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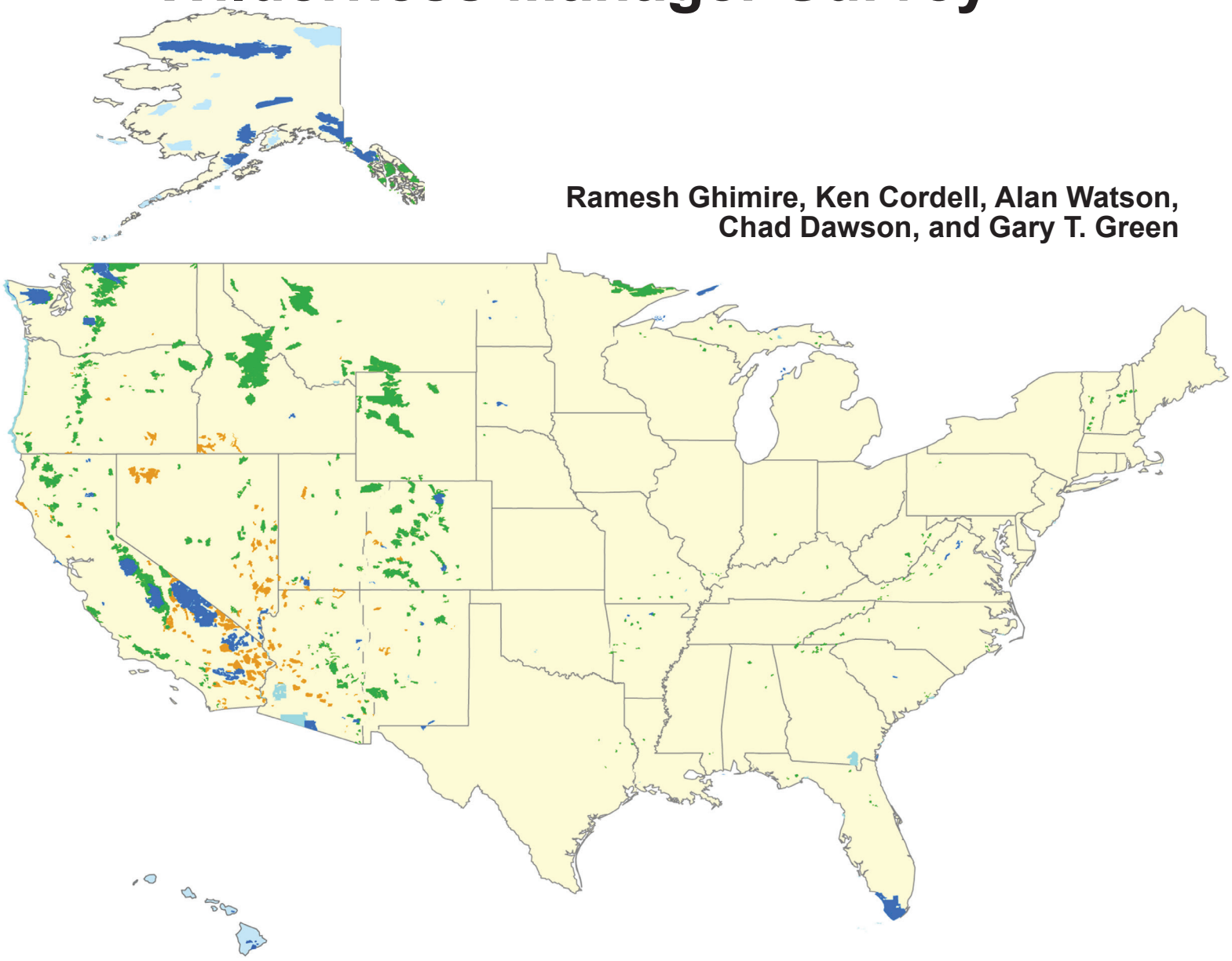
Results From the 2014 National Wilderness Manager Survey



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Abstract

A national survey of managers was developed to support interagency wilderness strategic planning. The focus was on major challenges, perceived needs for science and training, and accomplishments of 1995 Strategic Plan objectives. The survey was administered to managers at the four federal agencies with wilderness management responsibilities: the Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, and U.S. Forest Service. In spring 2014, responses were received from 368 managers. The highest ranking threat perceived was "lack of political and financial support for wilderness protection and management," followed by "invasive species," "disconnected urban audiences" and "adjacent land use and management." The greatest need for science-based information was "public attitudes toward intervention to adapt to climate change influences" and "public attitudes toward ecological restoration activities." The majority of managers commonly perceived no or only slight accomplishment of previous strategic plan objectives.

Keywords: Wilderness, manager survey, wilderness science, wilderness training, wilderness values.

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Introduction and Methods

The year 2014 marked the 50th anniversary of the passage of the U.S. Wilderness Act (Public Law 88-577). Across the nation, many celebrations; community events; acknowledgements in scientific journals, popular magazines and newspaper articles; and official actions celebrated the past and looked at the future of the National Wilderness Preservation System (NWPS), which the Act established. One official action in 2014 was release of a strategic planning document: *2020 Vision* (http://www.wilderness.net/toolboxes/documents/50th/2020_Vision.pdf) by the four agencies charged with wilderness management on federal lands: the Bureau of Land Management (BLM), the National Park Service (NPS), the U.S. Fish and Wildlife Service (USFWS), and the U.S. Forest Service (USFS). The only previous national, interagency wilderness strategic plan was released in 1995, just after the 30th anniversary of the Wilderness Act (Bureau of Land Management and others 1995).

The National Wilderness Preservation System has changed since 1995, and the public's relationships with it have also changed. The system now encompasses nearly 110 million acres, and hopes and methods of protecting wilderness values have spread around the world. The U.S. population is larger and more diverse and reasons for valuing wilderness have become more clear. The Nation's economy, leisure patterns, and scientific knowledge have changed, and the landscape is under pressure from many political and environmental forces. In 2013, the Interagency Wilderness Policy Council directed the Arthur Carhart National Wilderness Training Center and the Aldo Leopold Wilderness Research Institute to facilitate revision of the 1995 plan, as documented by the *2020 Vision*. Both the Carhart Center and Leopold Institute provided oversight of the 2014 National Wilderness Manager Survey (NWMS) to inform this plan revision.

The Survey and How It Was Distributed to Managers

Although the *2020 Vision* plan is intended to guide activities for only the next 5 years, the NWMS asked managers in all four agencies to consider the challenges facing wilderness stewardship over the next 20 years. Questions about the adequacy of scientific information concerned the current availability of knowledge, implying that if we are short of information now, these areas should be targeted for knowledge development. Depending upon the subject, these could be short-term emphases on knowledge transfer or could refer to long-term basic and applied science.

The NWMS was administered online. It included questions about the respondent and featured open-ended as well as categorical response options about major challenges, threats, training, science needs, and strategic planning issues. Information gathered about respondents included their duties and tenure in wilderness management, years with the agency, duty station, and wilderness area in which most of their wilderness management work was done. Open-ended questions asked respondents to list major challenges, identify specific threats, suggest training topics, identify research needs, and list the two most important problems facing future wilderness stewardship. These items were deemed important for the strategic plan to address.

Categorical questions typically asked managers to rate, on a multi-point scale, their perceived level of threat to the wilderness experience or resource, and the need for additional training and research. Two optional modules at the end of the survey could be completed at the discretion of the respondent on: (1) the importance of each of 13 previously studied wilderness values (Cordell et al. 2008) on a multi-point scale (asked of the general public in a nationwide survey), and (2) levels of perceived accomplishment of the 1995 NWPS strategic plan objectives (Bureau of Land Management and others 1995).

The survey instrument went through many rounds of team reviews and revisions. Both the instrument and its administration through SurveyMonkey® [1] (http://www.surveymonkey.com) were pilot-tested by a panel of career-rich retired wilderness managers who had worked at a variety of levels in one or more of the managing agencies.

Survey administration of the final revised NWMS was meant to include all managers working with the NWPS. However, full population inclusion or even meaningful sampling was not possible owing to differences in management organizations across the four agencies, and, even within agencies, differences in job responsibilities across regions, parks, or states. The e-mail contact system in all agencies is oriented toward individuals, not wilderness management units. Therefore, we did not have an accurate estimate of the number of wilderness managers (survey population) nor up-to-date identification of specific employees who had been assigned wilderness management duties. To approximate the population of managers, requests to participate were sent to the field, regional, and national offices by a representative of each agency.

Wilderness management by all four agencies was broadly defined to include resource and visitor management, law enforcement, public information, planning, and policy development. All levels of the organization were included, from the field to their Washington, D.C., offices. Completed surveys were forwarded automatically by SurveyMonkey to team members at the University of Georgia, Athens, Georgia, for analysis. The analysis reported here summarizes survey data provided by NWPS managers overall, but has also been reported, in most cases, separately by the agency. The survey instrument and an example letter sent to prospective respondents are included in appendix 1.

Pilot Testing and Pilot Results

A pilot test of the survey instrument and data collection methods was conducted by using a selected group of recently retired wilderness managers. Requesting retirees to complete and comment on the survey avoided using current managers for piloting and thus losing data from those respondents. Pilot respondents were asked to complete the survey, offer critiques of the question wording and survey instrument, and indicate how much time it took. A total of 17 retirees completed the pilot test survey, Although it was designed to take about 30 minutes to complete, some respondents reported that it took longer than anticipated. See appendix 1 for the approximate time burden they noted.

The questionnaire was reduced in length and wording of items clarified based on feedback from this pilot test. Hence, the knowledge and experience these retired managers brought to the pilot test helped us improve the survey before submitting it to current managers within the agencies.

Wilderness Manager Survey Response Metadata

Between February 24 and May 19, 2014, a total of 368 responses was collected from wilderness managers across the four agencies. Table 1 shows the number of wilderness managers responding to the survey and the number and percentage of wilderness units and acreage represented by these responses. Appendix 1, table A1.4, provides a listing of states and NWPS areas represented by survey participants.

The survey population is fairly evenly distributed across agencies. However, NPS and USFWS response shares overrepresent, whereas the USFS and BLM response shares underrepresent, the proportion of wilderness units each agency manages. On the other hand, in terms of acreage managed, the BLM and USFWS are overrepresented, the NPS is underrepresented, and the USFS proportion of respondents is very close to the proportion of NWPS acreage managed by the agency.

Table 1—Number and percentage of survey respondents and number and percentage of wilderness units and acreage represented by responding managers by agency, 2014.[1]

Agency	Responses	Wilderness units	Responses per wilderness unit	Acreage	Responses per million acres
	number (percent)	*number (percent)*	*number (percent)*	*number (percent)*	*number (percent)*
National Park Service (NPS)	82 (22)	61 (8)	1.34	43,926,153 (40)	1.87
Bureau of Land Management (BLM)	76 (21)	221 (28)	0.34	8,710,087 (8)	8.73
U.S. Fish and Wildlife Service (USFWS)	95 (26)	71 (9)	1.34	20,702,488 (19)	4.59
U.S. Forest Service (USFS)	109 (30)	439 (55)	0.25	36,165,620 (33)	3.01
Other combination	6 (1.6)				
Total	368 (100)	792 (100)		109,504,348 (100)	

[1] Data related to wilderness units and acreage came from http://www.wilderness.net/NWPS/fastfacts

Data Analysis

This report mostly provides a descriptive analysis of the survey findings. Simple descriptive analytics were used to develop summarization tables. Contents of the open-ended questions were coded using NVivo software (QSR International) to group similar types of comments within each set of question responses. Similar comments were then grouped into a small number of categories that the analysts felt best described the range of comments received. Results are summarized by these general categories. In many cases,

contents of more complex responses were sufficiently diverse to fit into multiple groupings. Hence, the count of responses or comments for open-ended questions across groups was greater than total number of respondents or responses. Some of the responses were very brief, sometimes just one word (for example, fire, technology, management). In these cases, analyst judgment was relied on for placement into groups.

The Survey Team

The National Wilderness Manager Survey was developed by a national team of experienced social scientists. This Survey Team was assembled to design, test, execute, and report results for use in development of the national interagency strategic plan and to inform policy decisions over the next several years. The team included both federal agency and university collaborators.

Initial instrument content was developed by Alan Watson, research social scientist, Aldo Leopold Wilderness Research Institute, Forest Service, Missoula, Montana and Chad Dawson, professor emeritus, College of Environmental Sciences and Forestry, State University of New York, Syracuse, N.Y. Additional modules, design, piloting, testing, revision, data management, and analyses were executed by team members in Athens, Georgia. The Athens team included Ramesh Ghimire, post-doctoral research associate, University of Georgia; Ken Cordell, scientist emeritus, Aldo Leopold Wilderness Research Institute, and Gary T. Green, associate professor, University of Georgia. Other team members involved in all phases of the project included Rudy Schuster, branch chief, U.S. Geological Survey, and Troy Hall, professor, Oregon State University, Corvallis, Oregon.[1]

Results

Manager Profiles

The profiles of responding managers can be described in terms of years in current position, years of wilderness management experience, agency employment, and location of wilderness management assignment.

