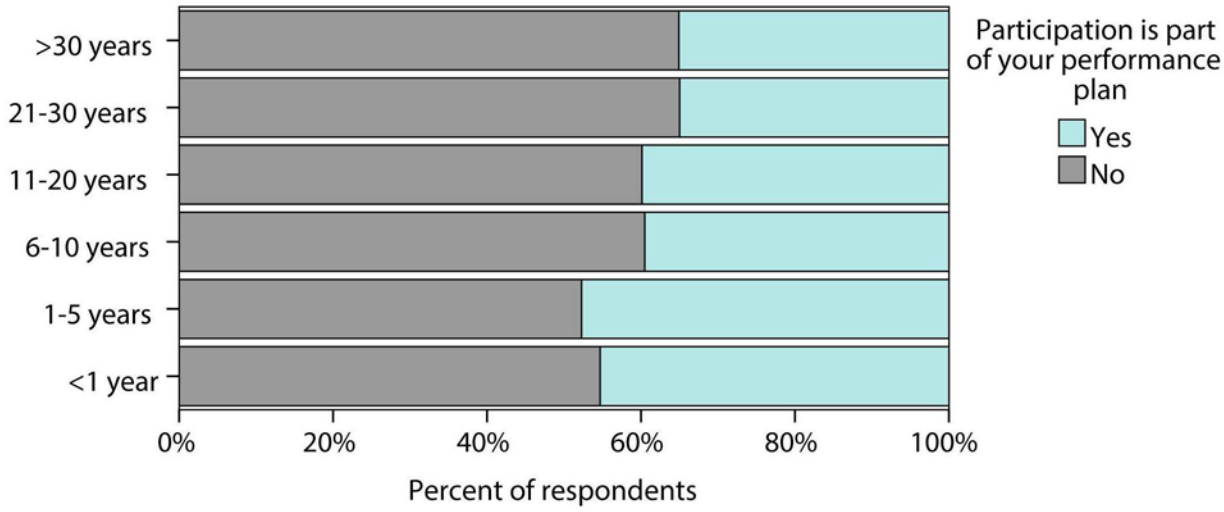

Figure 16. The percentage of respondents for which participation in collaborative or Alternative Dispute Resolution processes was part of their performance plan versus the number of years that they had worked for the Bureau of Land Management.

Collaboration and Alternative Dispute Resolution Skills and Training

The collaboration and ADR skills for which respondents rated themselves as the most highly skilled were communication, participation, partnering, team building, and facilitation of a meeting (greater than 65 percent of respondents rated themselves as an "intermediate" or "expert" skill level; table 3). This was not surprising given that these skills are often used in work activities other than collaborative or ADR processes. For the skills "communication and active listening" and "internal team-building," the majority (greater than 61 percent) had received training (table 3). For the skills "participation in public meetings," "partnering with non-BLM government agencies," "partnering with non-governmental organizations, communities, and(or) interest groups," and "facilitation of a meeting or working group," a majority of respondents (greater than 57 percent) had not received formal training. Despite this, slim majorities (51–57 percent) wanted training or additional training in these skills (table 3).

The skills for which fewer respondents rated their own skill level as "intermediate" or "expert" (44–65 percent) were the skills more specific to collaboration and ADR processes. These included "identifying when collaboration is needed," "negotiation and conflict resolution," "creating and drafting agreements," and "mediation of a dispute or conflict" (table 3). A majority of respondents (greater than 54 percent) had not received formal training in these skills. Despite this, slimmer majorities (greater than 51 percent) wanted training or additional training in these skills, with the notable exception of "negotiation and conflict resolution." Nonetheless, "negotiation and conflict resolution," "creating and drafting agreements," and "mediation of a dispute or conflict" were the most popular candidate skills for training or additional training among the 13 skills listed in the survey.

A majority of respondents (57–86 percent) rated themselves as having little to no skill in the remaining three skills listed in the survey: "building tribal and Government-to-Government relationships," "terminating collaborative efforts or partnerships when necessary," and "feasibility assessments" (table 3). In accordance with this, large majorities of respondents (79–93 percent) had not received formal training in these three skills. Despite this, only half of respondents (47–52 percent) were interested in training or additional training in these skills. This may have been due to the fact that these skills, particularly "terminating collaborative efforts or partnerships when necessary" and "feasibility assessments," may be used primarily by respondents with substantive decision-making authority, and the other respondents may not have much potential to use these skills in the future.

Table 3. Respondents' skill levels, past training, and requests for future training (BLM, Bureau of Land Management; %, percent).

Collaboration and Alternative Dispute Resolution skill items	Skill level									Have you had training in this?[2]		Do you want training/more training?[3]	
	n	No experience	Beginner	Intermediate	Advanced	Expert	Median	Mode	Friedman mean rank[1]	No	Yes	No	Yes
Communication and active listening	2,695	3%	9%	40%	39%	9%	Intermediate	Intermediate	10.1	36%	64%	44%	56%
Participating in public meetings	2,695	10%	18%	34%	27%	10%	Intermediate	Intermediate	8.9	68%	32%	49%	51%
Internal Team-building	2,688	9%	17%	41%	27%	6%	Intermediate	Intermediate	8.7	39%	61%	45%	55%
Partnering with non-BLM government agencies	2,691	11%	19%	35%	28%	8%	Intermediate	Intermediate	8.6	74%	26%	44%	56%
Partnering with non-governmental organizations, communities, and/or interest groups	2,685	14%	21%	34%	24%	7%	Intermediate	Intermediate	8.0	70%	30%	43%	57%
Facilitation of a meeting or working group	2,683	14%	21%	37%	22%	6%	Intermediate	Intermediate	7.7	57%	43%	44%	56%
Identifying when collaboration is needed	2,682	18%	23%	26%	20%	4%	Intermediate	Intermediate	7.2	78%	22%	49%	51%
Negotiation and conflict resolution	2,688	17%	26%	36%	17%	4%	Intermediate	Intermediate	6.9	54%	46%	37%	63%
Creating and drafting agreements	2,691	24%	25%	31%	16%	4%	Intermediate	Intermediate	6.4	71%	30%	42%	58%
Mediation of a dispute or conflict	2,689	28%	27%	31%	11%	2%	Beginner	Intermediate	5.6	67%	33%	42%	58%
Building tribal and Government-to-Government relationships	2,697	34%	23%	26%	13%	4%	Beginner	No experience	5.7	79%	21%	48%	52%
Terminating collaborative efforts or partnerships when necessary	2,684	51%	21%	20%	7%	1%	No experience	No experience	4.0	90%	10%	53%	47%
Feasibility assessments	2,673	66%	20%	11%	3%	1%	No experience	No experience	3.2	93%	7%	50%	50%

[1]The distribution of ranks significantly differs among one or more skill items (Friedman test: Chi-square = 10,176.49, d.f. = 12, n = 2,506, p <0.001).

[2]The proportion of respondents with training significantly differs among one or more skill items (Cochran test: Cochran's Q = 4,480.13, d.f. = 12, n = 2,093, p <0.001).

[3]The proportion of respondents that want future training significantly differs among one or more skill items (Cochran test: Cochran's Q = 282.46, d.f. = 12, n = 2,248, p <0.001).

Training in Collaboration and Alternative Dispute Resolution

We also counted the total number of skills in collaboration and ADR in which respondents had received training (out of 13 skills). The median number of skills in which respondents had received training was 4—approximately one third of the 13 skills. Nineteen percent of respondents had received no training in any of the 13 skills, while only 1 percent had received training in all 13 skills (fig. 17).

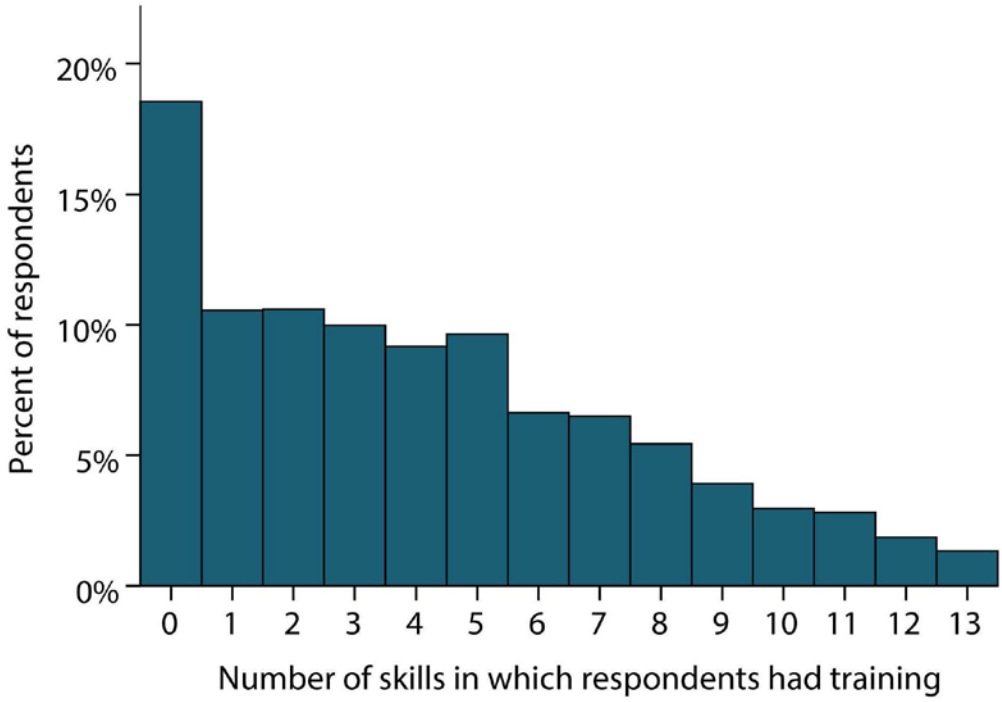

Figure 17. The number of skills in collaboration and Alternative Dispute Resolution in which respondents had training (out of 13).

Respondents in decision-making positions were more likely to have received training in a larger number of collaboration and ADR skills (median = 7, range = 0–13) than the other respondents (median = 3, range = 0–13; Wald $\chi^2(1, n = 1{,}672) = 51.43$, p less than 0.001; fig. 18). In general, respondents that had worked for the BLM for longer were more likely to have received training in a greater number of skills (Wald $\chi^2(5, n = 1{,}672) = 12.55$, $p = 0.028$; fig. 19). The amount of training received also differed by respondents' duty station level (Wald $\chi^2(3, n = 1{,}672) = 213.80$, p less than 0.001; fig. 20) and among the BLM State Offices and BLM Centers (Wald $\chi^2(12, n = 1{,}672) = 145.48$, p less than 0.001; fig. 21). Finally, in general, respondents that had direct experience with collaboration and (or) ADR processes were more likely to have received training in a larger number of skills than those without direct experience in either collaboration or ADR (Wald $\chi^2(3, n = 1{,}672) = 38.94$, p less than 0.001; fig. 22).

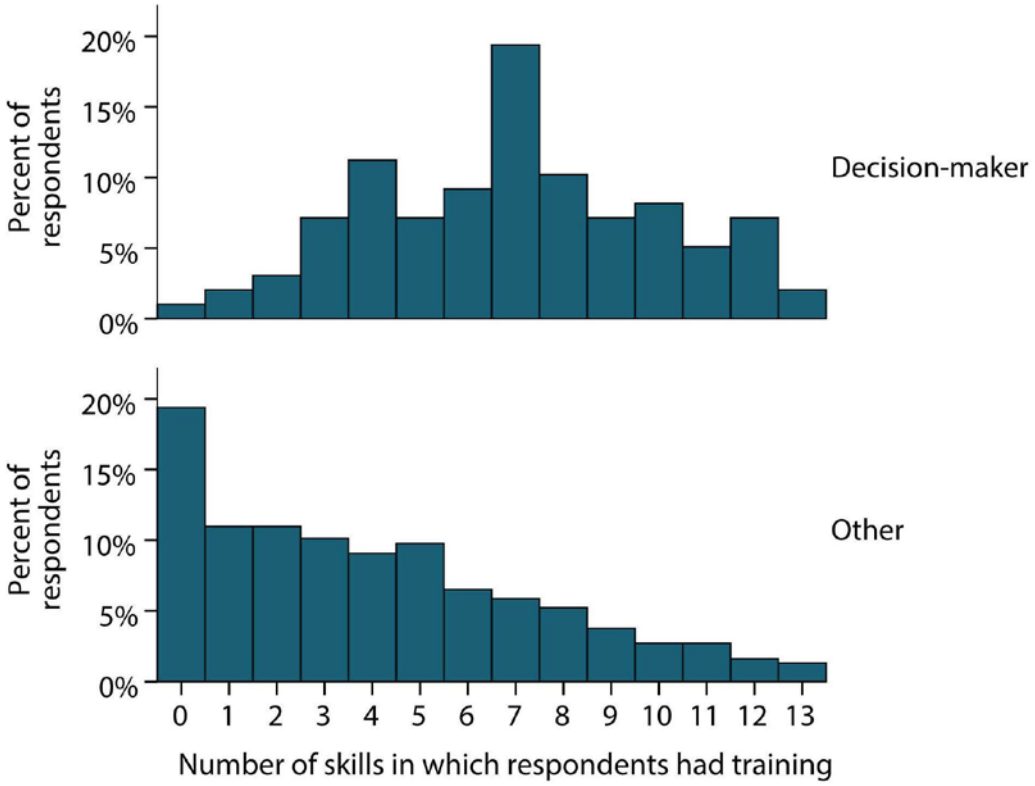

Figure 18. The number of skills in collaboration and Alternative Dispute Resolution in which respondents had training (out of 13) comparing decision-makers versus other respondents.

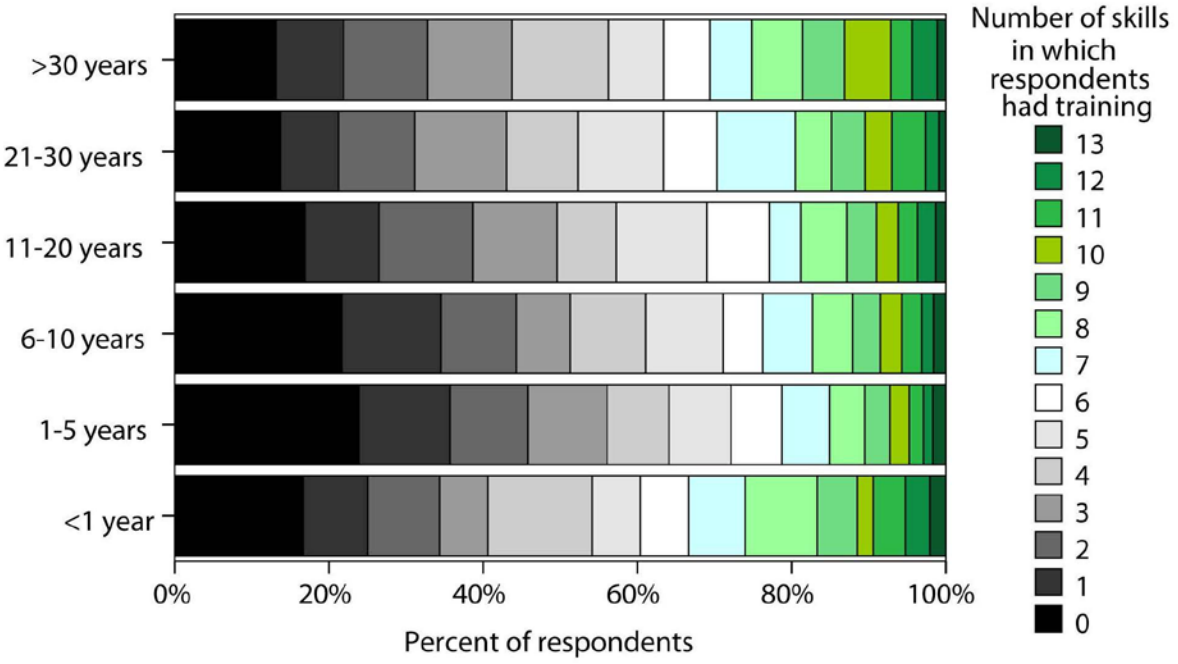

Figure 19. The number of skills in collaboration and Alternative Dispute Resolution in which respondents had training (out of 13) versus the number of years respondents had worked for the Bureau of Land Management.

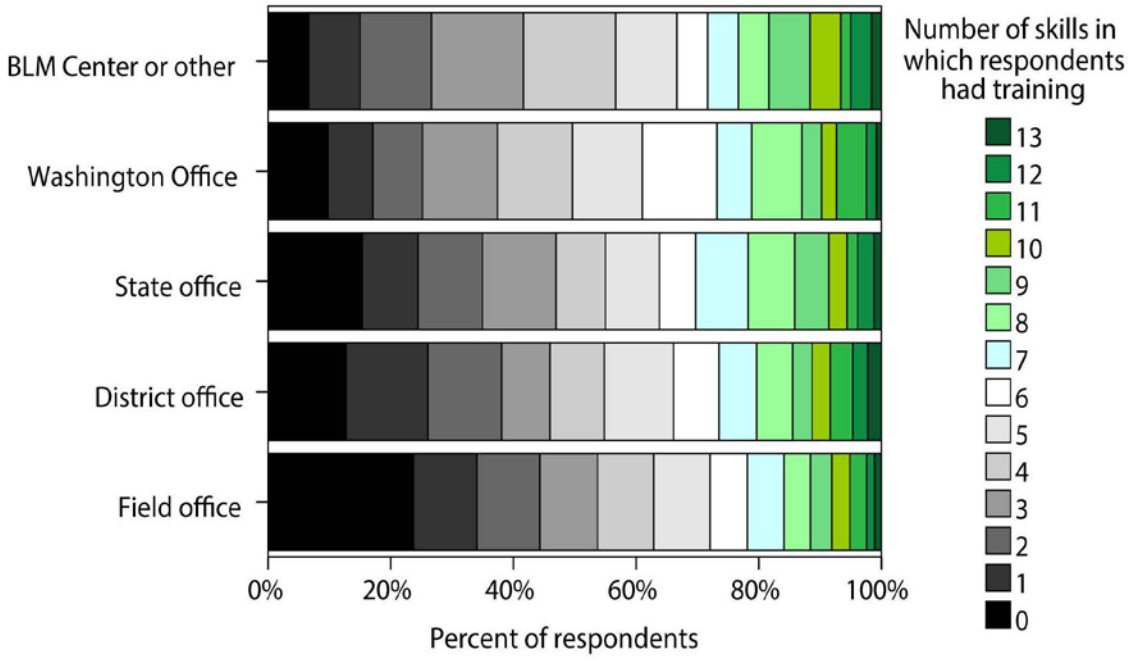

Figure 20. The number of skills in collaboration and Alternative Dispute Resolution in which respondents had training (out of 13) comparing each duty station level.

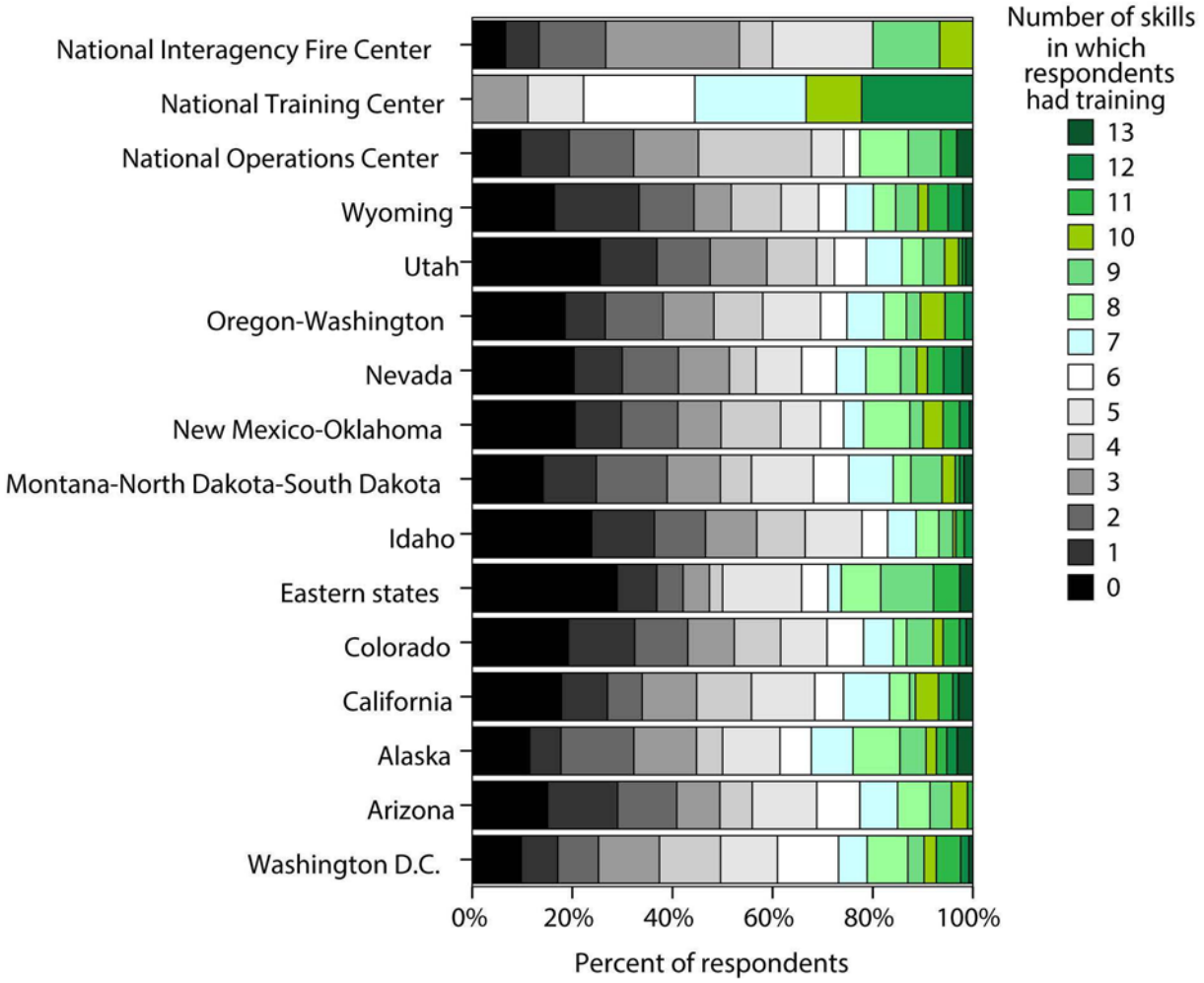

Figure 21. The number of skills in collaboration and Alternative Dispute Resolution in which respondents had training (out of 13) comparing the Bureau of Land Management's (BLM) State Offices and BLM Centers.

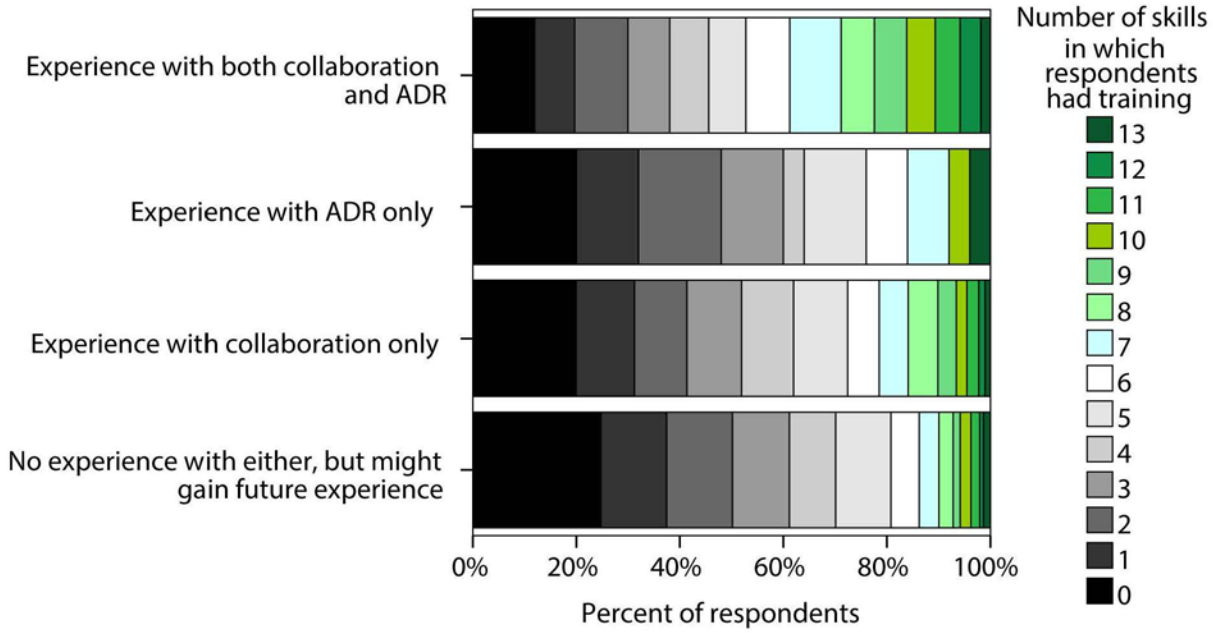

Figure 22. The number of skills in collaboration and Alternative Dispute Resolution (ADR) in which respondents had training (out of 13) versus their experience with collaboration and(or) ADR.

Overall Skill Level in Collaboration and Alternative Dispute Resolution

Respondents' rating of their overall level of skill in collaboration and ADR was measured as the sum of their ratings of their skill level for the 13 itemized skill items along the 5-point skill level scale (0 = no experience, 1 = beginner, 2 = intermediate, 3 = advanced, and 4 = expert). Thus, the potential range of the overall skill level scale was 0 (no experience in any of the 13 skills) to 52 (expert in all 13 skills). The scale's reliability was excellent (Cronbach's alpha = 0.93, n = 2,506). The median value of respondents' overall skill level was 21, which is between a "beginner" and "intermediate" skill level for collaboration and ADR skills on average (fig. 23).

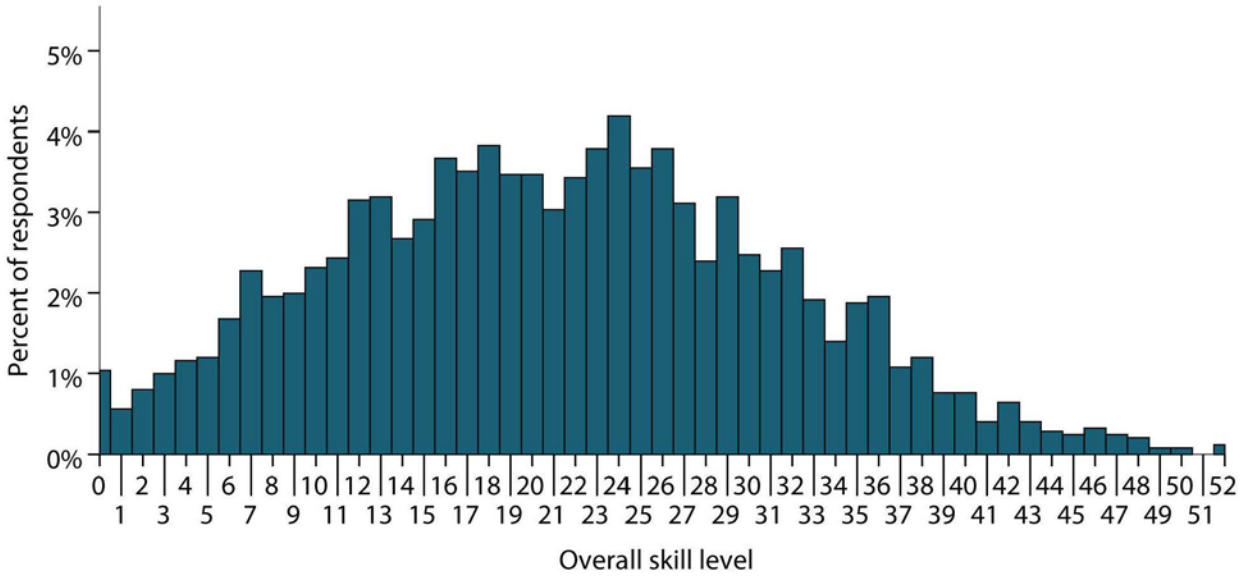

Figure 23. Respondents' self-rated overall skill level in collaboration and Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert" skill level).

Men were more likely to rate themselves as slightly more skilled in collaboration and ADR (median = 22, range = 0–52) than women (median = 20, range = 0–52; Wald $\chi^2(1, n = 1{,}591) = 7.43$, $p = 0.006$; fig. 24). Respondents in decision-making positions typically rated themselves as between an "intermediate" and "advanced" overall skill level (median = 31, range = 13–52), compared to the other respondents who typically rated themselves as between a "beginner" and "intermediate" overall skill level (median = 20, range = 0–52; Wald $\chi^2(1, n = 1{,}591) = 37.67$, p less than 0.001; fig. 25). Respondents that had worked for the BLM for more years rated themselves as increasingly more skilled overall (Wald $\chi^2(5, n = 1{,}591) = 11.76$, $p = 0.038$; fig. 26). Respondents from the higher level duty stations generally rated themselves as more skilled overall (Wald $\chi^2(3, n = 1{,}591) = 33.60$, p less than 0.001; fig. 27). There was some small variation in overall skill level among the BLM State Offices and BLM Centers (Wald $\chi^2(12, n = 1{,}591) = 27.84$, $p = 0.006$; fig. 28). Respondents that had received training in a greater number of skills in collaboration and ADR generally rated themselves as substantially more skilled overall than those with less training (Wald $\chi^2(13, n = 1{,}591) = 371.74$, p less than 0.001; fig. 29). Finally, respondents with experience with collaboration and(or) ADR processes typically rated themselves as more skilled than those without direct experience (Wald $\chi^2(3, n = 1{,}591) = 148.76$, p less than 0.001; fig. 30).

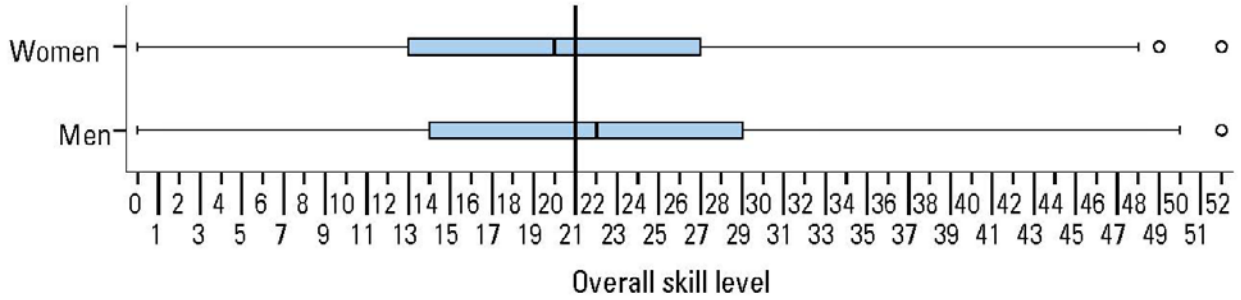

Figure 24. Respondents' self-rated overall skill level in collaboration and Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert" skill level), comparing women to men. The vertical line depicts the median for all respondents for which skill level could be calculated. Refer to the Glossary for further explanation of boxplots.

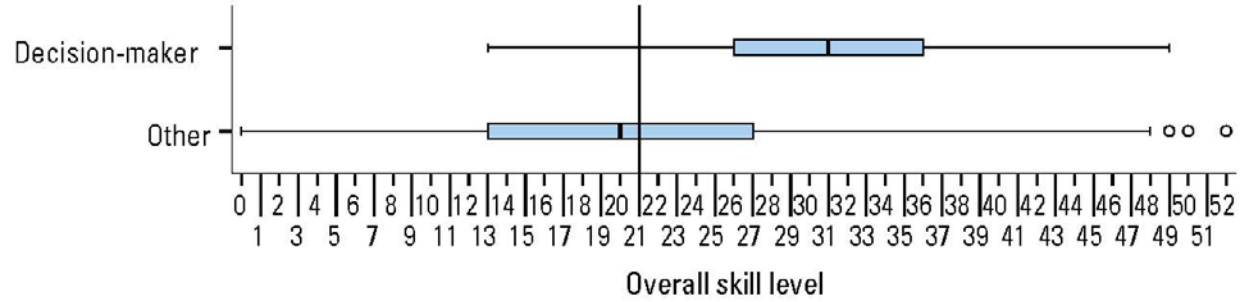

Figure 25. Respondents' self-rated overall skill level in collaboration and Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert" skill level), comparing decision-makers to other respondents. The vertical line depicts the median for all respondents for which skill level could be calculated. Refer to the Glossary for further explanation of boxplots.

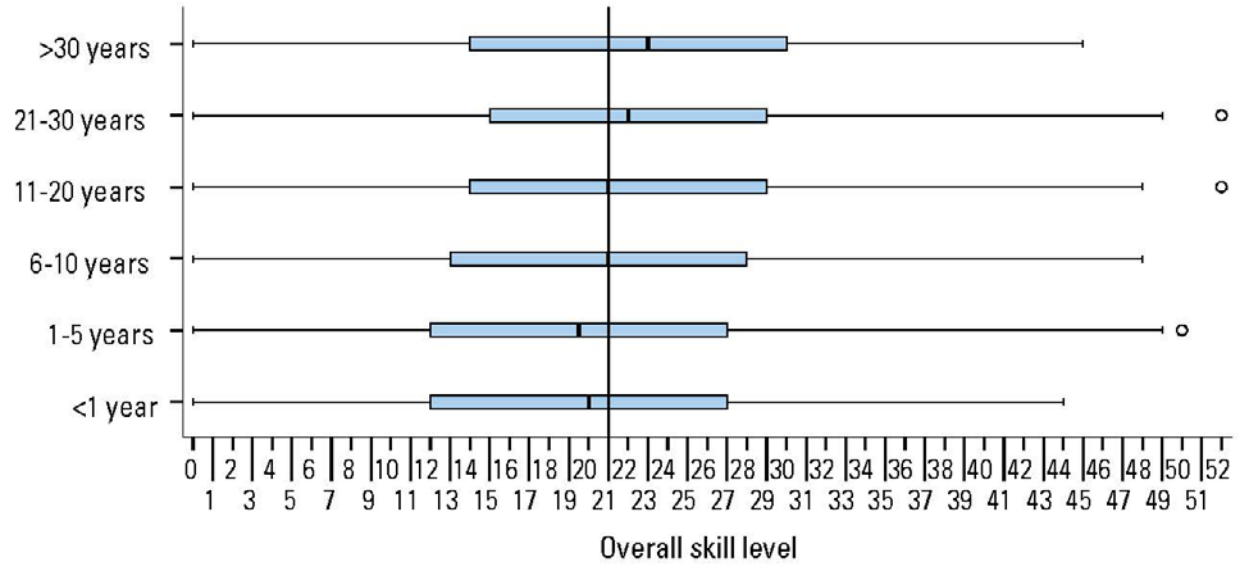

Figure 26. Respondents' self-rated overall skill level in collaboration and Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert" skill level) versus the number of years they had worked for the Bureau of Land Management. The vertical line depicts the median for all respondents for which skill level could be calculated. Refer to the Glossary for further explanation of boxplots.

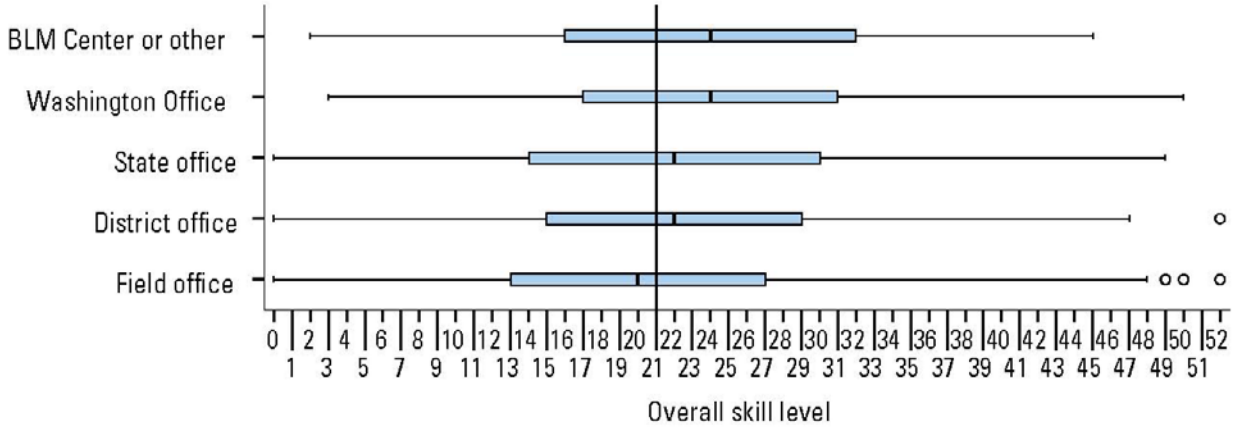

Figure 27. Respondents' self-rated overall skill level in collaboration and Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert" skill level) comparing duty station levels. The vertical line depicts the median for all respondents for which skill level could be calculated. Refer to the Glossary for further explanation of boxplots.

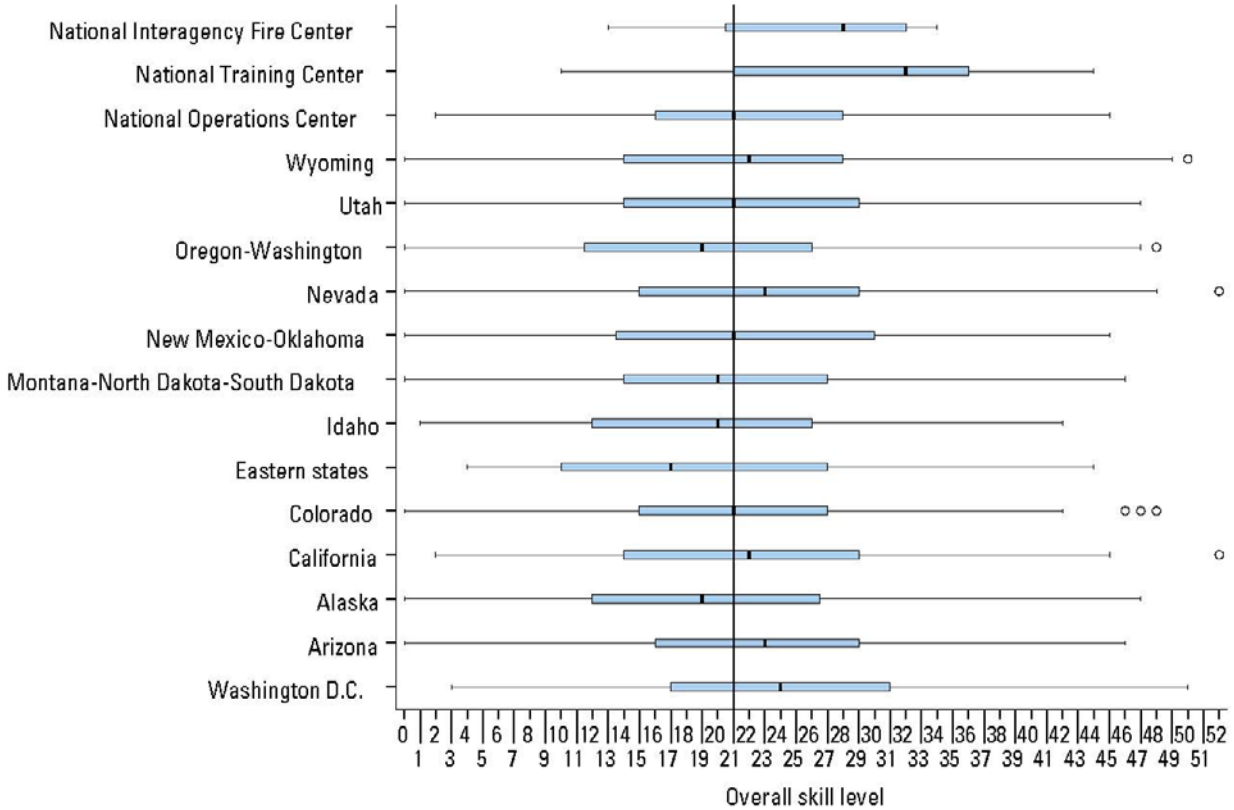

Figure 28. Respondents' self-rated overall skill level in collaboration and Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert" skill level), comparing Bureau of Land Management (BLM) State Offices and BLM Centers. The vertical line depicts the median for all respondents for which skill level could be calculated. Refer to the Glossary for further explanation of boxplots.

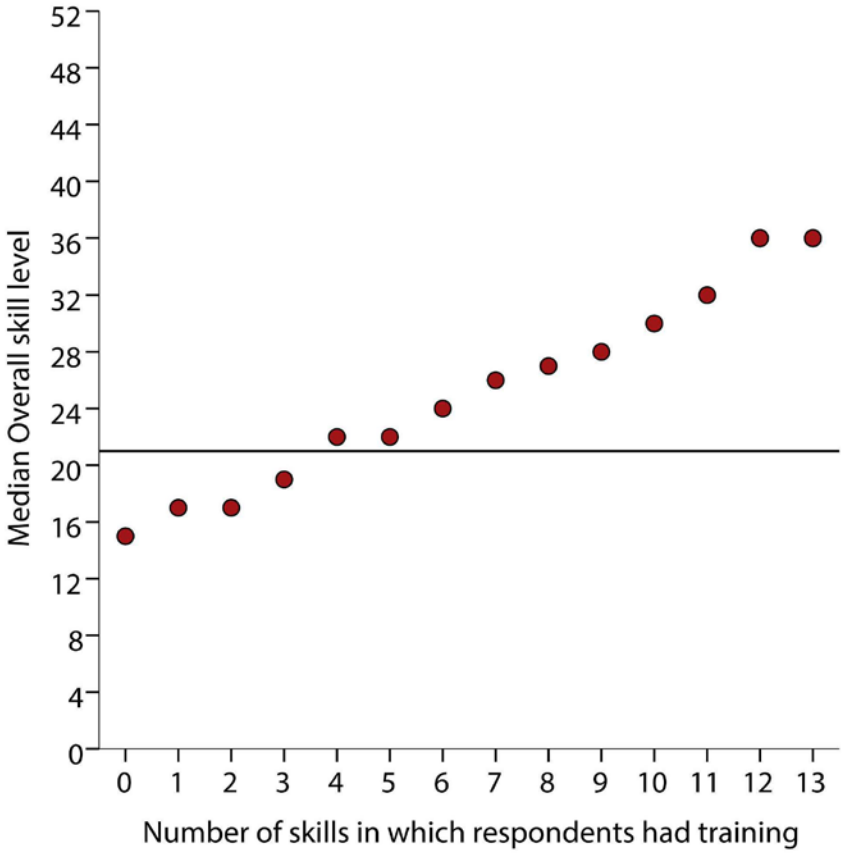

Figure 29. Respondents' self-rated overall skill level in collaboration and Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert" skill level) versus the number of skills in collaboration and Alternative Dispute Resolution in which they had training (out of 13). The horizontal line depicts the median for all respondents for which skill level could be calculated.

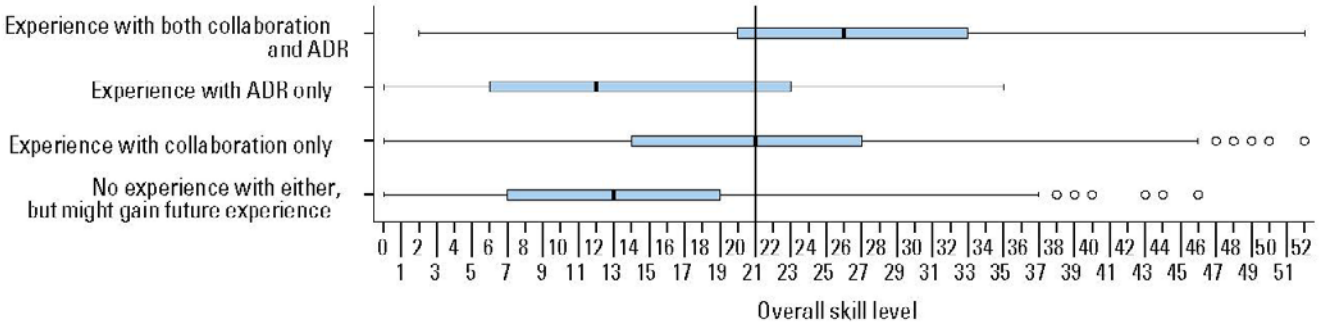

Figure 30. Respondents' self-rated overall skill level in collaboration and Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert" skill level) versus their experience with collaboration and(or) ADR. The vertical line depicts the median for all respondents for which skill level could be calculated. Refer to the Glossary for further explanation of boxplots.