Respondents by agency and years in current position

Managers reported an average of 8 years of tenure in their current position (appendix 2, table A2.1), though a slight majority (55 percent) reported 0 to 5 years (fig. 1). Number of years in current position varied somewhat though the patterns were similar across agencies. The BLM and the USFS, however, had higher percentages of respondents with more than 20 years of experience than did the other agencies.

[1] We thank Alexandra Fulmer (graduate student at the Warnell School of Forestry and Natural Resources at the University of Georgia) for her help in qualitative data analysis.

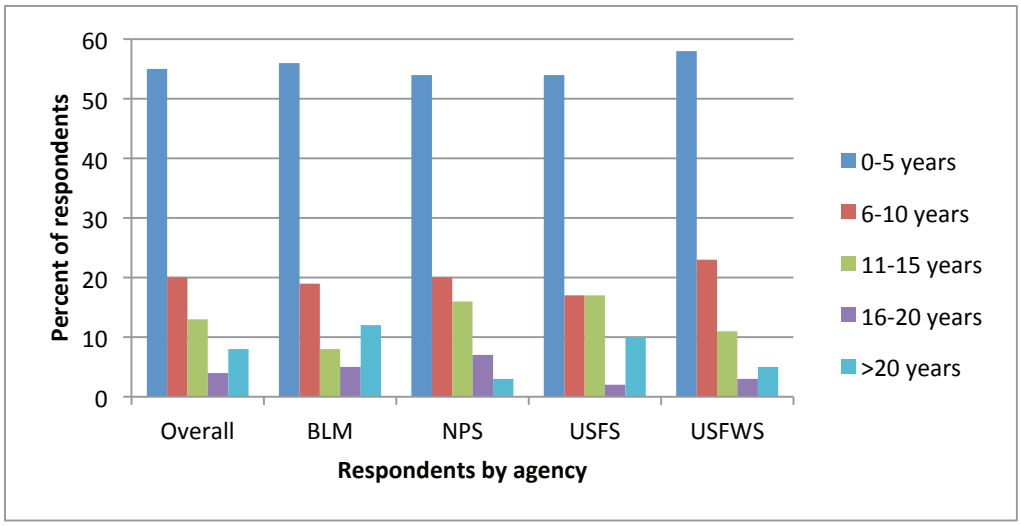

Figure 1—Respondent managers by agency and by years in current position.

Respondents by years of having responsibility for wilderness stewardship

On average, responding managers had worked for about 12 years with responsibilities for wilderness stewardship (appendix 2, table A2.2). The USFS had a much smaller percentage of respondents with 5 or fewer years of stewardship assignment (21 percent), whereas the USFWS had a larger percentage (42 percent) of respondents with 5 or fewer years (fig. 2).

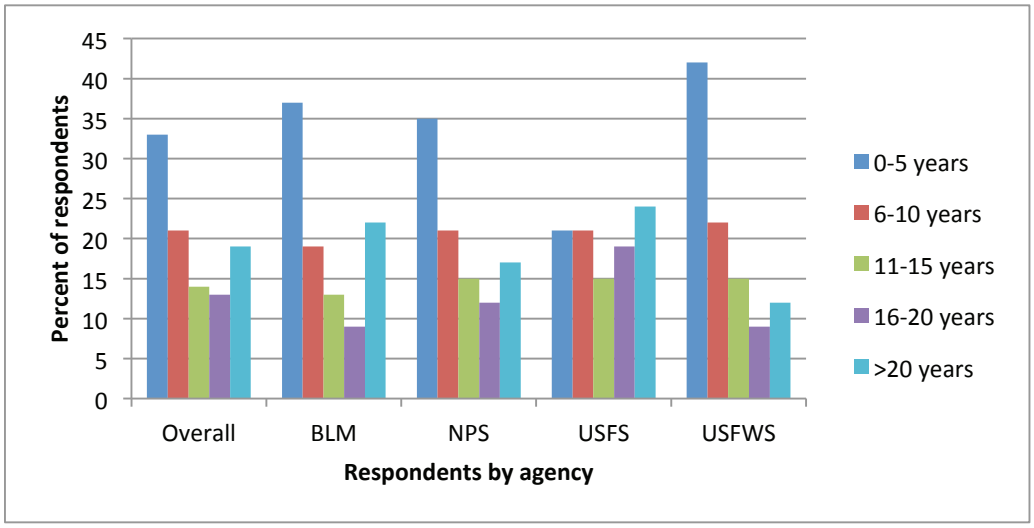

Figure 2—Respondent managers by years of responsibility for wilderness stewardship for all agencies and for each agency.

Respondents by employing agency

The largest percentage of respondents (30 percent) was from the USFS, followed by USFWS (26 percent), NPS (22 percent), and BLM (21 percent) (fig. 3 and appendix 2, table A2.3). Hence, respondent numbers were somewhat evenly spread across agencies.

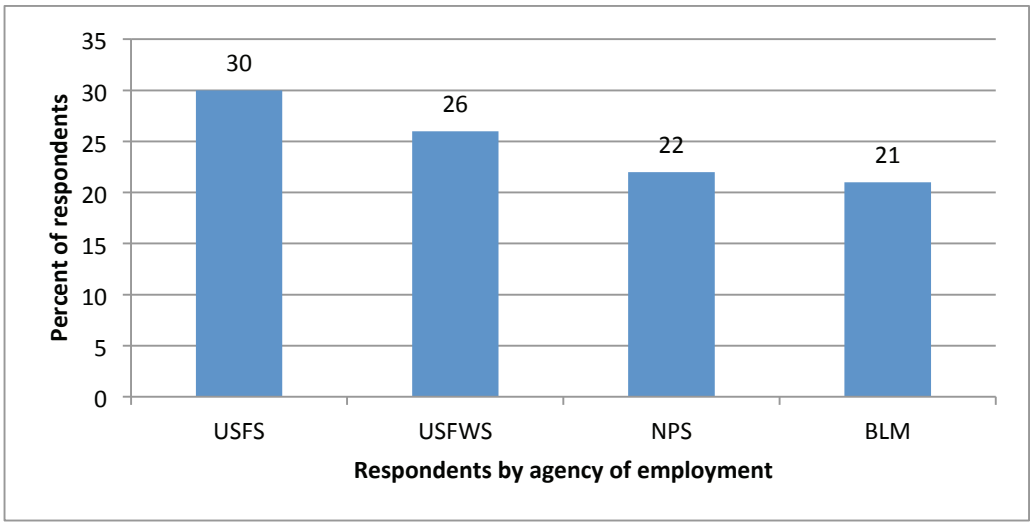

Figure 3—Respondent managers by agency of employment.

Respondents by office level in agency

Responding managers to the NWMS work at different levels of offices in their agency organizations. The majority of the BLM survey respondents were from the field offices (fig. 4 and appendix 2, table A2.3a). In the NPS, the majority (80 percent) of respondents worked at the Park level (fig. 5 and appendix 2, table A2.3b). In the USFS, the majority (65 percent) of respondents worked at the ranger district level (fig. 6 and appendix 2, table A2.3c). Moreover, the majority (86 percent) of survey respondents in the USFWS worked at the refuge level (fig. 7 and appendix 2, table A2.3d).

Respondents by primary professional responsibility

As shown in figure 8, primary management responsibilities included resource management (22 percent), planning (18 percent), public information and education (17 percent), policy (15 percent), visitor management (14 percent), and law enforcement (7 percent).

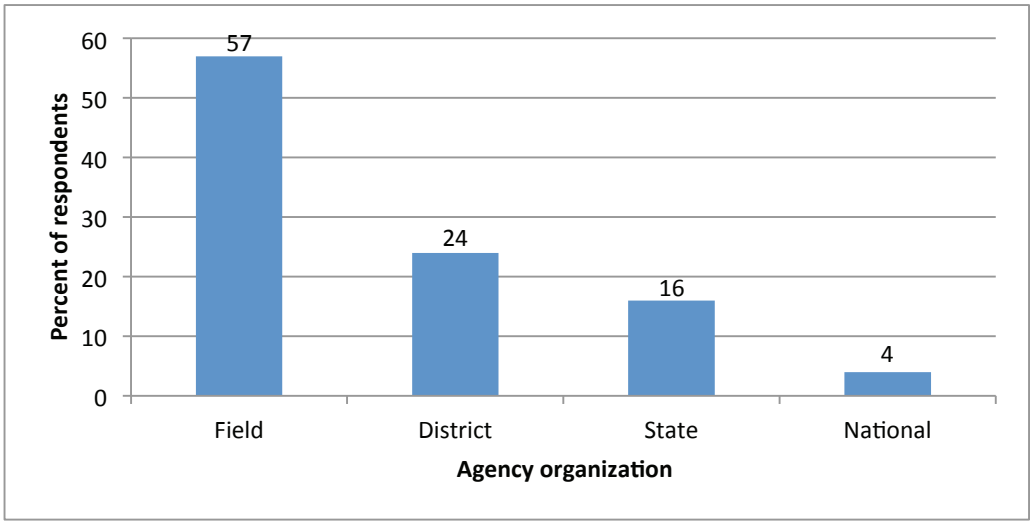

Figure 4—Respondent managers by level of office in the Bureau of Land Management.

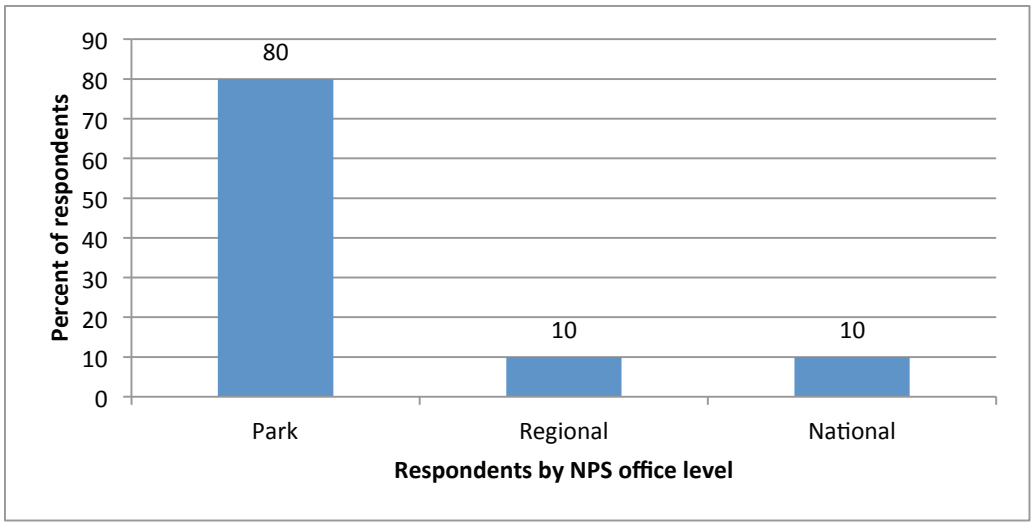

Figure 5—Respondent managers by level of office in the National Park Service.

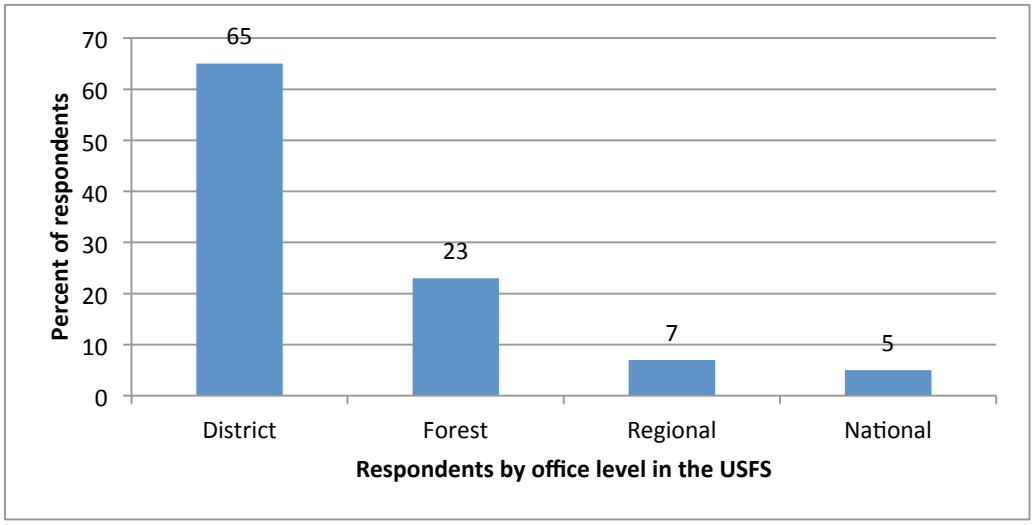

Figure 6—Respondent managers by level of office in the U.S. Forest Service.