The Origins of Respondents' Skill in Collaboration

Respondents indicated where they believed they had acquired their overall level of skill in collaboration by approximating the percentage of their skill that they attributed to each of the following five potential sources: (1) innate skill, (2) reading about collaboration, (3) hands-on experience, (4) mentors and coaches, and (5) formal training. In most cases, these five sources would represent all potential sources of skill for BLM personnel, and therefore, the combined total of percentages that respondents attributed to these five sources had to equal 100 percent. "Hands on experience" was credited with contributing the most (44 percent) to respondents' skill in collaboration (table 4). "Innate skill" and "mentors and coaches" were the next largest contributors (20 and 15 percent, respectively), and "formal training" and "reading about collaboration" were each credited the least (11 and 9 percent, respectively; table 4).

Table 4. The percentage of respondents' skill that they attributed to each of the five potential sources (mean, standard deviation [s.d.], median, and mode).

	Percentage of skill attributed to each source			
Source of collaborative skill (*n* = 2,655)	mean	s.d.	median	mode
Hands on experience	44%	23	40%	50%
Innate skill	20%	18	20%	10%
Mentors and coaches	15%	15	10%	0%
Formal training	11%	13	10%	0%
Reading about collaboration	9%	13	5%	0%

Interest in Future Training

We counted the total number of skills in collaboration and ADR (out of the 13 skills) for which respondents wanted training or additional training in the future. Although the median value was 8 or approximately two-thirds of the 13 skills, the distribution of responses across the scale was bimodal or U-shaped due to a relatively large group of respondents (20 percent) that had no interest in future training in collaboration (training or additional training in 0 skills) and a relatively large group of respondents (24 percent) that had a very strong interest in future training (training or additional training in 13 skills; fig. 31).

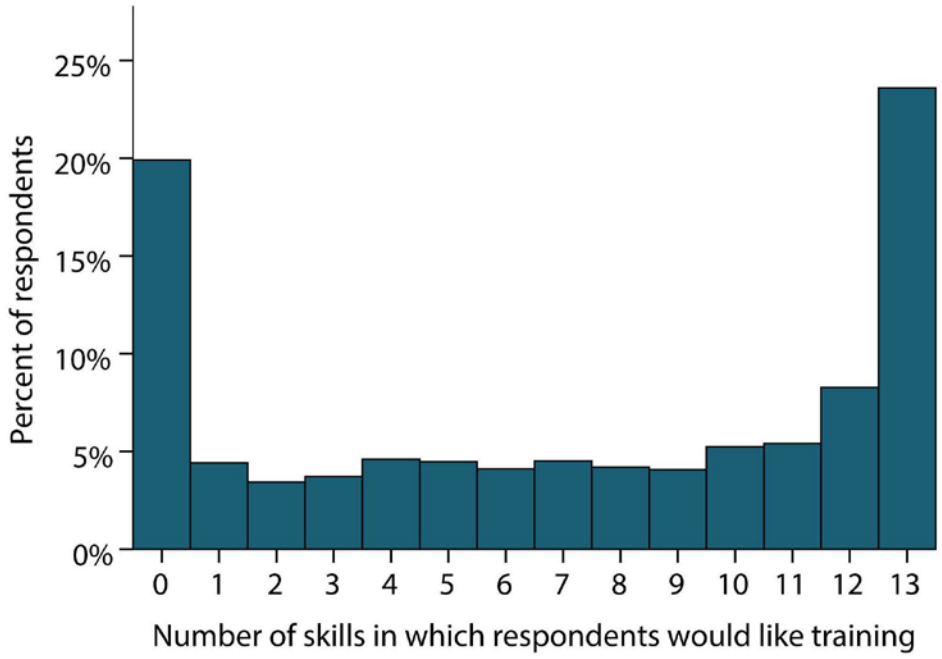

Figure 31. The number of skills in collaboration and Alternative Dispute Resolution in which respondents would like training or additional training (out of 13).

Women generally wanted future training in more collaboration and ADR skills than men (Wald $\chi^2(1, n = 1{,}516) = 31.57$, p less than 0.001; fig. 32). Decision-makers wanted slightly less training or additional training than other respondents (Wald $\chi^2(1, n = 1{,}516) = 10.55$, $p = 0.001$; fig. 33). Respondents were progressively less and less likely to want more training or additional training the longer they had worked for the BLM (Wald $\chi^2(5, n = 1{,}516) = 80.55$, p less than 0.001; fig. 34). Respondents varied by duty station level (Wald $\chi^2(3, n = 1{,}516) = 19.79$, p less than 0.001; fig. 35) and by how they rated their overall skill in collaboration and ADR (Wald $\chi^2(1, n = 1{,}516) = 150.469$, p less than 0.001; fig. 36).

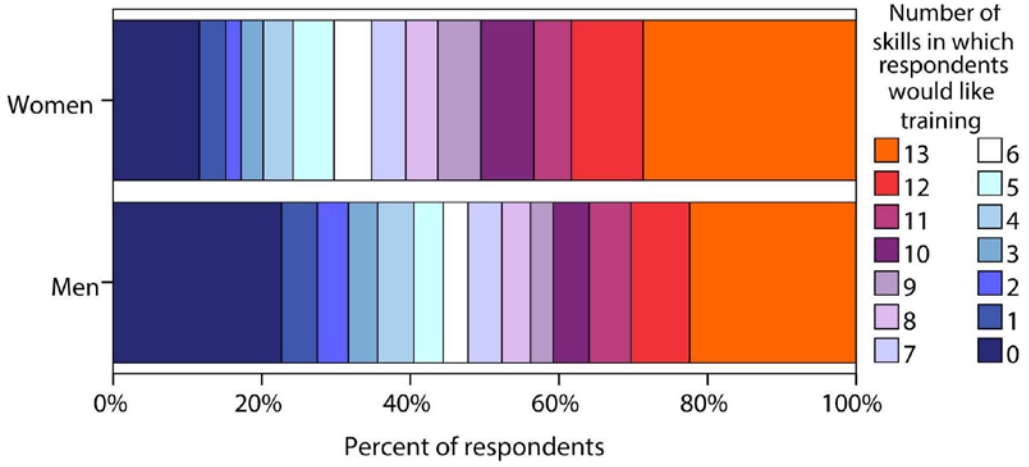

Figure 32. The number of skills in collaboration and Alternative Dispute Resolution in which respondents would like training or additional training (out of 13), comparing women to men.

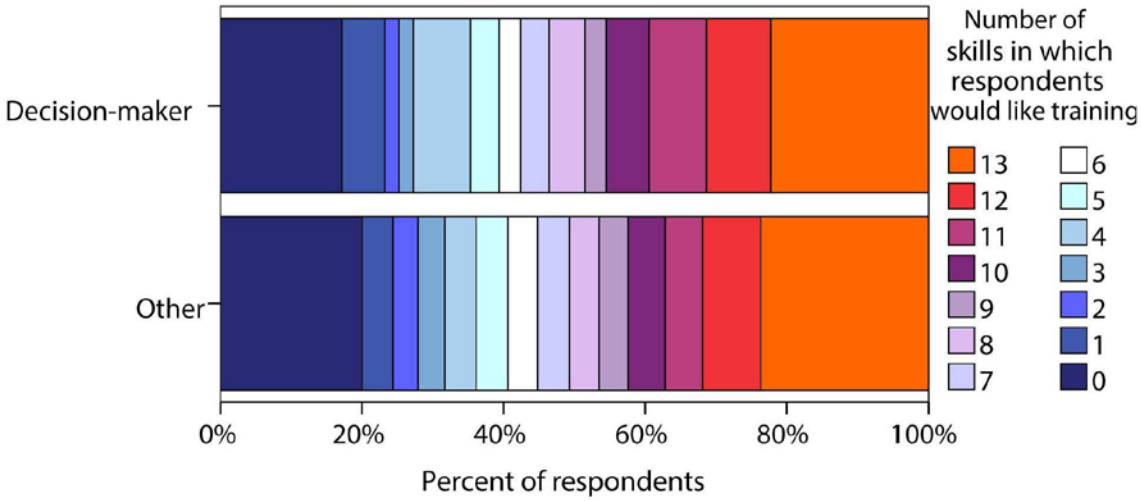

Figure 33. The number of skills in collaboration and Alternative Dispute Resolution in which respondents would like training or additional training (out of 13), comparing decision-makers to other respondents

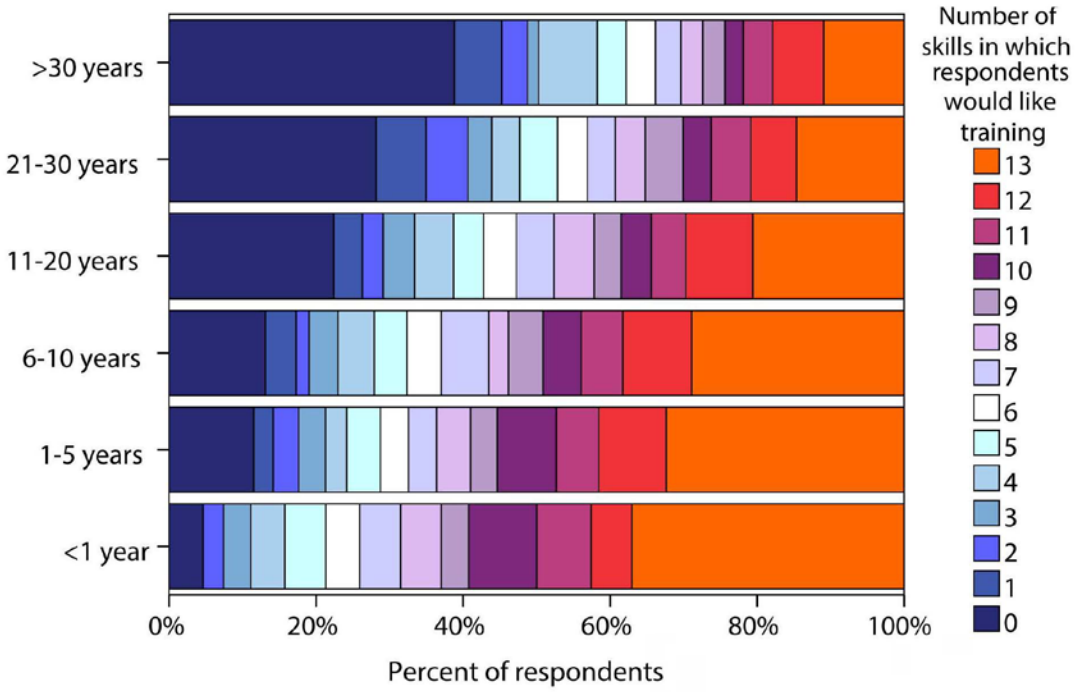

Figure 34. The number of skills in collaboration and Alternative Dispute Resolution in which respondents would like training or additional training (out of 13) versus the number of years they had worked for the Bureau of Land Management. (>, greater than; less than or equal to, less than).

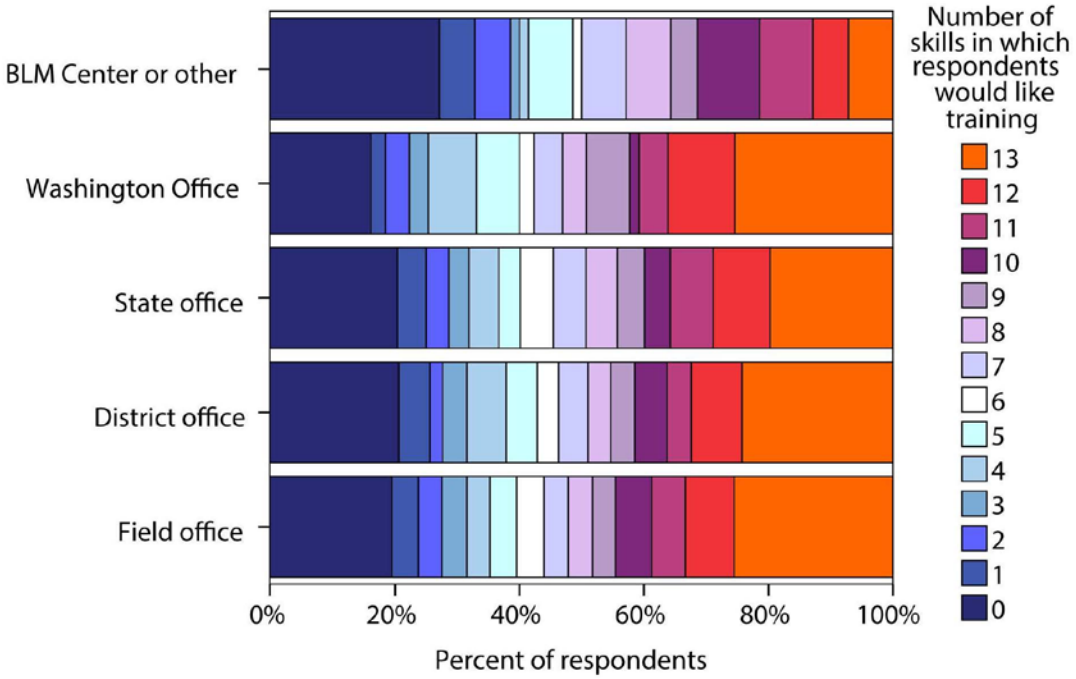

Figure 35. The number of skills in collaboration and Alternative Dispute Resolution in which respondents would like training or additional training (out of 13), comparing duty station levels. (BLM, Bureau of Land Management)

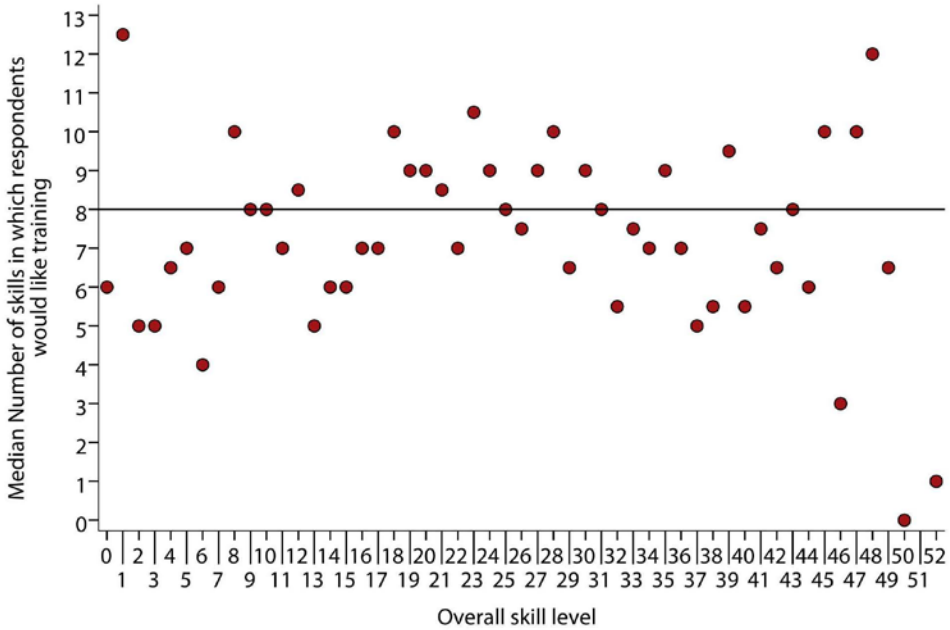

Figure 36. The number of skills in collaboration and Alternative Dispute Resolution in which respondents would like training or additional training (out of 13) versus their self-rated overall skill level in collaboration and Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert" skill level). The horizontal line depicts the median for all respondents that answered this question.

Professional and Personal Obstacles to Taking Training

The professional obstacles to taking training in collaboration listed in the survey were encountered by a larger proportion of respondents than the personal obstacles listed in the survey (table 5). A large majority of respondents (79 percent) had encountered "travel ceiling constraints." A majority of respondents had also been hindered by budget (72 percent) and time (52 percent) as barriers to taking training. A little less than half of respondents (45 percent) had been prevented from taking training in collaboration at some point in their career because they had been unaware that training in collaboration was available. In contrast, the professional barriers "collaboration is unlikely to be part of my job" and "my supervisor(s) discouraged me from taking further training" had been encountered by much smaller proportions of respondents (16 percent and 11 percent, respectively). All of the personal obstacles to taking training in collaboration had been encountered by a minority of respondents (less than 18 percent). In particular, only 6 percent of respondents indicated that their personality was not suited for collaboration.

Table 5. The percentage of respondents that had encountered each of the 11 professional and personal obstacles to taking training in collaboration. (%, percent)

Obstacle to taking training in collaboration	Personally encountered this obstacle[1]		
	n	Yes	No
Travel ceiling constraints	2,679	79%	21%
I lack the budget for training	2,681	72%	28%
I lack the time for training	2,674	52%	48%
I was unaware that training in collaboration was available	2,667	45%	55%
Training courses are offered at bad times of the year	2,547	26%	74%
I lack interest in learning any more about collaboration	2,665	18%	82%
Collaboration is unlikely to be part of my job	2,671	16%	84%
My supervisor(s) discouraged me from taking further training	2,663	11%	89%
I avoid situations with potential conflict, therefore, I have not sought training	2,672	10%	90%
I do not think that training is an effective way to improve peoples' skill at collaboration	2,664	8%	92%
My personality is not suited for collaboration	2,664	6%	94%

[1]The proportion of respondents that had experienced each obstacle to taking training in collaboration significantly differs among one or more of the obstacles (Cochran test: Cochran's Q = 8,554.10, d.f. = 10, n = 2,534, p <0.001).

We then counted the total number of obstacles to training encountered by each respondent (out of 11 obstacles). Almost all respondents indicated that they had encountered at least one professional or personal obstacle to taking training in collaboration (fig. 37); only 6 percent had not encountered any of the 11 obstacles listed in table 4. The median and mode number of obstacles to taking training was 3 of the 11 obstacles. Only 5 percent of respondents had encountered greater than or equal to 7 of the 11 obstacles.

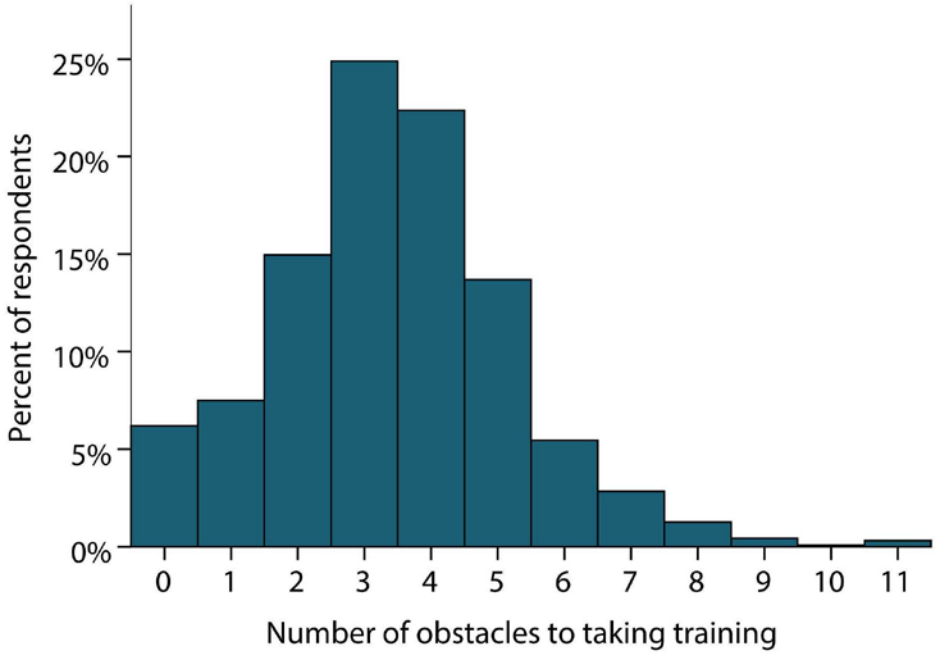

Figure 37. The total number of professional and personal obstacles to taking training in collaboration that respondents' had encountered in the past (out of 11).

Respondents in decision-making positions reported encountering fewer professional and personal obstacles to taking formal training than other respondents (Wald $\chi^2(1, n = 1{,}996) = 33.40$, p less than 0.001; fig. 38). Respondents varied by how many years they had worked for the BLM (Wald $\chi^2(5, n = 1{,}996) = 20.73$, $p = 0.001$; fig. 39). Also, the number of obstacles to taking training encountered by respondents differed among the BLM State Offices and BLM Centers (Wald $\chi^2(12, n = 1{,}996) = 34.47$, $p = 0.001$; fig. 40). Finally, the number of obstacles to taking training in collaboration that respondents had encountered varied by their experience with collaboration and(or) ADR (Wald $\chi^2(3, n = 1{,}996) = 15.86$, $p = 0.001$; fig. 41).

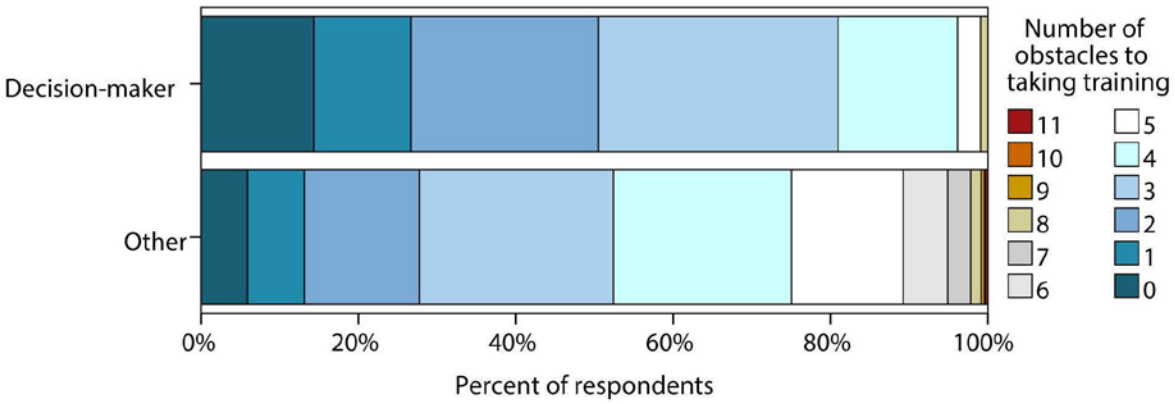

Figure 38. The number of professional and personal obstacles to taking training in collaboration that respondents had encountered in the past (out of 11), comparing decision-makers to other respondents.

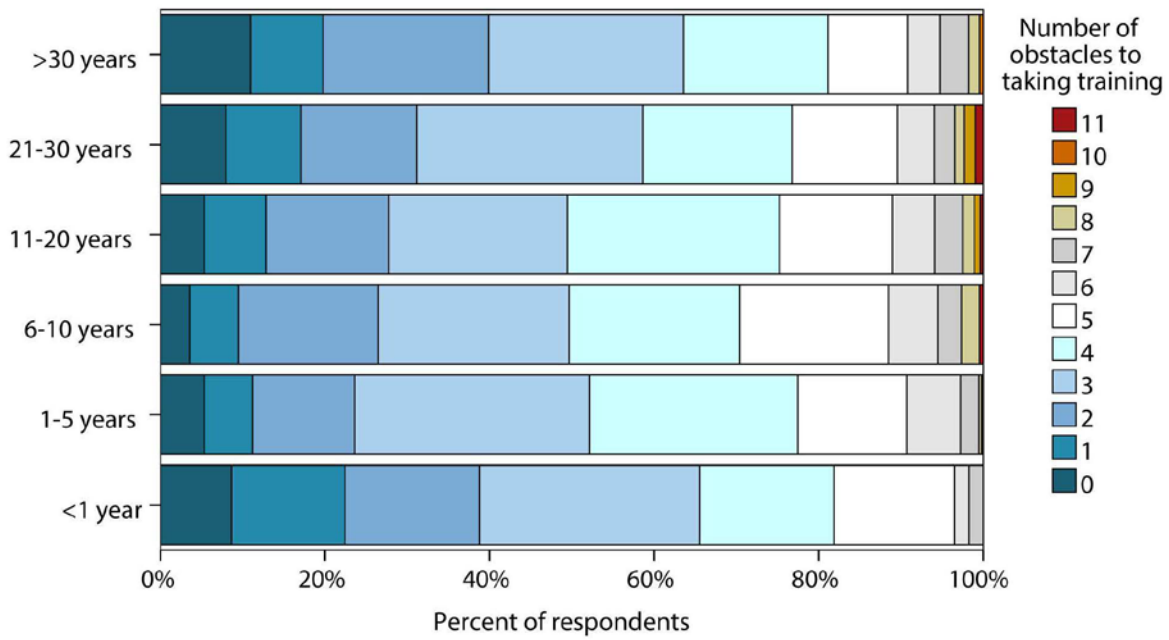

Figure 39. The number of professional and personal obstacles to taking training in collaboration that respondents had encountered in the past (out of 11) versus the number of years they had worked for the Bureau of Land Management. (>, greater than; <, less than)

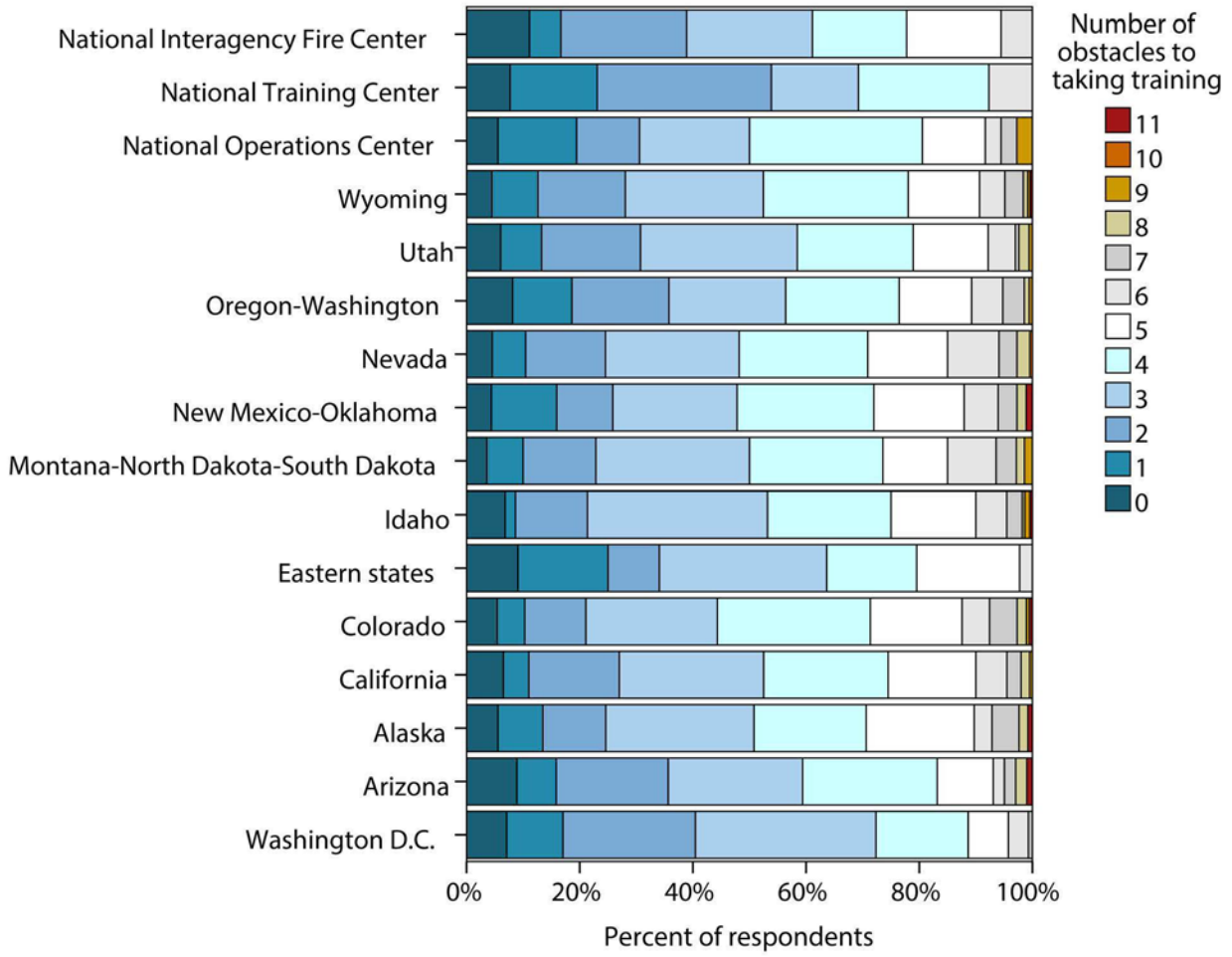

Figure 40. The number of professional and personal obstacles to taking training in collaboration that respondents had encountered in the past (out of 11), comparing Bureau of Land Management (BLM) State Offices and BLM Centers.

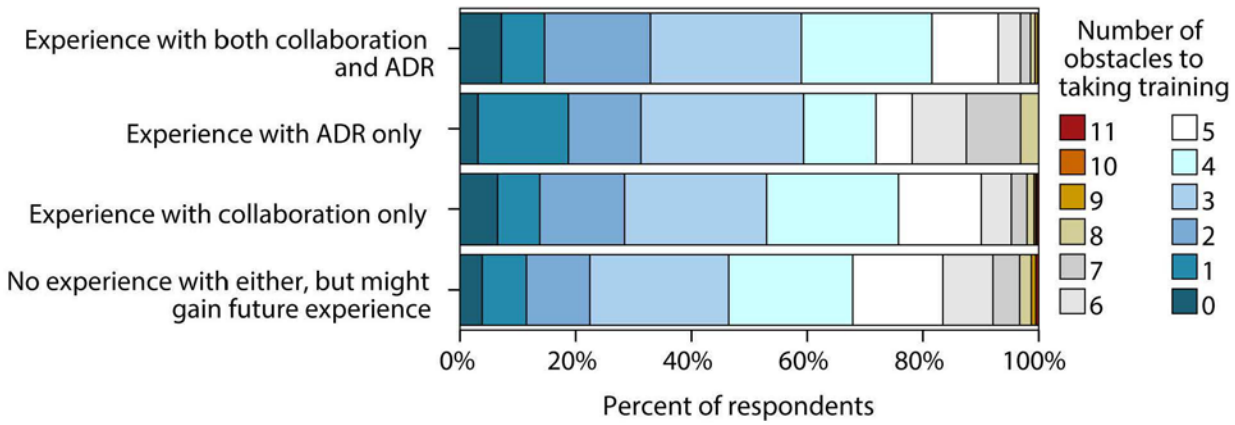

Figure 41. The number of professional and personal obstacles to taking training in collaboration that respondents had encountered in the past (out of 11) versus their experience with collaboration and(or) Alternative Dispute Resolution (ADR).

Resources for Collaboration and Alternative Dispute Resolution

Respondents were asked to identify which resources for collaboration and ADR they had been aware of prior to the survey and to rate how likely they would be to use those resources in the future. Large majorities of respondents (75–91 percent) were already aware of the availability of "a mentor or coach," "BLM field or desk guides/handbooks on collaboration, cooperating agencies, or the Federal Advisory Committee Act," "an online or media search," "formal training in collaboration or dispute resolution," and "a professional facilitator or mediator" (table 6). These were also the resources that respondents were most likely to use for collaboration and ADR in the future (table 6). Only half of respondents (49 percent) had been previously aware of the BLM's Collaboration and Dispute Resolution SharePoint site (table 6). Perhaps because so many respondents had been unaware of this resource, they were somewhat less likely to use this resource in the future than the resources above (table 6). Although the majority of respondents (55–64 percent) were previously aware of the "BLM's Washington Office of Collaboration and Appropriate Dispute Resolution" and collaboration and ADR specialists from the BLM, another agency, and outside consultants as available resources, they were generally "somewhat unlikely" to use these resources in the future (table 6). Finally, almost two thirds of respondents had been unaware of "The Udall Foundation's U.S. Institute for Environmental Conflict Resolution," and the majority were also "unlikely" or "very unlikely" to ever use this resource in the future (table 6).

Table 6. Respondents' awareness of and likelihood to use available resources for collaboration and Alternative Dispute Resolution (ADR) in the future. (BLM, Bureau of Land Management; %, percent; <, less than)

	Likelihood to to use the resource in the future								Awareness of the resource[2]	
Currently available resources for collaboration and Alternative Dispute Resolution	*n*	Unlikely or Very unlikely	Somewhat unlikely	Somewhat likely	Likely or Very likely	Median	Mode	Friedman mean rank[1]	No	Yes
A mentor or coach	2,600	19%	14%	27%	40%	Somewhat likely	Somewhat likely	7.5	12%	88%
BLM Field or Desk Guides/Handbooks on collaboration, cooperating agencies, or the Federal Advisory Committee Act	2,568	21%	15%	28%	36%	Somewhat likely	Somewhat likely	7.2	25%	75%
An online or media search	2,599	22%	15%	25%	37%	Somewhat likely	Somewhat likely	7.2	11%	89%
Formal training in collaboration or dispute resolution	2,603	25%	14%	28%	34%	Somewhat likely	Somewhat likely	7.0	14%	86%
A professional facilitator or mediator	2,622	24%	18%	28%	30%	Somewhat likely	Somewhat likely	6.8	9%	91%
BLM Collaboration and Dispute Resolution SharePoint site	2,376	31%	19%	28%	22%	Somewhat unlikely	Somewhat likely	6.0	51%	49%
A BLM State Natural Resources ADR Advisor	2,419	35%	19%	25%	22%	Somewhat unlikely	Somewhat likely	5.7	41%	59%
A collaboration specialist in DOI or another agency	2,477	35%	20%	26%	19%	Somewhat unlikely	Somewhat likely	5.5	36%	64%
BLM's Washington Office of Collaboration and Appropriate Dispute Resolution	2,387	45%	22%	19%	14%	Somewhat unlikely	Unlikely	4.6	45%	55%
A university or outside consultant group[3]	2,459	46%	19%	20%	14%	Somewhat unlikely	Unlikely	4.5	36%	64%
The Udall Foundation's US Institute for Environmental Conflict Resolution	2,171	54%	19%	16%	11%	Unlikely	Very unlikely	4.0	64%	36%

[1]The likelihood of using the resource in the future significantly differed among one or more of the resources (Friedman test: Chi-square = 3,541.88, d.f. = 10, n = 1,930, p <0.001 using the categories: very unlikely, unlikely, somewhat unlikely, somewhat likely, likely, very likely).

[2]The proportion of respondents that knew about each resource significantly differs among one or more resources (Cochran test: Cochran's Q = 4,120.33, d.f. = 10, n = 1,923, p

[3]Respondents were given the examples of the National Policy Consensus, the Consensus Building Institute (CBI), Collaborative Decision Resources (CDR) Associates, RESOLVE, the Indian Dispute Resolution Service.

Awareness of Resources Available for Collaboration and Alternative Dispute Resolution

We also counted the total number of resources available for collaboration and ADR that respondents were aware of prior to the survey (out of 11 resources). Almost all of the respondents were previously aware of at least some of the 11 resources listed, and about a quarter of respondents were already aware of all of them (fig. 42). The median value was 8 resources.

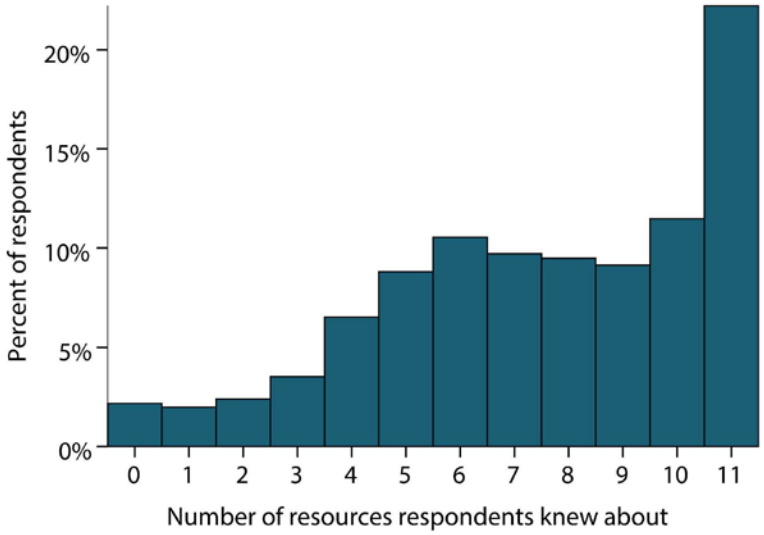

Figure 42. The total number of resources for collaboration and Alternative Dispute Resolution that respondents were aware of prior to the survey (out of 11).

Men were generally aware of more resources than women (Wald $\chi^2(1, n = 1{,}580) = 7.56$, $p = 0.006$; fig. 43). Decision-makers knew about more resources than other respondents (Wald $\chi^2(1, n = 1{,}580) = 8.41$, $p = 0.004$; fig. 44). Awareness of resources varied by respondents' duty station level (Wald $\chi^2(3, n = 1{,}580) = 42.76$, p less than 0.001; fig. 45), and across the State Offices and BLM Centers (Wald $\chi^2(12, n = 1{,}580) = 21.76$, $p = 0.040$; fig. 46). Finally, respondents were generally aware of more resources if they had training in more skills (Wald $\chi^2(13, n = 1{,}580) = 55.46$, p less than 0.001; fig. 47), and if they rated themselves as having a higher overall level of skill in collaboration and Alternative Dispute Resolution (Wald $\chi^2(51, n = 1{,}580) = 198.98$, p less than 0.001; fig. 48).

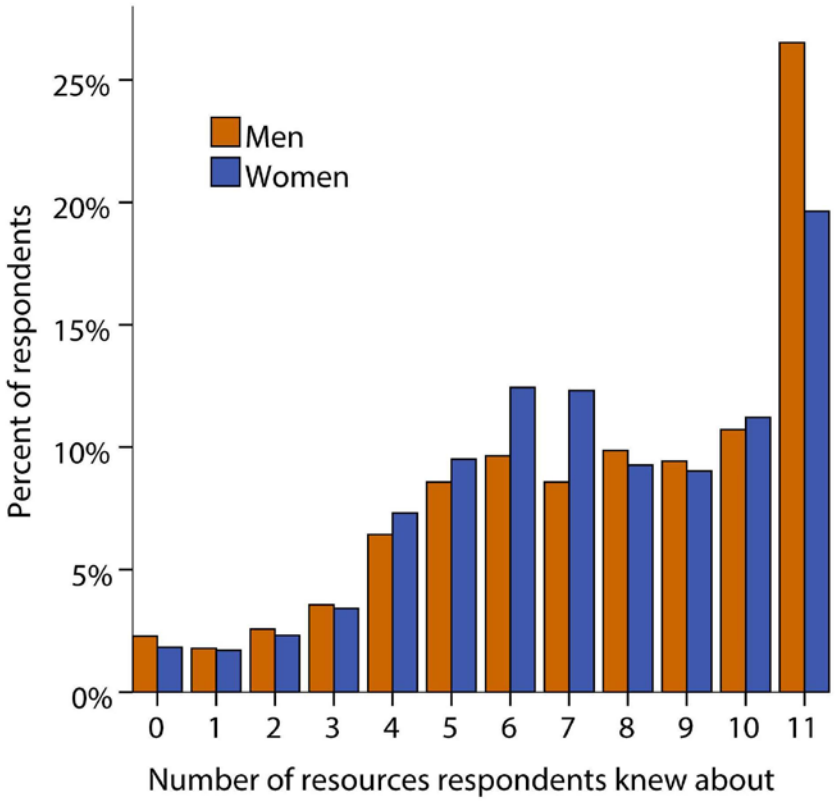

Figure 43. The number of resources in collaboration and Alternative Dispute Resolution that respondents were aware of prior to the survey (out of 11), comparing women to men.

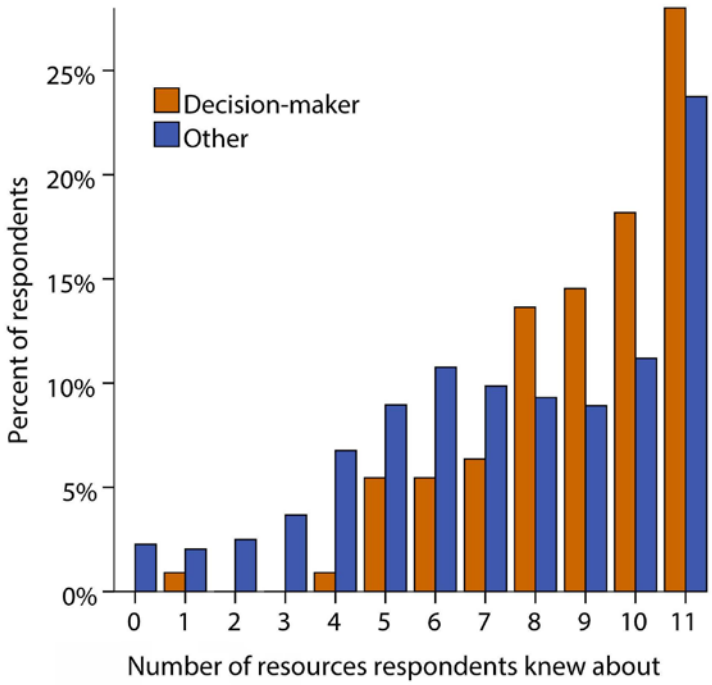

Figure 44. The number of resources in collaboration and Alternative Dispute Resolution that respondents were aware of prior to the survey (out of 11), comparing decision-makers to other respondents.

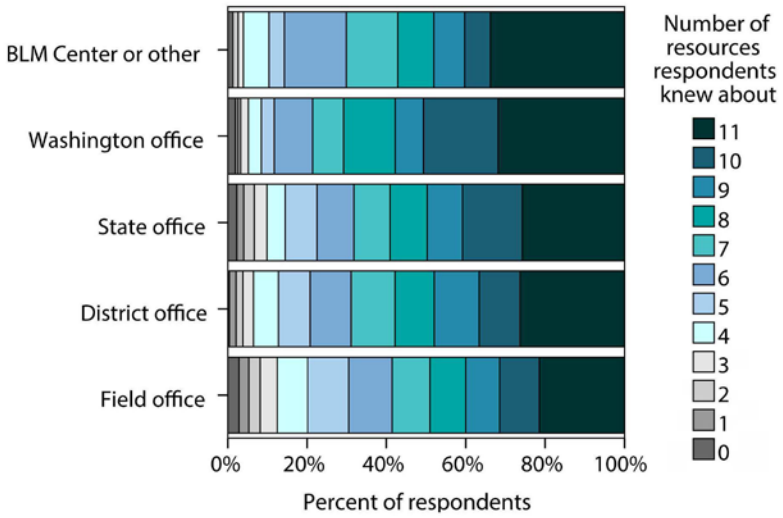

Figure 45. The number of resources in collaboration and Alternative Dispute Resolution that respondents were aware of prior to the survey (out of 11), comparing duty station levels. (BLM, Bureau of Land Management)

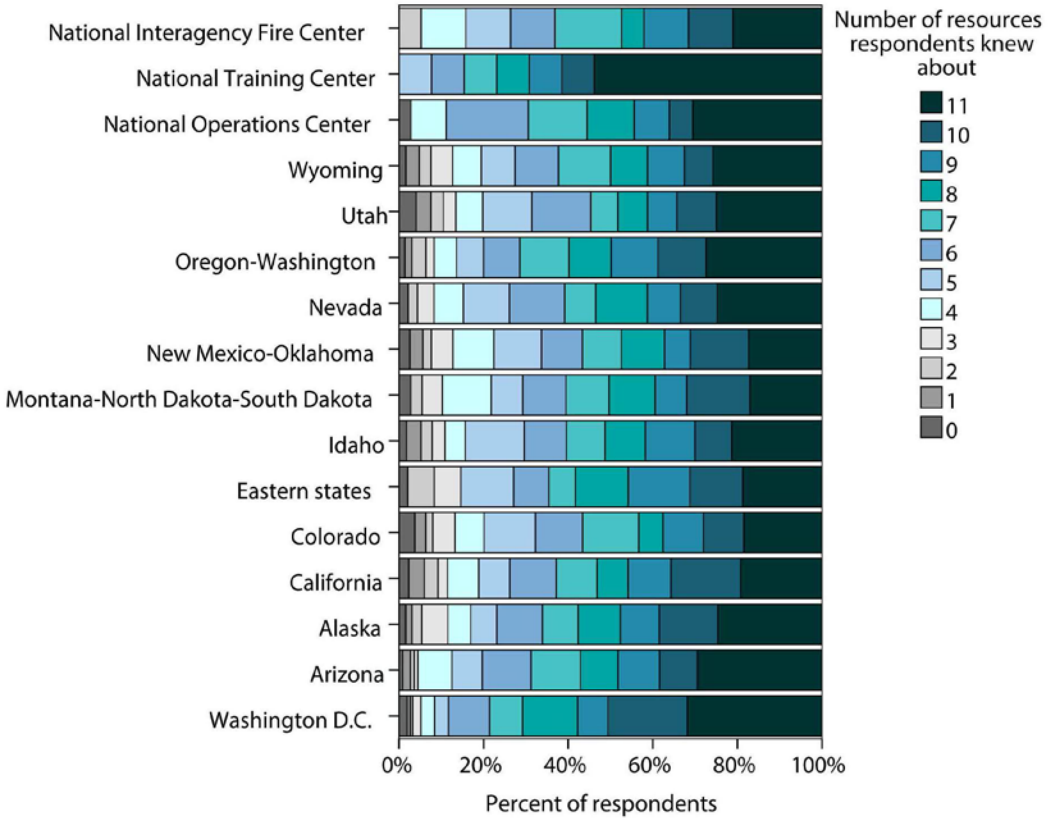

Figure 46. The number of resources in collaboration and Alternative Dispute Resolution that respondents were aware of prior to the survey (out of 11), comparing State Offices and Bureau of Land Management Centers.