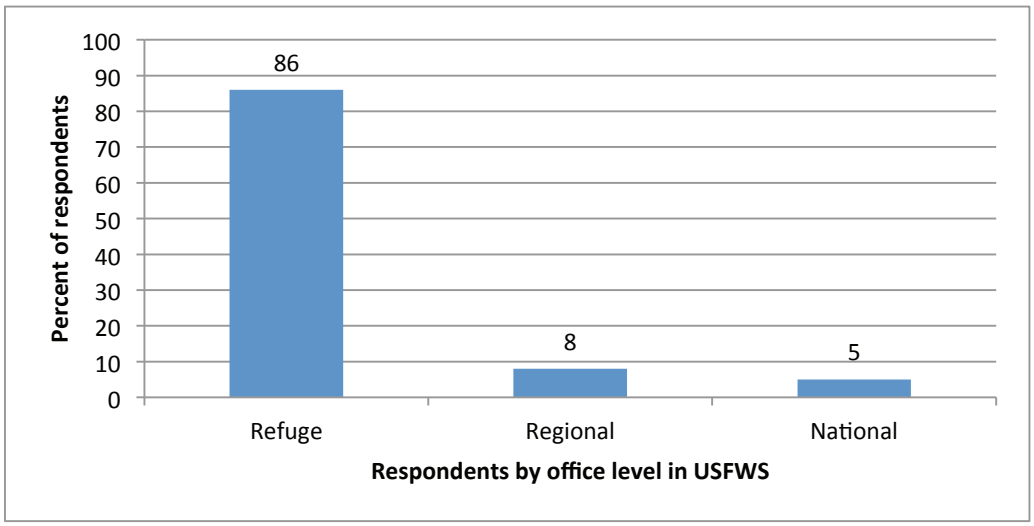

Figure 7—Respondent managers by office level in the U.S. Fish and Wildlife Service.

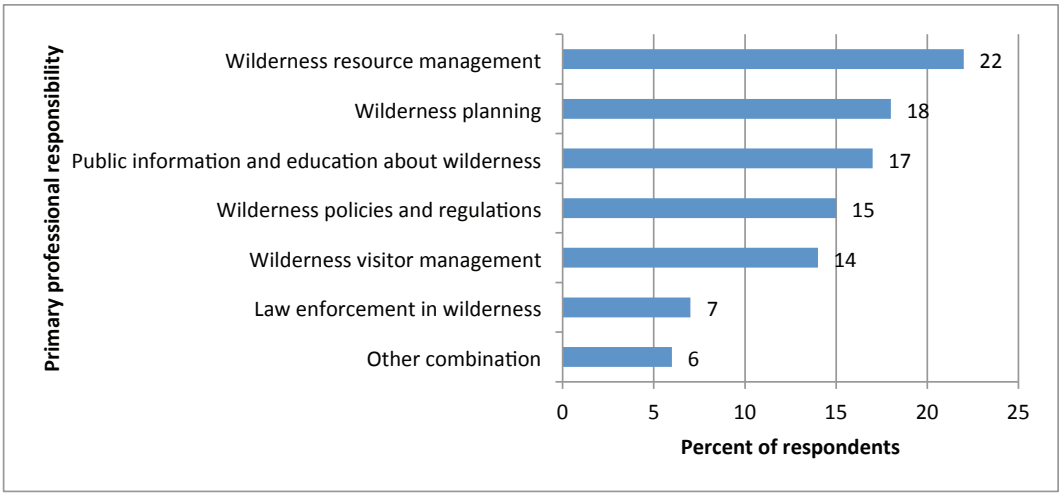

Figure 8—Respondent managers by primary professional responsibility.

Agency-specific details are available in appendix 2, (table A2.4). In all cases, many respondents indicated more than one area of responsibility, so these summary numbers are not proportions of people, but the proportion of duties indicated among the population of respondents.

Respondents by time and efforts in wilderness stewardship and planning

In the survey, 60 percent of respondents indicated that they spent 20 percent or less of their time and effort doing wilderness stewardship and planning related activities (fig. 9 and appendix 2, table A2.5).

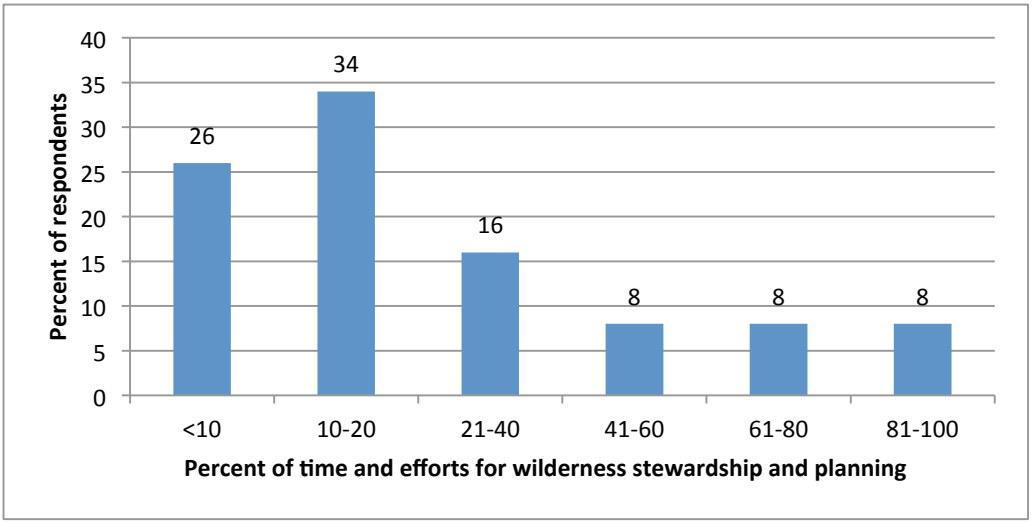

Figure 9—Respondent managers by time and efforts for wilderness stewardship and planning.

Respondents by state

As shown in fig. 10, the largest proportion of survey respondents (17) work in California, followed by 8 in Arizona, 7 in Alaska and Oregon, 6 in Colorado and Montana, 5 in Florida and New Mexico, and 4 in Idaho, Nevada, and Utah (appendix 2, table A2.6). For

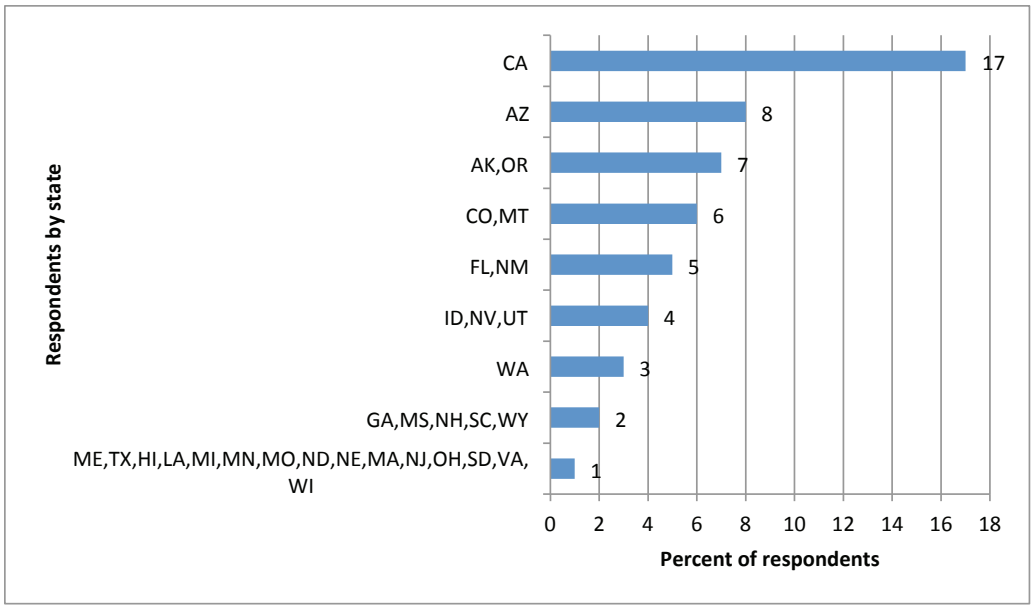

Figure 10—Respondent managers by state.

the number of survey respondents by name of the wilderness unit in which they conduct the most of their work effort, see appendix 1, table A1.4.

Values That Managers Attach to Wilderness

Managers were asked to rate the importance (from not at all important to extremely important) of each of 13 wilderness values. These wilderness value descriptions are well established and have been used extensively in previous studies to convey how the American public perceives benefits from protecting wilderness (Cordell et al. 2008). Respondents returned 157 completed responses to this optional Wilderness Values module. The statement selected by the largest percentage of responding managers as the most important of the 13 (among those rated very or extremely important) was to ensure that

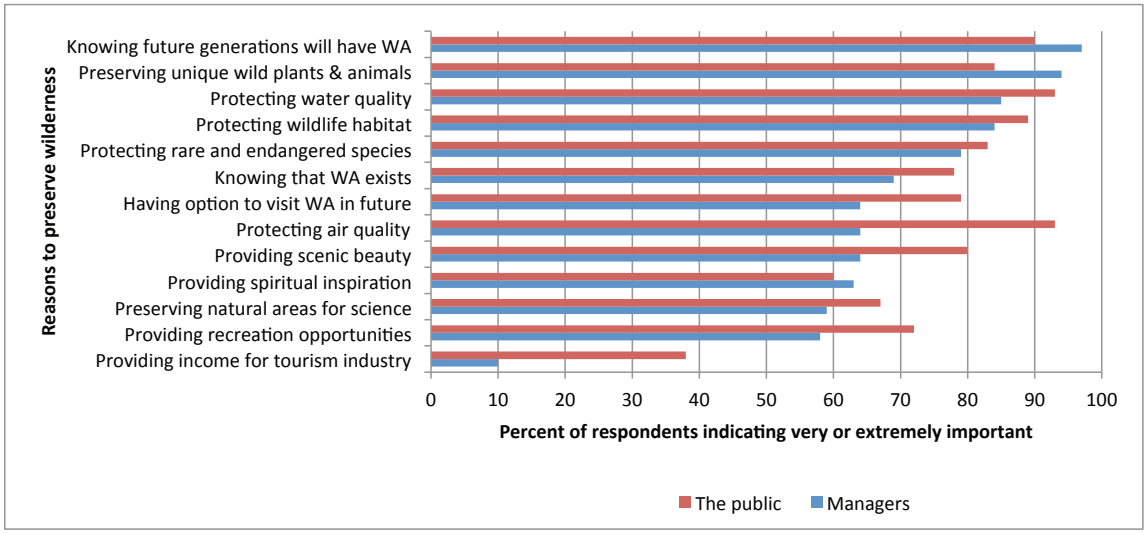

Figure 11—Percentage of the public and of managers which assigned very to extreme importance to each of 13 reasons to preserve wilderness.

future generations will have wilderness areas (97 percent). Following very closely was preserving unique wild plants and animals (94 percent) (see fig. 11 and appendix 2, table A2.7a for the agency breakdown).

Percentages of the managers were compared with percentages of the American public (from an earlier separate study) in rating the importance of the same 13 wilderness values. Data for ranking wilderness values by the public were based on the National Survey on Recreation and the Environment, conducted in 2008.[2] This comparison revealed some interesting differences (see fig. 11 and appendix 2, table A2.7b). Although a larger percentage of managers placed greatest importance (very to extremely important) on protecting wilderness to assure that future generations will have wilderness to visit or otherwise appreciate, the largest percentage of the public placed greatest importance (very or extreme importance) on wilderness for protecting air and water qualities. Protecting air quality and protecting water quality were the 3rd and 8th most important reasons identified by managers. Although managers and the public valued wilderness somewhat differently, they both indicated that the purpose of providing income for the tourism industry was the least important reason (ranked 13th) to preserve wilderness and recreation was also low (ranked 12th by managers and 10th by the public). Hence, both managers and the public demonstrate strong support beyond recreation and economic values of wilderness (appendix 2, table A2.7b).

Level of Potential Threats

Managers were provided a list of 24 potential threats that could possibly degrade or damage wilderness character, specific resources, or visitor experiences over the next 20 years. Table 2 summarizes the percentage of managers who rated each of these potential threats high or very high to the wilderness area or wilderness areas where they work.

Lack of political and financial support for wilderness protection and management, invasive plant and animal species, disconnected urban audiences, adjacent land management and use, and designation legislation that included language that was viewed as compromising natural conditions or containing special provisions for management were the top five potential threats to resources or visitor experiences identified by managers. Percentages vary across agencies. The NPS and the USFS rated lack of political or financial support as a much higher threat than did the BLM and USFWS (table 2). The USFS rated many (7 out of 24) and NPS rated almost half (11 out of 24) of the listed threats higher than did the other agencies. The USFWS only rated two items as larger threats than the other agencies (water quality impacts and sea level rise/coastal erosion threats) (For details on each agency responses, please see appendix 2, table A2.8).

[2] National Survey on Recreation and the Environment (NSRE) (2008), The Interagency National Consortium; coordinated by the USDA Forest Service, Recreation, Wilderness, and Demographics Trends Research Group, Athens, Georgia, and the Human Dimensions Research Laboratory, University of Tennessee, Knoxville, Tennessee.

Table 2—Percentage of managers indicating level of potential threat to be high or very high for all agencies and for each agency.

Potential Threats*	All Agency	BLM	NPS	USFS	USFWS
Lack of political and financial support for wilderness protection and management	74	61	80	88	63
Invasive species	56	60	73	48	46
Disconnected urban audiences	53	39	62	58	50
Adjacent land management and use	44	48	52	37	40
Legislation designating wilderness with compromised wilderness conditions or special provisions for management	41	39	41	52	30
Wild-land fire suppression and management	39	44	33	57	15
Motorized and mechanical equipment trespass and illegal use	38	50	22	48	27
Fragmentation and isolation of wilderness as ecological islands	38	37	38	40	34
Aircraft noise and airspace reservations	37	19	55	41	31
Increasing or changing non-commercial recreation	35	26	30	52	27
Air quality impacts	31	23	39	34	25
Risk of wildfire damage (outside wilderness) originating in wilderness	31	40	29	34	19
Visitor use of advanced technology and electronic equipment for navigation or communication	29	24	30	38	19
Disruption of wildlife corridors	29	26	34	24	28
Urbanization and encroaching development	28	32	25	30	22
Energy development and resource extraction	27	23	35	23	28
Increasing or changing commercial recreation	25	16	30	29	24
Pressure on threatened and endangered species management	25	24	26	24	23
Water quality impacts	23	14	19	20	33
Administrative access, facilities, or other administrative exceptions	22	20	32	24	13
Water projects facilities	19	15	29	22	8
Livestock grazing	18	21	18	23	7
Sea level rise; coastal erosion	15	8	14	5	37
Private inholdings and their uses	15	24	15	13	8

* Respondents were provided a five-point Likert-type scale (none to very high potential threat) and a “not sure” option to rate the level of potential threat over the next 20 years at the wilderness area or areas in which they work. This table summarizes the percentage of respondents that rated the level of potential threats high or very high.

Major Challenges

Managers were asked to describe up to five major challenges they will likely face over the next 20 years in wilderness stewardship or planning activities. Challenges were defined in the survey as "…type of wilderness stewardship or planning activities [that] will demand the most time and effort by wilderness managers or planners like you to be successfully accomplished." A total of 1,355 challenges were described in this open-ended question by 368 responding managers. These challenges can be grouped into six broad categories, as shown in figure 12 (in appendix 5, see the "Major Challenges" section and table A5.1 for a detailed description of these categories and/or wording provided by respondents). Please note that, in many cases, contents of more complex responses were sufficiently diverse to fit into multiple groupings.

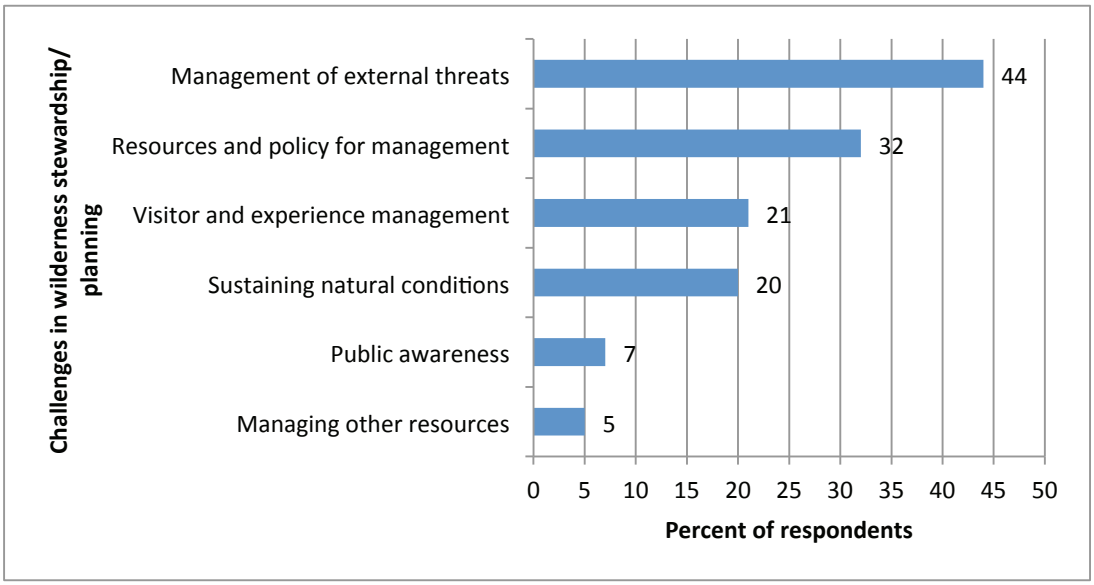

Figure 12—Six categories of major challenges in wilderness stewardship or planning.

Management of external threats (such as encroachment, human-caused wildfire, climate change, invasive species, and impacts of external factors) was the category with the largest number of major challenges described by managers. Other categories of challenges included having inadequate resources and policies to support management (staff, funding, law enforcement, agency policy, agency priority, improving legal and physical access, etc.), managing visitors and conditions for their experiences (visitor management, maintaining wilderness values, protecting visitors' experiences, protecting wilderness character, dealing with technologies that are sometimes inappropriate), sustaining natural conditions (restoring natural conditions, appropriately managing natural resources, attending to stewardship responsibilities, and adequately monitoring to detect change in character), public awareness (e.g., gaining public support), and managing resources other than natural resources (trails, cultural resource, etc.).

Two Most Important Problems

In appendix 5, section A5.2 provides a detailed description of these categories and wording provided by respondents. A total of 632 problem descriptions were collected from the 368 responding managers. These were grouped into five broad categories, shown in figure 13. In appendix 5, the "Two Most Important Problems" section and table A5.2 provide a detailed description of these categories and wording provided by respondents.

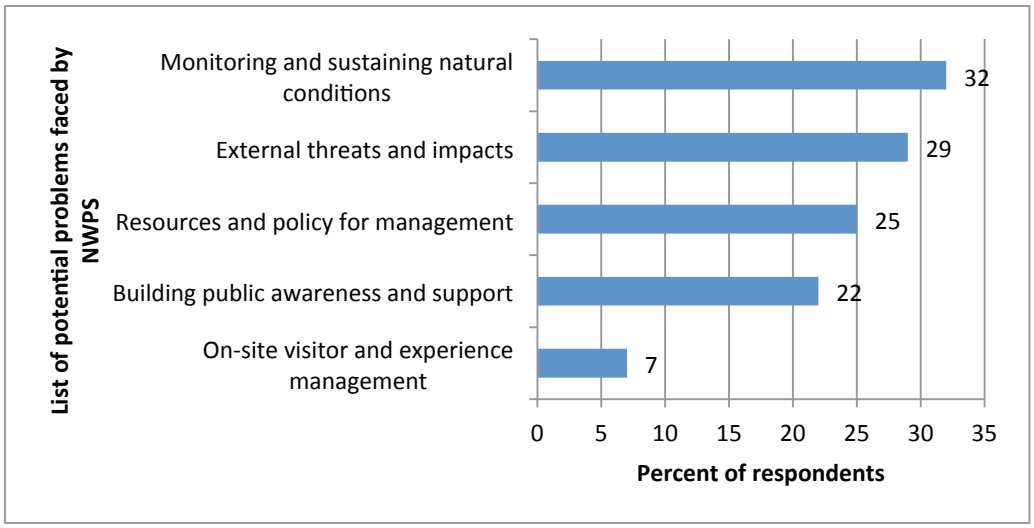

Figure 13—Potential problems facing NWPS managing agencies in the next 20 years.

Adequately monitoring and sustaining natural conditions (for example, protecting wilderness character; fire management; monitoring change in wilderness character; and maintaining and adequately monitoring air and water quality), external threats and their impacts (climate change, impact of human activities, encroachment, invasive species and weed control, adjacent land-use, etc.), adequate resources and policies to support management (funding, resources, workforce, protection of wilderness values, training for managers, relevant science for decisionmaking, etc.), building public awareness and support (increasing public awareness, educating the public, engaging urban populations, engaging the public in wilderness stewardship and management, developing partnerships, etc.), and on-site visitor and experience management (visitor management, increased visitation in wilderness, increased visitor access to wilderness, etc.) are the areas identified by managers as the most significant groups of problems that need to be addressed in the coming 20 years.

Training and Research

Level of Need for Manager Training

Wilderness managers were asked to provide input on the level of need for training topics during the next 20 years for building greater competencies within their agencies. Responding managers were provided a listing of seven different training topics and asked to evaluate the level of need for each of the topics. Table 3 summarizes the percentages of managers indicating a high or very high need. Appendix 3, table A3.1, provides more detail for all levels of need from very high to no need.

Table 3—Percentage of managers indicating high or very high need for training for all agencies and for each agency.

Training Needs*	All Agencies	BLM	NPS	USFS	USFWS
Wilderness history, law, regulation, and policy	58	53	62	61	51
Wilderness planning	57	51	71	61	47
Management skills related to communication, problem-solving, decision-making, and organizational management	57	56	57	61	50
Visitor use management and monitoring	55	51	61	68	41
Natural and cultural resources management and monitoring	51	44	66	45	47
Wilderness field skills	42	40	41	63	22
Managing special provisions	37	42	46	34	28

* Respondents were provided a five-point ranking scale (none to very high need) as well as a "not sure" response option.

The highest rated training needs identified included wilderness history, law, regulation, and policy; wilderness planning; management skills related to communication, problem-solving, decisionmaking, and organizational management; visitor use management and monitoring; and natural and cultural resources management and monitoring. There were some differences in needs ratings across agencies. Generally, the USFWS managers rated the needs lower than managers in other agencies. The NPS and USFS managers rated most of the listed training topics higher.

Training Needs

The NWMS asked managers to describe (open-ended question) the top five specific training measures needed for themselves. A total of 1,272 responses were received from the 368 respondents. These training needs were grouped into six broad categories, as shown in appendix A, Table A5.3.

Wilderness resource management (economic and noneconomic resources, adjustments for staff and budget cuts, establishment of baselines, monitoring, maintaining wilderness character and values, fire management, etc.) was the top category of training need. This was followed by skills, technology and analytical competencies (specific skills, using science in decisionmaking, more competency in information technology, approaches to minimum requirements analysis, decision guides, etc.), threats management (responding

to climate change influences, managing invasive species, soundscape protection, restoration guidance, etc.), building partnerships and education (building partnership, public education and outreach, communicating wilderness values, consultation, communication with tribal groups, responding to political pressure, etc.), laws, regulations and policy (wilderness regulations, wilderness policy, wilderness planning, wilderness laws, legal and policy context including ANILCA, etc.), and wilderness recreation management (visitor management, commercial use of wilderness, search and rescue, safe access for people with disabilities, control of motorized activities, carrying capacity analysis, etc.).

Research Needs Categories

Five research needs categories for resource and visitor management in wilderness areas are explained in appendix 5, section A5.4. A total of 1,173 responses have been grouped into four categories.

The largest of these categories was threats and impacts management (impact on wilderness resources and on opportunities for solitude resulting from human and natural factors, invasive species, climate change impact on wilderness character, monitoring/preserving soundscapes, ecosystem integrity, nearby land uses, etc.). The next largest category was wilderness resource management needs (such as emerging technologies to monitor wilderness use and access, how to incorporate science-based information into decisionmaking, fire, water resources, wilderness restoration, etc.), followed by building partnerships and education (employee development, communicating wilderness values with different public groups, partnership building, understanding wilderness values, and understanding public needs to get wilderness experience), and wilderness recreation management (visitor management, sanitation and waste management, conflict management, visitor impacts on wilderness character, capacity analysis, etc.).