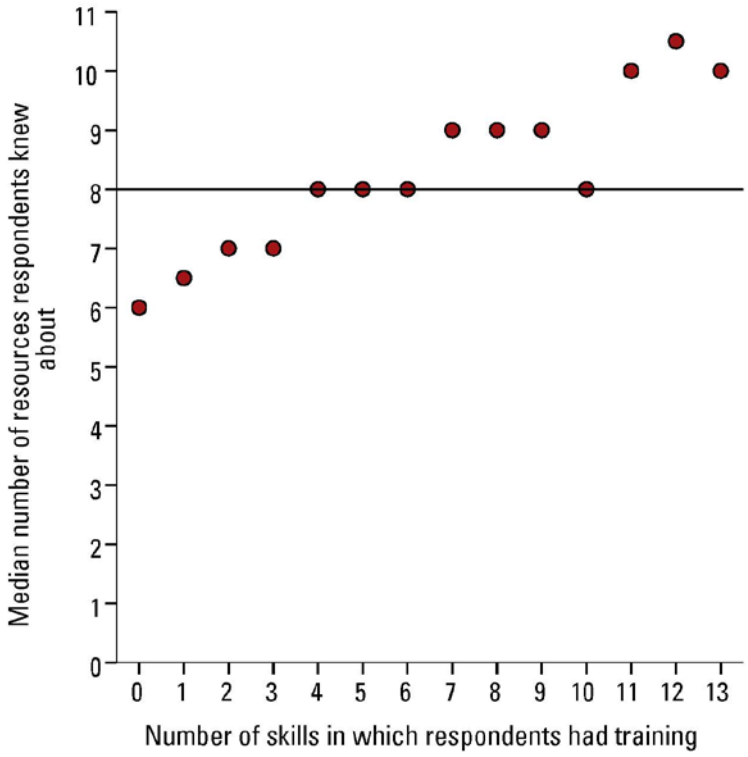

Figure 47. The number of resources in collaboration and Alternative Dispute Resolution that respondents were aware of prior to the survey (out of 11) versus the number of skills in collaboration and Alternative Dispute Resolution in which they had training (out of 13). The horizontal line depicts the median for all respondents that answered this question.

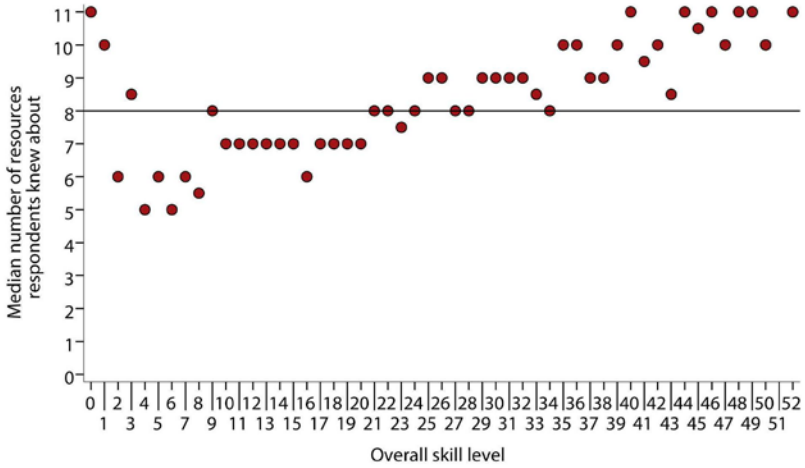

Figure 48. The number of resources in collaboration and Alternative Dispute Resolution that respondents were aware of prior to the survey (out of 11) versus their self-rated overall skill level in collaboration and Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert" skill level). The horizontal line depicts the median for all respondents that answered this question.

Overall Likelihood of Using Resources Available for Collaboration and Alternative Dispute Resolution

Respondents' overall likelihood of using available resources for collaboration and ADR skills was measured as the sum of their ratings of their likelihood of using the 11 listed resources along the 6-point likelihood scale (0 = very unlikely, 1 = unlikely, 2 = somewhat unlikely, 3 = somewhat likely, 4 = likely, and 5 = very likely). Thus, the potential range of the overall likelihood to use available resources in the future scale was 0 ("very unlikely" to use any of the 11 resources in the future) to 55 ("very likely" to use all 11 resources in the future). The scale's reliability was excellent (Cronbach's alpha = 0.92, n = 1,930). The median value of respondents' overall likelihood of using available resources in the future was 26, which is an average of "somewhat unlikely" to use resources available for collaboration and ADR skills in the future (fig. 49).

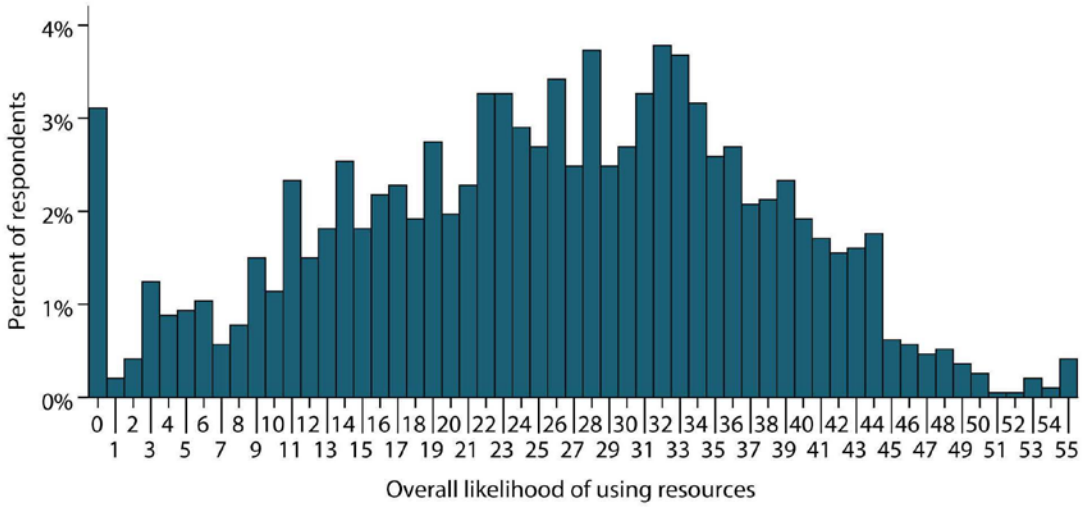

Figure 49. Respondents' overall likelihood to use available resources in collaboration and Alternative Dispute Resolution in the future (from 0 or "very unlikely" to 55 or "very likely").

In general, the longer that respondents had worked for the BLM, the less likely they were to use the resources available for collaboration and ADR in the future (Wald $\chi^2(5, n = 1{,}180) = 30.17$, p less than 0.001; fig. 50). Respondents went from being an average of "somewhat unlikely" to an average closer to "somewhat likely" to use available resources in the future when they had been previously aware of at least a few of the resources prior to the survey (Wald $\chi^2(10, n = 1{,}180) = 18.98$, $p = 0.041$; fig. 51), had training in several skills in collaboration and ADR (Wald $\chi^2(6, n = 1{,}180) = 30.65$, p less than 0.001; fig. 52), and had an average overall level of skill of "intermediate" or higher in collaboration and ADR (Wald $\chi^2(6, n = 1{,}180) = 650.60$, p less than 0.001; fig. 53).

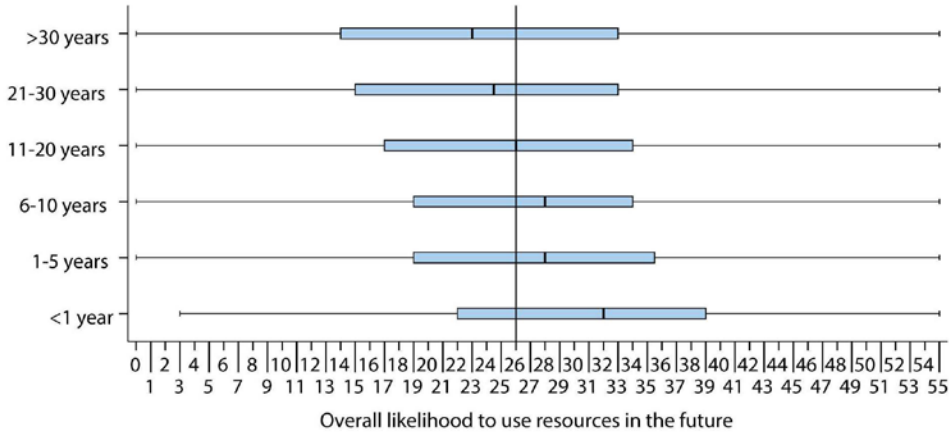

Figure 50. Respondents' overall likelihood to use available resources in collaboration and Alternative Dispute Resolution in the future (from 0 or "very unlikely" to 55 or "very likely") versus the number of years respondents had worked for the Bureau of Land Management. The vertical line depicts the median for all respondents for which the scale could be calculated. Refer to the Glossary for further explanation of boxplots. (>, greater than; <, less than)

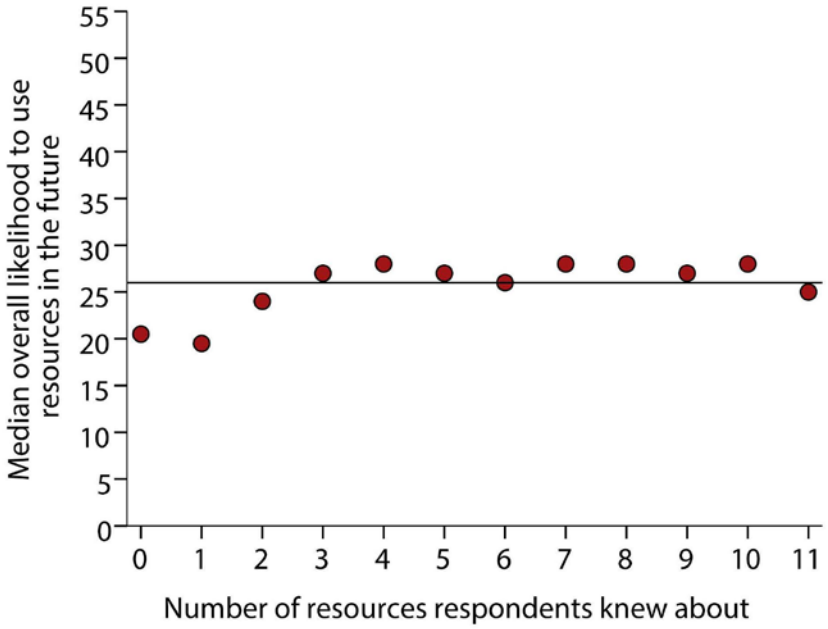

Figure 51. Respondents' overall likelihood to use available resources in collaboration and Alternative Dispute Resolution in the future (from 0 or "very unlikely" to 55 or "very likely") versus the number of resources they were aware of prior to the survey (out of 11). The horizontal line depicts the median for all respondents for which the scale could be calculated.

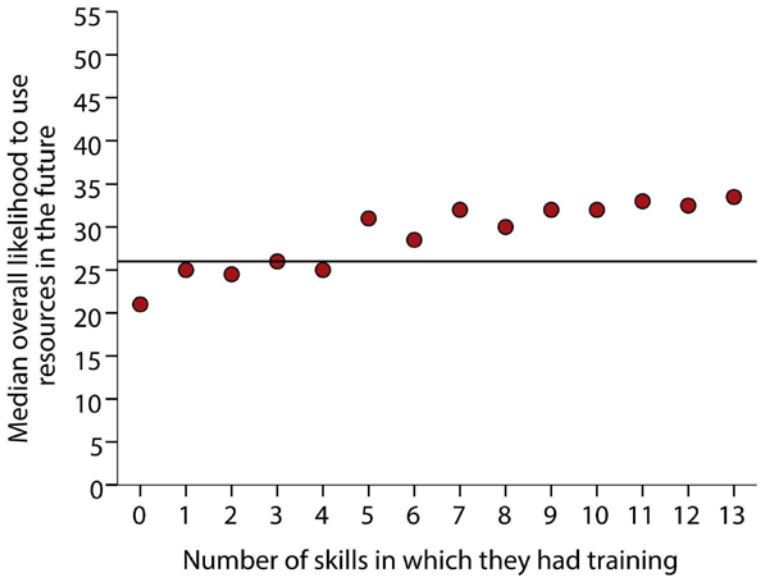

Figure 52. Respondents' overall likelihood to use available resources in collaboration and Alternative Dispute Resolution in the future (from 0 or "very unlikely" to 55 or "very likely") versus the number of skills in collaboration and Alternative Dispute Resolution in which they had training (out of 13). The horizontal line depicts the median for all respondents for which the scale could be calculated.

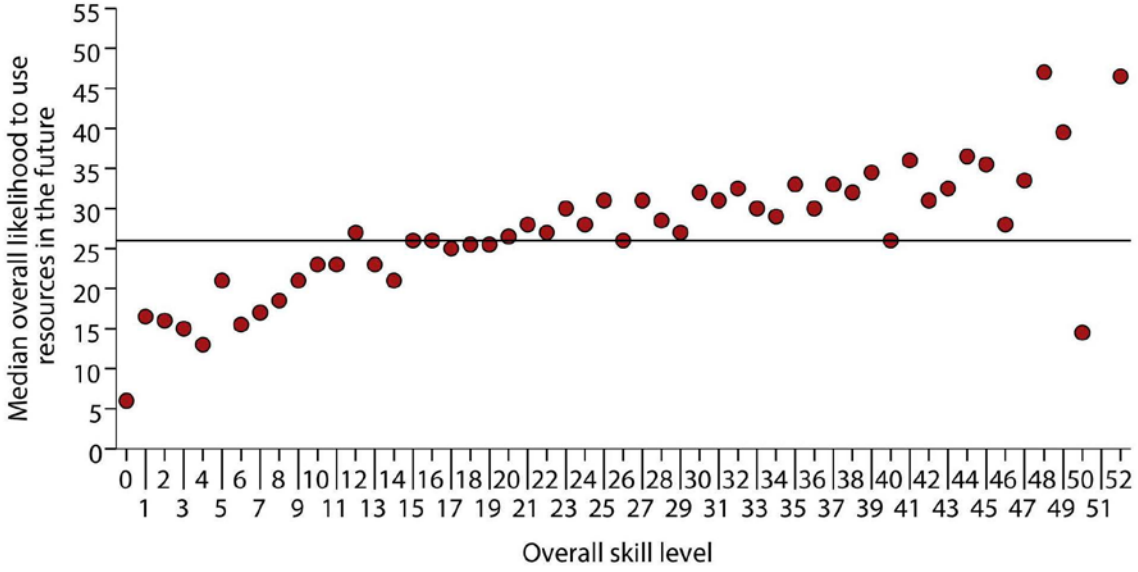

Figure 53. Respondents' overall likelihood to use available resources in collaboration and Alternative Dispute Resolution in the future (from 0 or "very unlikely" to 55 or "very likely") versus their self-rated overall skill level in collaboration and Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert" skill level). The horizontal line depicts the median for all respondents for which the scale could be calculated.

Facilitators and Mediators for Collaborations and Alternative Dispute Resolution Processes

Most respondents (91 percent) were already aware of the availability of professional facilitators and mediators and 58 percent were at least "somewhat likely" to use a facilitator and mediator in the future (table 6). The majority of respondents (59 percent) with experience with collaboration and ADR (n = 2,239) also had experience with the use of a facilitator in one or more of these processes. Thirty-seven percent of the respondents with experience with ADR processes (n = 696) had experience with the use of a mediator in one or more of these processes. Respondents that had experience with either or both were asked to rate their usefulness in a collaboration or ADR process along a 5-point usefulness scale ranging from "not useful" to "essential." Over two-thirds of respondents rated facilitators as being "very useful" or "essential" for collaborations (n = 1,371; fig. 54).

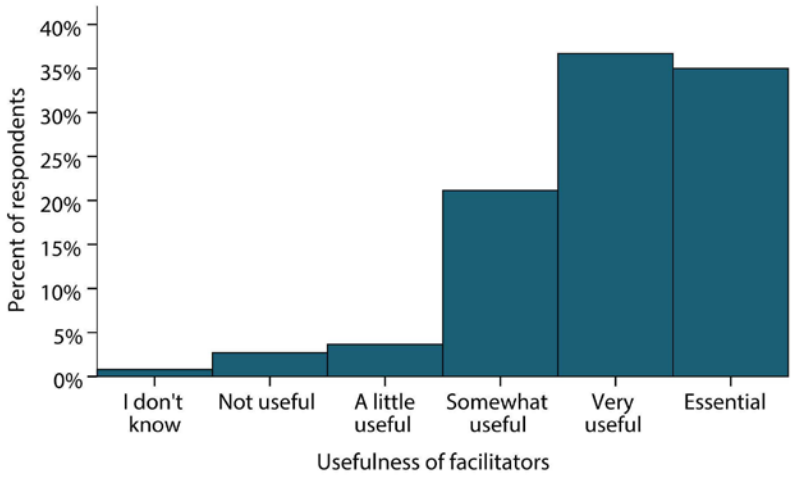

Figure 54. Respondents' ratings of the usefulness of facilitators for collaboration or Alternative Dispute Resolution (ADR) processes.

Respondents with training in facilitation of a meeting or working group generally considered facilitators to be more useful than did respondents without training (Wald $\chi^2(1, n = 1{,}021) = 10.67$, $p = 0.001$; fig. 55).

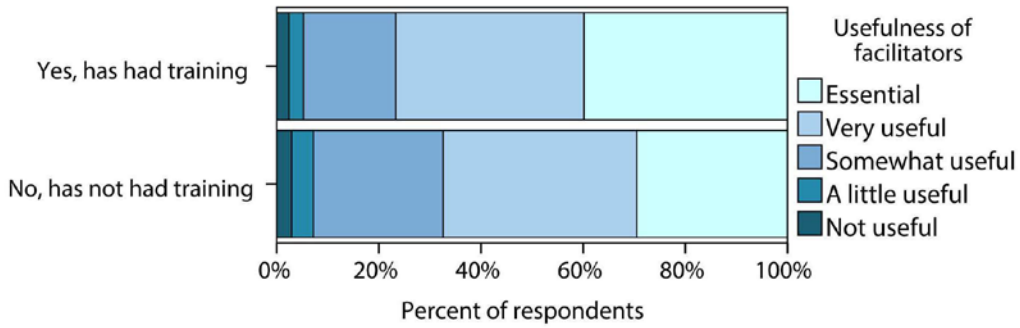

Figure 55. Respondents' ratings of the usefulness of facilitators for collaboration or Alternative Dispute Resolution (ADR) processes, comparing respondents with and without training in facilitation of a meeting or working group.

Respondents considered mediators to be even more useful than facilitators; over two-thirds of respondents rated mediators as being "very useful" or "essential" for ADR processes (n = 696; fig. 56).

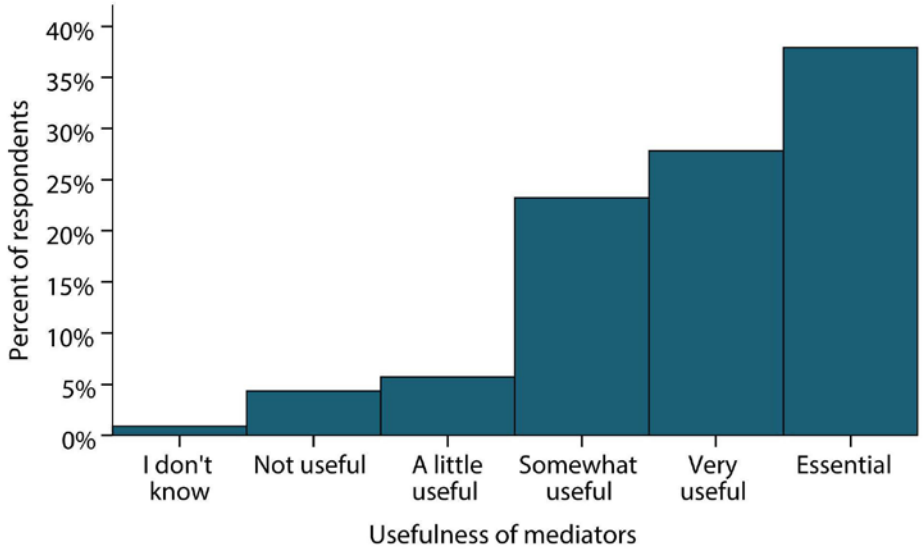

Figure 56. Respondents' ratings of the usefulness of mediators for Alternative Dispute Resolution (ADR) processes.

Feasibility Assessments for Collaboration

In contrast to facilitators and mediators, the majority of respondents (60 percent) with experience with collaboration or both collaboration and ADR (n = 2,275) were unaware that feasibility assessments existed for collaborations. An additional 27 percent of respondents were aware of feasibility assessments, but had no direct experience with them. This was consistent with the finding that two thirds of respondents (66 percent) had no experience at feasibility assessments, and a large majority (93 percent) had received no training in feasibility assessments (table 3). Respondents that had direct experience with a collaboration in which a feasibility assessment was conducted (11 percent) or that had personally organized a feasibility assessment for a collaboration (2 percent) were asked to rate the usefulness of feasibility assessments for collaborations along a 5-point usefulness scale ranging from "not useful" to "essential." Almost two-thirds of these respondents rated feasibility assessments as being "very useful" or "essential" for collaborations (n = 282; fig. 57).

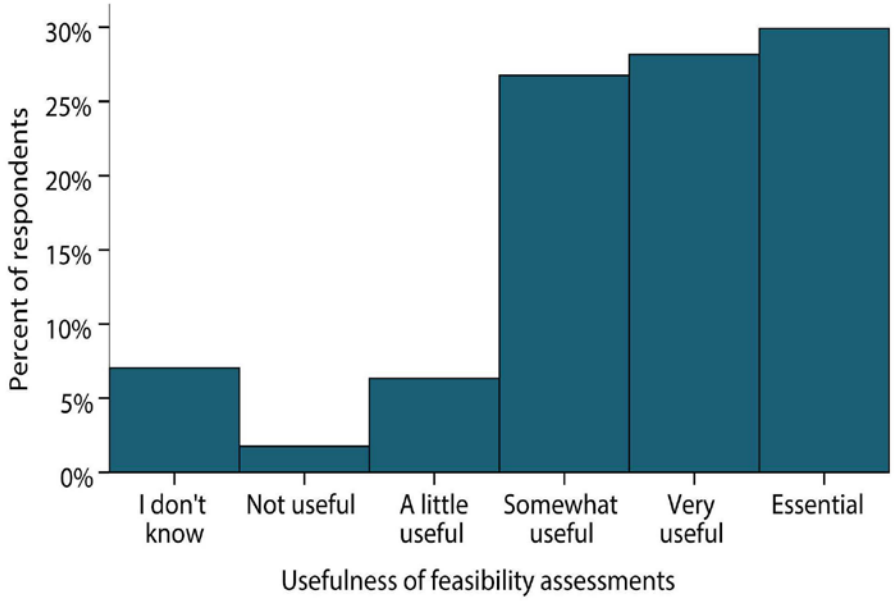

Figure 57. Respondents' ratings of the usefulness of feasibility assessments for collaboration

Respondents that rated themselves as having greater skill at feasibility assessments generally considered feasibility assessments to be more useful than those that rated themselves as having less skill (Wald $\chi^2(4, n = 187) = 17.22$, $p = 0.002$; fig. 58).

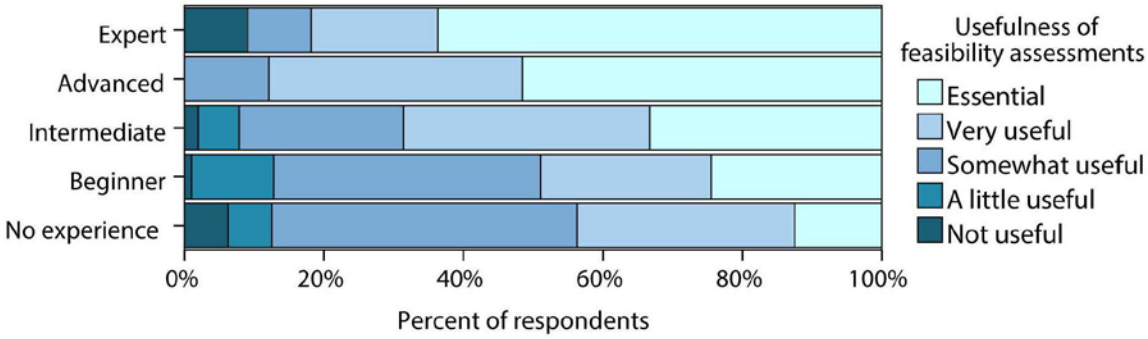

Figure 58. Respondents' ratings of the usefulness of feasibility assessments for collaboration versus how they rated their skill level at feasibility assessments.

Respondents' ratings of their skill level at feasibility assessments differed by gender (generalized linear model: Wald $\chi^2(1, n = 1{,}593) = 7.00$, $p = 0.008$; fig. 59). Men rated their own skill level at feasibility assessments slightly higher than women rated their own skill level. In general, respondents with training and experience in feasibility assessments also rated themselves as more skilled at feasibility assessments than those without training in feasibility assessments (Wald $\chi^2(1, n = 1{,}593) = 22.24$, p less than 0.001; fig. 60) or direct experience with feasibility assessments (Wald $\chi^2(2, n = 1{,}593) = 135.53$, p less than 0.001; fig. 61).

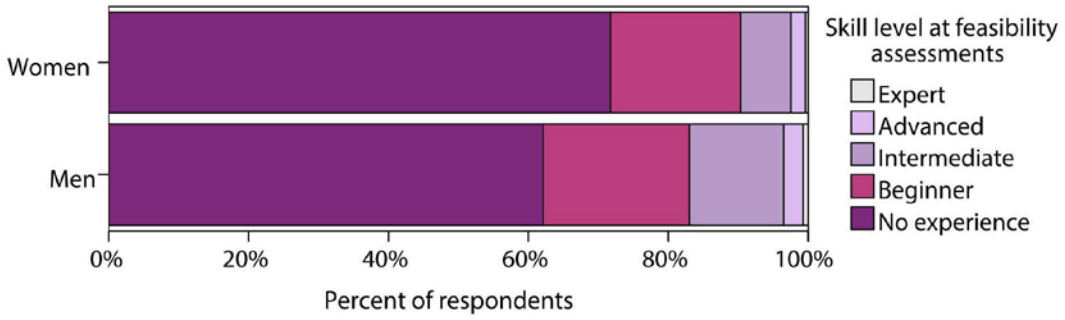

Figure 59. Respondents' self-rated skill level at feasibility assessments, comparing women to men.

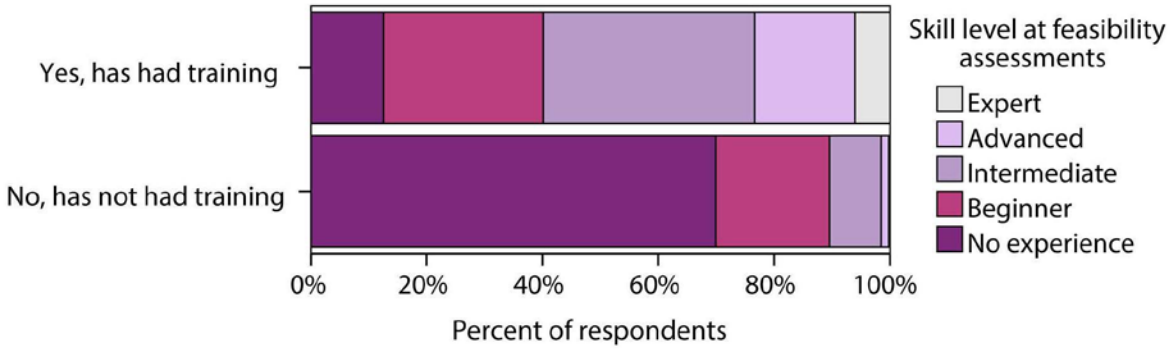

Figure 60. Respondents' self-rated skill level at feasibility assessments, comparing those that had to those that had not received training in feasibility assessments.

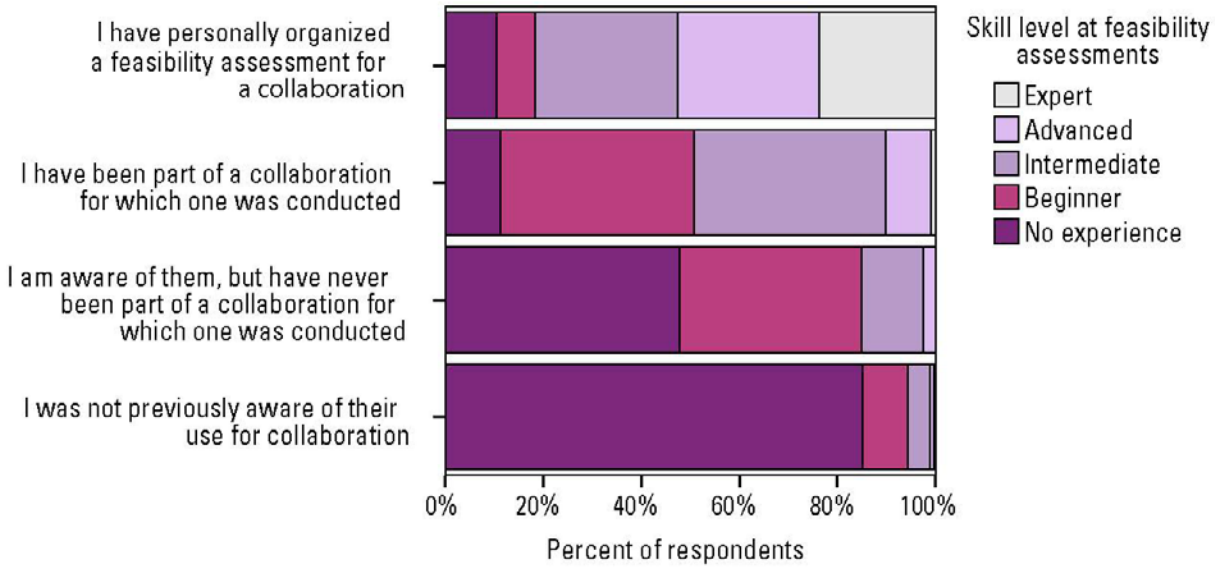

Figure 61. Respondents' self-rated skill level at feasibility assessments versus their level of experience with feasibility assessments.

The Priority of Potential Future BLM Resources for Collaboration

When given a list of resources for collaboration that the BLM could potentially make available in the future, respondents indicated that all of the resources were of "moderate" priority on average. In-person training in collaboration and dispute resolution was the potential future resource given the highest priority, while additional online training or resources such as guides or a clearinghouse for best practices and lessons learned were ranked somewhere in the middle (table 7). Respondents' preference for "in-person training in collaboration and dispute resolution" coincided with travel ceilings and budgetary limitations as being the most common obstacles to taking training in collaboration experienced by respondents (table 4).

The future resource given the second-highest priority was "support for building collaborative Government-to-Government relationships and Tribal consultation" (table 7). The need for this support in the future was underscored by the earlier finding that over three-quarters of respondents (79 percent) had received no training in "building tribal and Government-to-Government relationships" and the majority (57 percent) considered their skill level at building these relationships to be "beginner" or "no experience" (table 3).

"Additional funding resources for collaborative efforts" and "assistance or coaching in planning for collaboration and setting expectations with the public" were also among the potential future resources rated as having the highest priority within the list of potential resources (table 7). The three resources that were given the lowest priority from the list were "assistance finding and hiring facilitators," "training in feasibility assessments," and "support for conducting feasibility assessments" (table 7).

Table 7. Respondents' ratings of the priority level of potential resources for collaboration that the BLM could provide in the future. (%, percent; <, less than)

Potential future resource	Priority level of potential future resource						
	n	Low or Very low	Moderate	High or Very high	Median	Mode	Friedman mean rank[1]
In-person training on collaboration and dispute resolution	2,534	24%	32%	44%	Moderate	Moderate	6.9
Support for building collaborative Government-to-Government relationships and Tribal Consultation	2,466	27%	31%	43%	Moderate	Moderate	6.7
Additional funding resources for collaborative efforts	2,489	28%	31%	41%	Moderate	Moderate	6.6
Assistance or coaching in planning for collaboration and setting expectations with the public	2,515	26%	35%	39%	Moderate	Moderate	6.4
Assistance designing and structuring meetings and processes	2,519	28%	36%	36%	Moderate	Moderate	6.2
Online training on collaboration and dispute resolution	2,546	31%	37%	33%	Moderate	Moderate	6.1
Guidance or handbooks on techniques and strategies for collaboration	2,548	29%	39%	32%	Moderate	Moderate	6.1
A clearinghouse for best practices and lessons-learned from collaborative projects	2,501	29%	36%	35%	Moderate	Moderate	6.1
Training in feasibility assessments	2,305	40%	35%	25%	Moderate	Moderate	5.1
Support for conducting feasibility assessments	2,270	42%	35%	23%	Moderate	Moderate	4.9
Assistance finding and hiring facilitators	2,485	44%	32%	24%	Moderate	Moderate	4.9

[1]The priority level that respondents rated for each potential future resource significantly differed among one or more of the resources (Friedman test: Chi-square = 1,312.31, d.f. = 10, n = 1,973, p <0.001 using the categories: very low, low, moderate, high, very high).

The relatively low priority ranking respondents gave to future "assistance finding and hiring facilitators" initially appeared to be somewhat discordant with the earlier findings that the majority of respondents (91 percent) were familiar with and likely to use a professional facilitator (58 percent; table 6), and that facilitators were considered to be very useful by those with direct experience (fig. 54). Furthermore, only 43 percent had received training in facilitation of a meeting or working group (table 3). However, over twice as many of the 1,366 respondents that actually had direct experience with the use of a facilitator in a collaboration gave the potential future resource of assistance with finding and hiring facilitators a "high" to "very high" priority rating compared to the 873 respondents with no experience (Wald $\chi^2(1, n = 1{,}825) = 25.06$, p less than 0.001; fig. 62). Respondents that indicated that they were likely to use a professional facilitator or mediator in the future also usually gave this resource a much higher priority rating than respondents that were unlikely to use one in the future (Wald $\chi^2(5, n = 1{,}825) = 271.47$, p less than 0.001; fig. 63).

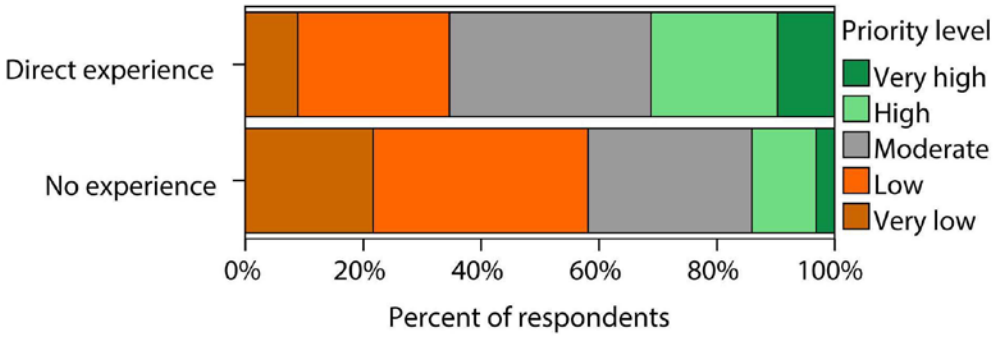

Figure 62. Respondents' ratings of the priority level of the Bureau of Land Management providing "assistance finding and hiring facilitators" in the future, comparing those with to those without direct experience with a facilitator during a collaboration or Alternative Dispute Resolution process.

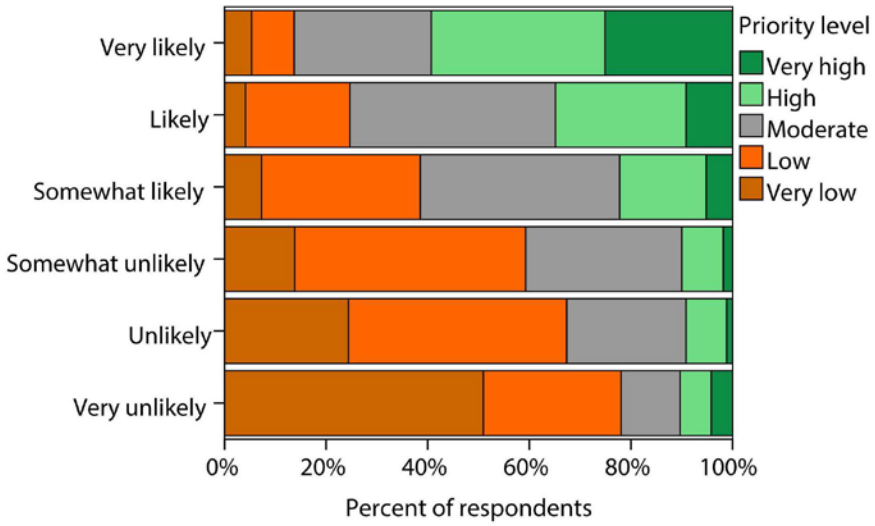

Figure 63. Respondents' ratings of the priority level of the Bureau of Land Management providing "assistance finding and hiring facilitators" in the future versus how they rated their likelihood to use professional facilitators or mediators in collaboration or Alternative Dispute Resolution processes in the future.

The relatively low priority ranking respondents gave to both the potential future resources "training in feasibility assessments" and "support for conducting feasibility assessments" also seemed surprising at first, given the apparent usefulness of feasibility assessments for collaboration (fig. 57). However, this may be driven primarily by the fact that most respondents rated training in and support for conducting feasibility assessments as having relatively low priority because they were either unaware of feasibility assessments before the survey (60 percent), lacked training in feasibility assessments (93 percent; table 3), or lacked direct experience with feasibility assessments (87 percent). Indeed, when analyzed further, the generalized linear model indicated that respondents with direct experience who considered themselves to have an advanced skill level in feasibility assessments considered "training in feasibility assessments" to be of much higher priority as a future resource than respondents without previous knowledge of or experience with feasibility assessments (Wald $\chi 2(3, n = 1{,}716) = 15.62$, $p = 0.001$; fig. 64) or that considered themselves to have little skill at feasibility assessments (Wald $\chi 2(4, n = 1{,}716) = 23.53$, p less than 0.001; fig. 65).

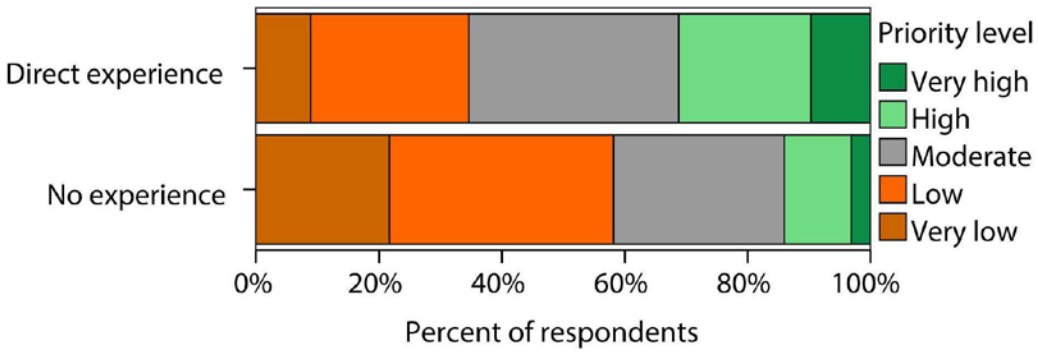

Figure 64. Respondents' ratings of the priority level of the Bureau of Land Management providing "training in feasibility assessments" in the future versus their level of experience with feasibility assessments for collaboration.

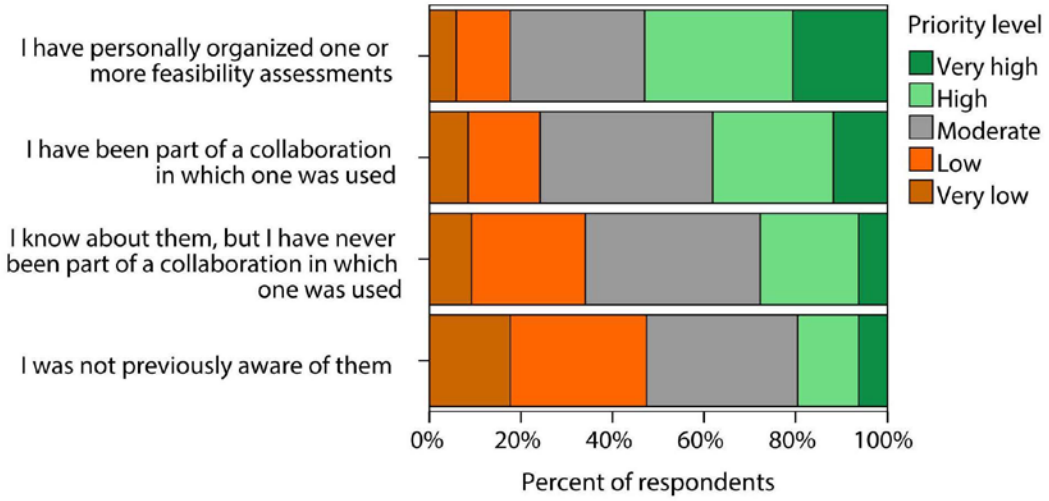

Figure 65. Respondents' ratings of the priority level of the Bureau of Land Management providing "training in feasibility assessments" in the future versus how they rated their skill level at conducting feasibility assessments for collaboration.

In addition, respondents with direct experience, that had received training and that considered themselves to have an "advanced" or "expert" skill level in feasibility assessments considered "support for conducting feasibility assessments" to be of much higher priority as a future resource than respondents without previous knowledge of or direct experience with feasibility assessments (Wald $\chi^2(3, n = 1{,}688) = 18.03$, p less than 0.001; fig. 66), without training in feasibility assessments (Wald $\chi^2(1, n = 1{,}688) = 5.59$, $p = 0.018$; fig. 67), or that considered themselves to have a low skill level at feasibility assessments (Wald $\chi^2(4, n = 1{,}688) = 26.96$, p less than 0.001; fig. 68).