Adequacy and Availability of Decision-Making Information

Responding managers were asked about 19 specific aspects of wilderness management and planning and asked to indicate how adequate and available science-based information is for each of these topics. Table 4 includes the percentages of managers indicating that science-based information is not adequate and available, or that it is only somewhat adequate for each of the 19 aspects. Appendix 3, table A3.2, provides a breakdown of percentages for each level of information adequacy and availability.

The five management decisionmaking topics with the highest percentage of managers rating them inadequate to somewhat adequate included public attitudes toward intervention to adapt to climate change, public attitudes toward ecological restoration activities (fire, vegetation, wildlife, etc.), relative value of wilderness benefits to different stakeholder groups, stewardship of spiritual values and uses, and managing field staff. Generally, higher percentages of the BLM managers felt that science-based information for these top five categories is neither adequate nor available. In contrast, relative to the other agencies, lower percentages of the USFWS managers felt that science-based information is not adequate.

Table 4—Percentages of managers indicating science-based information is not adequate or only somewhat adequate for all agencies and for each agency.

Decision-Making Information*	All Agencies	BLM	NPS	USFS	USFWS
Public attitudes toward intervention to adapt to climate change influences	58	65	56	56	53
Public attitudes toward ecological restoration (fire, vegetation, wildlife, etc.) activities	52	60	56	53	42
Relative value of wilderness benefits to stakeholder groups	51	55	53	47	51
Stewardship of spiritual values and uses	44	52	52	40	34
Managing field staff	36	45	39	32	31
Scenic quality protection	36	44	44	29	30
Visitor management (controlling use, managing conflict, mitigating impacts, etc.)	35	40	45	29	33
Wilderness monitoring protocol	34	35	47	29	28
Wilderness planning	33	31	41	35	28
Air quality protection	32	48	23	26	31
Cultural resources protection	30	30	38	25	30
Water resources protection	29	33	28	24	31
Managing subsistence activities and resources	29	29	36	31	25
Information and education for visitors and public	27	32	36	22	23
Historic resources protection	26	20	28	29	27
Grazing management	23	40	17	27	11
Fire and fuels management	22	24	21	28	16
Fish and wildlife management	21	24	22	26	10
Forest and vegetation resources protection	21	25	18	21	16

*Respondents were provided a five point Likert-type scale (not adequate, somewhat, moderate, good, and excellent). As well, “don’t know” option was provided.

Accomplishment of 1995 Strategic Plan Objectives

Introduction

In the optional part of the survey, wilderness managers were asked to assess the general success of their agencies in achieving the objectives laid out by the 1995 Interagency NWPS Strategic Plan. A total of 156 managers responded to this set of questions. Their evaluations were recorded on a scale that ranged from no achievement to very high achievement.

The five goals of the 1995 plan included preservation of natural and biological values, management of social values, administrative policy and interagency coordination, training of agency personnel, and enhanced public awareness and understanding. In

the following section, survey results are provided for each of the five overall goals and the objectives under each goal. To draw attention to objectives that need attention, and perhaps should be included in new strategic planning, percentages of managers who indicated there had been no or only slight progress and accomplishment are reported.

Level of Accomplishment of Management Goals and Objectives

Percentages of managers indicating no to slight accomplishment of the objectives are presented for each goal and its objectives. In the tables, the objectives are ranked from highest to lowest percentages indicating no or slight accomplishment by all agency.

Preservation of natural and biological values

The top five objectives rated as underachieved are (1) restoring fire to its natural role in the ecosystem, (2) inventorying and monitoring wilderness ecosystems and establishing long-term research, (3) restoring wilderness ecosystems damaged by humans, and identifying the processes needed to mitigate human-induced change, (4) implementing exotics management, and (5) retiring uses adversely affecting wilderness values.. Restoration, mitigation of human disturbances, and monitoring ecosystem conditions are themes that link these objectives. There is significant variation in scoring among the agencies. In general, smaller percentages of USFWS and NPS managers indicated no or low achievement of the seven natural and biological values management objectives stated in the 1995 Strategic Plan objectives. The USFS percentages tended to be the highest for scoring these objectives as not achieved or slightly achieved. The average achievement score for all managers and all agencies is 1.89 in a zero (none) to four (very high) scale, indicating a slight to moderate accomplishment of the natural and biological values management objective. Across agencies, the NPS has the highest score and the USFS has the lowest score (table 5 and appendix 4, table A4.1).

Management of social values

The top five underachieved objectives across managers in all four agencies are (1) minimizing low-level overflights, (2) assessing and mitigating impacts of emerging technologies, (3) coordinating with neighboring agencies on use restrictions, (4) developing and using evolving recreation management tools, and (5) minimizing the impact of structures.. Higher percentages of the BLM managers indicated concern that overflight and new technology objectives had not been achieved. Except for integration of new recreation management tools, the USFWS scored lower percentages indicating lack of achievement of social value management objectives. The average achievement score for all managers and all agencies is 1.78 on a zero (none) to four (very high) scale, indicating slight to moderate accomplishment of the social values management objectives (table 6 and appendix 4, table A4.2).

Table 5—Percentage of managers indicating accomplishment of the 1995 objectives under the goal of Preservation of Natural and Biological Values.

	No or Only Slight Accomplishment					High or Very High Accomplishment
Preservation of Natural and Biological Values*	**All Agencies**	**BLM**	**NPS**	**USFS**	**USFWS**	**All Agencies**
Restore fire to its natural role in the ecosystem	43	49	35	47	35	16
Inventory wilderness ecosystems to collect baseline data. Identify indicators and develop monitoring standards for those elements critical to ecological integrity. Develop monitoring strategies for high priority indicators and provide feedback for adaptive management. Where appropriate, establish long-term research programs	40	43	40	43	31	19
Restore wilderness ecosystems damaged by humans to the degree feasible. Identify the processes needed to assess, restore, or mitigate human-induced change	39	41	23	49	35	16
Implement integrated exotic plant and animal management which includes prevention, education, detection, quick elimination of spot infestations, and control of major occurrences	33	43	29	35	19	21
Exchange, purchase, or retire uses adversely affecting wilderness values where rights-holders are willing	30	27	29	42	16	16
Pursue acquisition or exchange of inholdings, subsurface rights, and adjacent lands critical to wilderness protection	28	25	31	32	19	20
Manage wilderness within the context of larger landscapes to ensure the protection and integrity of natural and biological processes	26	27	15	37	15	26
Average achievement score (in a scale of zero, none, to four, very high)**	1.89 (0.07)	1.90 (0.16)	2.00 (0.18)	1.70 (0.11)	1.97 (0.15)	NA

* Respondents were provided a five-point scale for rating the accomplishment (none, slight, moderate, high, and very high) and don't know or N/A.

**Values in parenthesis in average achievement score represent standard errors.

Table 6—Percentage of managers indicating accomplishment of the 1995 objectives under the goal of Management of Social Values.

	No or Only Slight Accomplishment					High or Very High Accomplishment
Management of Social Values*	**All Agencies**	**BLM**	**NPS**	**USFS**	**USFWS**	**All Agencies**
Coordinate with Department of Defense agencies and the Federal Aviation Administration to develop procedures and guidelines to avoid or mitigate low-level overflights	55	67	46	59	39	13
Assess impacts of new and emerging technologies on traditional wilderness values. Develop public information and education programs to address these effects and mitigate any unacceptable impacts	53	60	49	55	43	7
Coordinate with neighboring agencies and interests on wilderness use restrictions (such as campsite and fire regulations) and on the establishment of policies for limits such as group size and numbers of packstock	33	30	37	34	27	20
Develop, identify, and distribute information on new or evolving recreation management tools and techniques	33	24	34	34	46	20
Evaluate all existing and proposed structures and installations to minimize their impact on wilderness values	31	41	23	32	23	17
Emphasize opportunities outside wilderness for recreation activities that are not dependent on a wilderness setting	21	19	26	26	12	23
Establish an interagency national information network to provide wilderness information for public and agency use	17	14	23	22	8	45
Average achievement score (in a scale of zero, none, to four, very high)**	1.78 (0.061)	1.77 (0.124)	1.88 (0.148)	1.72 (0.095)	1.84 (0.147)	NA

* Respondents were provided a five point scaled for rating accomplishment (none, slight, moderate, high, and very high).

**Values in parenthesis in average achievement score are standard errors.

Administrative policy and interagency coordination

The top five underachieved administrative and policy objectives as rated by managers include participation in local government planning, fiscal accountability, seeking new partnerships, expanding research, and ensuring flexible spending of fire funding. There is quite a range of differences between agencies. Generally, higher percentages of the USFS managers rated the listed objectives as not achieved while lower percentages of the NPS managers rated achievement of these objectives low. The average achievement score for all managers and all agencies is 1.86 on a zero (none) to four (very high) scale, indicating a slight to moderate accomplishment of the administrative and policy objectives. Across agencies, the NPS managers gave the highest scores and the USFWS managers gave the lowest score (table 7 and appendix 4, table A4.3).

Training of agency personnel

Integrating wilderness manager and employee orientation training, expanding university partnerships, and developing a common understanding of wilderness management principles are the top three goals that are seen by managers as slightly or not at all achieved. Smaller percentages of the NPS managers rated the top two of these three objectives as underachieved while higher percentages of the USFS managers rated these two objectives as unachieved. The average achievement score for all managers and all agencies is 2.08 on a zero (none) to four (very high) scale, indicating a moderate accomplishment of the agency personnel training objectives. Across agencies, the BLM gave the highest scores and the USFWS gave the lowest scores (table 8 and appendix 4, table A4.4).

Public awareness and understanding

The top three objectives evaluated by managers as underachieved were wilderness education, communication with diverse social groups, and creating a wilderness curriculum for K-12. Percentages across agencies varied with the BLM tending to show higher percentages and the NPS showing lower percentages indicating low achievement. The average achievement score for all managers and all agencies is 1.77 on a zero (none) to four (very high) scale, indicating a slight to moderate accomplishment of the public awareness and understanding objectives. Across agencies, the BLM had the highest score and the USFWS had the lowest score (table 9 and appendix 4, table A4.5).

Table 7—Percentage of managers indicating accomplishment of the 1995 objectives under the goal of Administrative Policy and Interagency Coordination.

Administrative Policy and Interagency Coordination*	No or Only Slight Accomplishment					High or Very High Accomplishment
	All Agencies	BLM	NPS	USFS	USFWS	All Agencies
Participate in local government planning efforts to represent the wilderness resource	52	62	35	60	50	15
Ensure fiscal accountability in the budget process by identifying & tracking funding sources & accomplishments in the wilderness program	42	35	40	47	46	21
Aggressively seek new partnerships with diverse groups to support wilderness values and goals	34	33	29	37	42	18
Expand the emphasis of research to include natural and biological wilderness resources, and psychological and social values	33	43	29	28	35	16
Allow flexible spending of fire funding to cover prescribed fire	32	25	32	42	19	6
Maintain strong and professional leadership in wilderness stewardship at all levels. Each agency will: have a national wilderness coordinator; and require wilderness stewardship performance elements for those managing wilderness	31	8	34	42	35	34
Coordinate multiple-unit wildernesses to insure consistent administration	25	22	29	31	16	20
Create a National Interagency Steering Committee made up of the national wilderness coordinators of each agency to improve interagency understanding and consistency in managing the National Wilderness Preservation System, including: developing common guidelines, policies, and regulations on key wilderness issues; and identifying and coordinating research priorities for the Aldo Leopold Wilderness Research Institute, and training priorities with the Arthur Carhart Training Center	12	5	11	20	4	48
Average achievement score (in a scale of zero, none to four, very high)**	1.86 (0.088)	1.94 (0.180)	2.00 (0.213)	1.84 (0.132)	1.732 (0.259)	NA

*Respondents were provided a five point Likert-type scale (none, slight, moderate, high, and very high) and don't know or N/A to rate the level of achievements of the 1995 objectives.

**Values in parenthesis in average achievement score represent standard errors.

Table 8—Percentage of managers indicating accomplishment of the 1995 objectives under the goal of Training of Agency Personnel.

	No or Only Slight Accomplishment					High or Very High Accomplishment
Agency Personnel Training*	**All Agencies**	**BLM**	**NPS**	**USFS**	**USFWS**	**All Agencies**
Integrate wilderness into other program training and vice versa. Develop basic wilderness orientation training for presentation to all agency personnel	50	52	43	52	50	14
Establish partnerships with colleges and universities to recruit volunteers, participate in curriculum development, provide training, and conduct research	32	27	17	40	38	15
Develop common understanding and training on wilderness principles such as the minimum tool concept	29	35	29	27	27	28
Identify the core competencies required for wilderness rangers, wilderness managers, and line officers with wilderness management responsibilities. Identify tools, methods, and techniques to master the needed abilities	27	29	37	23	20	31
Continue to develop, utilize, and support wilderness training programs	25	22	23	33	19	27
Each agency will support the Arthur Carhart Training Center and the Aldo Leopold Wilderness Research Institute	9	5	14	11	4	46
Average achievement score (in a scale of zero, none to four, very high)**	2.08 (0.064)	2.25 (0.147)	2.10 (0.140)	2.05 (0.103)	1.88 (0.147)	NA

* Respondents were provided a five point Likert-type scale (none, slight, moderate, high, and very high) and don't know or N/A to rate the level of achievements of the 1995 objectives.

**Values in parenthesis in average achievement score represent standard errors.

Summary of Survey Findings

In support of interagency strategic planning for the National Wilderness Preservation System (NWPS), a national survey was administered to managers with the four federal agencies charged with management of the NWPS. Included were Forest Service, National Park Service, Bureau of Land Management, and Fish and Wildlife Service management personnel. The survey asked these managers about threats and challenges to stewardship of the NWPS. They were also asked to identify perceived needs for science information, and needed education and training to support decision-making over the next 20 years.

The National Wilderness Manager Survey conducted between February 24 and May 19, 2014, collected responses from 368 agency personnel across four federal agencies that are responsible to manage the National Wilderness Preservation System. Primary wilderness management responsibilities of these respondents included resource or visitor management (36 percent of respondents), planning (18 percent), public information and

Table 9—Percentage of managers indicating accomplishment of the 1995 objectives under the goal of Public Awareness and Understanding.

Public Awareness and Understanding*	No or Only Slight Accomplishment					High or Very High Accomplishment
	All Agencies	BLM	NPS	USFS	USFWS	All Agencies
Evaluate wilderness education programs to determine their effectiveness	54	60	49	49	58	7
Identify strategies to communicate wilderness education messages to diverse cultural, geographical, and sociological groups, including non-recreation users	53	57	46	55	50	12
Develop a wilderness curriculum for grades K through 12. Encourage state agencies to establish curricula for environmental/wilderness education in schools	38	38	37	42	31	14
Continue to support "Leave No Trace" as the official program for minimum impact recreation	8	8	12	4	12	61
Average achievement score (in a scale of zero, none to four, very high)**	1.77	1.88	1.82	1.80	1.36	
	(0.07)	(0.17)	(0.19)	(0.11)	(0.15)	NA

* Respondents were provided a five-point rating scale (none, slight, moderate, high, and very high) and a "don't know" or N/A option for rating level of achievements of the 1995 objectives.

**Values in parenthesis in average achievement score represent standard errors.

education (17 percent), and policy (15 percent). Among them, about 60 percent of the managers participating in the survey spend 20 percent or less of their work time and effort on wilderness stewardship and planning duties. Thirty-two percent of the responding managers had worked in wilderness for more than 15 years; 33 percent had worked five or fewer years.

Twenty-four potential threats were provided as one of the questions and managers were asked to identify which of these represented the most significant threats. Drawing the highest percentage of response was lack of political or financial support for wilderness protection and management. Next most frequently identified were invasive species, disconnected urban populations, incompatible adjacent land uses, and legislation that contained stipulations viewed as compromising stewardship and protection of the System. Managers were also asked about general and specific training needs to build greater competencies within their agencies. Topping the list of general needs were courses in wilderness history, law, regulation, and policy; wilderness planning; effective communication, problem-solving and decision-making tools; visitor use management and monitoring; and natural and cultural resource management and monitoring. More specific needs identified included field skills, technology applications, analytical tools, addressing threats, building partnerships, education, laws, regulations, specific policies and recreation management.

Managers were asked to identify general areas of research needs for resource and visitor management in wilderness areas they represent. The research needs identified were similar to identified training needs. Highest on their list was research focusing on threats and impacts management, followed by wilderness resource management, building partnerships and education, and wilderness recreation management. Another approach for identifying research needs was to ask about the adequacy of information and approaches for decision-making. The areas identified as not being adequate included understanding public attitudes toward intervention to adapt to climate change, public attitudes toward ecological restoration, differences in views of the benefits of wilderness among stakeholder groups, understanding spiritual values and uses, and effective management of field staff.

The most significant problems that will need to be addressed in the next 20 years as identified by the respondent managers were maintaining and sustaining stewardship of natural conditions, managing external threats and their impacts, inadequate resources and policies for wilderness protection, and lack of public awareness and support and effective management for on-site visitors and experiences management.

In regard to how well the 1995 Strategic Plan objectives had been accomplished, managers indicated only slight to moderate accomplishment of many of the plan objectives. Finally, out of a list of 13 wilderness value statements, the one selected by managers as most important was preserving wilderness so that it is there for future generations. Following the value for future generations were preservation of unique plants and animals, contributions to water quality, protection of wildlife habitat, and protection for rare and endangered species. When presented with the same list of wilderness values in an earlier survey, the U.S. public listed contributions to air quality, contributions to water quality, having wilderness for future generations, protection of wildlife habitat, and preserving unique wild plants and animals as their top choices.

References

Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, and U.S. Forest Service. [BLM, NPS, USFWS, and USFS]. 1995. Interagency Wilderness Strategic Plan 1995. http://wilderness.nps.gov/document/I-21.pdf. (November 15, 2014).

Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, and U.S. Geological Survey. [BLM, NPS, USFWS, USFS, and USGS]. 2014. 2020 Vision: Interagency stewardship priorities for America's National Wilderness Preservation System. http://www.wilderness.net/toolboxes/documents/50th/2020_Vision.pdf. (November 15, 2014).

Cordell, H.K.; Betz, C.J.; Fly, J.M.; Mou, S.; Green, G.T. 2008. How do Americans view wilderness. Internet Research Information Series. Athens, GA: University of Georgia, Warnell School of Forestry & Natural Resources. http://warnell.forestry.uga.edu/nrrt/nsre/IRISWild/IrisWild1rptR.pdf. (November 15, 2014).

QSR International. NVivo10 for Windows. Doncaster, Victoria, Australia. http://www.qsrinternational.com/default.aspx.

Appendix 1. Introduction and Methods

A1.1 Survey instruments

Part One—Primary survey presented via SurveyMonkey to respondents

Please complete the following survey on wilderness management. You have been selected to be part of this survey based on your current or recent past agency responsibilities related to wilderness in the National Wilderness Preservation System (NWPS). Your input will be included in development of the 2014 Inter-agency Strategic Plan for the NWPS.

The survey should take approximately 20-30 minutes to complete. Each question will need to be answered before the survey will advance. Your response is anonymous with no answers being associated with you personally. We will not share your individual answers with anyone else.

We appreciate your participation.

Your Connection to Wilderness

Q1. During 2013 (or during your most recent year in wilderness management), approximately what percentage of your **professional responsibilities** was spent doing wilderness stewardship or planning-related activities?
_____ % of 2013 (or most recent year) time and effort

Q2. During 2013 (or most recent year), what types of wilderness stewardship or planning activities were your **primary professional responsibilities**? (Check all that apply)

____ Law enforcement in Wilderness
____ Public information and education about Wilderness
____ Wilderness resource management
____ Wilderness visitor management
____ Wilderness planning
____ Wilderness policies and regulations
____ Other (Please describe

Agency Employment

Q3. During 2013 (or most recent year), for which federal agency did you work in wilderness stewardship or planning? Please indicate your agency below and you will then be prompted to identify office level within your agency.

☐ NPS
  ☐ National
  ☐ Regional
  ☐ Park, Preserve, Monument or National Seashore/Lakeshore
☐ BLM
  ☐ National
  ☐ State
  ☐ District
  ☐ Field

- ☐ USFWS
  - ☐ National
  - ☐ Regional
  - ☐ Refuge
- ☐ USFS
  - ☐ National
  - ☐ Regional
  - ☐ Forest
  - ☐ District
- ☐ Other affiliations or combinations? (please specify: _____)

Q4. During 2013 (or during your most recent year working in wilderness management), in which one state and with which one wilderness area in that state did you spend the most time and effort in managing wilderness.

If you click on state name below, and then click next, you will see a drop-down list to select state.

- ☐ State name
- ☐ Not applicable

Please select the state from the drop-down list below. Then click next and from the list of wilderness areas provided for that state, select the wilderness area to which you devote the most time and effort.

Major Challenges

Q5. Please identify **major challenges you think wilderness managers will face** over the next 20 years, such as law enforcement, making decisions about fire management, making decisions about restoring natural conditions, making decisions about intervention to adapt to climate change influences, protecting visitor experiences, managing staff or budgets, protecting water resources, understanding the role of wilderness in reducing impacts of severe weather events, etc.

By **major challenges**, we mean what type of wilderness stewardship or planning activities will demand the most time and effort by wilderness managers or planners like you to be successfully accomplished.

In the box below, please list **up to five major challenges** likely to be faced during the next 20 years.

Major challenges (please specify)
1.
2.
3.
4.
5.

Potential Threat

Q6. For each item listed below, please rate the **level of potential threat over the next 20 years to the wilderness resource or visitor experiences** at the wilderness area or areas in which you work. By potential threats, we mean forces or changes that could degrade or damage wilderness character, specific resources, or visitor experiences.

Potential Threats	Level of threat predicted for the next 20 years					
	None	Slight	Moderate	High	Very High	Not Sure
Adjacent land management and use						
Administrative access, facilities, or other administrative exceptions						
Visitor use of advanced technology and electronic equipment for navigation or communication						
Air quality impacts						
Aircraft noise and airspace reservations						
Fragmentation and isolation of wilderness as ecological islands						
Increasing or changing non-commercial recreation						
Increasing or changing commercial recreation						
Lack of political and financial support for wilderness protection and management						
Legislation designating wilderness with compromised wilderness conditions or special provisions for management						
Livestock grazing						
Energy development and resource extraction						
Motorized and mechanical equipment trespass and illegal use						
Invasive species						
Risk of wildfire damage (outside wilderness) originating in wilderness						
Private inholdings and their uses						
Pressure on threatened and endangered species management						
Urbanization and encroaching development						
Water projects facilities						
Water quality impacts						
Wildland fire suppression and management						
Disconnected urban audiences						
Disruption of wildlife corridors						
Sea level rise; coastal erosion						
Other, please specify:						

Training Programs

Q7. Please evaluate the **level of need for manager training during the next 20 years** related to general wilderness management competencies within your agency. The competency list below can refer to **training topics or specific skills** that can be presented within several hours or days in a classroom, in the field, or by on line programs.

Wilderness Manager Competencies	Level of need for training programs					
	None	Slight	Moderate	High	Very High	Not sure
Wilderness history, law, regulation and policy						
Wilderness planning						
Visitor use management and monitoring						
Natural and cultural resources management and monitoring						
Management skills related to communication, problem-solving, decision-making, and organizational management.						
Managing special provisions						
Wilderness field skills						

Training Needs

Q8. What do you believe are the **top 5 specific training needs** for wilderness managers, such as: making decisions about allowing appropriate research activities, incorporating scientific information into decision-making; building partnerships; communication with different public groups; tribal consultations; invasive species; soundscape protection; persons with disabilities; off-season use; conflicts, emerging technologies and uses; managing packstock use; responding to climate change influences, sanitation and waste management.

Please list the **top 5 specific training needs** in the box below.

Specific Training Topics
1.
2.
3.
4.
5.

Decision-Making Information

Q9. Listed below are various aspects of **wilderness management and planning**. How **adequate and available** is science-based information for each of these aspects of wilderness management and planning?

Aspects of Wilderness Management and Planning	Is the scientific information adequate on this topic?					
	Not adequate	Somewhat	Moderate	Good	Excellent	Don't Know
Air quality protection						
Cultural resources protection						
Fire and fuels management						
Fish and wildlife management						
Forest and vegetation resources protection						
Grazing management						
Historic resources protection						
Information and education for visitors and public						
Managing field staff						
Scenic quality protection						
Visitor management (controlling use, managing conflict, mitigating impacts, etc.)						
Water resources protection						
Wilderness monitoring protocol						
Wilderness planning						
Public attitudes toward intervention to adapt to climate change influences						
Public attitudes toward ecological restoration (fire, vegetation, wildlife, etc.) activities						
Relative value of wilderness benefits to stakeholder groups						
Managing subsistence activities and resources						
Stewardship of spiritual values and uses						

Research Needs

Q10. Please identify your **top 5 specific research needs** for resource and visitor management in wilderness areas, such as: incorporating scientific information into decision-making; building partnerships; communication with different public groups; tribal access and consultations; invasive species; soundscapes; workforce development; persons with disabilities; off-season use; visitor-to-visitor conflict, emerging technologies and uses; visitor fees; managing packstock use; sanitation and waste management; managing technological change.

Please list your **top 5 specific research needs** in the boxes below.

Specific Research
1.
2.
3.
4.
5.