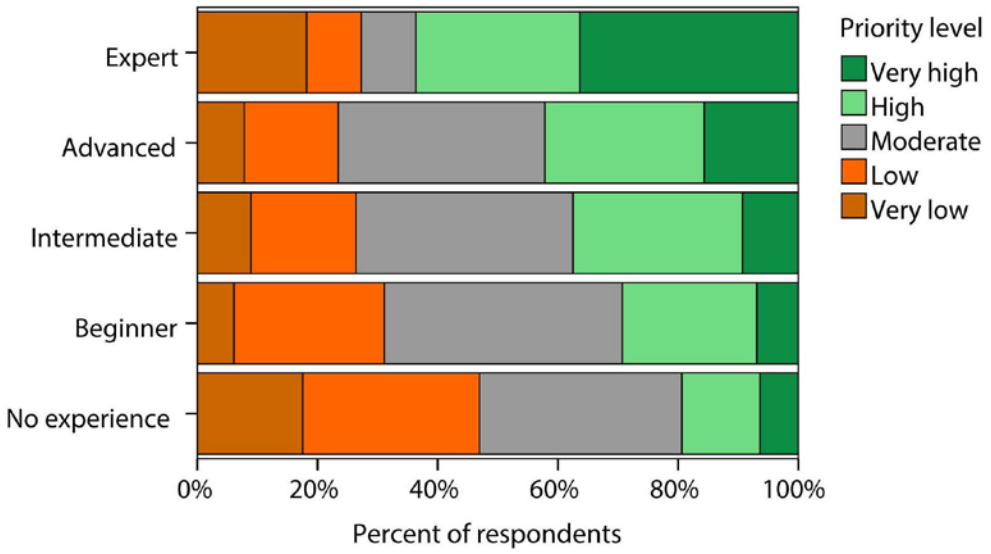

Figure 66. Respondents' ratings of the priority level of the Bureau of Land Management providing "support for conducting feasibility assessments" in the future versus their level of experience with feasibility assessments for collaboration.

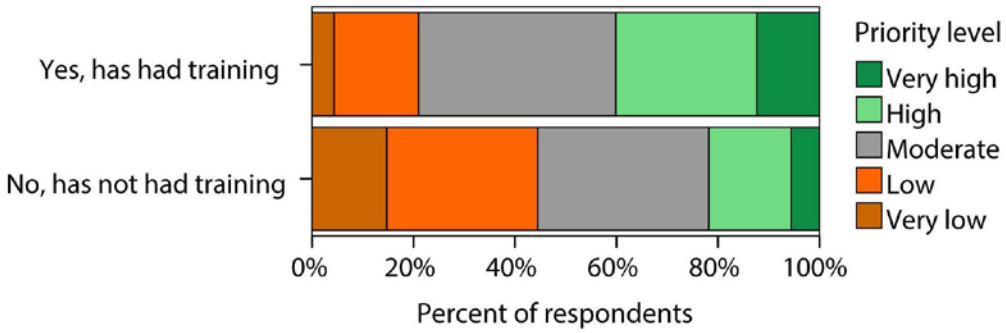

Figure 67. Respondents' ratings of the priority level of the Bureau of Land Management providing "support for conducting feasibility assessments" in the future, comparing those that had to those that had not received training in feasibility assessments for collaboration.

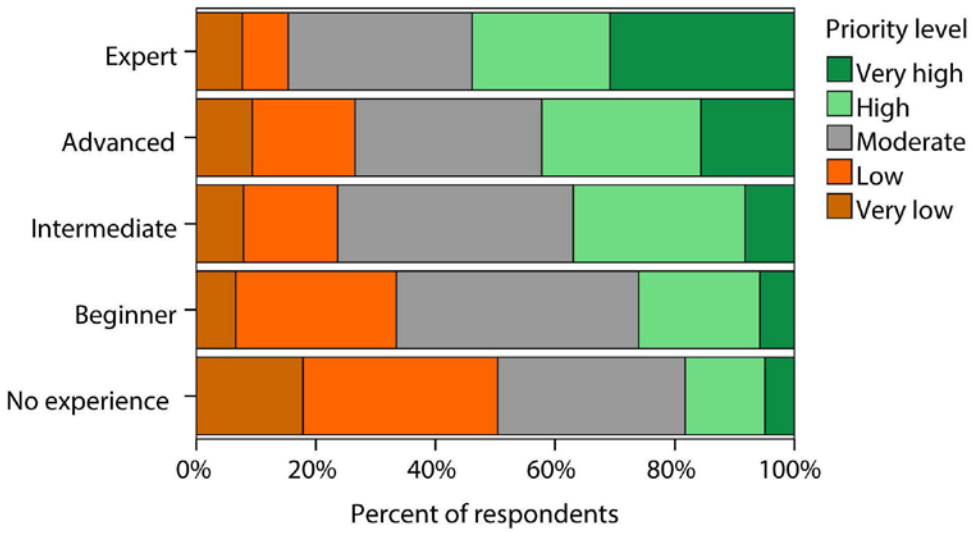

Figure 68. Respondents' ratings of the priority level of the Bureau of Land Management providing "support for conducting feasibility assessments" in the future versus how they rated their skill level at conducting feasibility assessments for collaboration.

Suitability of BLM Issue Areas for Collaboration

The majority of respondents considered all of the BLM issue areas listed at least "somewhat suitable" for collaboration (table 8). The majority of respondents (55–66 percent) considered "recreation," "land use planning and NEPA," "range management," and "fish and wildlife" to be "suitable" for collaboration (table 8). Another quarter or more (25–31 percent) considered them to be "somewhat suitable," and less than 6 percent considered them to be "somewhat unsuitable" or "unsuitable." There were six issue areas listed that were considered to be "somewhat unsuitable" or "unsuitable" by roughly one-tenth of the respondents (9–15 percent): "energy, minerals, and mining," "wild horses and burros," "species of concern," "fire management," "lands and realty," and "cultural resources."

Table 8. Respondents' ratings of the suitability level of Bureau of Land Management (BLM) issue areas for collaboration. (%, percent; <, less than)

		Suitability for collaboration							
BLM issue areas	***n***	**Unsuitable**	**Somewhat unsuitable**	**Neutral**	**Somewhat suitable**	**Suitable**	**median**	**mode**	**Friedman mean rank[1]**
Recreation	2,224	1%	1%	8%	25%	66%	Suitable	Suitable	7.1
Land use planning/NEPA	2,238	2%	4%	11%	25%	59%	Suitable	Suitable	6.6
Range management	2,138	2%	3%	10%	31%	55%	Suitable	Suitable	6.4
Fish and wildlife	2,194	2%	3%	11%	29%	55%	Suitable	Suitable	6.3
Forestry and timber	2,057	2%	4%	13%	33%	49%	Somewhat suitable	Suitable	6.0
Energy, minerals, and mining	2,164	4%	6%	12%	30%	49%	Somewhat suitable	Suitable	5.9
Wild horses and burros	2,016	5%	7%	13%	29%	47%	Somewhat suitable	Suitable	5.7
Species of concern	2,160	3%	7%	13%	29%	48%	Somewhat suitable	Suitable	5.7
Fire management	2,148	4%	7%	14%	27%	48%	Somewhat suitable	Suitable	5.6
Lands and realty	2,105	3%	6%	17%	31%	43%	Somewhat suitable	Suitable	5.4
Cultural resources	2,152	5%	10%	15%	27%	43%	Somewhat suitable	Suitable	5.2

[1]The suitability of the issue areas significantly differs among one or more issue areas (Friedman test: Chi-square = 910.57, d.f. = 10, n = 1,635, p <0.001).

Respondents whose primary program area in which they worked was "land use planning and NEPA" rated "land use planning and NEPA" as more "suitable" for collaboration than other respondents (Pearson's $\chi^2(4, n = 2{,}232) = 17.86$, $p = 0.001$; fig. 69).

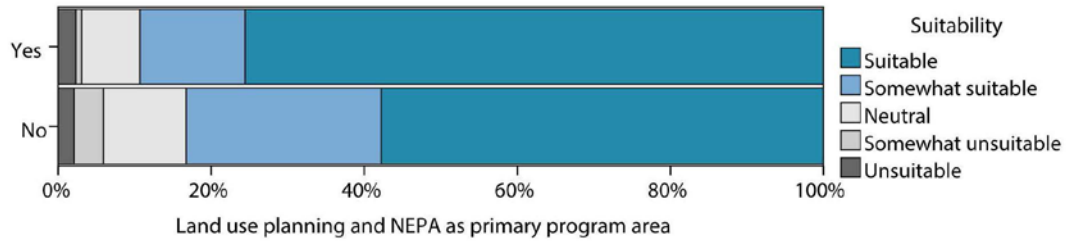

Figure 69. How respondents that selected "land use planning and the National Environmental Policy Act (NEPA)" as their primary program area rated the suitability level of "land use planning and NEPA" for collaboration compared to respondents from other program areas.

Respondents whose primary program area in which they worked was "forestry and timber" were more likely to rate "forestry and timber" "unsuitable" for collaboration than were other respondents (Pearson's $\chi^2(4, n = 2{,}053) = 29.19$, p less than 0.001; fig. 70).

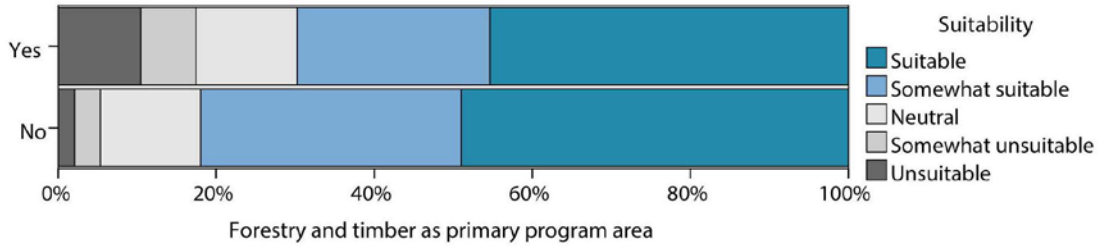

Figure 70. How respondents that selected "forestry and timber" as their primary program area rated the suitability level of "forestry and timber" for collaboration compared to respondents from other program areas.

Respondents whose primary program area in which they worked was "energy, minerals, and mining" were more likely to rate "energy, minerals, and mining" as "suitable" for collaboration than other respondents (Pearson's $\chi^2(4, n = 2{,}158) = 13.45$, $p = 0.009$; fig. 71).

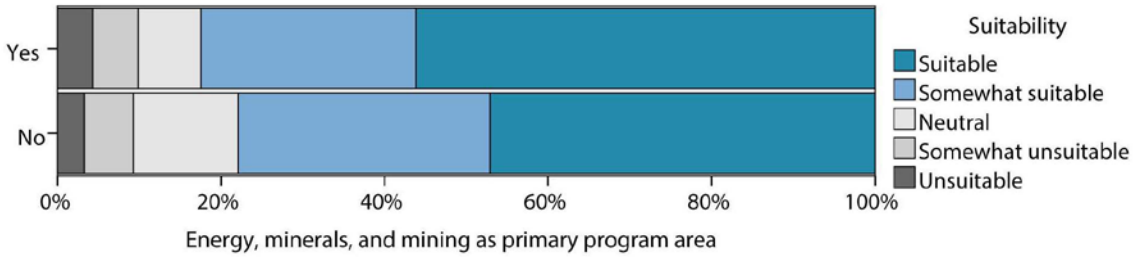

Figure 71. How respondents that selected "energy, minerals, and mining" as their primary program area rated the suitability level of "energy, minerals, and mining" for collaboration compared to respondents from other program areas.

Respondents whose primary program area in which they worked was "lands and realty" rated "lands and realty" more "suitable" for collaboration than other respondents (Pearson's $\chi^2(4, n = 2{,}099) = 9.98$, $p = 0.041$; fig. 72).

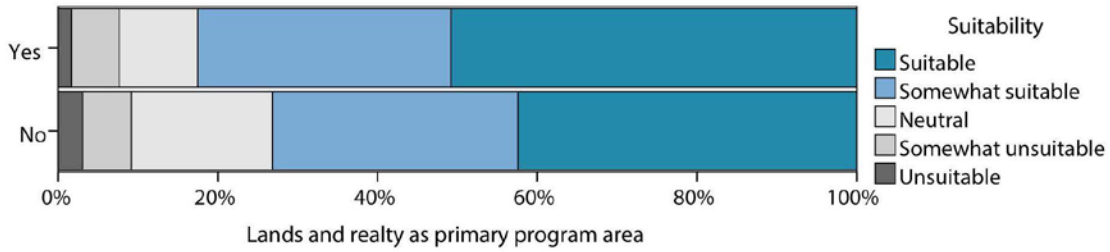

Figure 72. How respondents that selected "lands and realty" as their primary program area rated the suitability level of "lands and realty" for collaboration compared to respondents from other program areas.

Finally, respondents whose primary program area in which they worked was "cultural resources" were more likely to rate "cultural resources" as "suitable" for collaboration than other respondents (Pearson's $\chi^2(4, n = 2{,}099) = 9.98$, $p = 0.041$; fig. 73).

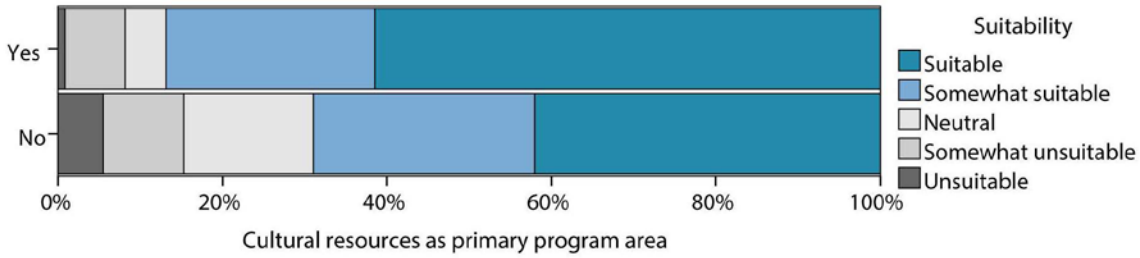

Figure 73. How respondents that selected "cultural resources" as their primary program area rated the suitability level of "cultural resources" for collaboration compared to respondents from other program areas.

Perceptions of Barriers to Collaboration

Situational Barriers to Collaboration

Respondents were asked to rate how frequently they thought that collaborations in the BLM encountered each of a list of 12 different situational barriers and then the magnitude of the effect of each barrier to collaboration when encountered (table 9). The situational barrier that was rated as being the most frequent and of greatest effect by respondents was that "some participants in collaborations have entrenched positions." Almost two thirds of respondents (62 percent) indicated that collaborations were "often" or "always" hindered by this barrier, and 88 percent indicated that this was a "moderate" or "major" barrier to collaborations (table 9). Other situational barriers that respondents thought occurred frequently and were of "moderate" to "major" effect were "knowledge imbalances between participants," "high political visibility," and "power imbalances among participants." The three barriers that were thought to be the most infrequent were "litigation was already ongoing," "collaborations are not untaken voluntarily by the BLM," and "a perception that collaboration leads to poor quality decisions." Of these three, only "litigation was already ongoing" was considered to be of "moderate" or "major" effect by the majority of respondents (70 percent).

Table 9. Respondents' ratings of the frequency and magnitude of effect of situational barriers to collaboration in the Bureau of Land Management (%, percent; <, less than).

	Frequency							Magnitude of effect					
Situational barriers to collaboration	*n*	Never or Seldom	Sometimes	Often or Always	Median	Mode	Friedman mean rank[1]	*n*	Zero or Minor	Moderate or Major	Median	Mode	Friedman mean rank[2]
Some participants have entrenched positions	2,007	4%	34%	62%	Often	Often	8.4	1,720	12%	88%	Moderate	Major	8.6
There are knowledge imbalances among participants	2,021	8%	42%	50%	Sometimes	Sometimes	7.8	1,716	27%	73%	Moderate	Moderate	6.9
The political visibility is high	1,984	8%	40%	52%	Often	Sometimes	7.7	1,687	22%	78%	Moderate	Moderate	7.4
There are power imbalances among participants	1,975	11%	43%	46%	Sometimes	Sometimes	7.3	1,666	26%	74%	Moderate	Moderate	6.9
Some participants prefer the status quo	1,975	9%	49%	42%	Sometimes	Sometimes	7.0	1,669	27%	73%	Moderate	Moderate	6.6
Litigation seems likely regardless of attempts to collaborate	1,861	16%	42%	42%	Sometimes	Sometimes	6.8	1,590	25%	75%	Moderate	Moderate	7.3
Turn-over is high among participants	1,851	15%	48%	37%	Sometimes	Sometimes	6.7	1,572	29%	71%	Moderate	Moderate	6.8
Win-lose situations appear unavoidable	1,838	19%	47%	34%	Sometimes	Sometimes	6.3	1,552	30%	70%	Moderate	Moderate	6.6
Collaborations are not assisted by dispute resolution professionals	1,496	26%	35%	40%	Sometimes	Sometimes	6.1	1,236	45%	55%	Moderate	Moderate	5.3
Litigation is already ongoing	1,696	24%	48%	29%	Sometimes	Sometimes	5.8	1,403	30%	70%	Moderate	Moderate	6.6
Collaborations are not undertaken voluntarily (for example, they are ordered by the Interior Board of Land Appeals or a court)	1,415	43%	42%	15%	Sometimes	Sometimes	4.1	1,171	55%	45%	Minor	Minor	4.6
A perception that collaborations lead to poor quality decisions	1,782	49%	39%	12%	Sometimes	Sometimes	4.0	1,499	61%	39%	Minor	Minor	4.4

[1]The frequency of occurrence significantly differed among one or more situational barriers (Friedman test: Chi-square = 1,939.29, d.f. = 11, $n = 987$, $p < 0.001$ using the categories: never, seldom, sometimes, often, and always).

[2]The magnitude of effect of the barrier significantly differed between one or more situational barriers (Friedman test: Chi-square = 1,314.27, d.f. = 11, $n = 751$, $p < 0.001$ using the categories: zero, minor, moderate, and major).

Overall Frequency of Situational Barriers to Collaboration in the BLM

The frequency with which respondents thought that situational barriers to collaboration were encountered in general was measured as the sum of their ratings of the frequency of the 12 situational barriers listed along the 5-point likelihood scale (0 = never, 1 = seldom, 2 = sometimes, 3 = often, and 4 = always). Thus, the potential range of the overall frequency of situational barriers scale was 0 (situational barriers are "never" encountered) to 60 (all 12 situational barriers are "always" encountered during collaborations). The scale's reliability was very good (Cronbach's alpha = 0.86, $n = 997$). The median value of respondents' overall frequency of situational barriers was 26, which indicates that respondents rate these situational barriers to collaborations generally in the middle of the frequency scale (that is, a rating of "sometimes" on average; fig. 74).

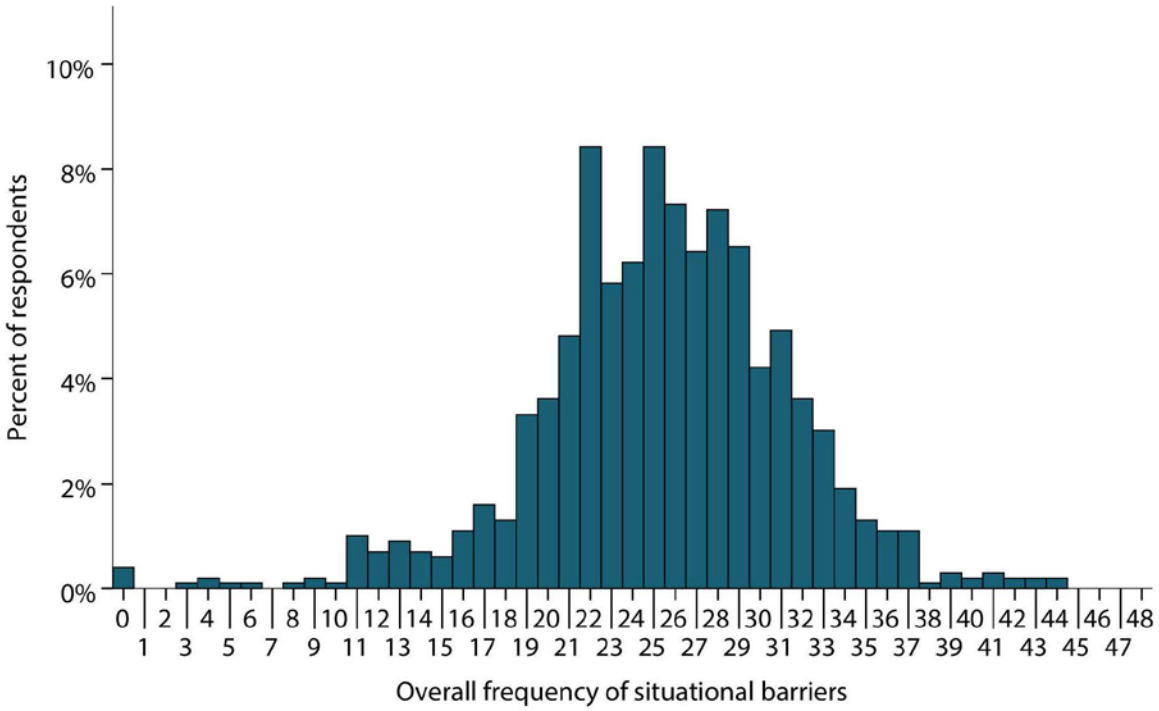

Figure 74. Respondents' ratings of the overall frequency of situational barriers (from 0 or "never" to 48 or "always").

Respondents that had worked for the BLM longer generally rated the situational barriers as occurring slightly less frequently than respondents that had worked for the BLM for fewer years (Wald $\chi^2(5, n = 790) = 23.78$, p less than 0.001; fig. 75). Respondents varied in how they rated the overall frequency of situational barriers to collaboration across duty station level (Wald $\chi^2(2, n = 790) = 20.60$, p less than 0.001; fig. 76) and across BLM State Offices and BLM Centers (Wald $\chi^2(11, n = 790) = 39.37$, p less than 0.001; fig. 77). Respondents also varied in how they rated the frequency of the situational barriers overall based on how they rated their overall level of skill in collaboration (Wald $\chi^2(47, n = 790) = 168.34$, p less than 0.001; fig. 78). Finally, respondents varied based on their experience with collaboration and(or) ADR (Wald $\chi^2(3, n = 790) = 14.35$, $p = 0.002$; fig. 79).

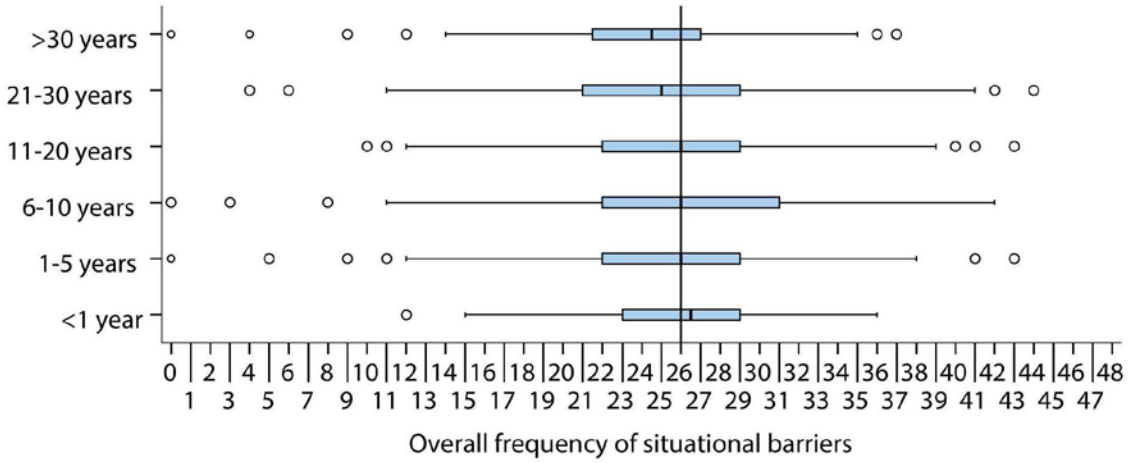

Figure 75. Respondents' ratings of the overall frequency of situational barriers (from 0 or "never" to 48 or "always") versus the number of years they had worked for the Bureau of Land Management. The vertical line depicts the median for all respondents for which the scale could be calculated. Refer to the Glossary for further explanation of boxplots. (>, greater than; <, less than)

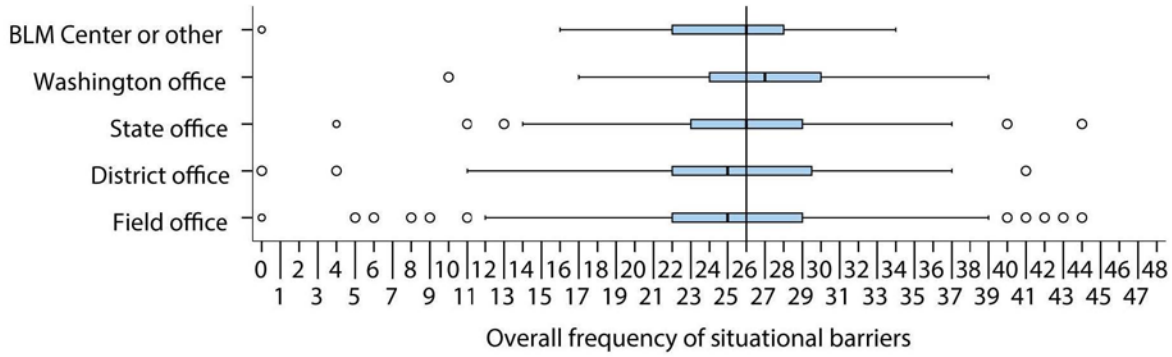

Figure 76. Respondents' ratings of the overall frequency of situational barriers (from 0 or "never" to 48 or "always"), comparing duty-station levels. The vertical line depicts the median for all respondents for which the scale could be calculated. Refer to the Glossary for further explanation of boxplots. (BLM, Bureau of Land Management)

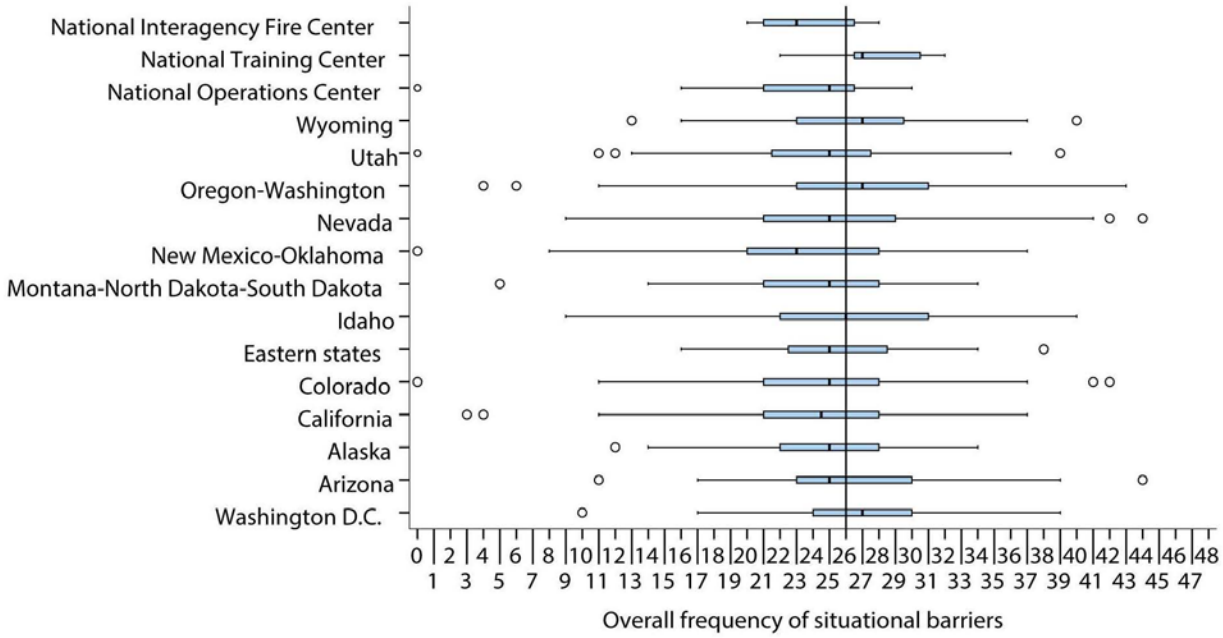

Figure 77. Respondents' ratings of the overall frequency of situational barriers (from 0 or "never" to 48 or "always"), comparing Bureau of Land Management (BLM) State Offices and BLM Centers. The vertical line depicts the median for all respondents for which the scale could be calculated. Refer to the Glossary for further explanation of boxplots.

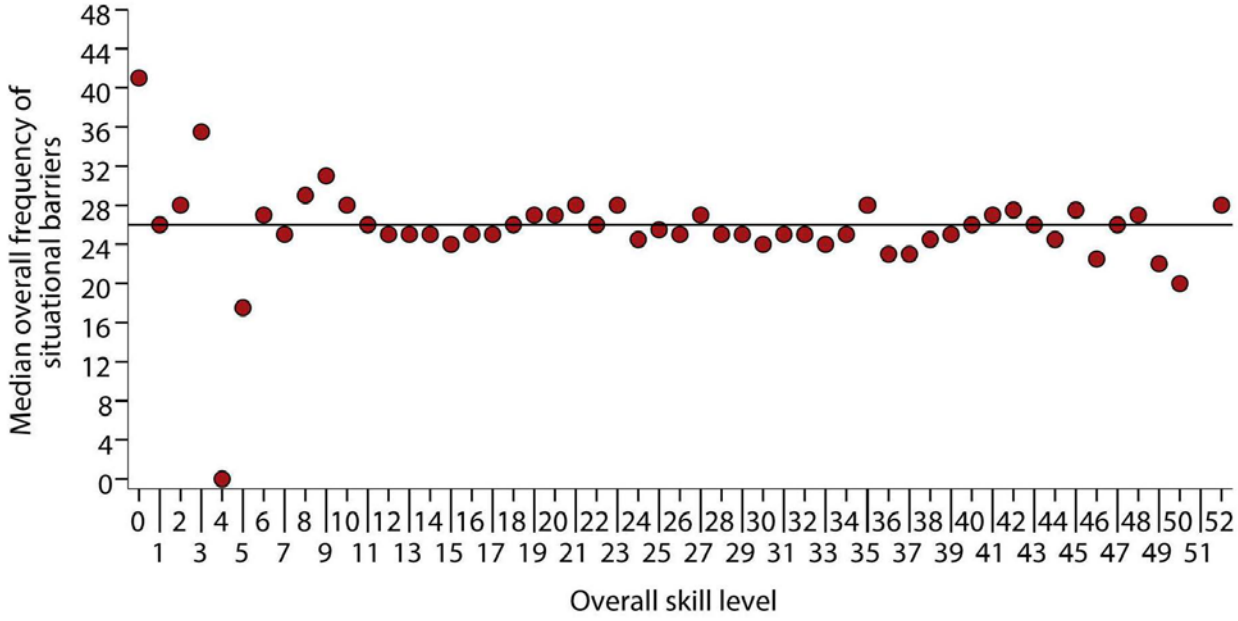

Figure 78. Respondents' ratings of the overall frequency of situational barriers (from 0 or "never" to 48 or "always") versus how they rated their overall skill level in collaboration and Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert"). The horizontal line depicts the median for all respondents for which the scale could be calculated.

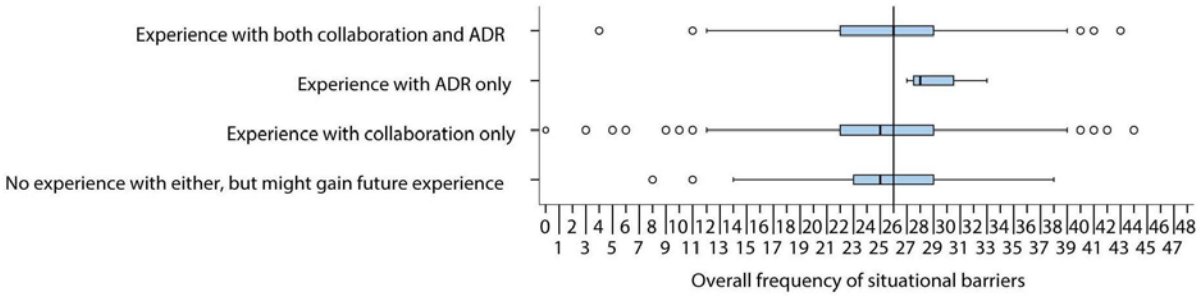

Figure 79. Respondents' ratings of the overall frequency of situational barriers (from 0 or "never" to 48 or "always") versus their experience with collaboration and(or) Alternative Dispute Resolution (ADR). The vertical line depicts the median for all respondents for which the scale could be calculated. Refer to the Glossary for further explanation of boxplots.

Overall Magnitude of Effect of Situational Barriers to Collaboration in the BLM

The degree to which respondents thought that situational barriers to collaboration hampered collaboration in the BLM was measured as the sum of their ratings of the magnitude of effect of the 12 situational barriers listed along the 4-point likelihood scale (0 = zero, because the barrier also has a frequency of zero, 1 = minor, 2 = moderate, and 3 = major). Thus, the potential range of the overall magnitude of effect of situational barriers scale was 0 (all 12 situational barriers are of "zero" effect, because they never occur) to 36 (all 12 situational barriers are "major" barriers to collaboration when they do occur). The scale's reliability was very good (Cronbach's alpha = 0.86, n = 997). The median value for all respondents was 24, which indicates that respondents rated these situational barriers to collaborations as having a "moderate" effect on average (fig. 80).

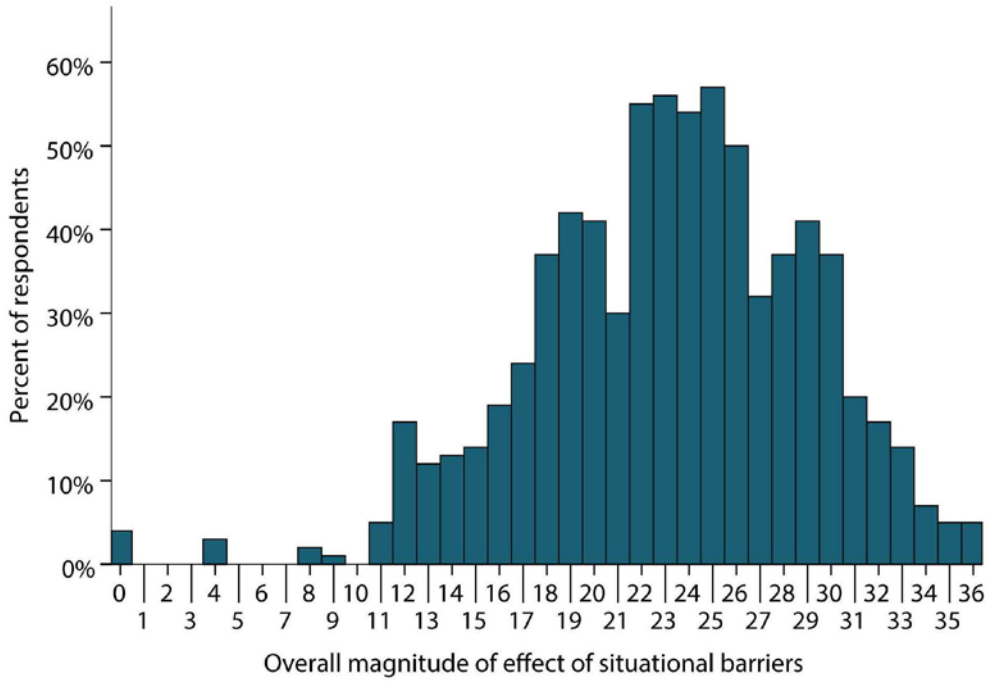

Figure 80. Respondents' ratings of the overall magnitude of effect of situational barriers (from 0 or "zero" effect, because they never occur, to 36 or "major").

Respondents varied in how they rated the magnitude of effect of situational barriers overall based on how they rated their overall skill level in collaboration (Wald $\chi^2(48, n = 619) = 80.05$, $p = 0.003$; fig. 81). Also, in general, respondents that had rated the situational barriers as occurring more frequently overall were increasingly more likely to rate the magnitude of effect of the situational barriers as "major" (Wald $\chi^2(36, n = 618) = 3{,}223.53$, p less than 0.001; fig. 82).

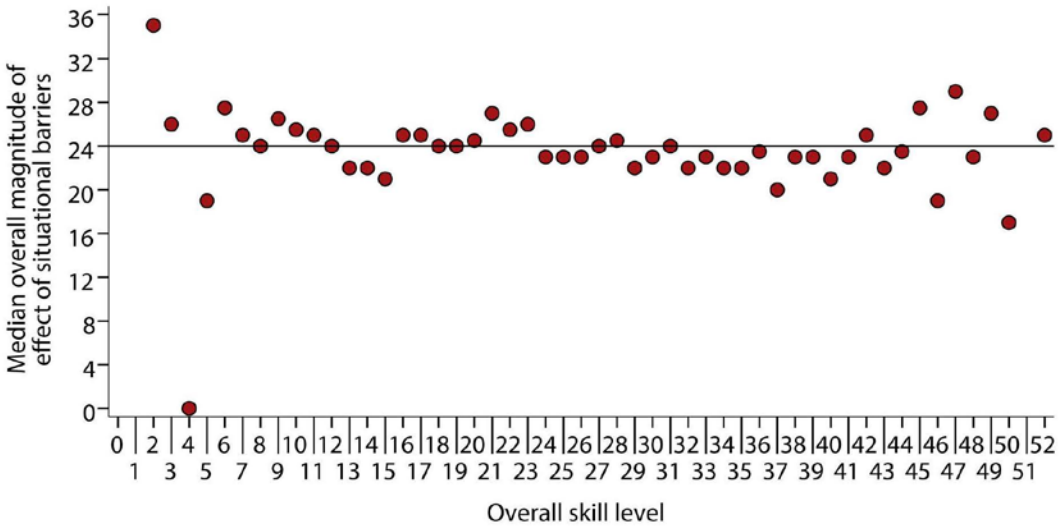

Figure 81. Respondents' ratings of the overall magnitude of effect of situational barriers (from 0 or "zero" effect, because they never occur, to 36 or "major") versus how they rated their overall skill level in collaboration and(or)

Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert"). The horizontal line depicts the median for all respondents for which the scale could be calculated.

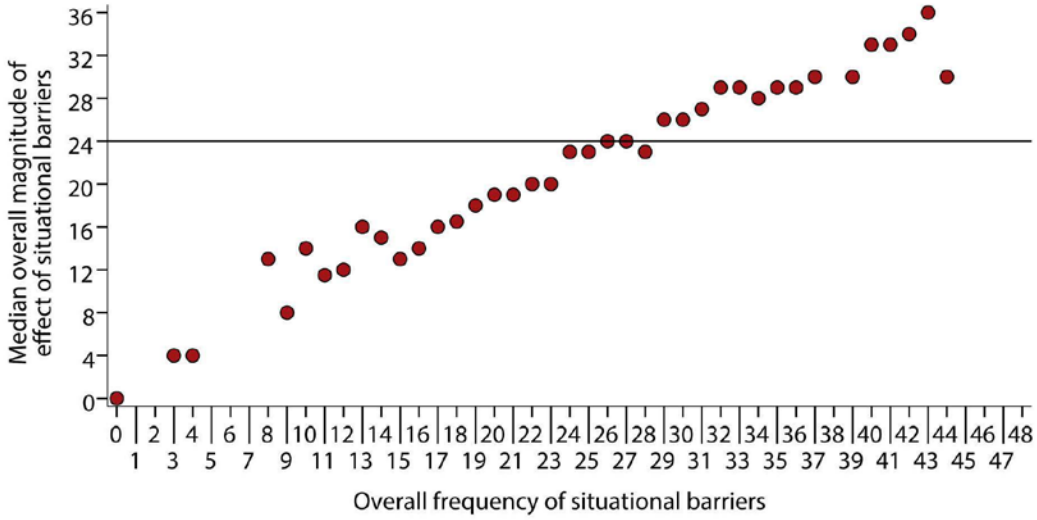

Figure 82. Respondents' ratings of the overall magnitude of effect of situational barriers (from 0 or "zero" effect, because they never occur, to 36 or "major") versus how they rated the overall frequency of situational barriers to collaboration (from 0 or "never" to 48 or "always"). The horizontal line depicts the median for all respondents for which the scale could be calculated.

Organizational Barriers to Collaboration

Respondents were asked to rate how frequently they thought that collaborations in the BLM encountered each of a list of 12 different organizational barriers and then to rate the magnitude of the effect of each barrier to collaboration when it was encountered (table 10). The organizational barrier that was rated as being the most frequent and of greatest effect by respondents was "travel ceilings." Almost two thirds of respondents (61 percent) indicated that collaborations were "often" or "always" hindered by travel ceilings, and 79 percent indicated that this was a "moderate" or "major" barrier to collaboration. The other organizational barrier that the majority of respondents (54 percent) thought occurred "often" or "always" and that almost three quarters of respondents (74 percent) thought was of "moderate" or "major" effect was "other BLM duties take priority over collaboration." Most of the remaining organizational barriers were generally rated as occurring "sometimes" and having "moderate" effect when they do occur. The three exceptions to this pattern were "lack of support in the BLM," "the BLM does not implement agreements made by collaborative groups," and "lack of support from your supervisor." All three were rated by over one-third (43–69 percent) of respondents as occurring "seldom" or "never," and the majority of respondents (53–73 percent) rated them as having a "minor" effect when they do occur.

Table 10. Respondents' ratings of the frequency and magnitude of effect of organizational barriers to collaboration in the Bureau of Land Management (BLM). (%, percent; NEPA, National Environmental Policy Act)

	Frequency							Magnitude of Effect					
Organizational barriers to collaboration	*n*	Never or Seldom	Sometimes	Often or Always	Median	Mode	Friedman mean rank[1]	*n*	Zero or Minor	Moderate or Major	Median	Mode	Friedman mean rank[2]
Travel ceilings	2,157	11%	28%	61%	Often	Often	8.6	1,789	21%	79%	Moderate	Major	8.1
Other BLM duties take priority over collaboration	2,189	13%	33%	54%	Often	Often	8.4	1,801	25%	74%	Moderate	Moderate	8.2
Lack of collaborative skills among BLM employees	2,105	19%	45%	37%	Sometimes	Sometimes	7.3	1,753	31%	69%	Moderate	Moderate	7.4
The BLM cannot cede decision-making authority to collaborative groups	1,708	25%	34%	41%	Sometimes	Sometimes	7.1	1,337	43%	57%	Moderate	Moderate	6.3
The BLM does not have enough social science capacity	1,662	28%	33%	39%	Sometimes	Sometimes	6.8	1,352	41%	59%	Moderate	Moderate	6.3
The NEPA process	1,994	30%	35%	35%	Sometimes	Sometimes	6.7	1,674	39%	60%	Moderate	Moderate	6.7
The BLM's land use planning process	1,914	29%	40%	31%	Sometimes	Sometimes	6.6	1,573	40%	51%	Moderate	Moderate	6.6
Field personnel lack authority to conduct collaborations	1,868	33%	38%	29%	Sometimes	Sometimes	6.2	1,499	47%	53%	Moderate	Moderate	6.2
Lack of support from other agencies	1,863	28%	52%	19%	Sometimes	Sometimes	6.1	1,528	42%	58%	Moderate	Moderate	6.3
Lack of support in the BLM	2,038	43%	39%	18%	Sometimes	Sometimes	5.4	1,697	53%	47%	Minor	Minor	6.0
The BLM does not implement agreements made by collaborative groups	1,543	45%	40%	15%	Sometimes	Sometimes	5.0	1,228	55%	45%	Minor	Minor	5.5
Lack of support from your supervisor	2,195	69%	19%	12%	Seldom	Seldom	3.9	1,314	73%	27%	Minor	Zero	4.4

[1]The frequency of occurrence significantly differed among one or more organizational barriers (Friedman test: Chi-square = 1,939.29, d.f. = 11, $n = 987$, $p < 0.001$ using the categories: never, seldom, sometimes, often, and always).

[2]The magnitude of effect of the barrier significantly differed between one or more organizational barriers (Friedman test: Chi-square = 774.10, d.f. = 11, $n = 610$, $p < 0.001$ using the categories: zero, minor, moderate, and major).

Frequency and Effect of Travel Ceilings as a Barrier to Collaboration

Women rated "travel ceilings" as occurring more frequently than men (Wald $\chi^2(1, n = 1{,}773) = 15.74$, p less than 0.001; fig. 83). Respondents that were decision-makers rated "travel ceilings" as occurring less frequently than other respondents (Wald $\chi^2(1, n = 1{,}773) = 9.16$, $p = 0.002$; fig. 84). Respondents varied by how many years they had worked for the BLM (Wald $\chi^2(5, n = 1{,}773) = 22.11$, p less than 0.001; fig. 85). Finally, respondents differed in how frequently they rated "travel ceilings" as a barrier to collaboration across the BLM State Offices and BLM Centers (Wald $\chi^2(12, n = 1{,}773) = 51.60$, p less than 0.001; fig. 86).