Two Most Important Problems

Q11. Please describe what you believe are the **two most important problems** managers and agencies need to collectively address in strategic planning to protect wilderness qualities in the coming 20 years for the National Wilderness Preservation System.

a. _____
_____
_____
_____

b. _____
_____
_____
_____

Information about You

Q12. How many **years** have you been in your current position? ____ Years

Q13. How many **years** have you had (or did you have) responsibility for wilderness stewardship? ____ Years

Q14. How many **years** total have you been employed by your current agency? ____ Years

Q15. Are you willing to answer some follow-up questions aimed at providing input on two additional important topics: 1) rating the values for which we manage wilderness, and 2) assessing the general success at accomplishing tasks in the 1995 inter-agency NWPS strategic plan. If yes, you will be directed to these two surveys on line.

☐ Yes, I want to complete these two important additional survey topics.
☐ No, thank you.

Do you have any comments to make about this survey or additional input to provide to the strategic planning process? If you do, please enter those comments here. Your opinions are highly valued.

Part Two—Values and Accomplishments for the 1995 NWPS Strategic Plan

Wilderness Values

Q1. Wilderness areas are designated and managed to provide a variety of purposes. Please indicate how much **importance** you attach to each of the following potential **wilderness values**. Check one response for each value listed.

	Level of importance				
Wilderness Values	Not at all important (1)	(2)	(3)	(4)	Extremely (5)
For future generations					
For scientific study					
Future option to visit					
Income for tourism industry					
Just knowing it exists					
Preserving ecosystems					
Protecting air quality					
Protecting water quality					
Protection for endangered species					
Protection of wildlife habitat					
Providing spiritual inspiration					
Recreation opportunities					
Scenic beauty					

Accomplishment of 1995 Objectives

Q2. Please evaluate the degree to which you believe the 1995 Interagency Wilderness Strategic Plan objectives have been accomplished to date within your agency. Check one response for each objective listed, although some objectives have multiple parts.

	The level of accomplishment of 1995 objectives					
Objectives	None	Slight	Moderate	High	Very High	Do not know or N/A
1. Preservation of natural and biological values						
Manage wilderness within the context of large landscapes to ensure the protection and integrity of natural biological processes.						

Objectives	The level of accomplishment of 1995 objectives					
	None	Slight	Moderate	High	Very High	Do not know or N/A
Inventory wilderness ecosystems to collect baseline data. Identify indicators and develop monitoring standards for those elements critical to ecological integrity. Develop monitoring strategies for high priority indicators and provide feedback for adaptive management. Where appropriate, establish long-term research programs.						
Restore wilderness ecosystems damaged by humans to the degree feasible. Identify the processes needed to assess, restore, or mitigate human-induced change.						
Restore fire to its natural role in the ecosystem.						
Implement integrated exotic plant and animal management which includes prevention, education, detection, quick elimination of spot infestations, and control of major occurrences.						
Exchange, purchase, or retire uses adversely affecting wilderness values where rights-holders are willing.						
Pursue acquisition or exchange of inholdings, subsurface rights, and adjacent lands critical to wilderness protection.						

Objectives	The level of accomplishment of 1995 objectives					
	None	Slight	Moderate	High	Very High	Do not know
2. Management of Social Values						
Evaluate all existing and proposed structures and installations to minimize the impact on wilderness values.						
Emphasize opportunities outside wilderness for recreation activities that are not dependent on a wilderness setting.						

Objectives	The level of accomplishment of 1995 objectives					
	None	Slight	Moderate	High	Very High	Do not know
Coordinate with neighboring agencies and interests on wilderness use restrictions (such as campsite and fire regulations) and on the establishment of policies for limits such as group size and numbers of packstock.						
Coordinate with Department of Defense agencies and the Federal Aviation Administration to develop procedures and guidelines to avoid or mitigate low-level overflights.						
Develop, identify, and distribute information on new or evolving recreation management tools and techniques.						
Establish an interagency national information network to provide wilderness information for public and agency use.						
Assess impacts of new and emerging technologies on traditional wilderness values. Develop public information and education programs to address these effects and mitigate any unacceptable impacts.						

Objectives	The level of accomplishment of 1995 objectives					
	None	Slight	Moderate	High	Very High	Do not know
3.Administrative Policy and Interagency Coordination						
Maintain strong and professional leadership in wilderness stewardship at all levels. Each agency will: have a national wilderness coordinator; and require wilderness stewardship performance elements for those managing wilderness.						

Objectives	The level of accomplishment of 1995 objectives					
	None	Slight	Moderate	High	Very High	Do not know
Create a National Interagency Steering Committee made up of the national wilderness coordinators of each agency to improve interagency understanding and consistency in managing the National Wilderness Preservation System, including: developing common guidelines, policies, and regulations on key wilderness issues; and identifying and coordinating research priorities for the Aldo Leopold Wilderness Research Institute, and training priorities with the Arthur Carhart Training Center.						
Coordinate multiple-unit wildernesses to insure consistent administration.						
Expand the emphasis of research to include natural and biological wilderness resources, and psychological and social values.						
Aggressively seek new partnerships with diverse groups to support wilderness values and goals.						
Participate in local government planning efforts to represent the wilderness resource.						
Ensure fiscal accountability in the budget process by identifying & tracking funding sources & accomplishments in the wilderness program.						
Allow flexible spending of fire funding to cover prescribed fire.						

Objectives	The level of accomplishment of 1995 objectives					
	None	Slight	Moderate	High	Very High	Do not know
4. Training of Agency Personnel						
Identify the core competencies required for wilderness rangers, wilderness managers, and line officers with wilderness management responsibilities. Identify tools, methods, and techniques to master the needed abilities.						
Integrate wilderness into other program training and vice versa. Develop basic wilderness orientation training for presentation to all agency personnel.						
Develop common understanding and training on wilderness principles such as the minimum tool concept.						
Continue to develop, utilize, and support wilderness training programs.						
Each agency will support the Arthur Carhart Training Center and the Aldo Leopold Wilderness Research Institute.						
Establish partnerships with colleges and universities to recruit volunteers, participate in curriculum development, provide training, and conduct research.						

Objectives	The level of accomplishment of 1995 objectives					
	None	Slight	Moderate	High	Very High	Do not know
5. Public Awareness and Understanding						
Evaluate wilderness education programs to determine their effectiveness.						
Identify strategies to communicate wilderness education messages to diverse cultural, geographical, and sociological groups, including non-recreation users.						

Objectives	The level of accomplishment of 1995 objectives					
	None	Slight	Moderate	High	Very High	Do not know
Develop a wilderness curriculum for grades K through 12. Encourage state agencies to establish curricula for environmental/ wilderness education in schools.						
Continue to support "Leave No Trace" as the official program for minimum impact recreation.						

A1.2 Example letter to prospective respondents

Hello Wilderness Managers, Planners and others involved with Wilderness Stewardship in the Bureau of Land Management:

With this letter you are being invited to participate in the ***2014 Wilderness Manager Survey (WMS)***. This survey is being sent to Wilderness managers throughout our agency, and as well, throughout the Park Service, Forest Service and Fish and Wildlife Service. Results from the WMS will be the foundation for developing a new Strategic Plan to guide management of the National Wilderness Preservation System (NWPS) over the next 20 years. The survey will be sent to managers from field level to national offices. Your perspectives on the issues covered in this survey are critical for future strategic planning for the Wilderness System.

Results from the WMS will go to an interagency team to be used in drafting the new NWPS Strategic Plan. The last plan was developed in 1995 (http://wilderness.nps.gov/document/I-21.pdf). Your agency scientists have collaborated with university researchers to develop, test, and implement the WMS to coincide with this 50th Anniversary year for the Wilderness Act. Results from you and your Wilderness manager peers will be presented and discussed at the 50th anniversary conference this coming October. Results will be distributed through many channels. Watch for them!

There are two parts to the WMS. The first part looks at future challenges for management of the NWPS and should take only 25 to 30 minutes. The second, equally important part, asks you to reflect on what is valuable about wilderness, and on past accomplishments in managing the NWPS. This second part should require only about an additional 10 to 15 minutes. Upon completing the first part of the survey, you will be given the opportunity to open and complete the second part.

Please open this link (https://www.surveymonkey.com/s/CTGPBPD) as soon as you can and take the survey. All completed surveys will be forwarded by SurveyMonkey to Dr. Ramesh Ghimire at the University of Georgia. If you need more information you may phone Dr. Ghimire at 706-542-3098 or e-mail him at ghimire@uga.edu. Thank you for helping make this a successful national, interagency effort. The success of the WMS and development of a new Strategic Plan for the National Wilderness Preservation System depend on your participation and knowledge.

A1.3 Time burden of the survey as indicated by the pilot respondents

Four respondents indicated how much time they had spent completing the survey (please see table A1.3a). In the comment box, one respondent mentioned it took 34 minutes to complete the survey (part I + part II). SurveyMonkey tracks the time used by each respondent in completing a survey (Table A1.3b).

Table A1.3a—Approximate time burden of the survey reported by pilot respondents

	Reported time to complete (in minutes)		Total time (in
Respondent Initials	Part I	Part II	minutes)
RO	23	7	30
TC	20	9	29
LT	46	20	66
Average time	30	14	44

Table A1.3b—Approximate time burden of the survey tracked by SurveyMonkey

Time used to complete both parts (in minutes)	Number of respondents
Approximately 30 minutes	5
35-50 minutes	2
Approximately one hour	5
More than one hour	5
Average time	52 minutes

Table A1.4—Respondents by state and wilderness units

Respondents in Alaska	Number of Respondents	Percent
Aleutian Islands Wilderness	2	9
Becharof Wilderness	1	5
Denali Wilderness	1	5
Gates of the Arctic Wilderness	5	23
Innoko Wilderness	1	5
Izembek Wilderness	1	5
Katmai Wilderness	1	5
Kenai Wilderness	1	5
Mollie Beattie Wilderness	4	18
Togiak Wilderness	2	9
Wrangell-Saint Elias Wilderness	1	5
Other	2	9
Total	22	100

Respondents in Alabama	Number of Respondents	Percent
Dugger Mountain Wilderness	1	100

Respondents in Arizona	Number of Respondents	Percent
Aravaipa Canyon Wilderness	1	4
Baboquivari Peak Wilderness	1	4
Cabeza Prieta Wilderness	1	4
Chiricahua National Monument Wilderness	1	4
Escudilla Wilderness	2	8
Havasu Wilderness	1	4
Hells Canyon Wilderness (AZ)	1	4
Juniper Mesa Wilderness	1	4
Kachina Peaks Wilderness	1	4
Kendrick Mountain Wilderness	1	4
Kofa Wilderness	1	4
Organ Pipe Cactus Wilderness	1	4
Paiute Wilderness	1	4
Pajarita Wilderness	1	4
Paria Canyon-Vermilion Cliffs Wilderness	1	4
Red Rock-Secret Mountain Wilderness	1	4
Saddle Mountain Wilderness	1	4
West Clear Creek Wilderness	1	4
Other	5	21
Total	24	100

Respondents in California	Number of Respondents	Percent
Agua Tibia Wilderness	1	2
Ansel Adams Wilderness	1	2
Bighorn Mountain Wilderness	1	2
Carson-Iceberg Wilderness	1	2
Cedar Roughs Wilderness	1	2
Dead Mountains Wilderness	1	2
Desolation Wilderness	2	4
Domeland Wilderness	1	2
Emigrant Wilderness	1	2
Golden Trout Wilderness	1	2
Grass Valley Wilderness	1	2
Hoover Wilderness	2	4
Imperial Refuge Wilderness	1	2
Inyo Mountains Wilderness	2	4
Ishi Wilderness	1	2
Jacumba Wilderness	1	2
John Krebs Wilderness	1	2
John Muir Wilderness	1	2
King Range Wilderness	1	2
Lassen Volcanic Wilderness	1	2
Marble Mountain Wilderness	2	4
Mojave Wilderness	2	4
Monarch Wilderness	2	4
Mt. Shasta Wilderness	1	2
Rocks and Islands Wilderness	1	2
San Gorgonio Wilderness	2	4
Santa Rosa Wilderness	2	4
Sequoia-Kings Canyon Wilderness	6	11
South Fork Eel River Wilderness	1	2
Trinity Alps Wilderness	1	2
Ventana Wilderness	2	4
Yolla Bolly-Middle Eel Wilderness	1	2
Yosemite Wilderness	2	4
Other	5	9
Total	53	100