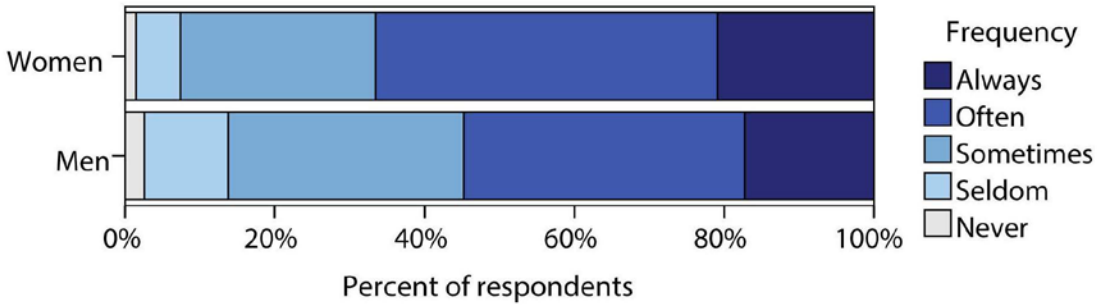

Figure 83. Respondents' ratings of the frequency of "travel ceilings" as a barrier to collaboration, comparing women to men.

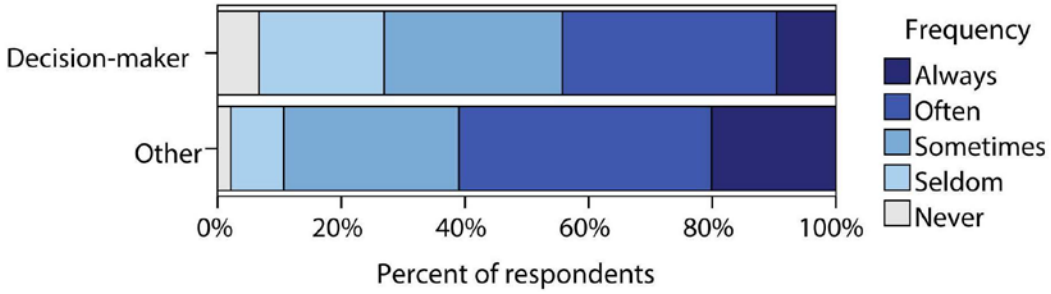

Figure 84. Respondents' ratings of the frequency of "travel ceilings" as a barrier to collaboration, comparing decision-makers to other respondents.

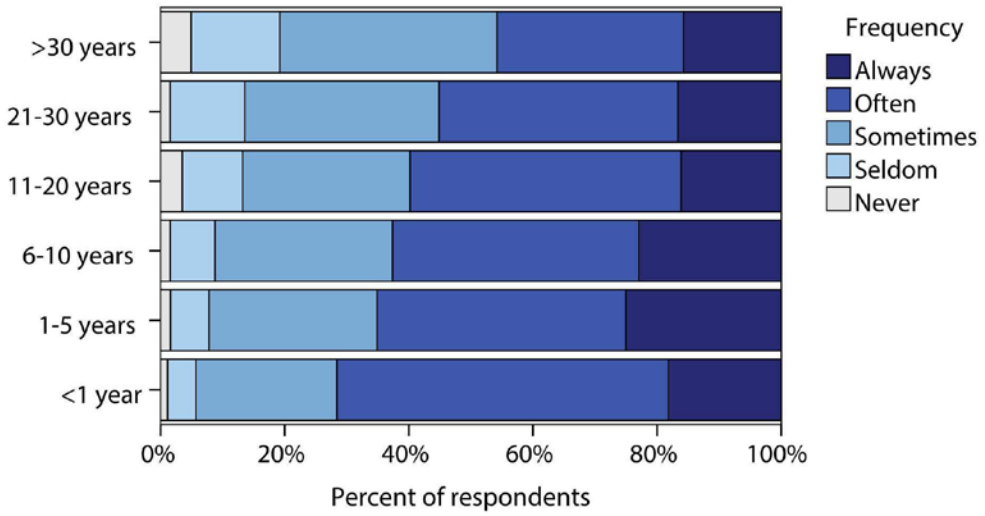

Figure 85. Respondents' ratings of the frequency of "travel ceilings" as a barrier to collaboration versus how many years they had worked for the Bureau of Land Management. (>, greater than; <, less than)

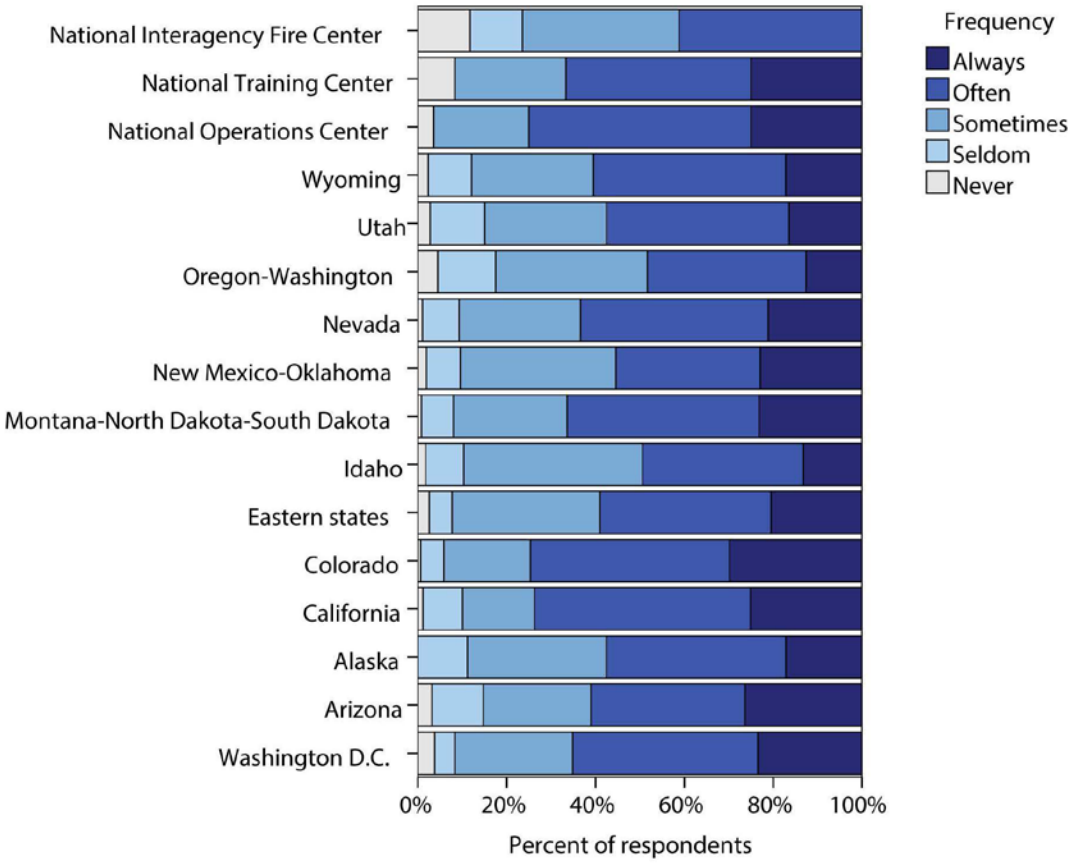

Figure 86. Respondents' ratings of the frequency of "travel ceilings" as a barrier to collaboration, comparing the Bureau of Land Management (BLM) State Offices and BLM Centers.

Respondents differed in how they rated the effect of "travel ceilings" on collaborations across duty station levels (Wald $\chi^2(3, n = 1{,}773) = 10.37$, $p = 0.016$; fig. 87). Also, respondents that rated "travel ceilings" as occurring more frequently also rated them as having a greater effect on collaborations and vice versa (Wald $\chi^2(3, n = 1{,}773) = 137.48$, p less than 0.001; fig. 88).

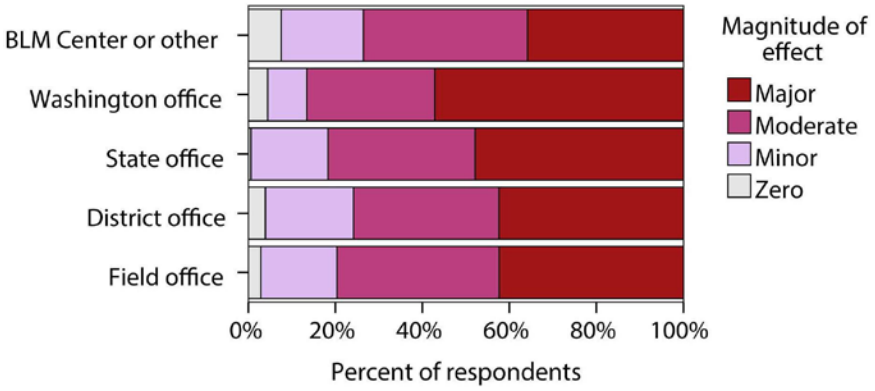

Figure 87. Respondents' ratings of the magnitude of effect of "travel ceilings" as a barrier to collaborations, comparing duty station levels. (BLM, Bureau of Land Management)

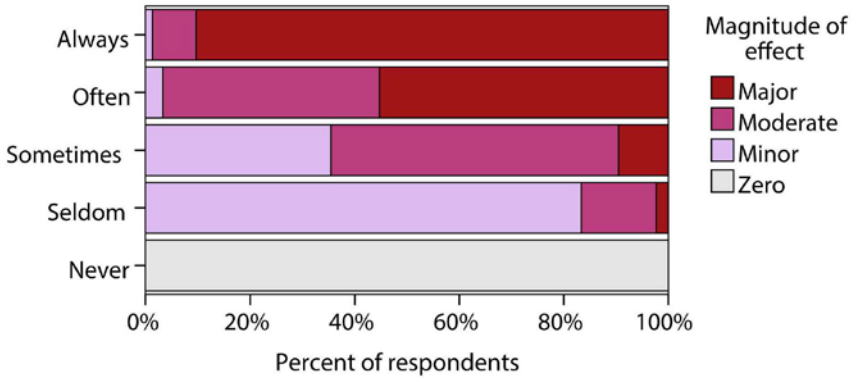

Figure 88. Respondents' ratings of the magnitude of effect of "travel ceilings" as a barrier to collaborations versus how they rated its frequency as a barrier to collaborations.

Frequency and Effect of "Other BLM Duties Take Priority over Collaboration" as a Barrier to Collaboration

Respondents differed among BLM State Offices and BLM Centers in how frequently they thought that "other BLM duties take priority over collaboration" was a barrier to collaboration (Wald $\chi^2(12, n = 1{,}796) = 31.47$, $p = 0.002$; fig. 89).

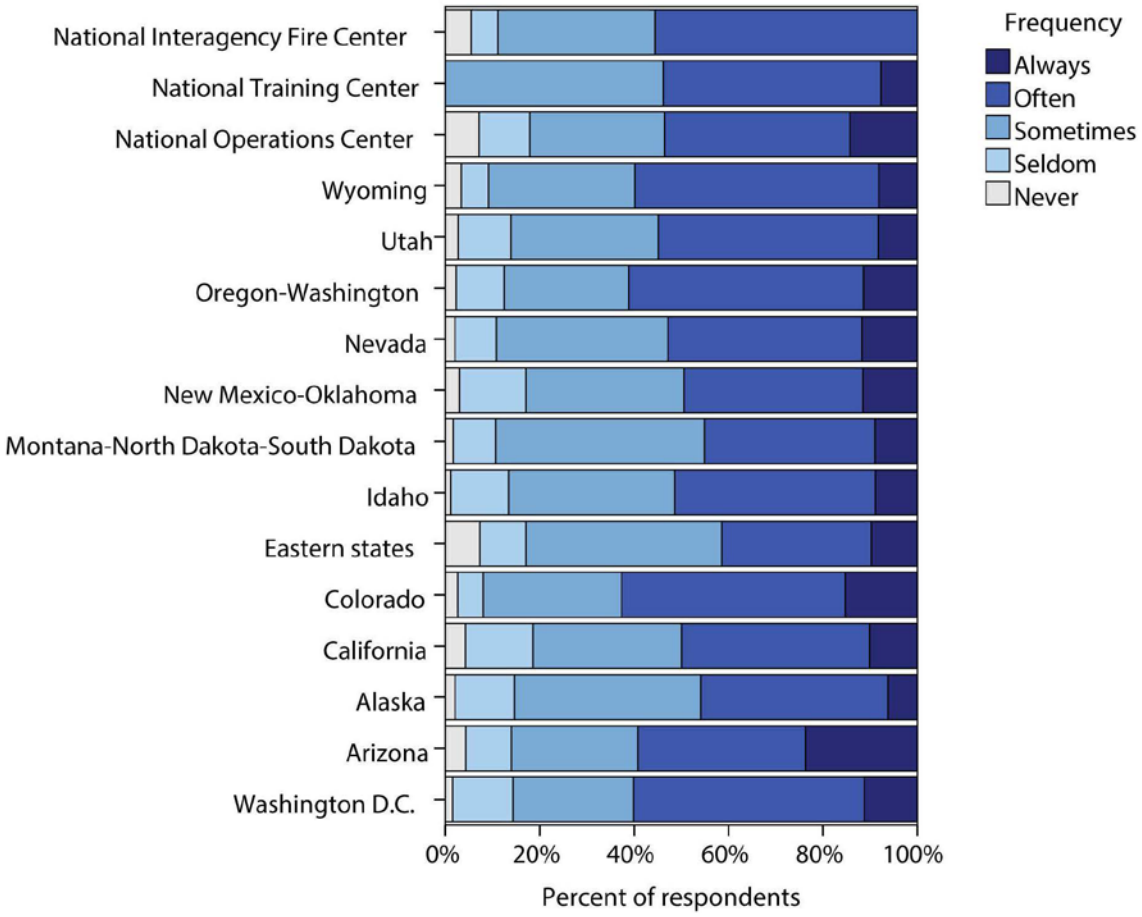

Figure 89. Respondents' ratings of the frequency of "other BLM duties take priority over collaboration" as a barrier to collaboration, comparing Bureau of Land Management (BLM) State Offices and BLM Centers.

Respondents that rated "other BLM duties take priority over collaboration" as occurring more frequently also rated it as having a greater effect on collaborations and vice versa (Wald $\chi^2(4, n = 1{,}796) = 708.06$, p less than 0.001; fig. 90).

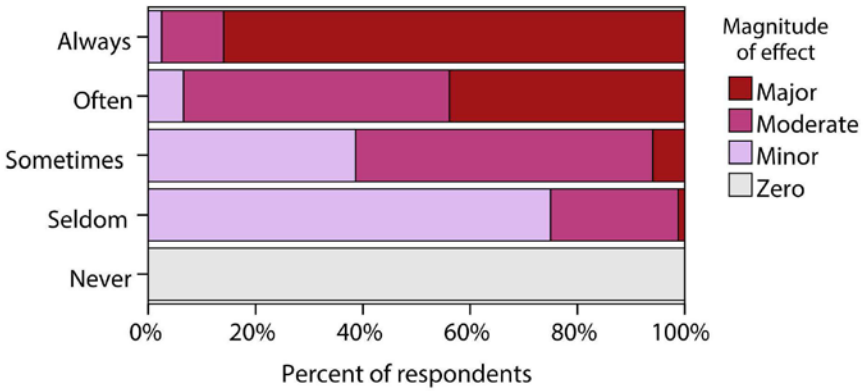

Figure 90. Respondents' ratings of the magnitude of effect of "other BLM duties take priority over collaboration" as a barrier to collaboration versus how they rated its frequency as a barrier to collaboration. (BLM, Bureau of Land Management)

Frequency and Effect of "Field Personnel Lack Authority to Conduct Collaborations" as a Barrier to Collaboration

Decision-makers typically rated "field personnel lack authority to conduct collaborations" as a less frequent barrier than other respondents (Wald $\chi^2(1, n = 1{,}530) = 20.55$, p less than 0.001; fig. 91). Respondents differed based on how many years they had worked for the BLM (Wald $\chi^2(5, n = 1{,}530) = 16.98$, $p = 0.005$; fig. 92). Finally, respondents varied based on their experience with collaboration and(or) ADR (Wald $\chi^2(3, n = 1{,}530) = 13.93$, $p = 0.003$; fig. 93).

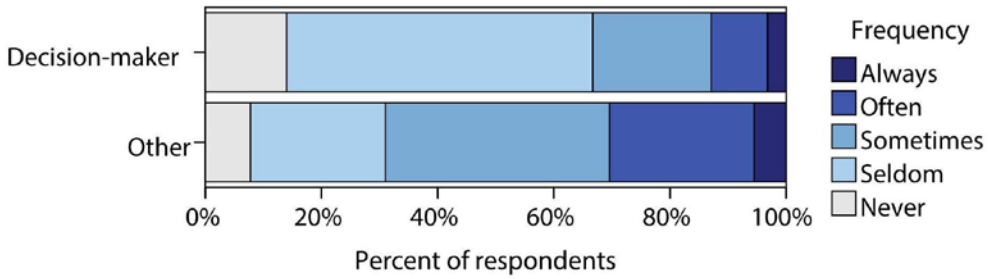

Figure 91. Respondents' ratings of the frequency of "field personnel lack authority to conduct collaborations" as a barrier to collaboration, comparing decision-makers to other respondents.

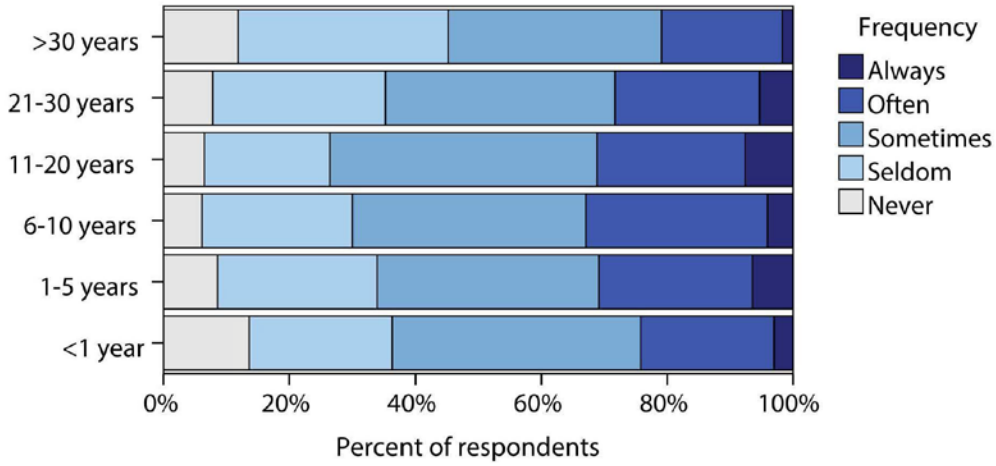

Figure 92. Respondents' ratings of the frequency of "field personnel lack authority to conduct collaborations" as a barrier to collaboration versus the number of years they had worked for the Bureau of Land Management (BLM). (>, greater than; <, less than)

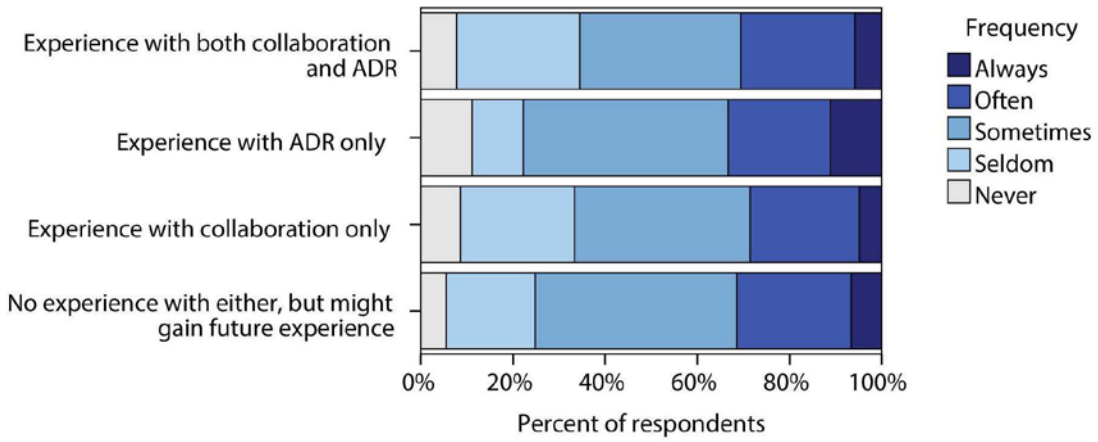

Figure 93. Respondents' ratings of the frequency of "field personnel lack authority to conduct collaborations" as a barrier to collaboration versus their experience with collaboration and(or) Alternative Dispute Resolution (ADR).

Respondents' ratings of the effect of "field personnel lack authority to conduct collaborations" on collaborations varied by duty station level (Wald $\chi^2(3, n = 1{,}530) = 8.61$, $p = 0.035$; fig. 94). Also, respondents that rated this barrier as occurring more frequently also rated it as having a greater effect on collaborations and vice versa (Wald $\chi^2(2, n = 1{,}530) = 96.83$, p less than 0.001; fig. 95).

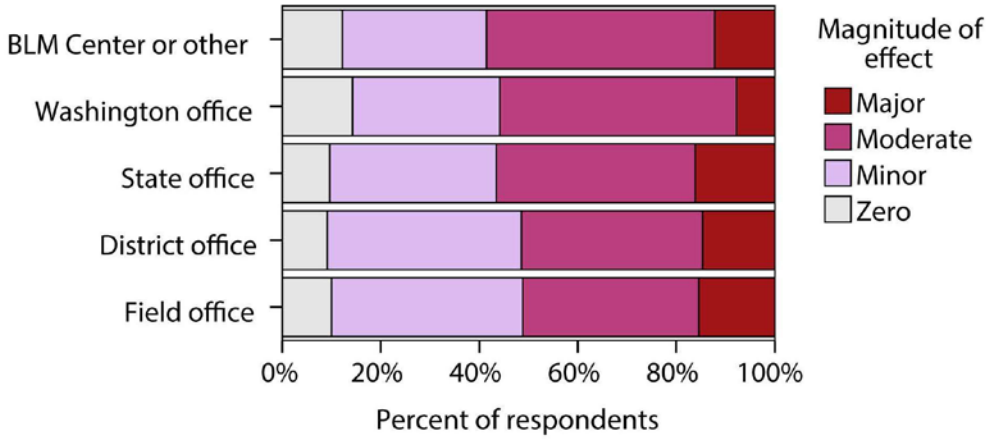

Figure 94. Respondents' ratings of the magnitude of effect of "field personnel lack authority to conduct collaborations" as a barrier to collaboration, comparing duty station levels. (BLM, Bureau of Land Management)

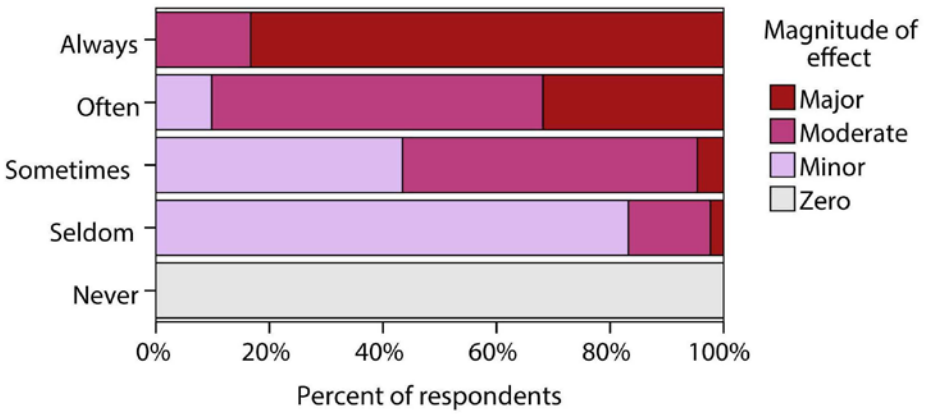

Figure 95. Respondents' ratings of the magnitude of effect of "field personnel lack authority to conduct collaborations" as a barrier to collaboration versus how they rated its frequency as a barrier to collaboration.

Frequency and Effect of "Lack of Support in the BLM" as a Barrier to Collaboration

Decision-makers typically rated "lack of support in the BLM" as a barrier less frequently than other respondents (Wald $\chi^2(1, n = 1{,}689) = 27.25$, p less than 0.001; fig. 96). Respondents also differed in how they rated the frequency of lack of support in the BLM as a barrier to collaboration by duty station level (Wald $\chi^2(3, n = 1{,}689) = 215.26$, p less than 0.001; fig. 97) and across the BLM State Offices and BLM Centers (Wald $\chi^2(12, n = 1{,}689) = 215.26$, p less than 0.001; fig. 98).

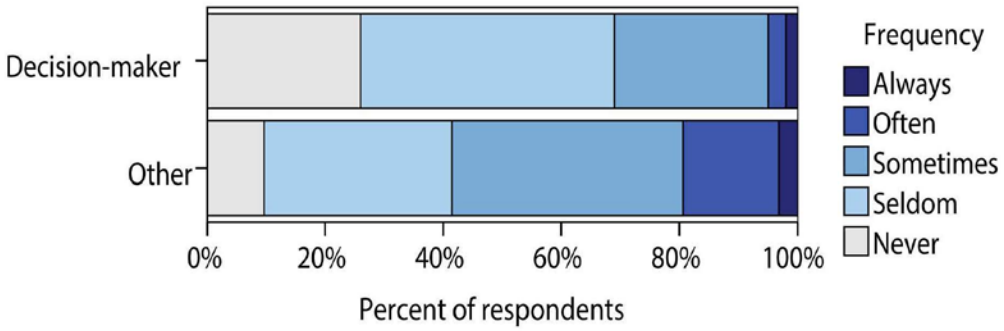

Figure 96. Respondents' ratings of the frequency of "lack of support in the BLM" as a barrier to collaboration, comparing decision-makers to other respondents. (BLM, Bureau of Land Management)

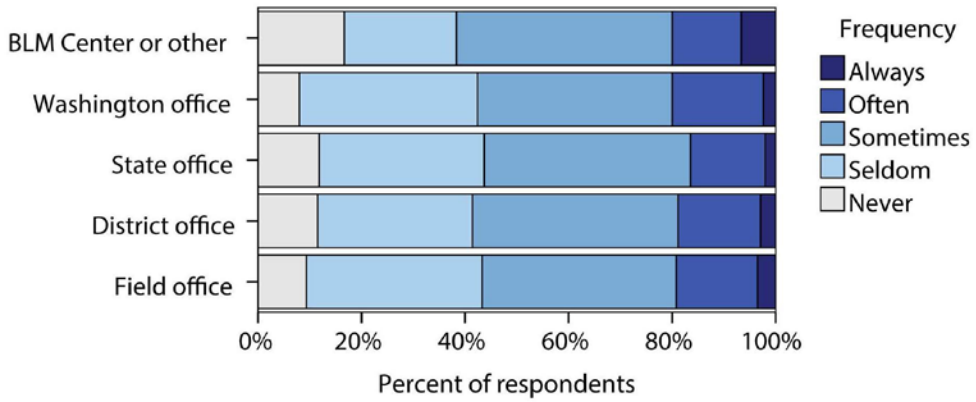

Figure 97. Respondents' ratings of the frequency of "lack of support in the BLM" as a barrier to collaboration, comparing duty station levels. (BLM, Bureau of Land Management)

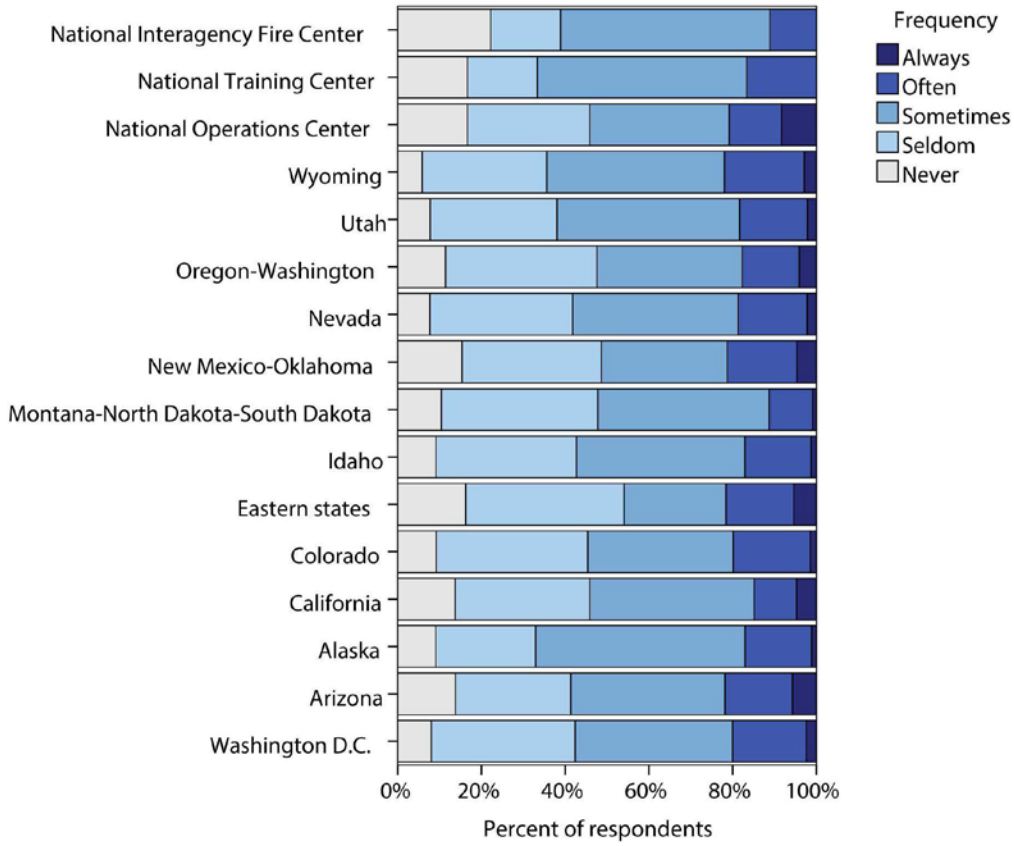

Figure 98. Respondents' ratings of the frequency of "lack of support in the BLM" as a barrier to collaboration, comparing Bureau of Land Management (BLM) State Offices and BLM Centers.

Respondents that rated "lack of support in the BLM" as occurring more frequently also rated it as having a greater effect on collaborations and vice versa (Wald $\chi^2(2, n = 1{,}530) = 96.83$, p less than 0.001; fig. 99).

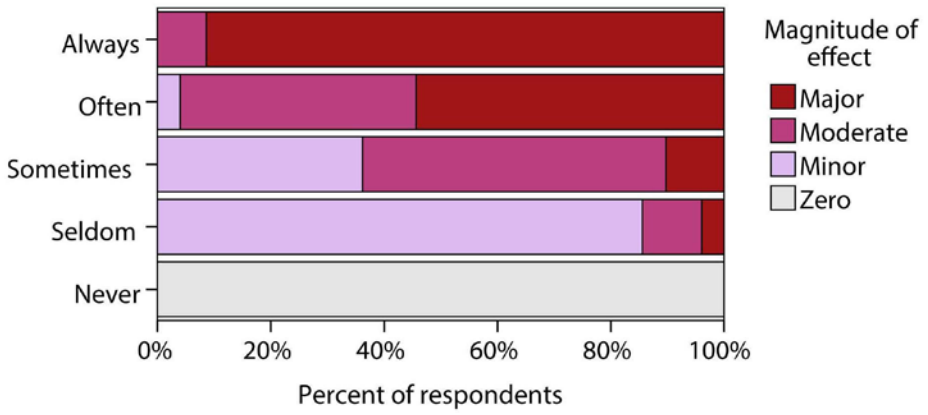

Figure 99. Respondents' ratings of the frequency of "lack of support in the BLM" as a barrier to collaboration versus how they rated its frequency as a barrier to collaboration.

Frequency and Effect of "Lack of Support from Your Supervisor" as a Barrier to Collaboration

Women tended to rate "lack of support from your supervisor" as a slightly more frequent barrier than men (Wald $\chi^2(1, n = 1{,}806) = 5.75$, $p = 0.017$; fig. 100). Decision-makers typically rated this barrier as less frequent than other respondents (Wald $\chi^2(1, n = 1{,}806) = 20.59$, p less than 0.001; fig. 101). In general, respondents progressively rated this as a more frequent barrier until they had worked for the BLM for about10 yr, and then they progressively rated this as a less frequent barrier the longer they had worked for the BLM (Wald $\chi^2(5, n = 1{,}806) = 12.26$, $p = 0.031$; fig. 102). Finally, respondents rated this barrier differently based on their experience with collaboration and(or) ADR (Wald $\chi^2(3, n = 1{,}806) = 13.98$, $p = 0.003$; fig. 103).

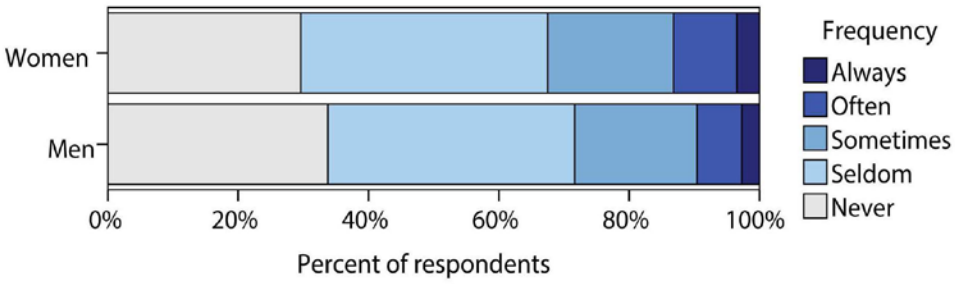

Figure 100. Respondents' ratings of the frequency of "lack of support from your supervisor" as a barrier to collaboration, comparing women to men.

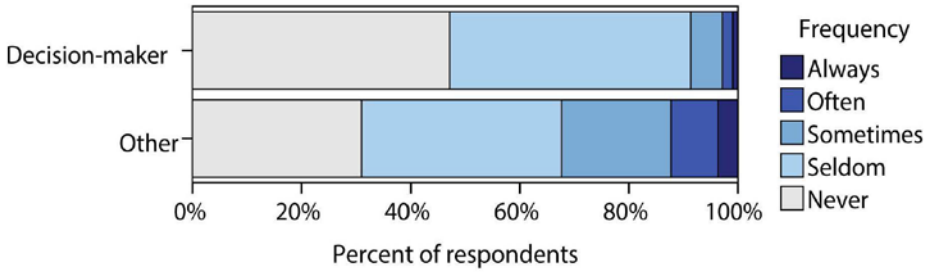

Figure 101. Respondents' ratings of the frequency of "lack of support from your supervisor" as a barrier to collaboration, comparing decision-makers to other respondents.

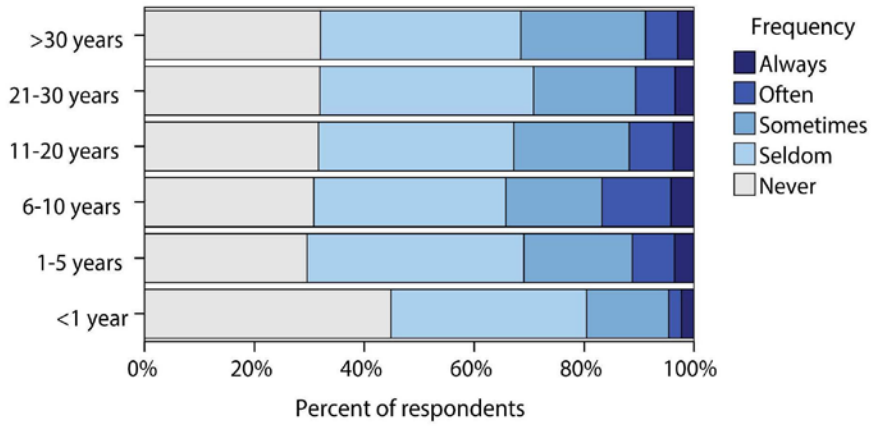

Figure 102. Respondents' ratings of the frequency of "lack of support from your supervisor" as a barrier to collaboration versus how many years they had worked for the Bureau of Land Management. (>, greater than; <, less than)

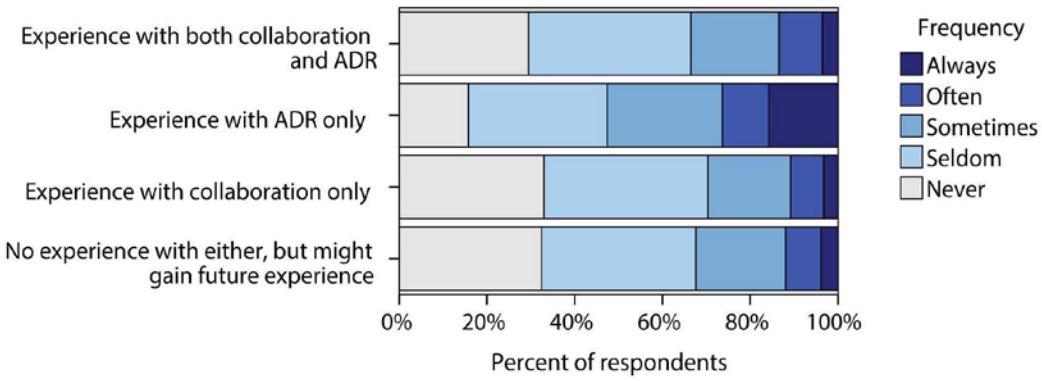

Figure 103. Respondents' ratings of the frequency of "lack of support from your supervisor" as a barrier to collaboration versus their experience with collaboration and(or) Alternative Dispute Resolution (ADR).

Respondents from the Washington office and BLM Centers rated "lack of support from your supervisor" as having a greater effect on collaborations than respondents in other duty station levels (Wald $\chi^2(3, n = 1{,}806) = 90.47$, p less than 0.001; fig. 104). Respondents differed in how they rated the magnitude of this barrier's effect on collaborations across the BLM State Offices and BLM Centers (Wald $\chi^2(11, n = 1{,}806) = 695.28$, p less than 0.001; fig. 105). Finally, respondents that rated this barrier as occurring more frequently also rated it as having a greater effect on collaborations and vice versa (Wald $\chi^2(3, n = 1{,}806) = 934.43$, p less than 0.001; fig. 106).

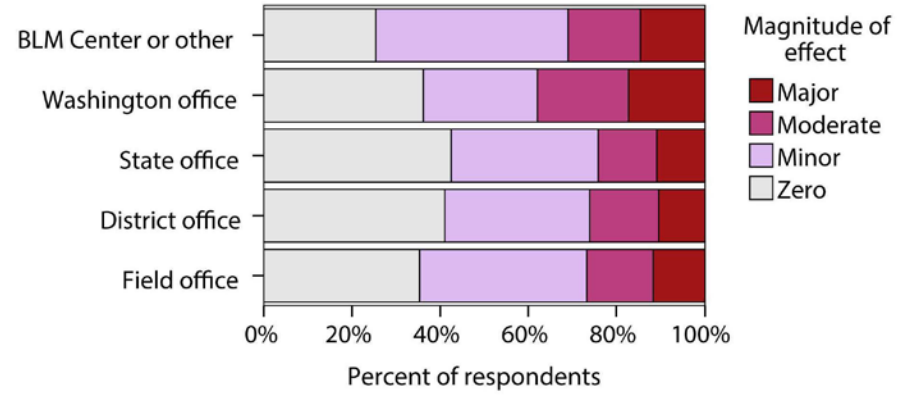

Figure 104. Respondents' ratings of the magnitude of effect of "lack of support from your supervisor" as a barrier to collaboration, comparing duty station levels. (BLM, Bureau of Land Management)

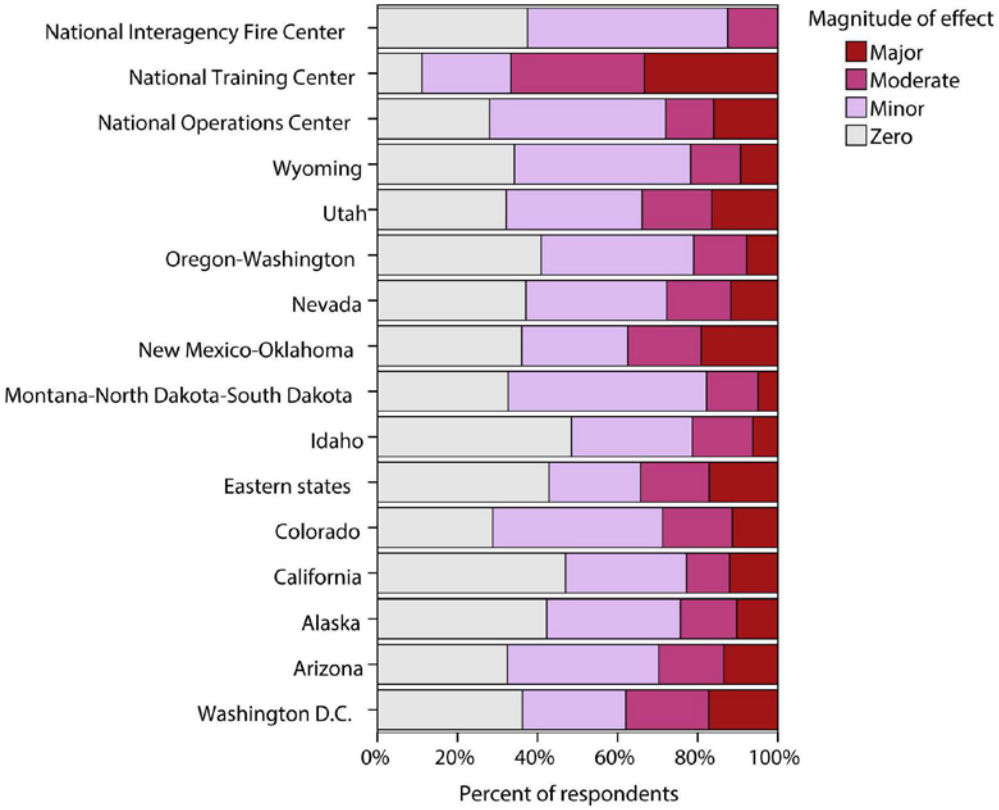

Figure 105. Respondents' ratings of the magnitude of effect of "lack of support from your supervisor" as a barrier to collaboration, comparing Bureau of Land Management (BLM) State Offices and BLM Centers.

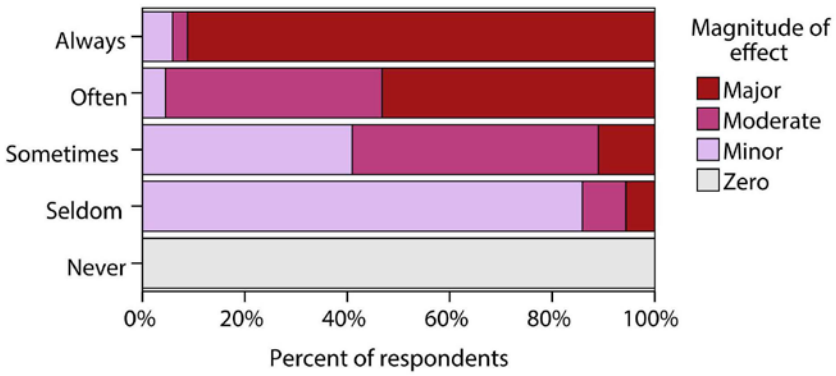

Figure 106. Respondents' ratings of the magnitude of effect of "lack of support from your supervisor" as a barrier to collaboration versus how they rated its frequency as a barrier to collaboration.

Overall Frequency of Organizational Barriers to Collaboration in the BLM

How frequently respondents thought that organizational barriers to collaboration were encountered in general was measured as the sum of their ratings of the frequency of the 12 organizational barriers listed along the 5-point likelihood scale (0 = never, 1 = seldom, 2 = sometimes, 3 = often, and 4 = always). Thus, the potential range of the overall frequency of organizational barriers scale was 0 (these 12 organizational barriers are "never" encountered) to 60 (all 12 organizational barriers are "always" encountered during collaborations). The scale's reliability was very good (Cronbach's alpha = 0.84, n = 987). The median value of respondents' overall frequency of organizational barriers was 25, which indicates that respondents rate these organizational barriers to collaborations generally in the middle of the frequency scale (that is, a rating of "sometimes" on average; fig. 107).

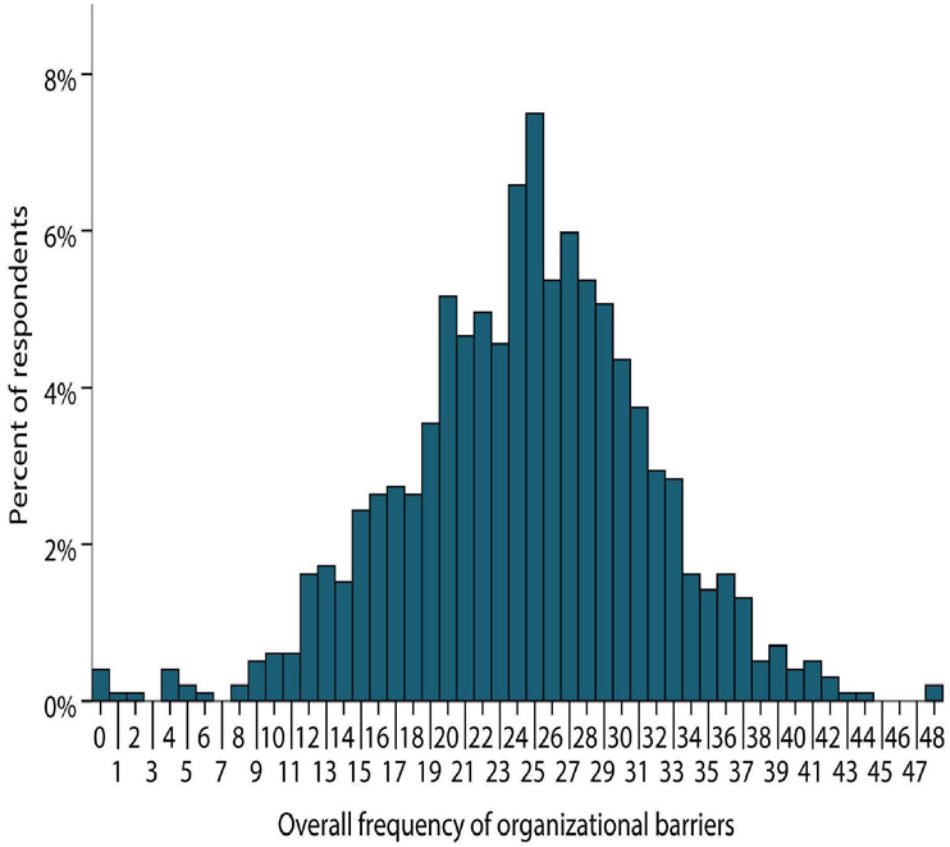

Figure 107. Respondents' ratings of the overall frequency of organizational barriers (from 0 or "never" to 48 or "always").

Decision-makers rated the frequency of organizational barriers overall as occurring slightly less frequently than other respondents (Wald $\chi^2(1, n = 771) = 7.3$, $p = 0.007$; fig. 108). Respondents that had worked for the BLM for longer rated the organizational barriers as occurring less frequently overall than respondents that had not worked for the BLM as long (Wald $\chi^2(5, n = 771) = 15.95$, $p = 0.007$; fig. 109). Respondents also varied in how they rated the overall frequency of organizational barriers to collaboration across BLM State Offices and BLM Centers (Wald $\chi^2(11, n = 771) = 25.27$, $p = 0.008$; fig. 110). Finally, respondents differed in how they rated the frequency of the organizational barriers overall by how they rated their overall level of skill in collaboration (Wald $\chi^2(48, n = 771) = 91.76$, p less than 0.001; fig. 111).

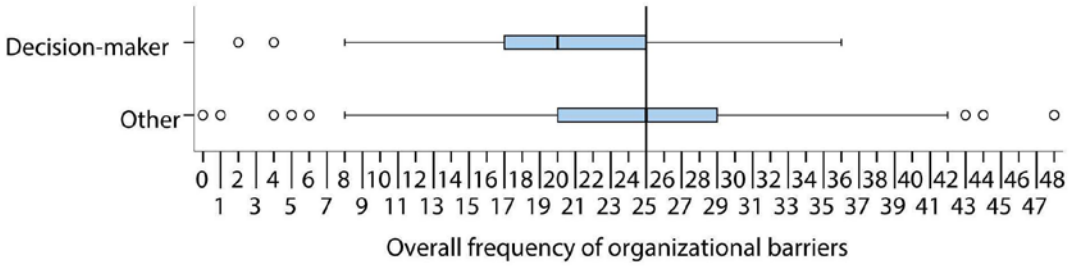

Figure 108. Respondents' ratings of the overall frequency of organizational barriers (from 0 or "never" to 48 or "always"), comparing decision-makers to other respondents. The vertical line depicts the median for all respondents for which the scale could be calculated. Refer to the Glossary for further explanation of boxplots.

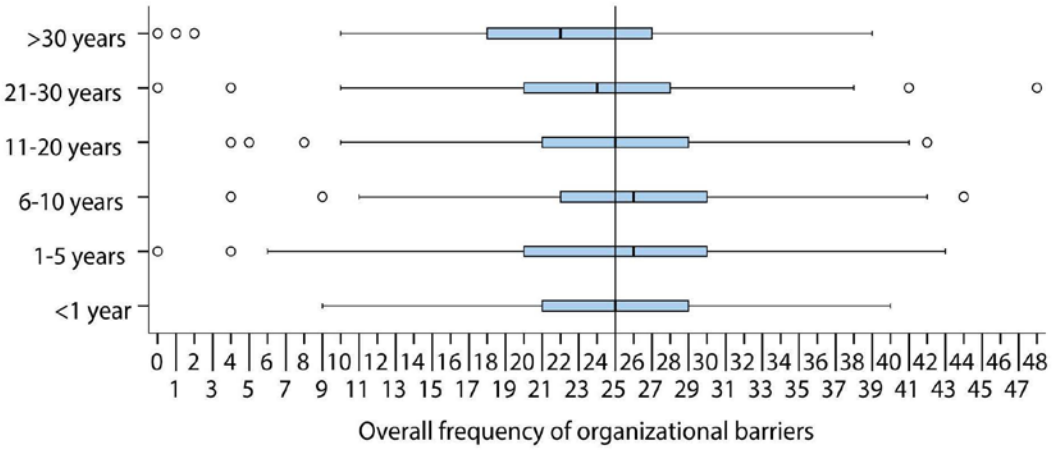

Figure 109. Respondents' ratings of the overall frequency of organizational barriers (from 0 or "never" to 48 or "always") versus how many years they had worked for the Bureau of Land Management. The vertical line depicts the median for all respondents for which the scale could be calculated. Refer to the Glossary for further explanation of boxplots. (>, greater than; <, less than)

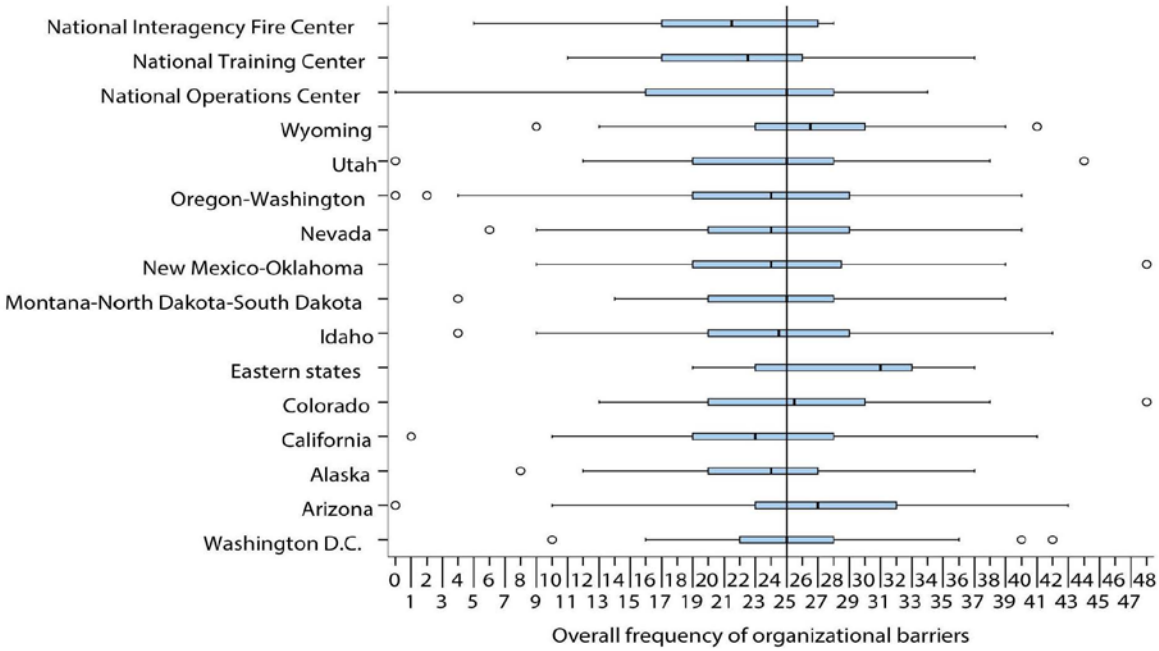

Figure 110. Respondents' ratings of the overall frequency of organizational barriers (from 0 or "never" to 48 or "always"), comparing Bureau of Land Management (BLM) State Offices and BLM Centers. The vertical line depicts the median for all respondents for which the scale could be calculated. Refer to the Glossary for further explanation of boxplots.

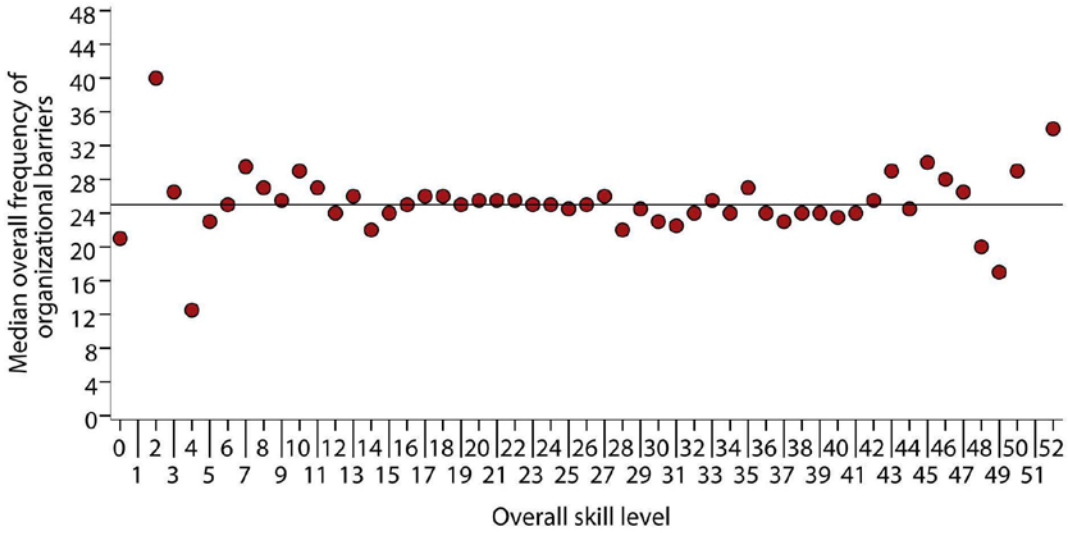

Figure 111. Respondents' ratings of the overall frequency of organizational barriers (from 0 or "never" to 48 or "always") versus their self-rated overall skill level in collaboration and Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert"). The horizontal line depicts the median for all respondents for which the scale could be calculated.

Overall Magnitude of Effect of Organizational Barriers to Collaboration in the BLM

The perceived magnitude of organizational barriers to collaboration as a whole was measured as the sum of respondents' ratings of the magnitude of effect of the 12 organizational barriers listed along the 4-point likelihood scale (0 = zero, because the barrier also has a frequency of zero, 1 = minor, 2 = moderate, and 3 = major). Thus, the potential range of the overall magnitude of effect of organizational barriers scale was 0 (all 12 organizational barriers are of "zero" effect because they never occur) to 36 (all 12 organizational barriers are "major" barriers to collaboration when they do occur). The scale's reliability was very good (Cronbach's alpha = 0.83, n = 610). The median value for all respondents was 21, which indicates that respondents rated these situational barriers to collaborations as having a "minor" to "moderate" effect on average when they do occur (fig. 112).

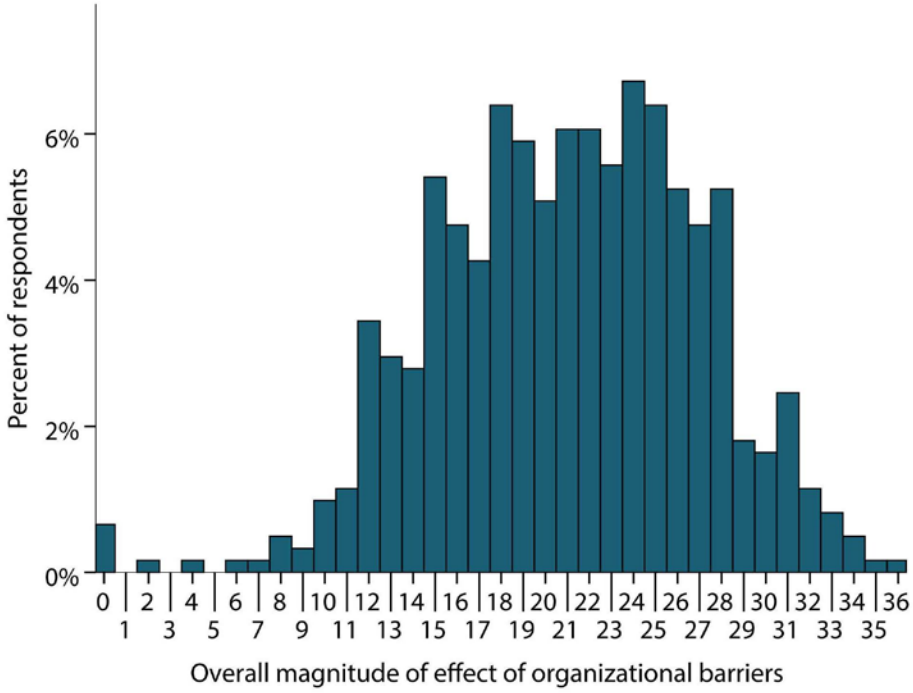

Figure 112. Respondents' ratings of the overall magnitude of effect of organizational barriers (from 0 or "zero" effect, because they never occur, to 36 or "major").

Decision-makers rated the magnitude of effect of organizational barriers as somewhat more minor overall than other respondents (Wald $\chi^2(1, n = 492) = 6.62$, $p = 0.010$; fig. 113). Respondents that rated themselves as an average overall level of skill of "no experience" to "beginner" and those that rated themselves as "expert" in collaboration and Alternative Dispute Resolution were more likely than other respondents to rate the magnitude of effect of organizational barriers overall as "major" (Wald $\chi^2(47, n = 492) = 157.74$, p less than 0.001; fig. 114). In general, respondents that had rated the situational barriers as occurring more frequently overall were increasingly more likely to rate the magnitude of effect of the situational barriers as "major" (Wald $\chi^2(38, n = 492) = 6{,}480.92$, p less than 0.001; fig. 115). Respondents differed in how they rated the magnitude of effect of organizational barriers overall based on their experience with collaboration and(or) ADR (Wald $\chi^2(3, n = 492) = 18.65$, p less than 0.001; fig. 116).

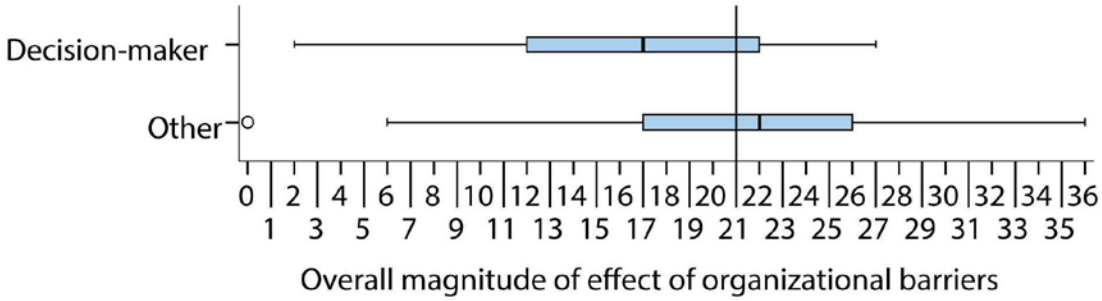

Figure 113. Respondents' ratings of the overall magnitude of effect of organizational barriers (from 0 or "zero" effect, because they never occur, to 36 or "major"), comparing decision-makers to other respondents. The vertical line depicts the median for all respondents for which the scale could be calculated. Refer to the Glossary for further explanation of boxplots.

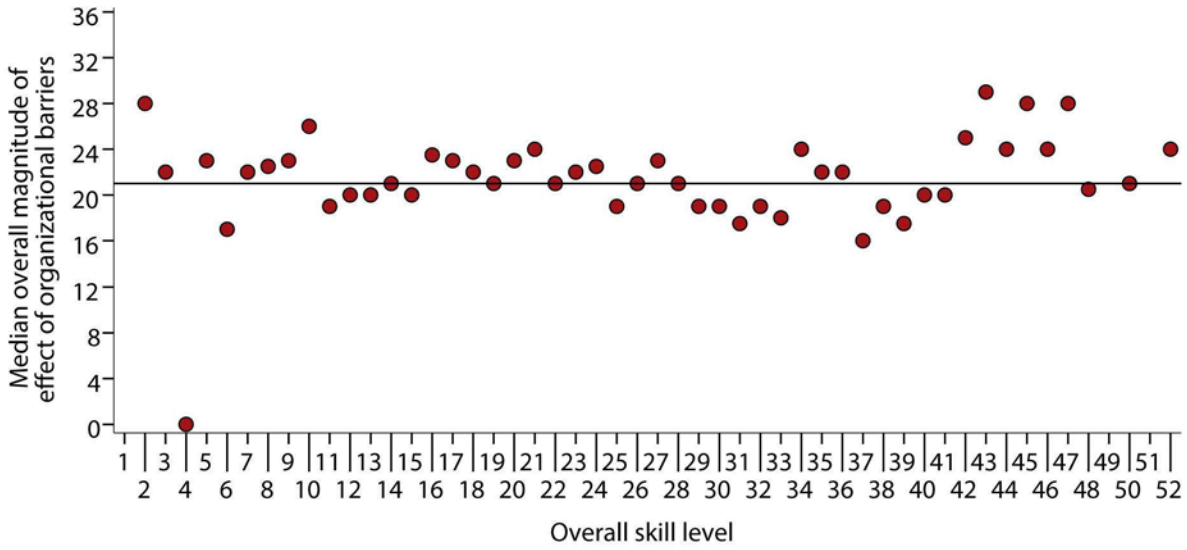

Figure 114. Respondents' ratings of the overall magnitude of effect of organizational barriers (from 0 or "zero" effect, because they never occur, to 36 or "major") versus their self-rated overall skill level in collaboration and(or) Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert"). The horizontal line depicts the median for all respondents for which the scale could be calculated.

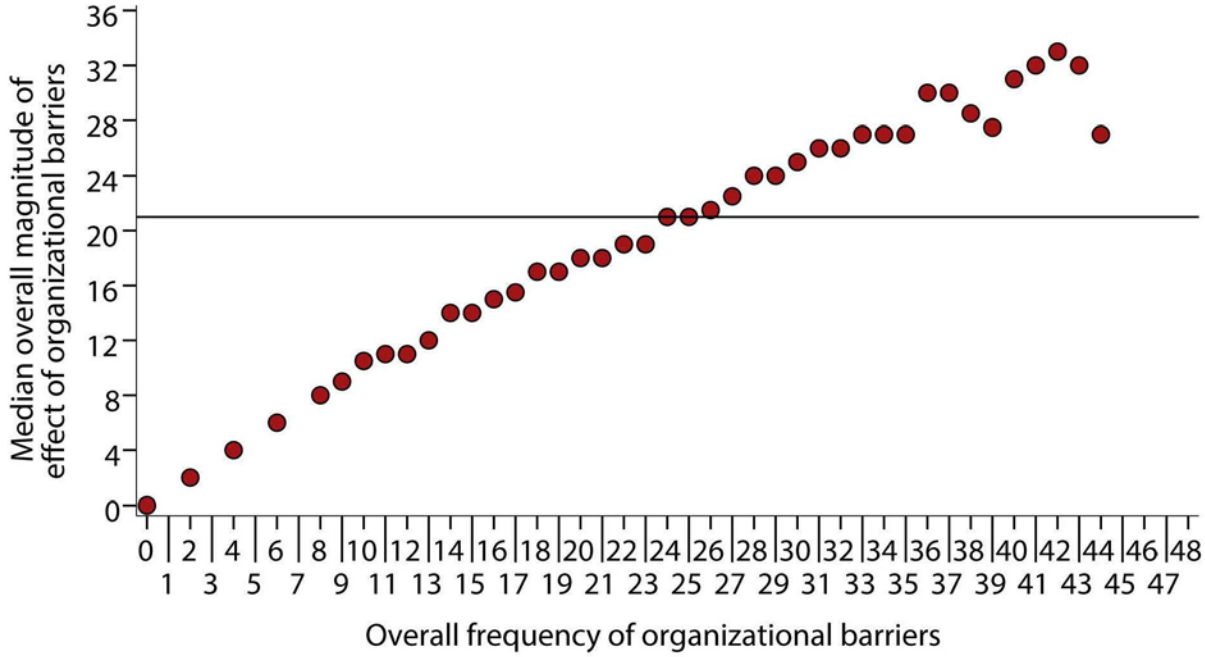

Figure 115. Respondents' ratings of the overall magnitude of effect of organizational barriers (from 0 or "zero" effect, because they never occur, to 36 or "major") versus how they rated the overall frequency of organizational barriers to collaboration (from 0 or "never" to 48 or "always"). The horizontal line depicts the median for all respondents for which the scale could be calculated.

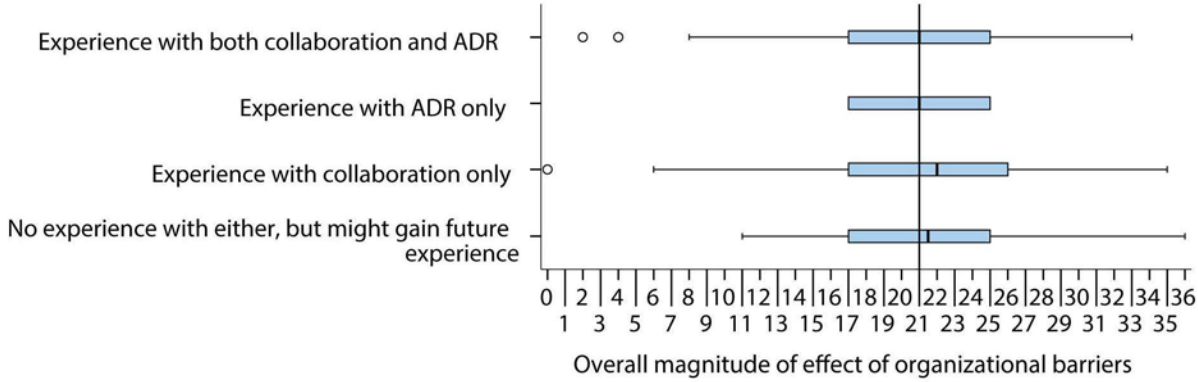

Figure 116. Respondents' ratings of the overall magnitude of effect of organizational barriers (from 0 or "zero" effect, because they never occur, to 36 or "major") versus their experience with collaboration and(or) Alternative Dispute Resolution (ADR). The vertical line depicts the median for all respondents for which the scale could be calculated. Refer to the Glossary for further explanation of boxplots.

Field Office Perceptions of Support for Collaboration

Respondents that indicated their duty station was a field office were asked to rate their perceived level of support for collaboration in (1) their field office, (2) their State Office, and (3) the Washington office along a 6-point scale ranging from "non-existent" to "very high" or "I don't know." An increasingly large proportion of respondents indicated they did not know what the level of support was for collaboration up the organizational hierarchy, and almost half indicated that they did not know what the level of support for collaboration was in the Washington office (fig. 117). Omitting the "I don't know" responses, the median field personnel rating of the level of support in all three levels was "moderate," although personnel did rate the level of support in their field office as slightly higher than the level of support in their State Office or the Washington office (Friedman test: $\chi^2(2, n = 702) = 44.14$, p less than 0.001; fig. 117). However, the rating that field personnel gave to their field office was significantly and highly positively correlated with the ratings they gave to their BLM State Office (Spearman's rho = 0.66, $n = 845$, p less than 0.001) and the Washington office (Spearman's rho = 0.72, $n = 713$, p less than 0.001). Furthermore, the ratings that field personnel gave to the level of support in their BLM State Office was even more highly correlated with the ratings they gave the level of support in the Washington office (Spearman's rho = 0.85, $n = 708$, p less than 0.001).

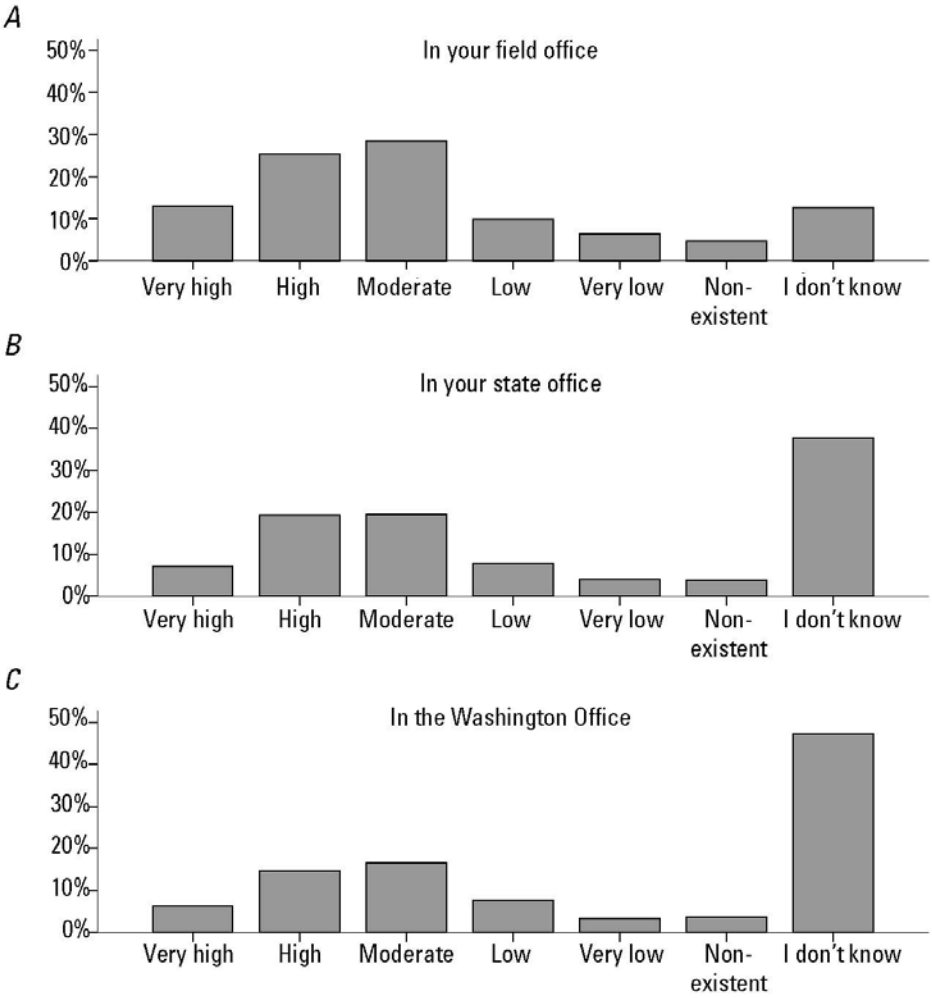

Figure 117. How field personnel rated the level of support for collaboration in *A*, their field office; *B*, their State Office; and *C*, the Washington office.

Decision-makers (in this case, Field Managers) generally rated the level of support in their field office as much higher than other field personnel (Wald $\chi^2(1, n = 1{,}005) = 13.55$, p less than 0.001; fig. 118). How field personnel perceived the level of support in their field office also varied depending on the BLM State Office to which their field office reported (Wald $\chi^2(12, n = 1{,}005) = 27.88$, $p = 0.006$; fig. 119). Finally, field personnel varied in how they rated the level of support in their field office based on their experience with collaboration and(or) ADR (Wald $\chi^2(3, n = 1{,}005) = 27.02$, p less than 0.001; fig. 120).

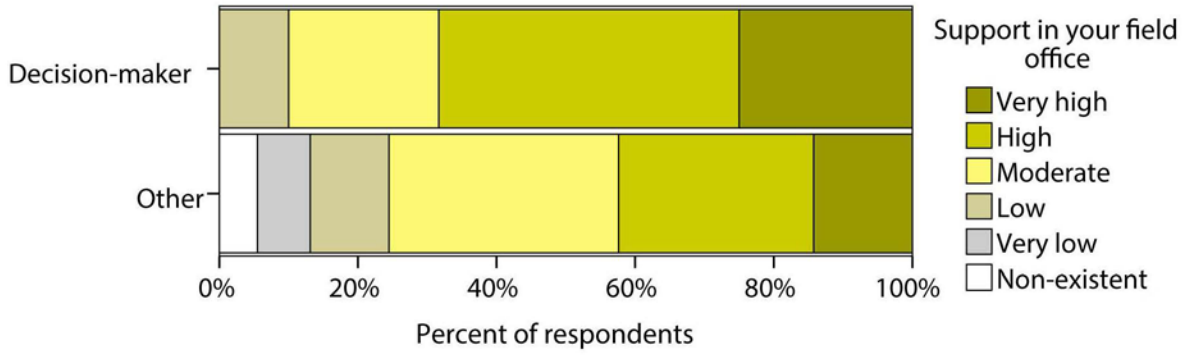

Figure 118. How field personnel rated the level of support for collaboration in their field office, comparing decision-makers (Field Managers) to other respondents.

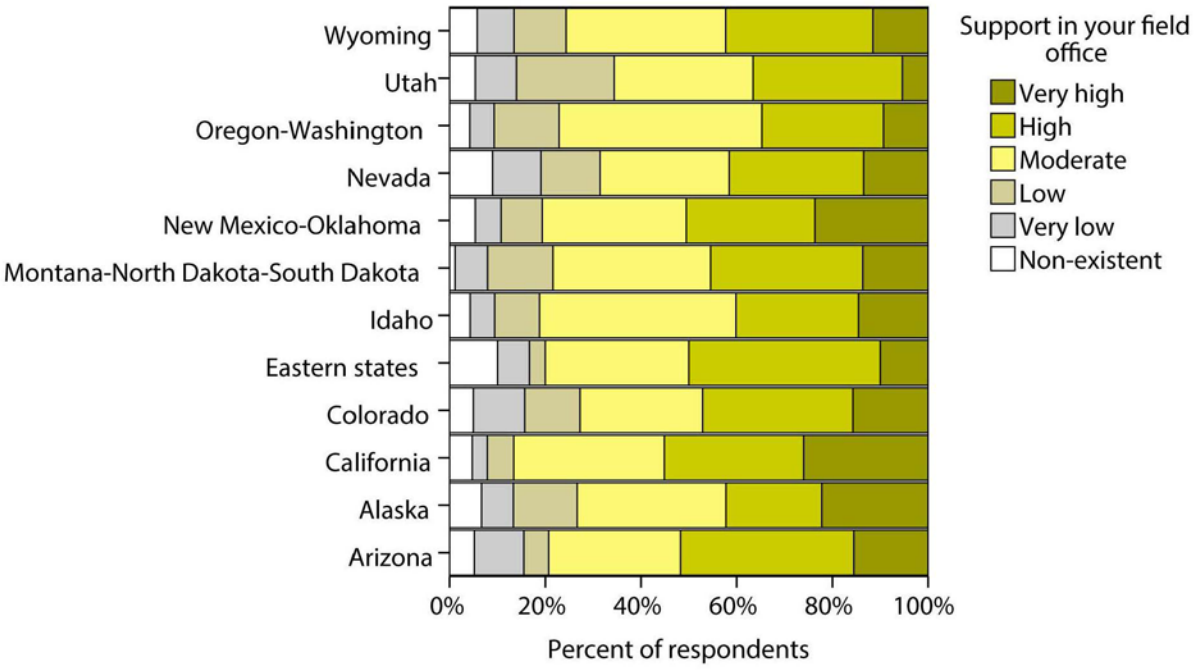

Figure 119. How field personnel rated the level of support for collaboration in their field office, comparing Bureau of Land Management State Offices.

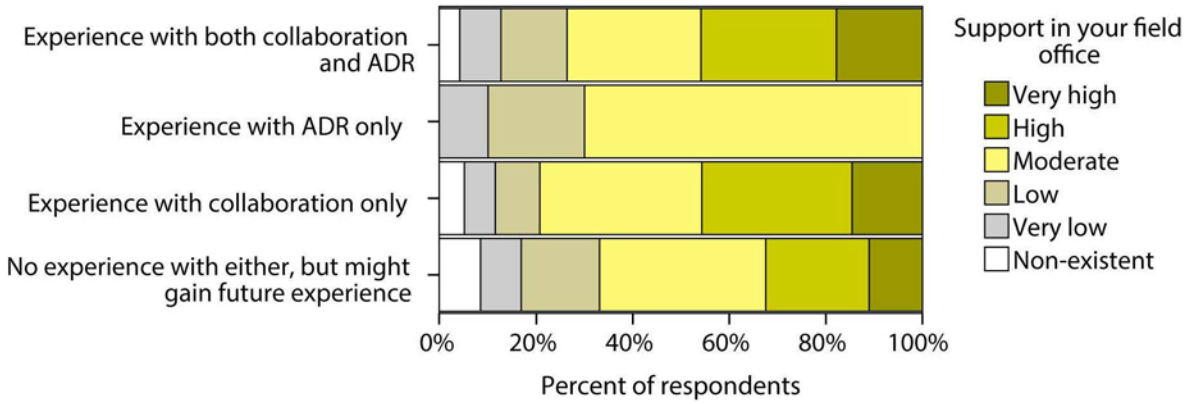

Figure 120. How field personnel rated the level of support for collaboration in their field office versus their experience with collaboration and(or) Alternative Dispute Resolution (ADR).

Field Managers (decision-makers) again rated the level of support from their State Office as much higher than other field personnel (Wald $\chi^2(1, n = 719) = 16.51$, p less than 0.001; fig. 121). In addition, field office personnel in varied by geographic region in how they rated the level of support in their State Office (Wald $\chi^2(12, n = 719) = 34.15$, $p = 0.001$; fig. 122).

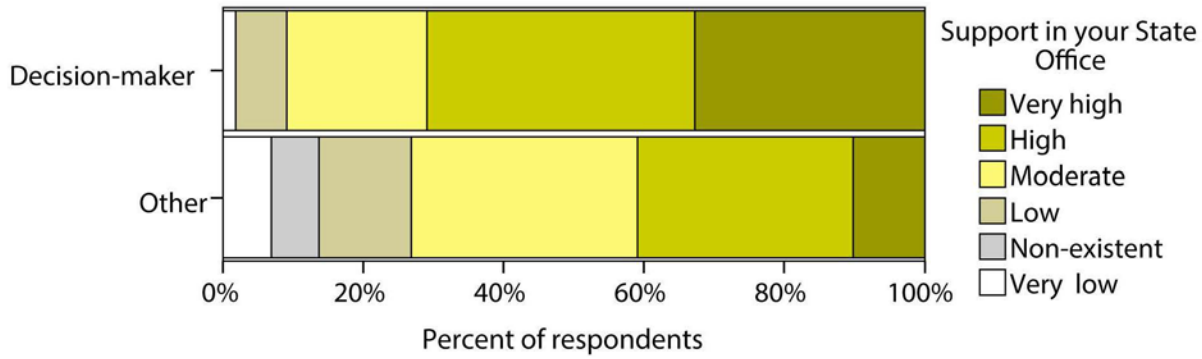

Figure 121. How field personnel rated the level of support for collaboration in their State Office, comparing decision-makers (Field Managers) to other respondents.

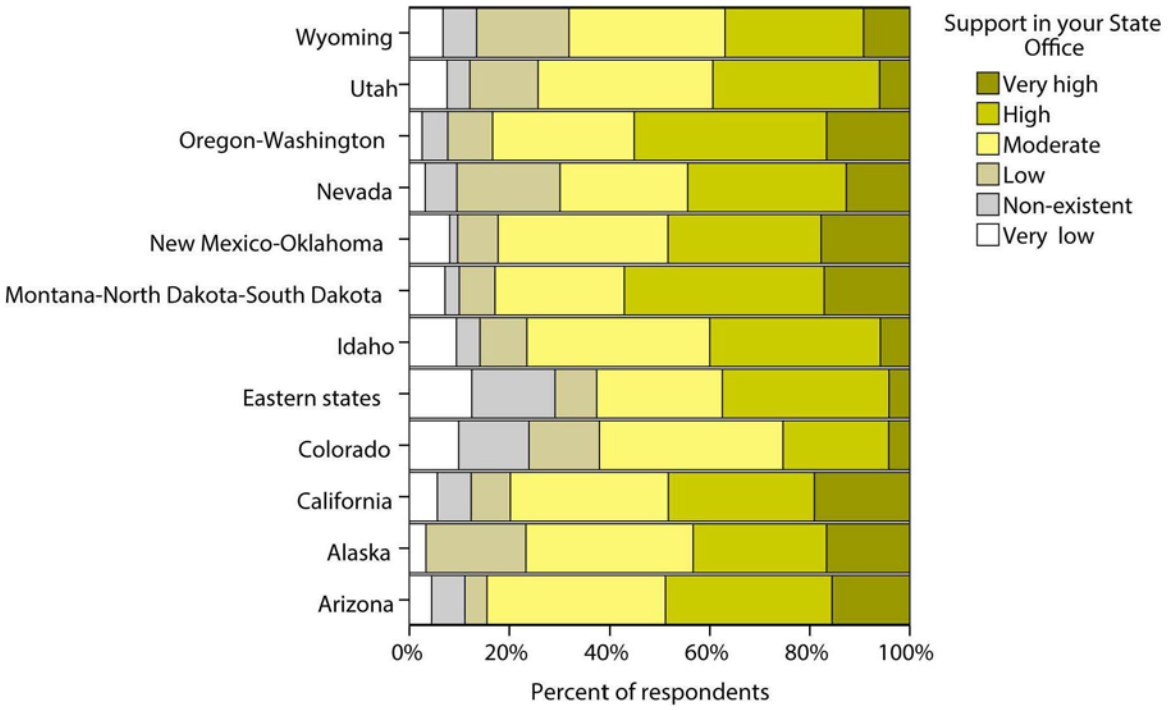

Figure 122. How field personnel rated the level of support for collaboration in their State Office, comparing Bureau of Land Management State Offices.

Finally, field personnel reporting to different BLM State Offices varied in how they rated the level of support in the Washington office (Wald $\chi^2(12, n = 613) = 24.38, p = 0.018$; fig. 123).

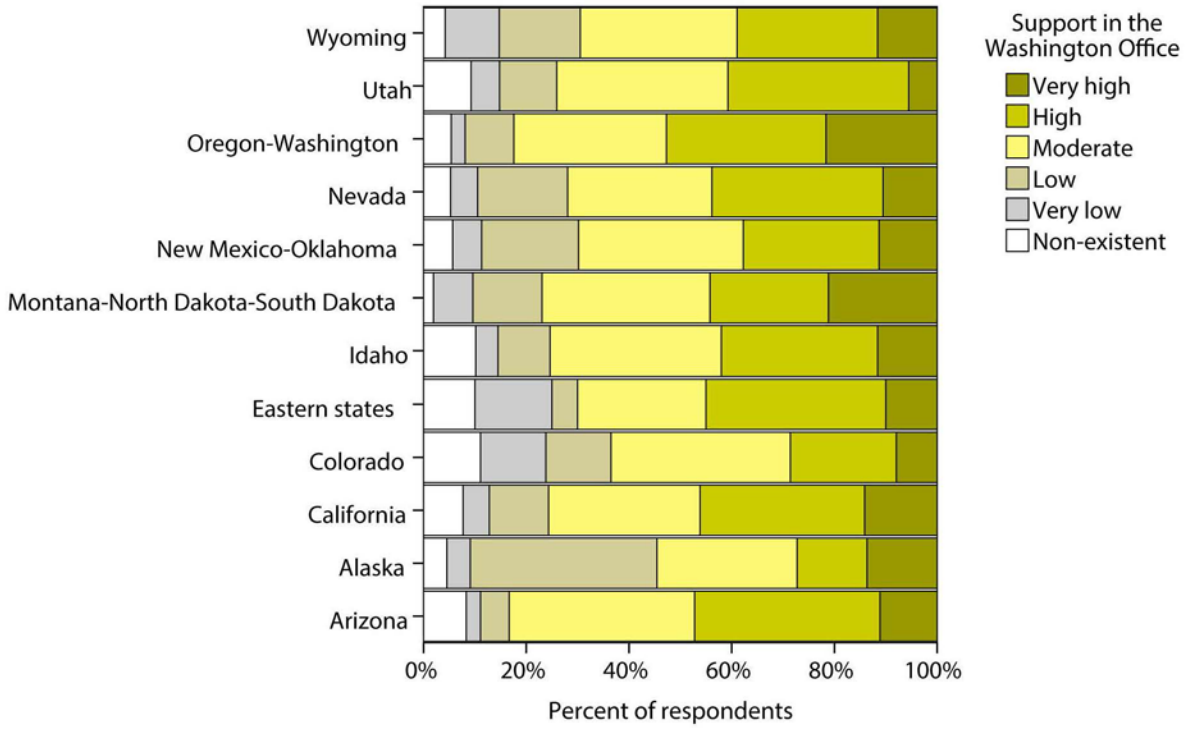

Figure 123. How field personnel rated the level of support for collaboration in the Washington office, comparing Bureau of Land Management State Offices.

Perceptions of How Collaboration Affects Outcomes

Respondents were asked to rate the effects of collaboration in the BLM on a list of 11 different outcomes on a 5-point scale, from "greatly worsens" to "greatly improves" (table 11). In general, respondents thought that collaboration "somewhat improved" all 13 outcomes listed, with the greatest improvement ratings given to "communication among different parties" and "the BLM's credibility with other agencies" (table 11). The outcomes that respondents were somewhat less likely to rate as greatly improved by collaboration were "the level of conflict among parties" and "BLM's risk of future litigation."

Table 11. Respondents' perceptions of how collaboration in the Bureau of Land Management (BLM) affects each of the following outcomes. (%, percent; <, less than)

		How collaboration by the BLM affects the outcome							
Outcomes	***n***	**Greatly worsens**	**Somewhat worsens**	**No difference**	**Somewhat improves**	**Greatly improves**	**median**	**mode**	**Friedman mean rank[1]**
Communication among different parties	2,117	1%	3%	8%	50%	38%	Somewhat improves	Somewhat improves	7.2
The BLM's credibility with other agencies	2,066	1%	4%	15%	47%	34%	Somewhat improves	Somewhat improves	6.7
Trust among different parties	2,108	2%	4%	13%	50%	31%	Somewhat improves	Somewhat improves	6.5
The quality of BLM's decisions	2,095	2%	6%	13%	47%	33%	Somewhat improves	Somewhat improves	6.5
The public's understanding of BLM decisions	2,080	2%	4%	16%	47%	31%	Somewhat improves	Somewhat improves	6.4
BLM's ability to incorporate local/traditional knowledge in decisions	1,946	5%	13%	14%	41%	26%	Somewhat improves	Somewhat improves	5.8
The level of agreement among parties on shared goals or vision	1,959	5%	14%	15%	43%	24%	Somewhat improves	Somewhat improves	5.7
The legitimacy (that is, democratic and transparent) of BLM's decisions	1,931	6%	14%	17%	35%	29%	Somewhat improves	Somewhat improves	5.7
BLM's ability to incorporate multiple disciplines in decisions	1,950	6%	14%	19%	37%	25%	Somewhat improves	Somewhat improves	5.5
The level of conflict among parties	1,962	4%	10%	16%	57%	14%	Somewhat improves	Somewhat improves	5.2
BLM's risk of future litigation	1,904	5%	7%	24%	52%	13%	Somewhat improves	Somewhat improves	4.9

[1]The effects of collaboration by the BLM significantly differ among one or more outcomes (Friedman test: Chi-square = 1,125.88, d.f. = 10, n = 1,537, p <0.001).

General Attitudes toward How Collaboration Affects Outcomes

Respondents' general attitudes toward the effects of collaboration on outcomes was measured as the sum of their ratings for the 13 outcomes listed along a 5-point scale (–2 = greatly worsens, –1 = somewhat worsens, 0 = no difference, 1 = somewhat improves, and 2 = greatly improves). Thus, the potential range of the scale for general attitudes about how collaboration affects outcomes was –26 (collaboration "greatly worsens" all 13 outcomes) to 26 (collaboration "greatly improves" all 13 outcomes). The 13 outcomes include those reported in table 11 and two outcomes related to short and long- term costs, reported in table 12.The scale's reliability was very good (Cronbach's alpha = 0.86, n = 1,537). The median value of respondents' overall frequency of organizational barriers was 10, which indicates that respondents generally thought that collaboration "somewhat improves" outcomes (fig. 124).

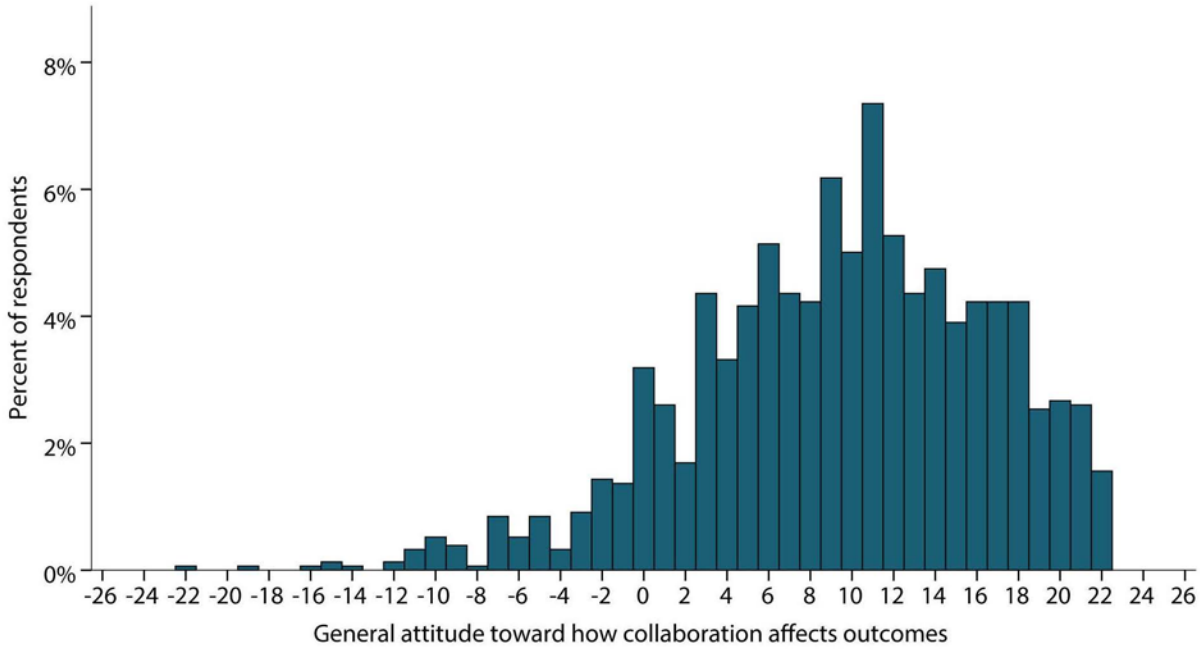

Figure 124. Respondents' general attitude toward how collaboration affects outcomes (from –26 or "greatly worsens" to 26 or "greatly improves").

Women were slightly more positive about how collaboration affects outcomes than men (Wald $\chi^2(1, n = 436) = 4.84$, $p = 0.028$; fig. 125). Decision-makers were slightly more positive than the other respondents (Wald $\chi^2(1, n = 436) = 7.30$, $p = 0.007$; fig. 126). In general, respondents that rated the situational barriers as occurring frequently overall were somewhat less positive about the effect of collaboration on outcomes than other respondents (Wald $\chi^2(34, n = 436) = 121.63$, p less than 0.001; fig. 127). In addition, respondents that rated the organizational barriers as occurring frequently overall were also generally less positive about the effect of collaboration on outcomes than other respondents (Wald $\chi^2(37, n = 436) = 105.58$, p less than 0.001; fig. 128). Finally, respondents that rated themselves as an average overall level of skill of "no experience" to "beginner" were generally less positive about collaboration's effects on outcomes than other respondents, and respondents that rated themselves as highly skilled were slightly more positive (Wald $\chi^2(46, n = 436) = 86.28$, p less than 0.001; fig. 129).

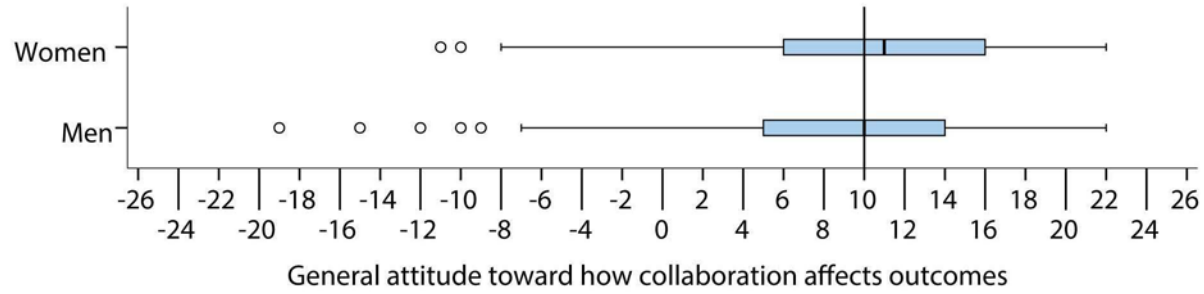

Figure 125. Respondents' general attitude toward how collaboration affects outcomes (from –26 or "greatly worsens" to 26 or "greatly improves"), comparing women to men. The vertical line depicts the median for all respondents for which the scale could be calculated. Refer to the Glossary for further explanation of boxplots.

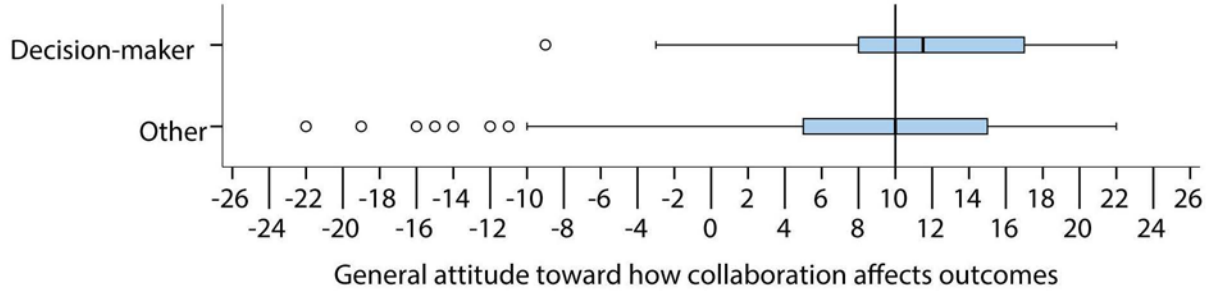

Figure 126. Respondents' general attitude toward how collaboration affects outcomes (from –26 or "greatly worsens" to 26 or "greatly improves"), comparing decision-makers to other respondents. The vertical line depicts the median for all respondents for which the scale could be calculated. Refer to the Glossary for further explanation of boxplots.

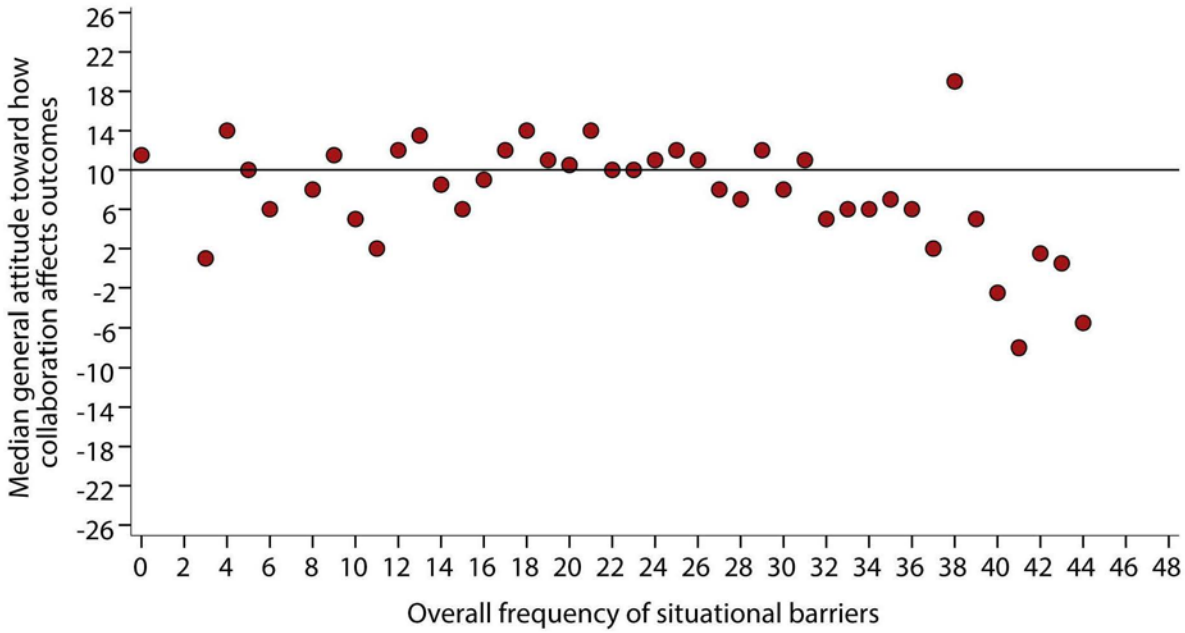

Figure 127. Respondents' general attitude toward how collaboration affects outcomes (from –26 or "greatly worsens" to 26 or "greatly improves") versus how they rated the overall frequency of situational barriers (from 0 "never" to 48 or "always"). The horizontal line depicts the median for all respondents for which the scale could be calculated.

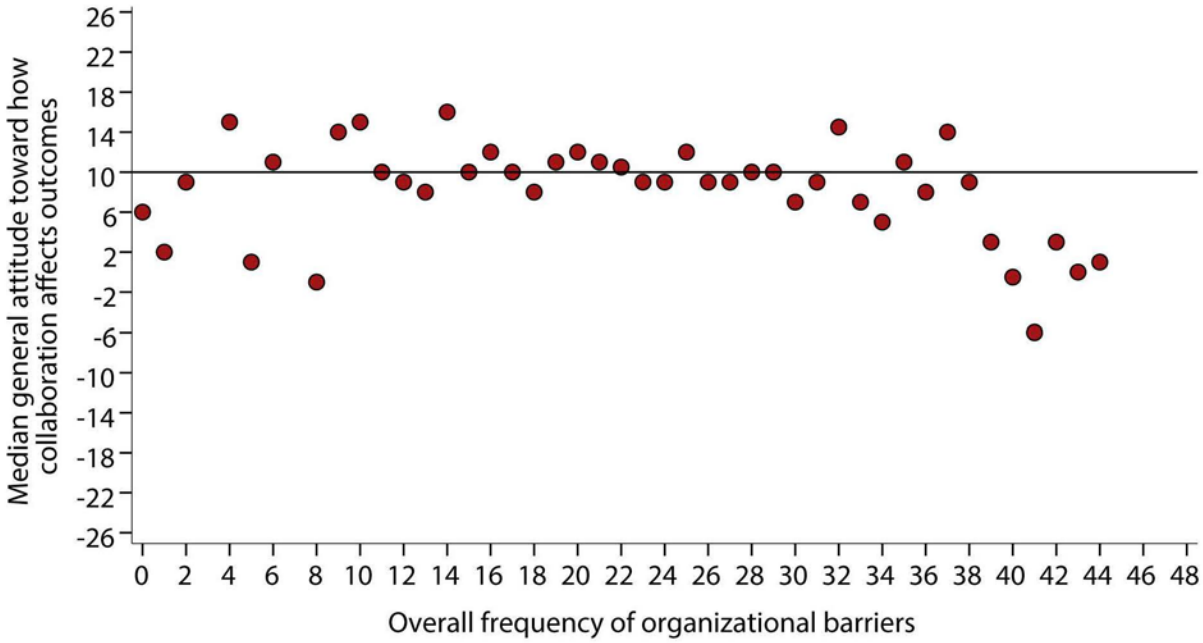

Figure 128. Respondents' general attitude toward how collaboration affects outcomes (from –26 or "greatly worsens" to 26 or "greatly improves") versus how they rated the overall frequency of organizational barriers (from 0 "never" to 48 or "always"). The horizontal line depicts the median for all respondents for which the scale could be calculated.

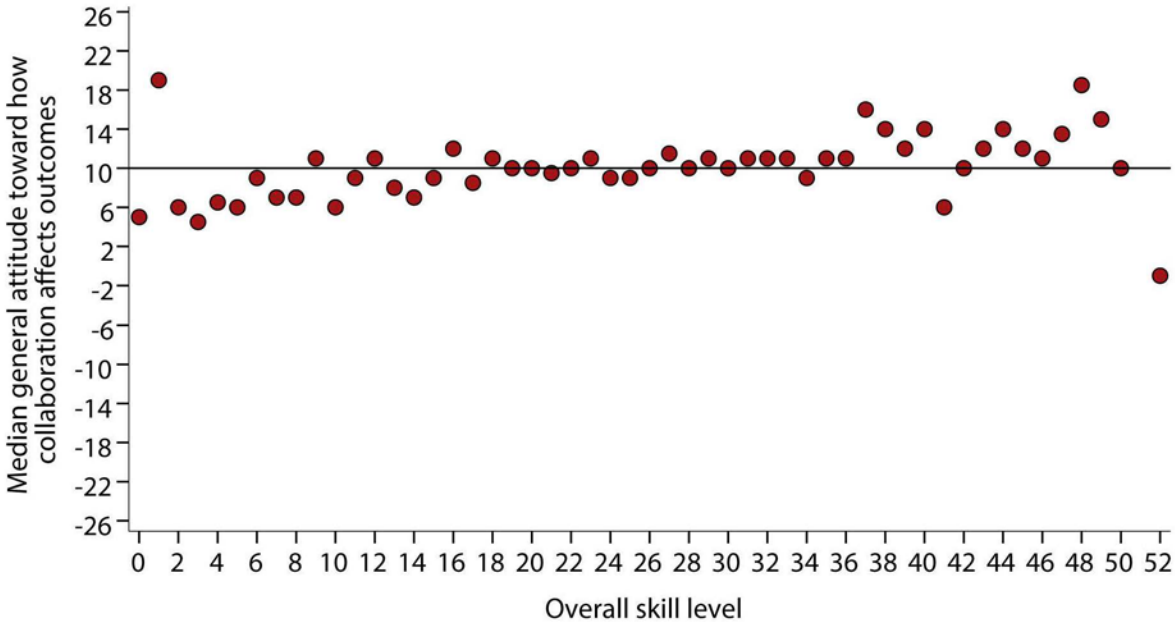

Figure 129. Respondents' general attitude toward how collaboration affects outcomes (from –26 or "greatly worsens" to 26 or "greatly improves") versus their self-rated overall skill level in collaboration and(or) Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert").

Perceptions of How Collaboration Affects Costs

Respondents were asked to rate how they thought that collaboration affected costs in the short-term and in the long-term along a 5-point scale that ranged from "greatly reduces" to "greatly increases." The majority of respondents (59 percent) indicated that that collaboration "somewhat increases" or "greatly increases" short-term costs, while a slight majority of respondents (51 percent) indicated that collaboration "somewhat reduces" or "greatly reduces" long-term costs (table 12). Despite the reverse ratings given to short-term versus long-term costs across all respondents, within respondent ratings of short-term versus long-term costs were still positively correlated (Spearman's rho = 0.401, n = 1,665, p less than 0.001; fig. 130).

Table 12. Respondents' perceptions of how collaboration in the Bureau of Land Management affects short- and long-term costs. (%, percent)

Cost outcomes	*n*	Greatly reduces	Somewhat reduces	No difference	Somewhat increases	Greatly increases	Median	Mode
Short-term costs	1,745	4%	18%	19%	44%	15%	Somewhat increases	Somewhat increases
Long-term costs	1,727	10%	41%	19%	21%	10%	Somewhat reduces	Somewhat reduces

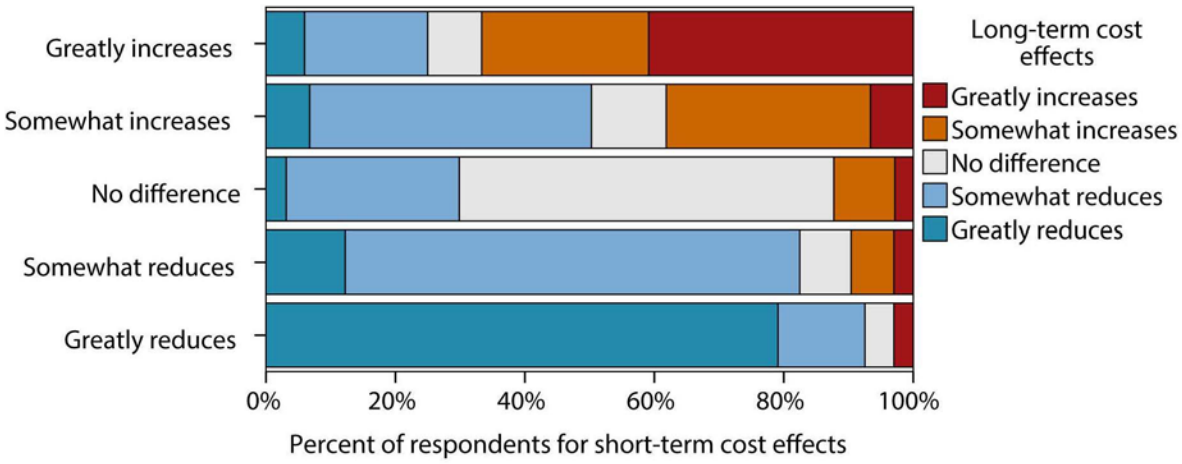

Figure 130. Respondents' ratings of how collaboration affects long-term costs compared to how they rated how collaboration affects short-term costs.

In general, respondents differed in how they rated collaboration's effect on short-term costs based how they rated their overall skill level in collaboration (Wald $\chi^2(51, n = 1{,}439) = 127.68$, p less than 0.001; fig. 131). In addition, respondents with direct experience with collaboration were more likely to indicate that collaboration increases short-term costs than those with no direct experience (Wald $\chi^2(3, n = 1{,}439) = 11.82$, $p = 0.008$; fig. 132).

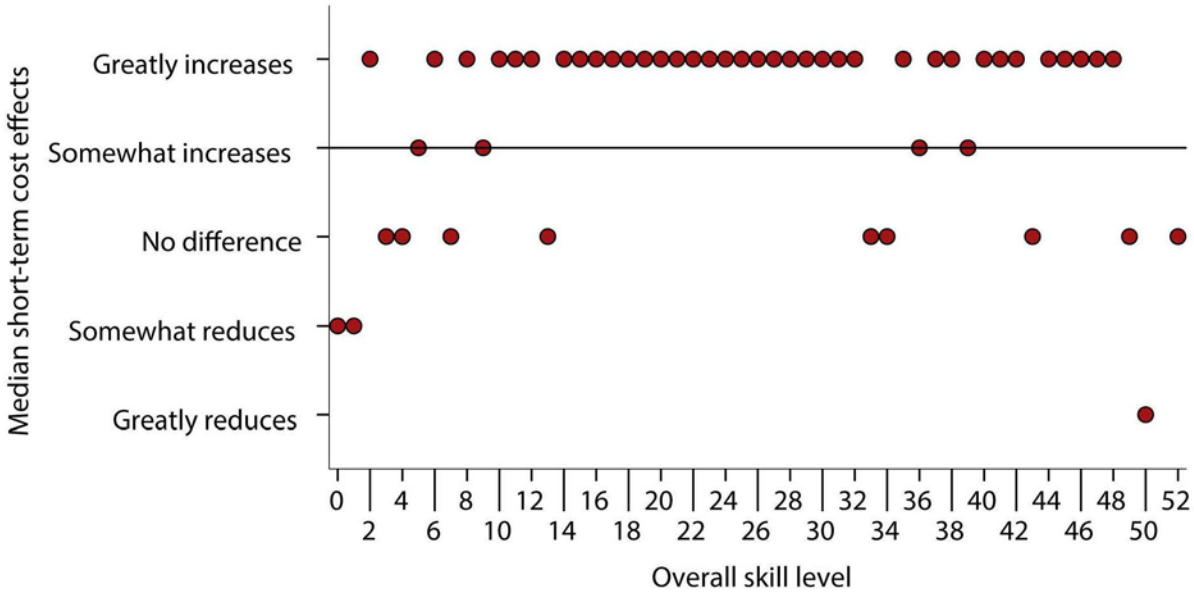

Figure 131. Respondents' ratings of how collaboration affects short-term costs versus their self-rated overall skill level in collaboration and(or) Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert"). The horizontal line depicts the median response.

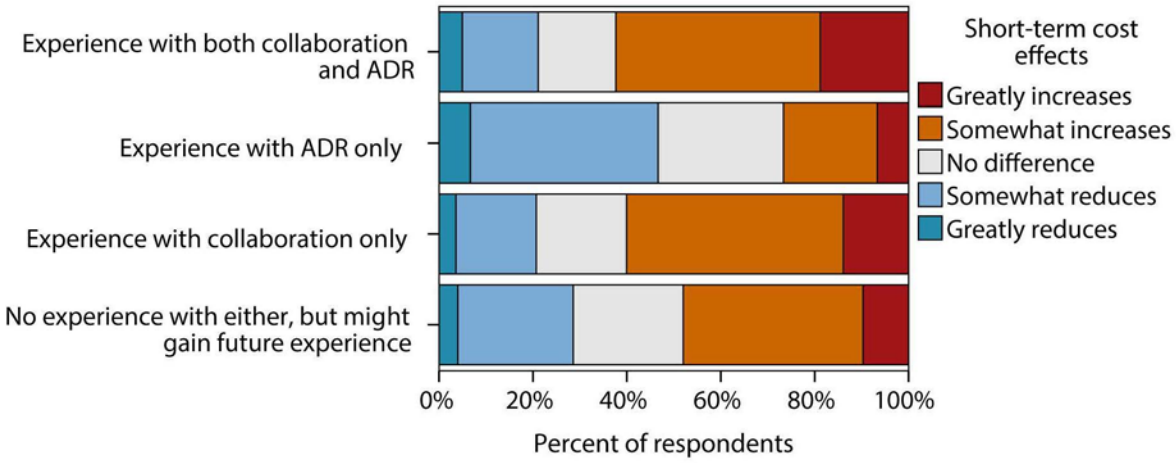

Figure 132. Respondents' ratings of how collaboration affects short-term costs versus their experience with collaboration and(or) Alternative Dispute Resolution (ADR).

Women were slightly more likely than men to indicate that collaboration reduces long-term costs (Wald $\chi^2(1, n = 1{,}418) = 5.62$, $p = 0.018$; fig. 133). In general, respondents that had worked for the BLM for less time were more likely than respondents that had worked at the BLM for longer to indicate that collaboration reduced long-term costs (Wald $\chi^2(5, n = 1{,}418) = 11.09$, $p = 0.050$; fig. 134). Respondents varied in how they rated collaboration's effect on long-term costs among the BLM State Offices and BLM Centers (Wald $\chi^2(13, n = 1{,}418) = 29.08$, $p = 0.006$; fig. 135). Finally, respondents differed in how they rated collaboration's effect on long-term costs based on how they rated their overall level of skill in collaboration (Wald $\chi^2(51, n = 1{,}418) = 91.59$, p less than 0.001; fig. 136).

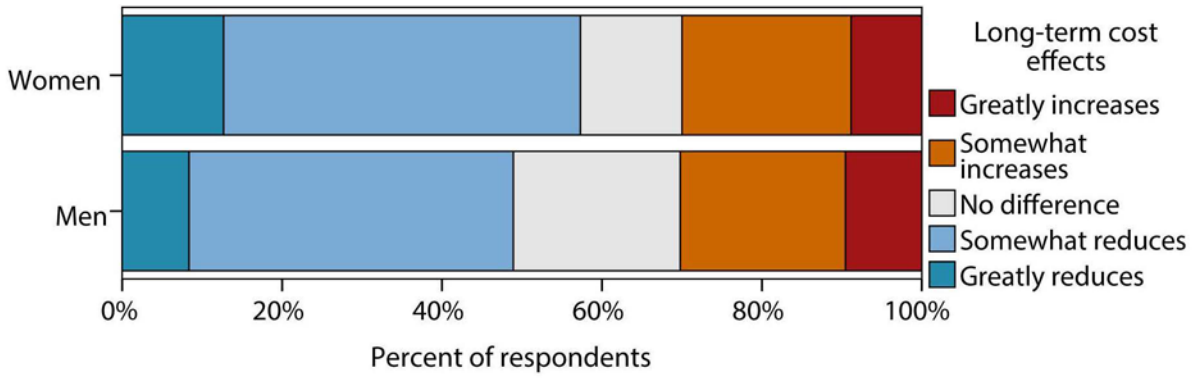

Figure 133. Respondents' ratings of how collaboration affects long-term costs, comparing women to men.

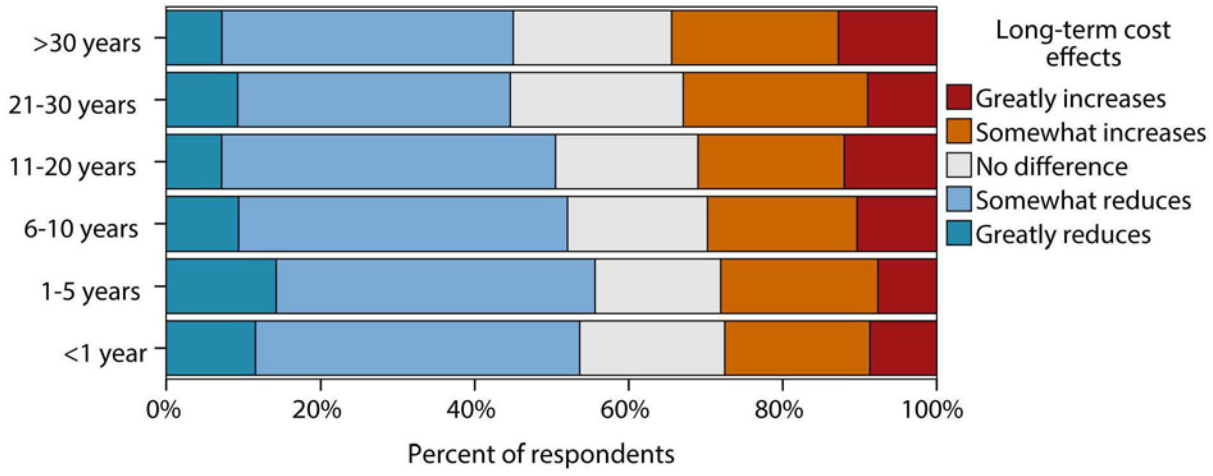

Figure 134. Respondents' ratings of how collaboration affects long-term costs versus how many years they had worked for the Bureau of Land Management. (>, greater than; <, less than)

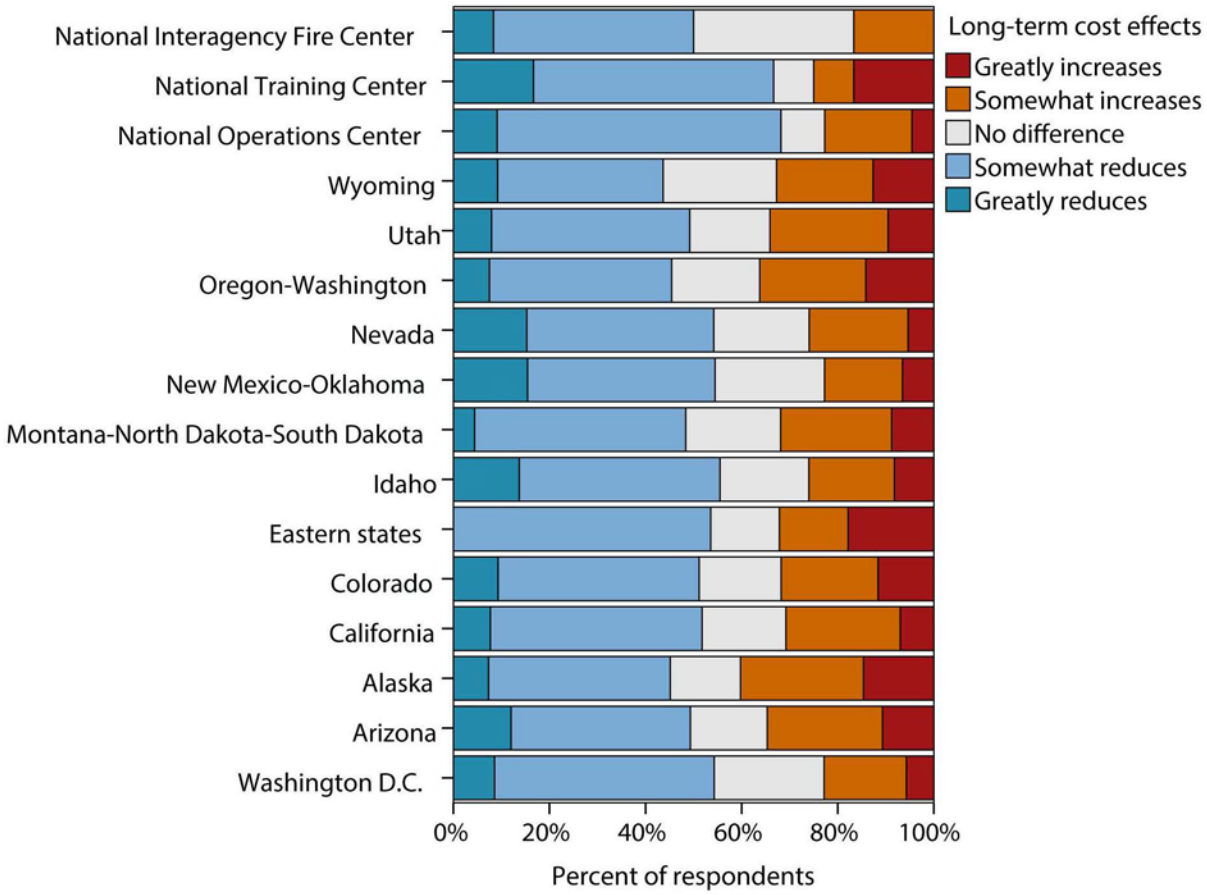

Figure 135. Respondents' ratings of how collaboration affects long-term costs, comparing Bureau of Land Management (BLM) State Offices and BLM Centers.

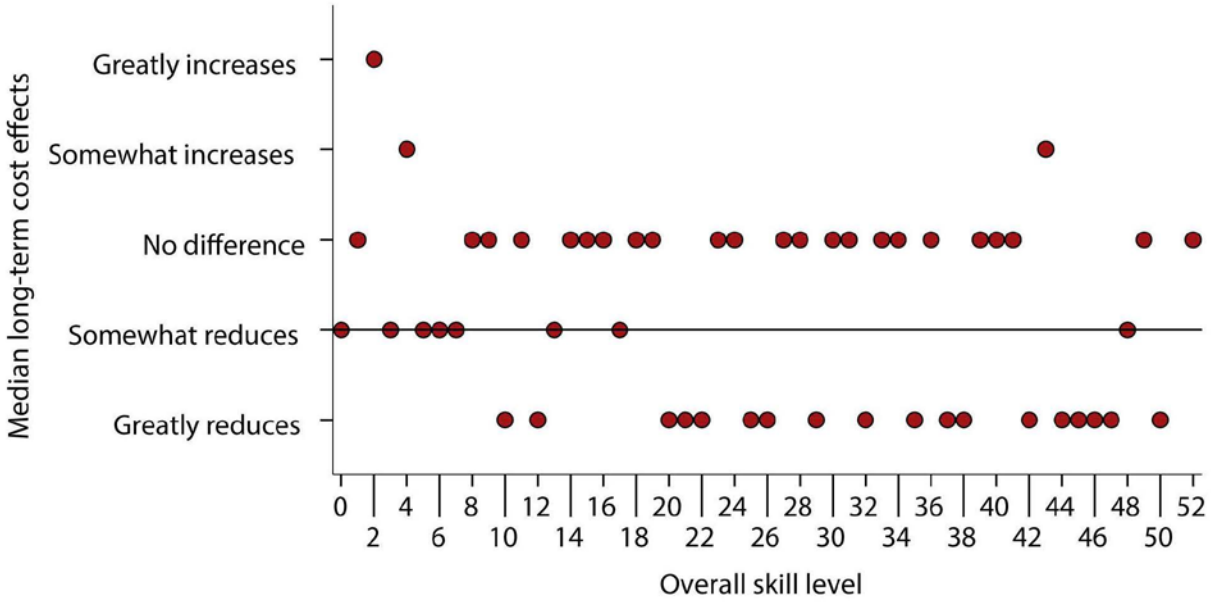

Figure 136. Respondents' ratings of how collaboration affects long-term costs versus their self-rated overall skill level in collaboration and(or) Alternative Dispute Resolution (from 0 or "no experience" to 52 or "expert"). The horizontal line depicts the median response.

Open-Ended Questions

We asked two open ended questions at the end of the survey. The first question provided the BLM definition of collaboration: "a cooperative process in which interested parties, often with widely varying interests, work together to seek solutions with broad support for managing public and other lands," and asked respondents "As the BLM revises its strategic plan for collaboration, what are your suggestions for revising this definition?"

We received 1,037 comments about the definition. Of these, 375 respondents indicated that they had no suggestions or that the definition was acceptable. Specific wording suggestions for the definition were provided by 378 individuals. Another 178 made comments about the process of collaboration or ways that the BLM could better support collaborative efforts. Comments about the survey itself, both positive and negative accounted for 20 comments, and 86 comments could not be categorized and were coded as "miscellaneous."

The second open-ended question was the final question in the survey: "Please provide any additional comments about collaboration and ADR in the BLM." A total of 620 respondents answered this question. Of the comments, 161 were either not analyzed (135) because the responses were not additive (off topic, etc.) or labeled as "no comment" (26) because the respondent indicated he or she had nothing more to add. Responses in these two categories were not included in our analysis. Additionally, 100 respondents commented on the survey itself. In these instances, if the comment was only regarding the survey, it was not included. If a respondent commented on the survey and made other comments, then the full response was included.

Categories used to classify responses are below (with number of responses in each category). Please note that some comments discussed several different topics and were categorized as such, so the number of mentions of a topic is greater than the total number of comments received:

- Generally Supportive of Collaboration in the BLM (119)

- Generally Skeptical of Collaboration in the BLM (37)
- Discussed Barriers to Collaboration in the BLM (155)
  Mentioned Specific Barriers to Collaboration:
  - Budget and Personnel Restrictions (36)
  - Federal Advisory Committee Act (FACA) issues (9)
  - Support from Management (48)
- Included a statement about training in collaboration (88)
- Shared a success story (17)

We provided the list of categorized comments for both of the open-ended questions to the BLM strategic planning team after we removed all identifying information from the comments.

Discussion

The survey of BLM employees provided a great deal of useful information about skills and perceptions regarding collaboration and ADR. Several themes emerged as the survey was analyzed and the more prominent among them are discussed below.

BLM Employees Involvement in Collaboration and ADR Processes

Our survey respondents were those with experience in collaboration and ADR, or those who expected to gain this experience in the future. The longer their tenure with BLM, the more likely they were to have experience with both collaboration and ADR. Processes that lasted for a year or longer were reported by 57 percent of respondents, and 59 percent had been involved with a NEPA process. Despite this, only 39 percent indicated that participating in collaborative or ADR processes was part of their performance plan. Those with five or fewer years with BLM were slightly more likely to have these elements in their performance plans. It is possible that there is a recent trend toward including these elements, but the survey was not able to evaluate this. A majority of respondents (59 percent) spend less than 10 percent of their time on collaboration and ADR, but 24 percent stated that they spend from 10 to 20 percent of their time in these processes.

Decision-makers had Different Perceptions and Experiences with Collaboration and ADR than others in the BLM

Generally, BLM decision-makers reported a higher level of skill and training in collaboration and ADR than others in the BLM who completed the survey. They also reported fewer obstacles to taking training, were more aware of the resources that are available to support collaboration and ADR, spent more time on collaboration and ADR than others in BLM, and were more likely to have collaboration and(or) ADR elements in their performance plans. In addition, decision-makers had somewhat different views of barriers and rated lack of BLM support and lack of their supervisor's support as less problematic than others who completed the survey. While none of these findings were surprising, it would be instructive to know whether those who were interested in collaboration and ADR were more likely to become Field Office Managers, at what point in their careers they received their training and skills, and how they understand the views of collaboration and ADR of their employees. Additionally, it would be interesting to learn whether and how they impart their attitudes of and knowledge about collaboration and ADR to their colleagues and those whom they supervise.

Attitudes about Training Needs

Survey respondents reported low levels of skill and training in Tribal relations/government-to-government consultations, terminating unproductive collaborative processes, and feasibility assessments. However, only about half of the respondents were interested in having more training in these areas. As noted in the body of this report, this may be in part because these are higher level or specialized skills that may be used by those with decision-making authority. This may point to a need to match training with organizational level, providing employees who are likely to be involved in collaboration or ADR with a basic skill set that can be expanded over time. Those who indicated their skill level as "intermediate" were the most interested in additional training.

More training was positively associated with a higher skill level, increased awareness of resources for supporting collaborations or ADR processes, and increased likelihood to use these resources in the future. While a causal relationship cannot be assumed, it was an interesting finding and one that may be important for defining and developing a culture of collaboration in BLM.

Of note, feasibility assessment skills were reported as especially valuable by the small number of survey respondents with experience in these assessments. Because it is often thought that upstream processes are more effective at reducing or managing conflict, there may be some justification in exploring the opportunities for providing training in skills that promote early identification of stakeholders, interests, and issues. Although the number of feasibility assessments conducted within BLM may be small, it may be possible to evaluate the perceived effects of these assessments on outcomes to help determine whether this skill set could have value for the BLM.

In general, those with more training felt more skilled in collaboration and ADR; this suggests that training is a worthwhile investment for the BLM. However, when asked to attribute skill to a variety of factors (hands-on experience, innate skill, mentors and coaches, formal training, reading about collaboration), hands-on experience was credited with contributing the most to respondents' skill. Thus, it seems reasonable that a combination of training and experience is necessary to build skill.

Those with more years of employment with the BLM reported a lower level of interest in training than those who had been with the agency for fewer years. There are several possible explanations for this. One, perhaps this group has had all the training that is available or that they think they need. Since many respondents attributed their skills to hands on experience, it may be that this group with more years in BLM has developed deeper or more nuanced skills through more experience. Alternatively, those with lack of interest in additional training may be disillusioned with collaboration, training, or the BLM.

Perceptions of Barriers to Collaboration are Effected by a Variety of Factors

Those with experience in ADR, but not collaboration, are more likely to be more pessimistic in their views about barriers facing collaboration than those whose experience includes collaboration. Perceptions on barriers also differed based on gender, whether or not one is a decision-maker, level in the organizational structure, and experience with collaboration and ADR. Decision-makers see fewer barriers, perhaps because they are in positions to overcome them. Those with longer tenure in BLM typically saw fewer barriers in some areas. However, travel ceilings and lack of time to devote to collaboration and ADR were frequent barriers of large effect for most respondents. An earlier study of the BLM (Laninga, 2004) also highlighted these same barriers.

Awareness of and Interest in Resources for Collaboration and ADR

The finding that respondents were unlikely to use resources of which they were not aware of prior to the survey was not surprising. However, many indicated that they were unlikely to use resources of which they had been aware, such as a collaboration specialist in DOI or another agency, a university or outside consulting group, or to a lesser extent, a BLM State Natural Resources ADR Advisor. One possible explanation for this is lack of knowledge of what these resources or specialists can offer, or it could indicate an unwillingness to request help. It would be useful to learn more about whether either of these explanations is accurate.

Facilitators and Mediators are Viewed as Valuable by Those Who Have Used Them

Some findings about resources used by BLM employees might lead to the thought that there is reluctance to find outside help, but those who have used facilitators or mediators are strongly supportive of their use. It is unknown whether those who used these forms of assistance relied on outside parties or BLM employees, but as with situation assessments, those with experience found them valuable.

Different Types of Resources and Support may be Needed for Collaboration Versus ADR

A small group of respondents (1 percent) had experience in ADR but not collaboration; 25 percent had experience with both collaboration and ADR. Some collaborative skills are transferrable to ADR processes, but the skill set and context differ between collaboration and ADR. Developing a culture of collaboration could include acknowledgment that ADR is sometimes necessary to achieve agency goals, and that conflict is sometimes unavoidable and can be beneficial in certain situations (Ruell and others 2010).

Limitations of the Survey

Our survey had some limitations, and we wish to acknowledge them here. First, to focus survey participants, we used a definition of collaboration that was in use by the BLM: "A cooperative process in which interested parties, often with widely varying interests, work together to seek solutions with broad support for managing public and other lands." If survey respondents believed they had participated in activities that could be included in the definition, they may have indicated that they had participated in a collaborative process. Once respondents made this determination, they answered the survey questions based on their interpretation of that definition. However, we set limited sideboards on the definition, only asking respondents if they had been involved in a collaboration that included parties external to the BLM. We do not know how many of these collaborative processes were formal or how survey respondents decided what activities to include in collaboration. For example, is a short meeting with a land user collaboration? Not knowing more about how respondents defined collaboration limited our ability to interpret some of our findings.

Second, one question in the survey asked respondents to select their primary program area from a list that we believed to be comprehensive because it represents the major programs as defined by the BLM. "Program area" includes categories like wild horses and burros; forestry and timber; energy, minerals and mining, and others (see Appendix 2, page 2 for the complete list). However, the fact that 24 percent of the respondents selected "other" rather than one of the provided program areas suggests a disconnect between respondents' perceptions of what they do and the BLM program areas. We had hoped to use program area as a variable in our analysis, but because of the large number of "other" responses, we were not able to do this.

Third, while we intended our results to be generalizable to the population of BLM employees with experience with collaboration or ADR, our survey was long and had a number of branching questions, which may have produced respondent fatigue. Thus, some respondents did not complete the survey and in some cases their input was not usable. We do not know whether the respondents that completed the entire survey were as representative of the entire group as the respondents that finished only part of the survey. Additionally, since we did not conduct a non-response bias survey, it is not possible to know whether our sample was representative overall. We reported sample sizes throughout this report in order to be transparent about the number of respondents for each question.

Conclusion

Participating in collaborative and ADR processes is likely to continue to be a significant part of many BLM employees' duties. The survey identified a number of opportunities and means by which the BLM could further develop these employees' collaborative and dispute-resolution capabilities. Although direct experience appeared to play a major role in how respondents rated their own skill at collaboration and ADR, training was also an important contributor to respondents' skill in collaboration and ADR. Under the assumption that collaboration and ADR processes have better outcomes when initiated and run by skilled professionals, BLM employees would benefit from additional training in the collaboration and ADR skills that they may not get anywhere else or that are likely critical for consistently successful collaboration and ADR. One set of skills in which respondents were particularly interested in receiving further training was "negotiation and conflict resolution." In addition, training also appeared to increase respondents' awareness of and likelihood to use the resources that are currently available to assist them in collaborative and ADR processes.

The survey also confirmed that respondents' access to training and collaborative efforts was oftentimes hampered by organizational or occupational constraints, such as travel ceilings, time, and budgetary constraints. These logistical obstacles could potentially be mitigated or reduced in the future. However, it is important to highlight the fact that even though respondents agreed that attempts at collaboration were often impeded by numerous organizational, social, and political factors, they still considered collaboration to be a worthwhile endeavor for a broad range of BLM activities.

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Appendixes

Appendix 1

Glossary

Bonferroni correction A correction of the alpha level used for multiple significance tests in order to reduce the probability of false positives (that is, to reduce type I error).

Boxplot These figures visually describe the grouping and distribution of data points (or responses). The box always describes the first and third quartiles of data points, and the line bisecting the box describes the median of the data point. Here the lines or "whiskers" describe the lowest data points still within 1.5 interquartile range of the lower and upper quartile. The circles represent the data points outside of these ranges (that is, the outliers).

Cauchit link function This is a link function that is used when extreme values are present in the data.

Cochran's Q test This is a non-parametric statistical test for binomial dependent variables that compares whether or not *k* treatments or repeated measures have different effects on a single sample. For example, this test can be used to detect differences among multiple items assessed using the same binomial measurement (for example, yes or no) by the same sample of survey respondents.

Cronbach's alpha This is an estimate of the reliability or internal consistency across multiple items (that is, across questions, rankings, ratings, and so forth) for a single sample used in a Likert scale. A higher value indicates that the test results have higher reliability. Under standard convention, Cronbach's alpha must be greater than or equal to 0.7 for Likert scales constructed from survey data.

Effect size Unstandardized or absolute effect sizes report the difference between two groups without any indication of the variance of the sample. Standardized effect sizes report the magnitude of effect relative to the variability in the sample.

Fixed effect Independent or predictor variables are treated in the statistical model as arising from non-random causes.

Friedman test This is a non-parametric statistical test for ordinal dependent variables that compares whether or not the distributions of ranks differs across *k* treatments or repeated measures on a single sample. First, the proportion of responses for all items is ranked separately for each category of the rating scale. Then each item's ranks are summed, and the sum is compared to the sum of the other items. This test can be used to detect whether the distributions of ratings differs among multiple items when all items were assessed on the same scale (for example, a scale ranging from strongly agree to strongly disagree) by the same sample of survey respondents. A Friedman mean rank is the average of the ranks assigned to each item and was used to order the items from highest to lowest mean rank. Note that the Friedman's mean rank is not the same as the average rating given to each item.

General linear model This type of statistical model is appropriate and robust for dependent variables that are continuous and for which the residuals are normally distributed, independent, and have the same variance. Multivariate models are appropriate when dependent variables are not independent and should be tested together.

Generalized linear model (GZLM) This type of statistical model is appropriate and robust for dependent variables, such as binomial, ordinal, and count data, that are neither continuous nor meet the underlying assumptions of general linear models. These models are generalizations of the ordinary least squares regression, which uses a link function to relate the linear model to the non-normally distributed dependent variable.

Likert item This is a single factor, statement, or question for which the respondent is asked to rank along a symmetric rating scale that depicts a range of intensity. Likert items are typically used with 5-point, 7-point, or 9-point ordered-category scales with neutral middle values, such as a scale ranging from strongly agree to strongly disagree.

Likert scale These scales are often used as a proxy of a broader concept or phenomenon that includes a number of Likert items that measure aspects of the same subject or concept and are assessed along the same rating scale by respondents. Likert items are summed to create a bigger scale that more closely approximates the properties of normal, continuous data than the original rating scale. Under standard convention, a Likert scale constructed from survey data must have adequate internal consistency or an estimated Cronbach's alpha of greater than or equal to 0.7.

Parametric statistics These are statistical tests that assume an underlying normal distribution to the data. If the assumptions are correct, parametric methods can produce more accurate and precise estimates. They are said to have more statistical power. However, if the assumptions are incorrect, parametric methods can be misleading.

Nonparametric statistics These are statistical tests that do not assume an underlying distribution (for example, a normal distribution) to the data, and therefore, do not specify the model structure and parameters *a priori*. As a result, they are more robust and have much broader applications than parametric statistics, but at the cost of reduced power to detect different effects. Examples of data that require non-parametric statistics are rank order, count data, and ordinal response data, such as data derived from rating scales. These types of data often have no real-world numerical interpretation, and the difference between each successive rating scale category is not truly equidistant.

Pearson's chi-squared test A statistical test of independence that evaluates whether or not the frequency of paired observations of two categorical variables differs from what would be expected if the variables were independent.

Poisson distribution This is a discrete probability distribution that expresses the probability of a given number of events occurring in a fixed interval of time and/or space if these events occur with a known average rate and independently of the time since the last event.

Probit function This is the quantile function association with the standard normal distribution.

Tweedie distributions This is a family of probability distributions which includes the purely continuous normal and gamma distributions, the Poisson distribution, and others.

Type I error The probability of incorrectly rejecting the a true null hypothesis (that is, finding a main effect to be significant when it is really not).

Type II error The probability of incorrectly failing to reject a false null hypothesis (that is, failing to detect a significant main effect).

Appendix 2

BLM Employee Survey

Page 1

Dear BLM Employee,

We are researchers with the U.S. Geological Survey who are working with the BLM's Office of Collaboration and Dispute Resolution as they develop a strategic plan for collaboration in the BLM. We are asking you to complete a short survey that should take between 5 and 25 minutes of your time, depending on your level of experience with collaboration and Alternative Dispute Resolution (ADR).

Your participation in this survey is important, because your responses will help the BLM identify the elements and resources that are necessary for effective collaboration with a broad array of stakeholders as the strategic plan on collaboration is developed.

Participating in this survey is voluntary. Your responses will be confidential, and will be reported in aggregate form and not attributed to you, so feel free to be candid.

The following are instructions you may find useful while you are completing the survey:

- *To pause at any time, simply close the browser window and your answers will be saved.*
- *To resume and complete the survey, just click on the link to the survey in the email you received. At that point, you can answer any remaining questions as well as edit any of your previous responses.*
- *The text boxes will expand to accommodate longer responses.*
- *When you have answered all of the questions and are satisfied with your responses, click on the red "Submit" button at the end of the survey.*
- *If you have any questions about the survey, please contact the research team at BLM_Survey@usgs.gov, or call Nina Burkardt at 970-226-9275.*

Thank you in advance for your participation!

To enter the survey, please click "Next".

Next

What is your duty station?

- Field office
- District office
- State office
- Washington D.C. office
- BLM Center or other

Please specify the name of your duty station below.

Please select the primary program area in which you currently work.

- Range management
- Supervisor or manager of multiple programs
- Forestry and timber
- Energy, minerals, and mining
- Recreation
- Cultural resources
- Wild horses and burros
- Land use planning/NEPA
- Fish and wildlife
- Lands and realty
- Species of concern
- Fire management
- Other, please specify:

Does your job description include supervising or managing others?

- Yes
- No

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The BLM Land Use Planning Handbook defines **collaboration** as:

"A cooperative process in which interested parties, often with widely varied interests, work together to seek solutions with broad support for managing public and other lands."

For the purpose of answering the questions in this survey, we ask that you refer to this definition, specifically as it applies to collaboration with **parties external to the BLM**.

Have you ever been part of a collaboration as defined above as part of your job duties at the BLM (e.g., other governmental agencies, non-governmental organizations, interest groups, citizens)?

- ○ Yes
- ○ No, but I may in the future
- ○ No, and I don't expect to in the future

Alternative Dispute Resolution (ADR) involves managing, mitigating, or resolving an existing dispute, sometimes with the assistance of a neutral third-party (e.g., a mediator).

Have you ever been part of an ADR process as defined above as part of your job duties at the BLM?

- ○ Yes
- ○ No, but I may in the future
- ○ No, and I don't expect to in the future

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In roughly how many different collaborative/ADR processes involving external parties have you participated during your career?

- 1
- 2-3
- 4-6
- 7-10
- 11-20
- >20

Did any of these collaborative/ADR processes involving external parties last longer than a year?

- Yes
- No

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Roughly what percentage of your time in the past year have you spent on collaborative/ADR processes involving external parties?

- <10%
- 10-20%
- 21-40%
- 41-60%
- >60%

Is participating in collaborative/ADR processes part of your current performance plan?

- Yes
- No
- I don't know

Have you participated in a collaborative/ADR process that also involved a NEPA process?

- Yes
- No

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Which of the following best describes your highest level of experience with feasibility assessments (sometimes called Situation Assessments) for collaboration? These processes evaluate stakeholders' positions and relevant policy and legal factors to determine the feasibility of conducting a collaboration before initiation.

- I was not previously aware of feasibility assessments
- I know about feasibility assessments, but I have never been part of a collaboration in which one was conducted
- I have been part of a collaboration in which a feasibility assessment was conducted
- I have personally organized a feasibility assessment for a collaboration

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In your opinion, how useful are feasibility assessments in the context of collaboration?

	Not useful 1	2	Somewhat useful 3	4	Essential 5	I don't know
Feasibility assessments are:	○	○	○	○	○	○

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Have you ever been part of a collaborative/ADR process that used the services of a facilitator (a person that assists with the process of a meeting or working group)?

- Yes
- No
- I don't know

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In your experience, how useful are facilitators in collaborative/ADR processes?

	Not useful 1	2	Somewhat useful 3	4	Essential 5	I don't know
Facilitators are:						

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Have you ever been part of an ADR process that used the services of a mediator (a neutral third party that helps disputing parties reach an agreement)?

- Yes
- No
- I don't know

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In your experience, how useful are mediators in ADR processes?

	Not useful 1	2	Somewhat useful 3	4	Essential 5	I don't know
Mediators are:						

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This question has three parts:

First, please rate your level of skill at the following.

Second, please indicate whether you have had training in any of the following using the first drop-down menu.

Third, please indicate whether you would like training in any of the following using the drop-down menu on the far right.

	No experience	Beginner	Intermediate	Advanced	Expert	Have you had training in this?	Would you like training/more training in this?
Creating and drafting agreements	○	○	○	○	○		
Partnering with non-BLM government agencies	○	○	○	○	○		
Negotiation and conflict resolution	○	○	○	○	○		
Mediation of a dispute or conflict	○	○	○	○	○		
Identifying when collaboration is needed	○	○	○	○	○		
Terminating collaborative efforts or partnerships when necessary	○	○	○	○	○		
Partnering with non-governmental organizations, communities, and/or interest groups	○	○	○	○	○		
Internal Team-building	○	○	○	○	○		
Participating in public meetings	○	○	○	○	○		
Facilitation of a meeting or working group	○	○	○	○	○		
Feasibility assessments	○	○	○	○	○		
Building tribal and Government-to-Government relationships	○	○	○	○	○		
Communication and active listening	○	○	○	○	○		

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To which of the following factors do you attribute your skill in collaboration?

Please provide rough estimates of the percentage you attribute to each category below (the combined total must add up to 100%).

Innate skill	
Reading about collaboration	
Hands on experience	
Mentor(s)/coach(es)	
Formal training	
Total	0

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This question has two parts:

First, please rate how likely you are to make use of each of the resources listed below.

Second, please select which resources you **did not know about** prior to this.

	Very unlikely	Unlikely	Somewhat unlikely	Somewhat likely	Likely	Very likely	I didn't know about this resource
The Udall Foundation's US Institute for Environmental Conflict Resolution	○	○	○	○	○	○	☐
An online or media search	○	○	○	○	○	○	☐
BLM's Washington Office of Collaboration and Appropriate Dispute Resolution	○	○	○	○	○	○	☐
Formal training in collaboration or dispute resolution	○	○	○	○	○	○	☐
A mentor or coach	○	○	○	○	○	○	☐
A collaboration specialist in DOI or another agency	○	○	○	○	○	○	☐
BLM Collaboration and Dispute Resolution SharePoint site	○	○	○	○	○	○	☐
A BLM State Natural Resources ADR Advisor	○	○	○	○	○	○	☐
A university or outside consultant group (e.g., National Policy Consensus, Consensus Building Institute (CBI), Collaborative Decision Resources (CDR) Associates, RESOLVE, Indian Dispute Resolution Service)	○	○	○	○	○	○	☐
A professional facilitator or mediator	○	○	○	○	○	○	☐
BLM Field or Desk Guides/Handbooks on collaboration, cooperating agencies, or the Federal Advisory Committee Act	○	○	○	○	○	○	☐

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Have any of the following reasons prevented you from taking training to develop your collaboration skills? Please indicate "Yes" or "No" for each reason.

	Yes	No
I lack the budget for training	○	○
My personality is not suited for collaboration	○	○
I was unaware that training in collaboration was available	○	○
Travel ceiling constraints	○	○
Collaboration is unlikely to be part of my job	○	○
I lack the time for training	○	○
My supervisor(s) discouraged me from taking further training	○	○
I lack interest in learning any more about collaboration	○	○
Training courses are offered at bad times of the year	○	○
I avoid situations with potential conflict, therefore, I have not sought training	○	○
I do not think that training is an effective way to improve peoples' skill at collaboration	○	○

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If BLM were able to make any of the following resources for collaboration available in the future, how would you rate their priority?

	Very low priority	Low priority	Moderate priority	High priority	Very high priority	I don't know
Support for building collaborative Government-to-Government relationships and Tribal Consultation	○	○	○	○	○	○
Support for conducting feasibility assessments	○	○	○	○	○	○
Online training on collaboration and dispute resolution	○	○	○	○	○	○
Training in feasibility assessments	○	○	○	○	○	○
Additional funding resources for collaborative efforts	○	○	○	○	○	○
Assistance finding and hiring facilitators	○	○	○	○	○	○
Assistance designing and structuring meetings and processes	○	○	○	○	○	○
Assistance or coaching in planning for collaboration and setting expectations with the public	○	○	○	○	○	○
A clearinghouse for best practices and lessons-learned from collaborative projects	○	○	○	○	○	○
In-person training on collaboration and dispute resolution	○	○	○	○	○	○
Guidance or handbooks on techniques and strategies for collaboration	○	○	○	○	○	○

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How would you rate the level of support for collaborative planning in:

	Very high	High	Moderate	Low	Very low	Non-existent	I don't know
Your field office	○	○	○	○	○	○	○
State Director's office	○	○	○	○	○	○	○
National office	○	○	○	○	○	○	○

If you have comments about the level of support for collaborative planning in the BLM, please provide them in the text box, below.

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This question has two parts:

First, in your experience, how often do collaborative processes encounter the following organizational barriers or obstacles in the BLM?

Second, please rate the severity of each barrier or obstacle using the drop-down menu on the right.

	Always	Often	Sometimes	Seldom	Never	I don't know	Rate the severity of this barrier
Lack of support in the BLM	○	○	○	○	○	○	
The BLM cannot cede decision-making authority to collaborative groups	○	○	○	○	○	○	
Lack of support from your supervisor	○	○	○	○	○	○	
Other BLM duties take priority over collaboration	○	○	○	○	○	○	
Lack of support from other agencies	○	○	○	○	○	○	
Travel ceilings	○	○	○	○	○	○	
The NEPA process	○	○	○	○	○	○	
Field personnel lack authority to conduct collaborations	○	○	○	○	○	○	
The BLM does not implement agreements made by collaborative groups	○	○	○	○	○	○	
The BLM does not have enough social science capacity	○	○	○	○	○	○	
The BLM's land use planning process	○	○	○	○	○	○	
Lack of collaborative skills among BLM employees	○	○	○	○	○	○	

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This question also has two parts:

First, in your experience, how often do collaborative processes encounter the following situational barriers or obstacles?

Second, please rate the severity of each barrier or obstacle using the drop-down menu on the right.

	Always	Often	Sometimes	Seldom	Never	I don't know	Rate the severity of this barrier
Litigation seems likely regardless of attempts to collaborate	○	○	○	○	○	○	
The political visibility is high	○	○	○	○	○	○	
There are knowledge imbalances among participants	○	○	○	○	○	○	
There are power imbalances among participants	○	○	○	○	○	○	
Litigation is already ongoing	○	○	○	○	○	○	
Some participants prefer the status quo	○	○	○	○	○	○	
A perception that collaborations lead to poor quality decisions	○	○	○	○	○	○	
Collaborations are not assisted by dispute resolution professionals	○	○	○	○	○	○	
Collaborations are not undertaken voluntarily (e.g., they are ordered by the Interior Board of Land Appeals or a court)	○	○	○	○	○	○	
Win-lose situations appear unavoidable (i.e., resources are limited or zero-sum)	○	○	○	○	○	○	
Some participants have entrenched positions	○	○	○	○	○	○	
Turn-over is high among participants	○	○	○	○	○	○	

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In your opinion, how suitable are the following issue areas for collaboration by the BLM?

	Suitable	Somewhat suitable	Neutral	Somewhat unsuitable	Unsuitable	I don't know
Forestry and timber	○	○	○	○	○	○
Wild horses and burros	○	○	○	○	○	○
Recreation	○	○	○	○	○	○
Land use planning/NEPA	○	○	○	○	○	○
Range management	○	○	○	○	○	○
Species of concern	○	○	○	○	○	○
Cultural resources	○	○	○	○	○	○
Energy, minerals, and mining	○	○	○	○	○	○
Fish and wildlife	○	○	○	○	○	○
Lands and realty	○	○	○	○	○	○
Fire management	○	○	○	○	○	○

Are there any areas or issue types in the BLM where collaboration should be used, but is not currently?

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In your opinion, how does BLM's use of collaboration affect the following?

	Eliminates or greatly reduces	Somewhat reduces	No difference	Somewhat increases	Greatly increases	I don't know
The legitimacy (i.e., democratic and transparent) of BLM's decisions	○	○	○	○	○	○
BLM's ability to incorporate multiple disciplines in decisions	○	○	○	○	○	○
The level of conflict among parties	○	○	○	○	○	○
The BLM's short-term costs	○	○	○	○	○	○
BLM's ability to incorporate local/traditional knowledge in decisions	○	○	○	○	○	○
The BLM's long-term costs	○	○	○	○	○	○
The level of agreement among parties on shared goals or vision	○	○	○	○	○	○
BLM's risk of future litigation	○	○	○	○	○	○

In your opinion, how does the BLM's use of collaboration affect the following:

	Makes much worse	Makes somewhat worse	No difference	Somewhat improves	Greatly improves	I don't know
Trust among different parties	○	○	○	○	○	○
The public's understanding of BLM decisions	○	○	○	○	○	○
Communication among different parties	○	○	○	○	○	○
The quality of BLM's decisions	○	○	○	○	○	○
The BLM's credibility with other agencies	○	○	○	○	○	○

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Thinking again about the BLM's current definition of collaboration:

"A cooperative process in which interested parties, often with widely varied interests, work together to seek solutions with broad support for managing public and other lands"

As the BLM develops its strategic plan for collaboration, what are your suggestions for revising this definition?

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How long have you worked for the federal government?

- <1 year
- 1-5 years
- 6-10 years
- 11-20 years
- 21-30 years
- >30 years

How long have you worked for the BLM?

- <1 year
- 1-5 years
- 6-10 years
- 11-20 years
- 21-30 years
- >30 years

How long have you worked in your current office?

- <1 year
- 1-5 years
- 6-10 years
- 11-20 years
- 21-30 years
- >30 years

What is your current job title?

What is your gender?

- Male
- Female
- Other
- I prefer not to answer

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Please provide any additional comments about collaboration and ADR in the BLM.

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Appendix 3

Description of Statistical Analyses

All descriptive and inferential statistical analyses were completed using IBM® SPSS® Statistics Desktop V20.0.0 (IBM Corporation, Armonk, New York, U.S.A.). Descriptions of all inferential statistical analyses in the order they are presented in the results section are provided below. Dependent variables were included as additive main effects in all statistical models, and were considered statistically significant at α less than 0.05. The goodness-of-fit statistics provided by SPSS were used to select the best assumed distribution and link function for generalized linear models (GZLM). Overdispersion was corrected for when necessary. Main effects that were not significant were not reported in the results section. All other statistical tests (for example, Friedman test, Pearson's Chi-square test, and Cochran's Q test) were considered statistically significant at α less than 0.05.

Experience with Collaboration and Alternative Dispute Resolution Processes

We tested whether respondents differed in their experience with collaboration and(or) ADR (3 = "experience with both collaboration and ADR," 2 = "experience with collaboration only," 1 = "experience with ADR only," 0 = "no experience with either, but might gain future experience"; modified from Appendix 2, survey page 3) by gender (women, men; see Appendix 2, survey page 23), whether or not they were in a decision-making position (yes, no; coded from respondents' job titles), the number of years they had worked for the BLM (1 = "less than 1 year," 2 = "1–5 years," 3 = "6–10 years," 4 = "11–20 years," 5 = "21–30 years," 6 = "greater than 30 years"; see Appendix 2, survey page 23), their duty station level ("field office," "district office," "state office," "Washington D.C. office," "BLM Center"; see Appendix 2, survey page 2), or the BLM State Office or BLM Center to which they report (Washington D.C., Arizona, Alaska, California, Colorado, Eastern states, Idaho, Montana-North Dakota-South Dakota, New Mexico-Oklahoma, Nevada, Oregon-Washington, Utah, Wyoming, the National Operations Center, the National Training Center, the National Interagency Fire Center; coded from open-ended responses to Appendix 2, survey page 2) using a GZLM with a multinomial distribution and a cumulative negative log-log link function (n = 2,223).

We tested whether respondents that had direct experience with collaboration and(or) ADR differed in the number of collaborations and(or) ADR processes in which they had been involved (1 = "1," 2 = "2-3," 3 = "4–6," 4 = "7–10," 5 = "11–20," 6 = "greater than 20"; see Appendix 2, survey page 4), or by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, or the BLM State Office or BLM Center to which they report. This was tested using a GZLM with a multinomial distribution and a cumulative cauchit link function (n = 2,581).

We tested whether respondents that had direct experience with collaboration and(or) ADR differed in whether or not any of these collaborations and(or) ADR processes had lasted longer than one year (1 = "yes," 0 = "no"; see Appendix 2, survey page 4) by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, or the BLM State Office or BLM Center to which they report using a GZLM with a binomial distribution and a cumulative negative log-log link function (n = 1,817).

We tested whether respondents that had direct experience with collaboration and(or) ADR differed in whether or not any of these collaborations and(or) ADR processes had involved a NEPA process (1 = "yes," 0 = "no"; see Appendix 2, survey page 5), or by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, or the BLM

State Office or BLM Center to which they report. This was tested using a GZLM with a binomial distribution and a cumulative negative log-log link function (n = 1,878).

We tested whether respondents that had direct experience with collaboration and(or) ADR differed in the percentage of their time they had spent on collaborative and(or) ADR processes in the last year (1 = "less than 10 percent," 2 = "10–20 percent," 3 = "21–40 percent," 4 = "41–60 percent," 5 = "greater than 60 percent"; see Appendix 2, survey page 5) by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, or which BLM State Office or BLM Center to which they report. This was tested using a GZLM with a multinomial distribution and a cumulative cauchit function (n = 1,843).

We tested whether respondents that had direct experience with collaboration and(or) ADR differed in whether or not participation in collaborative and(or) ADR processes was part of their performance plans (1 = "yes," 0 = "no"; see appendix 2, survey page 5), or by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, or the BLM State Office or BLM Center to which they report. This was tested using a GZLM with a binomial distribution and a cumulative probit link function (n = 1,732).

Collaborative and Alternative Dispute Resolution Skills and Training

We tested whether respondents rated themselves differently for any of the 13 collaboration and ADR skill items (see Appendix 2, survey page 12) along the 5-point skill level scale (0 = "no experience," 1 = "beginner," 2 = "intermediate," 3 = "advanced," 4 = "expert") using a Friedman test (n = 2,506) and ordered the skill items from the most to the least skilled using Friedman mean ranks. We tested whether the 13 collaboration and ADR skills differed in the proportion of respondents that had received training in each skill (yes, no) using a Cochran test (n = 2,093). We also tested whether the 13 collaboration and ADR skills differed in the proportion of respondents that wished to receive training or additional training in each skill in the future (yes, no). This was tested using a Cochran test (n = 2,248).

We tested whether respondents' overall training level in the 13 collaboration and ADR skills (the scale ranged from 0 or no training in any of the 13 itemized skills to 13 or training in all 13 skills; see Appendix 2, survey page 12) differed by gender, whether or not respondents were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, or their experience with collaboration and(or) ADR. This was tested using a GZLM with a multinomial distribution and a cumulative logit link function (n = 1,672).

We tested whether any of the 11 professional and personal obstacles to taking training in collaboration (see Appendix 2, survey page 15) were experienced by a larger or smaller proportion of respondents than the other obstacles. This was tested using a Cochran test (n = 2,534).

We tested whether respondents' general past difficulty with taking formal training (the scale ranged from 0 or "no past difficulty with any of the 11 professional and personal obstacles to taking training" to 11 or "past difficulty with all 11 professional and personal obstacles to taking training"; see Appendix 2, survey page 15) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, or their experience with collaboration and(or) ADR. This was tested using a GZLM with a Poisson distribution and an identity link function (n = 1,996).

We tested whether respondents' self-rated overall skill level in the 13 collaboration and ADR skills (the scale ranged from 0 or "no experience" in any of the 13 itemized skills to 52 or an "expert" skill level in all 13 skills; see Appendix 2, survey page 12) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their overall level of training, or their experience

with collaboration and(or) ADR. This was tested using a GZLM with a multinomial distribution and a cumulative logit link function (n = 1,591).We tested whether respondents' overall interest in future training in any of the 13 collaboration and ADR skills (the scale ranged from 0 or "does not want future training in any of the 13 itemized skills" to 13 or "would like future training in all 13 skills"; see Appendix 2, survey page 12) differed by gender, whether or not respondents were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their overall level of training, their overall skill level, or their experience with collaboration and(or) ADR. This was tested using a GZLM with a negative binomial distribution and a log link function (n = 1,516).

Resources for Collaboration and Alternative Dispute Resolution

We tested whether respondents rated their likelihood of using any of the 11 resources for collaboration and ADR (Appendix 2, survey page 14) along the 6-point likelihood scale (0 = "very unlikely," 1 = "unlikely," 2 = "somewhat unlikely," 3 = "somewhat likely," 4 = "likely," 5 = "very likely") differently than the others using a Friedman test (n = 1,930) and ordered the resources from the most to the least likely using Friedman mean ranks. We tested whether any of the 11 resources for collaboration and ADR differed in the proportion of respondents that had been previously aware of them (1 = "yes," 0 = "no"; Appendix 2, survey page 14) using a Cochran test (n = 1,923).

We tested whether respondents' general level of awareness of resources for collaboration and ADR (the scale ranged from 0 or "was not previously aware of any of the 11 resources listed" to 11 or "was already aware of all 11 resources listed"; see Appendix 2, survey page 14) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their overall level of training, their overall skill level, or their experience with collaboration and(or) ADR. This was tested using a GZLM with a Poisson distribution and an identity link function (n = 1,580).

We tested whether respondents' overall likelihood of using available resources for collaboration and ADR (the scale ranged from 0 or "very unlikely" to use any of the 11 resources in the future to 55 or "very likely" to use all 11 resources in the future; see Appendix 2, survey page 14) differed by gender, whether or not respondents were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their general level of awareness of resources, their overall level of training, their overall skill level, or their experience with collaboration and(or) ADR. This was tested using a GZLM with a tweedie distribution and an identity link function (n = 1,180).

We tested whether respondents' ratings of the usefulness of facilitators (0 = "not useful," 1 = "a little useful," 2 = "somewhat useful," 3 = "very useful," 4 = "essential"; see Appendix 2, survey page 9) differed by their duty station level, the BLM State Office or BLM Center to which they report, whether or not they had received training in facilitation of a meeting or working group ("yes"; "no"; see Appendix 2, survey page 12), their skill level at facilitating a meeting or working group (0 = "no experience," 2 = "beginner," 3 = "intermediate," 4 = "advanced," 5 = "expert"; see appendix 2, survey page 12), or their experience with collaboration and(or) ADR. This was tested using a GZLM with a multinomial distribution and a cumulative probit link function (n = 1,021).

We tested whether respondents' ratings of the usefulness of feasibility assessments (0 = "not useful," 1 = "a little useful," 2 = "somewhat useful," 3 = "very useful," 4 = "essential"; see Appendix 2, survey page 7) differed by their duty station level, the BLM State Office or BLM Center to which they report, whether or not they had received training in feasibility assessments ("yes"; "no"; see Appendix 2, survey page 12), their skill level at feasibility assessments (0 = "no experience," 2 = "beginner," 3 =

"intermediate," 4 = "advanced," 5 = "expert"; see Appendix 2, survey page 12), or whether or not they had personally organized a feasibility assessment ("yes"; "no"; see Appendix 2, survey page 6) . This was tested using a GZLM with a multinomial distribution and a cumulative complementary log-log link function (n = 187).

We then tested whether respondents' self-rating of their skill level at feasibility assessments (0 = "no experience," 2 = "beginner," 3 = "intermediate," 4 = "advanced," 5 = "expert"; see Appendix 2, survey page 12) differed by their gender, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, whether or not they had received training in feasibility assessments ("yes"; "no"; see Appendix 2, survey page 12), or their level of experience with feasibility assessments ("I was not previously aware of them," "I know about feasibility assessments, but I have never been part of a collaboration in which one was used," "I have been part of a collaboration in which a feasibility assessment was conducted," "I have personally organized a feasibility assessment for a collaboration"; see Appendix 2, survey page 6) using a GZLM with a multinomial distribution and a cumulative cauchit link function (n = 1,593).

We tested whether respondents rated their likelihood of using any of the 11 potential future resources for collaboration and ADR (see Appendix 2, survey page 16) along the 5-point priority level scale (0 = "very low," 1 = "low," 2 = "moderate," 3 = "high," 4 = "very high") differently than the other resources using a Friedman test (n = 1,973) and ordered the resources from the most to the least priority. This was tested using Friedman mean ranks.

We tested whether respondents' ratings of the priority level of the BLM providing assistance finding and hiring facilitators in the future (0 = "very low," 1 = "low," 2 = "moderate," 3 = "high," 4 = "very high"; see Appendix 2, survey page 16) differed based on whether or not they were previously aware of facilitators and mediators for collaboration and ADR processes ("yes"; "no"; see Appendix 2, survey page 14), they had received training in the facilitation of a meeting or working group (yes, no; appendix 2, survey page 12), their skill level at the facilitation of a meeting or working group (0 = "no experience," 2 = "beginner," 3 = "intermediate," 4 = "advanced," 5 = "expert"; see Appendix 2, survey page 12), whether or not they had experience with a collaboration or ADR processes that used a facilitator ("yes"; "no"; see Appendix 2, survey page 8), or how likely they were to use a professional facilitator or mediator in the future (0 = "very unlikely," 1 = "unlikely," 2 = "somewhat unlikely," 3 = "somewhat likely," 4 = "likely," 5 = "very likely"; see Appendix 2, survey page 14). This was tested using a GZLM with a multinomial distribution and a cumulative logit link function (n = 1,825).

We tested whether respondents' ratings of the priority level of the BLM providing future training in feasibility assessments (0 = "very low," 1 = "low," 2 = "moderate," 3 = "high," 4 = "very high"; see Appendix 2, survey page 16) differed based on whether or not they had received training in feasibility assessments ("yes"; "no"; see Appendix 2, survey page 12), their skill level at feasibility assessments (0 = "no experience," 2 = "beginner," 3 = "intermediate," 4 = "advanced," 5 = "expert"; see Appendix 2, survey page 12), or their level of experience with feasibility assessments ("I was not previously aware of them," "I know about feasibility assessments, but I have never been part of a collaboration in which one was used," "I have been part of a collaboration in which a feasibility assessment was conducted," "I have personally organized a feasibility assessment for a collaboration"; see Appendix 2, survey page 6) using a GZLM with a multinomial distribution and a cumulative logit link function (n = 1,716).

We tested whether respondents' ratings of the priority level of the BLM providing future support for conducting feasibility assessments (0 = "very low," 1 = "low," 2 = "moderate," 3 = "high," 4 = "very high"; see Appendix 2, survey page 16) differed based on whether or not they had received training in feasibility assessments (1 = "yes," 0 = "no"; see Appendix 2, survey page 12), their skill level at feasibility assessments (0 = "no experience," 2 = "beginner," 3 = "intermediate," 4 = "advanced," 5 = "expert"; see Appendix 2, survey page 12), or their level of experience with feasibility assessments ("I was not

previously aware of them," "I know about feasibility assessments, but I have never been part of a collaboration in which one was used," "I have been part of a collaboration in which a feasibility assessment was conducted," "I have personally organized a feasibility assessment for a collaboration"; see Appendix 2, survey page 6). This was tested using a GZLM with a multinomial distribution and a cumulative logit link function (n = 1,688).

Suitability of BLM Issue Areas for Collaboration

We tested whether respondents rated suitability of any of the 11 BLM issue areas for collaboration and ADR (see Appendix 2, survey page 20) along the 5-point suitability scale (0 = "unsuitable," 1 = "somewhat unsuitable," 2 = "neutral," 3 = "somewhat suitable," 4 = "suitable") differently than the others using a Friedman test (n = 1,635) and ordered the issue areas from the most to the least suitable using Friedman mean ranks.

We tested whether the respondents that worked in an issue area (see Appendix 2, survey page 2) rated the suitability of that same issue area (0 = "unsuitable," 1 = "somewhat unsuitable," 2 = "neutral," 3 = "somewhat suitable," 4 = "suitable"; see Appendix 2, survey page 20) differently than the respondents that worked in other issue areas using Pearson chi-square tests.

Perceptions of Barriers to Collaboration

We tested whether respondents rated frequency of any of the 12 situational barriers to collaboration (see Appendix 2, survey page 18) along the 5-point frequency scale (0 = "never," 1 = "seldom," 2 = "sometimes," 3 = "often," 4 = "always") differently than the others using a Friedman test (n = 987) and ordered the barriers from the most to the least frequent using Friedman mean ranks. We also tested whether respondents rated magnitude of effect of any of the 12 situational barriers to collaboration (see Appendix 2, survey page 18) along the 4-point effect scale (0 = "zero," 1 = "minor," 2 = "moderate," 3 = "major") differently than the others using a Friedman test (n = 751) and ordered the barriers from the most to the least effect using Friedman mean ranks.

We tested whether respondents' ratings of the overall frequency of situational barriers to collaboration differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their overall skill level, or their experience with collaboration and(or) ADR. This was tested using a GZLM with a Poisson distribution and a log link function (n = 790). The scale ranged from 0 or situational barriers are "never" encountered to 48 or all 12 situational barriers are "always" encountered during collaborations; see Appendix 2, survey page 18.

We tested whether respondents' ratings of the overall magnitude of effect of situational barriers to collaboration (scale ranged from 0 or all 12 situational barriers are of "zero" effect because they never occur to 36 or all 12 situational barriers are "major" barriers to collaboration when they do occur; see Appendix 2, survey page 18) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their overall skill level, their experience with collaboration and(or) ADR, or how they rated the overall frequency of situational barriers. This was tested using a GZLM with a multinomial distribution and a cumulative probit link function (n = 618).

We tested whether respondents rated frequency of any of the 12 organizational barriers to collaboration (see Appendix 2, survey page 19) along the 5-point frequency scale (0 = "never," 1 = "seldom," 2 = "sometimes," 3 = "often," 4 = "always") differently than the others using a Friedman test (n = 987) and ordered the barriers from the most to the least frequent using Friedman mean ranks. We also

tested whether respondents rated magnitude of effect of any of the 12 situational barriers to collaboration (see Appendix 2, survey page 19) along the 4-point effect scale (0 = "zero," 1 = "minor," 2 = "moderate," 3 = "major") differently than the others using a Friedman test (n = 610) and ordered the barriers from the most to the least effect using Friedman mean ranks.

We tested whether respondents' ratings of the overall frequency of travel ceilings as a barrier to collaboration (0 = "never," 1 = "seldom," 2 = "sometimes," 3 = "often," 4 = "always"; see appendix 2, survey page 19) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, or their experience with collaboration and(or) ADR. This was tested using a GZLM with a multinomial distribution and a cumulative probit link function (n = 1,773).

We tested whether respondents' ratings of the overall magnitude of effect of travel ceilings as a barrier to collaboration (0 = "zero," 1 = "minor," 2 = "moderate," 3 = "major"; see appendix 2, survey page 19) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their experience with collaboration and(or) ADR, or how they rated the frequency of travel ceilings as a barrier to collaboration. This was tested using a GZLM with a multinomial distribution and a cumulative cauchit link function (n = 1,773).

We tested whether respondents' ratings of the overall frequency of "other BLM duties take priority over collaboration" as a barrier to collaboration (0 = "never," 1 = "seldom," 2 = "sometimes," 3 = "often," 4 = "always"; see Appendix 2, survey page 19) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, or their experience with collaboration and(or) ADR. This was tested using a GZLM with a multinomial distribution and a cumulative logit link function (n = 1,796).

We tested whether respondents' ratings of the overall magnitude of effect of "other BLM duties take priority over collaboration" as a barrier to collaboration (0 = "zero," 1 = "minor," 2 = "moderate," 3 = "major"; see Appendix 2, survey page 19) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their experience with collaboration and(or) ADR, or how they rated the frequency of "other BLM duties take priority over collaboration" as a barrier to collaboration. This was tested using a GZLM with a multinomial distribution and a complementary log-log link function (n = 1,796).

We tested whether respondents' ratings of the overall frequency of "field personnel lack authority to conduct collaborations" as a barrier to collaboration (0 = "never," 1 = "seldom," 2 = "sometimes," 3 = "often," 4 = "always"; see Appendix 2, survey page 19) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, or their experience with collaboration and(or) ADR. This was tested using a GZLM with a multinomial distribution and a cumulative probit link function (n = 1,530).

We tested whether respondents' ratings of the overall magnitude of effect of "field personnel lack authority to conduct collaborations" as a barrier to collaboration (0 = "zero," 1 = "minor," 2 = "moderate," 3 = "major"; see Appendix 2, survey page 19) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their experience with collaboration and(or) ADR, or how they rated the frequency of "field personnel lack authority to conduct collaborations" as a barrier to collaboration. This was tested using a GZLM with a multinomial distribution and a cumulative cauchit link function (n = 1,530).

We tested whether respondents' ratings of the overall frequency of "lack of support in the BLM" as a barrier to collaboration (0 = "never," 1 = "seldom," 2 = "sometimes," 3 = "often," 4 = "always"; see Appendix 2, survey page 19) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, or their experience with collaboration and(or) ADR. This was tested using a GZLM with a multinomial distribution and a cumulative logit link function (n = 1,689).

We tested whether respondents' ratings of the overall magnitude of effect of "lack of support in the BLM" as a barrier to collaboration (0 = "zero," 1 = "minor," 2 = "moderate," 3 = "major"; see Appendix 2, survey page 19) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their experience with collaboration and(or) ADR, or how they rated the frequency of "lack of support in the BLM" as a barrier to collaboration. This was tested using a GZLM with a multinomial distribution and a cumulative cauchit link function (n = 1,689).

We tested whether respondents' ratings of the overall frequency of "lack of support from your supervisor" as a barrier to collaboration (0 = "never," 1 = "seldom," 2 = "sometimes," 3 = "often," 4 = "always"; see Appendix 2, survey page 19) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, or their experience with collaboration and(or) ADR. This was tested using a GZLM with a multinomial distribution and a cumulative logit link function (n = 1,806).

We tested whether respondents' ratings of the overall magnitude of effect of "lack of support from your supervisor" as a barrier to collaboration (0 = "zero," 1 = "minor," 2 = "moderate," 3 = "major"; see Appendix 2, survey page 19) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their experience with collaboration and(or) ADR, or how they rated the frequency of "lack of support from your supervisor" as a barrier to collaboration. This was tested using a GZLM with a multinomial distribution and a cumulative cauchit link function (n = 1,806).

We tested whether respondents' ratings of the overall frequency of organizational barriers to collaboration (scale ranged from 0 or organizational barriers are "never" encountered to 48 or all 12 organizational barriers are "always" encountered during collaborations; see Appendix 2, survey page 19) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their overall skill level, or their experience with collaboration and(or) ADR. This was tested using a GZLM with a tweedie distribution and a log link function (n = 771).

We tested whether respondents' ratings of the overall magnitude of effect of organizational barriers to collaboration (scale ranged from 0 or all 12 organizational barriers are of zero effect because they never occur to 36 or all 12 organizational barriers are major barriers to collaboration when they do occur; see Appendix 2, survey page 19) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their overall skill level, their experience with collaboration and(or) ADR, or how they rated the overall frequency of organizational barriers. This was tested using a GZLM with a Poisson distribution and a log link function (n = 492).

We tested whether field personnel rated the level of support for collaboration in their field office, different than in their BLM State Office or different than the Washington D.C. office (see Appendix 2, survey page 17) along the 6-point frequency scale (0 = "non-existent," 1 = "very low," 2 = "low," 3 = "moderate," 4 = "high," 5 = "very high") using a Friedman test (n = 702). We also tested whether the rating that field personnel gave to their field office was correlated with the rating they gave their BLM

State Office, whether the rating they gave their field office was correlated with the rating they gave the Washington D.C. office, and whether the rating they gave their BLM State Office was correlated with the rating they gave the Washington D.C. office using Spearman correlation tests.

We tested whether field personnel's ratings of the level of support for collaboration in their field office (0 = "non-existent," 1 = "very low," 2 = "low," 3 = "moderate," 4 = "high," 5 = "very high"; see Appendix 2, survey page 17) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, or their experience with collaboration and(or) ADR. This was tested using a GZLM with a multinomial distribution and a cumulative probit link function (n = 1,005).

We tested whether field personnel's ratings of the level of support for collaboration in their BLM State Office (0 = "non-existent," 1 = "very low," 2 = "low," 3 = "moderate," 4 = "high," 5 = "very high"; see appendix 2, survey page 17) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, or their experience with collaboration and(or) ADR using a GZLM with a multinomial distribution and a cumulative negative log-log link function (n = 719).

We tested whether field personnel's ratings of the level of support for collaboration in the Washington D.C. office (0 = "non-existent," 1 = "very low," 2 = "low," 3 = "moderate," 4 = "high," 5 = "very high"; see appendix 2, survey page 17) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, or their experience with collaboration and(or) ADR using a GZLM with a multinomial distribution and a cumulative cauchit link function (n = 613).

Perceptions about How Collaboration Affects Outcomes

We tested whether respondents rated how any of the 13 social and political outcomes to collaboration (modified from Appendix 2, survey page 21) along the 5-point effect scale (–2 = "greatly worsens," –1 = "somewhat worsens," 0 = "no difference," 1 = "somewhat improves," 2 = "greatly improves") differently than the others using a Friedman test (n = 1,537) and ordered the outcomes' ratings using Friedman mean ranks.

The original scale for respondents' general attitude towards collaboration (modified from Appendix 2, survey page 21) that ranged from –26 or collaboration "greatly worsens" all 13 outcomes to 26 or collaboration "greatly improves" all 13 outcomes was shifted by adding 26 to each scale value so that the range distribution was greater than or equal to 0 (the new scale ranged from 0 = "greatly worsens" all 13 outcomes to 52 = "greatly improved" all 13 outcomes) in order to fit non-normal distributions in the GZLM. We then tested whether respondents' general attitudes toward collaboration differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their overall level of training, their overall skill level, or their experience with collaboration and(or) ADR, their rating of the overall frequency of situational barriers, or their rating of the overall frequency of organizational barriers. This was tested using a GZLM with a Poisson distribution and an identity link function (n = 436).

We also tested whether the rating that respondents gave to how collaboration affects short-term costs (0 = "eliminates or greatly reduces," 1 = "somewhat reduces," 2 = "no difference," 3 = "somewhat increases," 4 = "greatly increases"; see Appendix 2, survey page 21) were correlated with the rating they gave to how collaboration affects long-term costs (0 = "eliminates or greatly reduces," 1 = "somewhat reduces," 2 = "no difference," 3 = "somewhat increases," 4 = "greatly increases"; see Appendix 2, survey page 21) . This was tested using a Spearman correlation test.

We tested whether respondents' ratings of the short-term costs of collaboration (0 = "eliminates or greatly reduces," 1 = "somewhat reduces," 2 = "no difference," 3 = "somewhat increases," 4 = "greatly increases"; see Appendix 2, survey page 21) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their overall skill level, their experience with collaboration and(or) ADR. This was tested using a GZLM with a multinomial distribution and a cumulative negative log-log link function (n = 1,439).

We tested whether respondents' ratings of the long-term costs of collaboration (0 = "eliminates or greatly reduces," 1 = "somewhat reduces," 2 = "no difference," 3 = "somewhat increases," 4 = "greatly increases"; see Appendix 2, survey page 21) differed by gender, whether or not they were in a decision-making position, the number of years they had worked for the BLM, their duty station level, the BLM State Office or BLM Center to which they report, their overall skill level, their experience with collaboration and(or) ADR. This was tested using a GZLM with a multinomial distribution and a cumulative probit link function (n = 1,418).