Respondents in Colorado	Number of Respondents	Percent
Black Canyon of the Gunnison Wilderness	2	11
Comanche Peak Wilderness	1	5
Dominguez Canyon Wilderness	1	5
Gunnison Gorge Wilderness	1	5
Indian Peaks Wilderness	2	11
Mount Evans Wilderness	1	5
Mount Massive Wilderness	1	5
Rocky Mountain National Park Wilderness	1	5
Sarvis Creek Wilderness	1	5
Weminuche Wilderness	3	16
Other	5	26
Total	19	100

Respondents in Florida	Number of Respondents	Percent
Cedar Keys Wilderness	2	13
Florida Keys Wilderness	2	13
J.N. “Ding” Darling Wilderness	2	13
Lake Woodruff Wilderness	2	13
Marjory Stoneman Douglas Wilderness	3	19
Pelican Island Wilderness	1	6
St. Marks Wilderness	3	19
Other	1	6
Total	16	100

Respondent in Georgia	Number of Respondents	Percent
Brasstown wilderness	1	17
Cohutta wilderness	1	17
Okefenokee wilderness	3	50
Wolf Island Wilderness	1	17
Total	6	100

Respondents in Hawaii	Number of Respondents	Percent
Hawaii Volcanoes Wilderness	3	100

Respondents in Idaho	Number of Respondents	Percent
Big Jacks Creek Wilderness	1	8
Bruneau-Jarbidge Rivers Wilderness	1	8
Frank Church-River of No Return Wilderness	4	33
Little Jacks Creek Wilderness	1	8
Owyhee River Wilderness	3	25
Selway-Bitterroot Wilderness	1	8
Other	1	8
Total	12	100

Respondents in Illinois	Number of Respondents	Percent
Crab Orchard Wilderness	1	100

Respondents in Kentucky	Number of Respondents	Percent
Clifty Wilderness	1	100

Respondents in Louisiana	Number of Respondents	Percent
Breton Wilderness	1	33
Lacassine Wilderness	1	33
Other	1	33
Total	3	100

Respondents in Maine	Number of Respondents	Percent
Moosehorn (Baring Unit) Wilderness	1	25
Moosehorn Wilderness	2	50
Other	1	25
Total	4	100

Respondents in Massachusetts	Number of Respondents	Percent
Monomoy Wilderness	1	100

Respondents in Michigan	Number of Respondents	Percent
Seney Wilderness	2	67
Sylvania Wilderness	1	33
Total	3	100

Respondents in Minnesota	Number of Respondents	Percent
Agassiz Wilderness	2	67
Tamarac Wilderness	1	33
Total	3	100

Respondents in Mississippi	Number of Respondents	Percent
Black Creek Wilderness	1	20
Gulf Islands Wilderness	3	60
Other	1	20
Total	5	100

Respondents in Missouri	Number of Respondents	Percent
Mingo Wilderness	2	67
Other	1	33
Total	3	100

Respondents in Montana	Number of Respondents	Percent
Absaroka-Beartooth	1	6
Anaconda Pintler	3	19
Bob Marshall	1	6
Cabinet Mountains	2	13
Lee Metcalf	3	19
Medicine Lake	1	6
Red Rock Lakes	1	6
Selway-Bitterroot	1	6
UL Bend	1	6
Other	2	13
Total	16	100

Respondents in Nebraska	Number of Respondents	Percent
Fort Niobrara Wilderness	1	50
Other	1	50
Total	2	100

Respondents in Nevada	Number of Respondents	Percent
High Rock Canyon Wilderness	1	9
Highland Ridge Wilderness	1	9
La Madre Mountain Wilderness	1	9
Mount Grafton Wilderness	1	9
Mt. Moriah Wilderness	1	9
Ruby Mountains Wilderness	1	9
South Jackson Mountains Wilderness	1	9
Spirit Mountain Wilderness	1	9
Other	3	27
Total	11	100

Respondents in New Hampshire	Number of Respondents	Percent
Pemigewasset Wilderness	2	40
Presidential Range-Dry River Wilderness	2	40
Wild River Wilderness	1	20
Total	5	100

Respondents in New Jersey	Number of Respondents	Percent
Brigantine Wilderness	1	50
Great Swamp National Wildlife Refuge	1	50
Total	2	100

Respondents in New Mexico	Number of Respondents	Percent
Aldo Leopold Wilderness	2	13
Bandelier Wilderness	1	6
Bisti/De-Na-Zin Wilderness	1	6
Blue Range Wilderness	1	6
Carlsbad Caverns Wilderness	1	6
Gila Wilderness	2	13
Pecos Wilderness	3	19
Sabinoso Wilderness	1	6
Salt Creek Wilderness	1	6
Sandia Mountain Wilderness	2	13
Other	1	6
Total	16	100

Respondents in New York	Number of Respondents	Percent
Brigantine Otis Pike Fire Island High Dune Wilderness	1	100

Respondents in North Dakota	Number of Respondents	Percent
Chase Lake Wilderness	1	33
Lostwood Wilderness	2	67
Total	3	100

Respondents in Ohio	Number of Respondents	Percent
West Sister Island Wilderness	2	100

Respondents in Oklahoma	Number of Respondents	Percent
Wichita Mountains Wilderness	1	100

Respondents in Oregon	Number of Respondents	Percent
Gearhart Mountain Wilderness	1	5
Hells Canyon Wilderness (ID/OR)	3	14
Oregon Badlands Wilderness	4	19
Soda Mountain Wilderness	1	5
Spring Basin Wilderness	1	5
Steens Mountain Wilderness	5	24
Table Rock Wilderness	1	5
Three Sisters Wilderness	3	14
Waldo Lake Wilderness	1	5
Other	1	5
Total	21	100

Respondents in South Carolina	Number of Respondents	Percent
Cape Romain Wilderness	2	40
Congaree National Park Wilderness	3	60
Total	5	100

Respondents in South Dakota	Number of Respondents	Percent
Badlands Wilderness	2	100

Respondents in Texas	Number of Respondents	Percent
Guadalupe Mountains Wilderness	2	50
Other	2	50
Total	4	100

Respondents in Utah	Number of Respondents	Percent
Ashdown Gorge Wilderness	2	20
Mount Naomi Wilderness	1	10
Pine Valley Mountain Wilderness	1	10
Red Mountain Wilderness	1	10
Twin Peaks Wilderness	1	10
Zion Wilderness	2	20
Other	2	20
Total	10	100

Respondents in Vermont	Number of Respondents	Percent
Breadloaf Wilderness	1	100

Respondents in Virginia	Number of Respondents	Percent
Lewis Fork Wilderness	1	50
Saint Mary's Wilderness	1	50
Total	2	100

Respondents in Washington	Number of Respondents	Percent
Alpine Lakes Wilderness	2	22
Glacier Peak Wilderness	2	22
Juniper Dunes Wilderness	2	22
Mount Baker Wilderness	2	22
Stephen Mather Wilderness	1	11
Total	9	100

Respondents in West Virginia	Number of Respondents	Percent
Otter Creek Wilderness	1	100

Respondents in Wisconsin	Number of Respondents	Percent
Gaylord Nelson Wilderness	1	50
Wisconsin Islands Wilderness	1	50
Total	2	100

Respondents in Wyoming	Number of Respondents	Percent
Bridger Wilderness	1	20
Cloud Peak Wilderness	1	20
Jedediah Smith Wilderness	1	20
Other	2	40
Total	5	100

Appendix 2. Manager Profiles, Importance of Wilderness Values, Perceived Threats, Challenges and Strategic Issues

Table A2.1—Respondents by years in current position

Years	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
0-5	190 (55)	42 (56)	41 (54)	56 (54)	51 (58)
6-10	68 (20)	14 (19)	15 (20)	18 (17)	20 (23)
11-15	45 (13)	6 (8)	12 (16)	17 (17)	10 (11)
16-20	15 (4)	4 (5)	5 (7)	2 (2)	3 (3)
>20	26 (8)	9 (12)	2 (3)	10 (10)	4 (5)
Total*	344 (100)	75 (100)	75 (100)	103 (100)	88 (100)
Mean	8 years	9 years	7 years	8 years	7 years

* Three respondents belonged to other combinations.

Table A2.2—Respondents by years with responsibility for wilderness stewardship

Years	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
0-5	114 (33)	28 (37)	26 (35)	22 (21)	37 (42)
6-10	71 (21)	14 (19)	16 (21)	22 (21)	19 (22)
11-15	49 (14)	10 (13)	11 (15)	15 (15)	13 (15)
16-20	44 (13)	7 (9)	9 (12)	19 (19)	8 (9)
>20	66 (19)	16(22)	13 (17)	25 (24)	11 (12)
Total*	344 (100)	75 (100)	75 (100)	103 (100)	88 (100)
Mean	12 years	12 years	12 years	15 years	10 years

* Three respondents belonged to other combinations.

Table A2.3—Respondents by agency of employment

Agency	Number	Percent
Bureau of Land Management	77	21
National Park Service	82	22
U.S. Forest Service	109	30
U.S. Fish and Wildlife Service	96	26
Other combinations	4	1
Total	368	100

Table A2.3a—Respondents by level of office in Bureau of Land Management

Level	Number	Percent
Field	43	57
District	18	24
State	12	16
National	3	4
Total*	76	100

*Note: One respondent did not select Bureau of Land Management level.

Table A2.3b—Respondents by level of office in National Park Service

Level	Number	Percent
Park	66	80
Regional	8	10
National	8	10
Total	82	100

Table A2.3c— Respondents by level of office in U.S. Forest Service

Level	Number	Percent
District	71	65
Forest	25	23
Regional	8	7
National	5	5
Total	109	100

Table A2.3d—Respondents by level of office in U.S. Fish and Wildlife Service

Level	Number	Percent
Refuge	82	86
Regional	8	8
National	5	5
Total*	95	100

*Note: One respondent did not select U.S. Fish and Wildlife Service office level

Table A2.4—Respondents by primary professional responsibility

Primary professional responsibilities	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
	number (percent)				
Law enforcement in wilderness	77 (7)	9 (3)	14 (6)	28 (7)	25 (9)
Public information and education about wilderness	203 (17)	50 (19)	30 (13)	69 (18)	53 (20)
Wilderness resource management	260 (22)	61 (23)	51 (21)	89 (23)	59 (22)
Wilderness visitor management	166 (14)	35 (13)	32 (13)	60 (15)	39 (15)
Wilderness planning	213 (18)	55 (21)	56 (23)	69 (18)	33 (12)
Wilderness policies and regulations	178 (15)	42 (16)	45 (19)	54 (14)	37 (14)
Other combination	72 (6)	16 (6)	12 (5)	22 (6)	19 (7)
Total*	1169 (100)	268 (100)	240 (100)	391 (100)	265 (100)

*Three respondents belonged to other agency combinations. Since respondents were asked to check all professional responsibilities that apply, total frequencies are much greater than total number of respondents.

Table A2.5—Respondents by time and effort on wilderness stewardship and planning

Proportion of Duties	Number of Respondents	Percent
<10	93	26
10-20	126	34
21-40	55	16
41-60	31	8
61-80	31	8
81-100	30	8
Total	366	100

Mean time and effort = 29 percent; Median time and effort = 20 percent

Table A2.6—Respondents by state

State	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
California	55 (17)	20 (28)	14 (21)	20 (21)	1 (1)
Arizona	24 (8)	8 (11)	4 (6)	9 (10)	3 (4)
Alaska	23 (7)	1 (1)	8 (11)	—	14 (19)
Oregon	21 (7)	15 (21)	1 (2)	5 (5)	—
Colorado	19 (6)	7 (10)	3 (4)	9 (9)	—
Montana	17 (6)	3 (4)	2 (3)	7 (8)	5 (7)
Florida	16 (5)	—	4 (6)	—	12 (16)
New Mexico	16 (5)	3 (4)	3 (5)	9 (9)	1 (1)
Idaho	11 (4)	6 (8)	—	5 (5)	—
Nevada	11 (4)	6 (8)	1 (2)	2 (2)	2 (3)
Utah	11 (4)	1 (1)	5 (8)	5 (5)	—
Washington	9 (3)	2 (3)	1 (2)	6 (7)	—
Georgia	7 (2)	—	—	3 (3)	4 (5)
Mississippi	5 (2)	—	3 (5)	1 (1)	1 (1)
New Hampshire	5 (2)	—	—	5 (5)	—
South Carolina	5 (2)	—	3 (5)	—	2 (3)
Wyoming	5 (2)	—	2 (3)	3 (3)	—
Maine	4 (1)	—	—	—	4 (5)
Texas	4 (1)	—	4 (6)	—	—
Hawaii	3 (1)	—	3 (5)	—	—
Louisiana	3 (1)	—	—	—	3 (4)
Michigan	3 (1)	—	—	1 (1)	2 (3)
Minnesota	3 (1)	—	—	—	3 (4)
Missouri	3 (1)	—	—	1 (1)	2 (3)
North Dakota	3 (1)	—	—	—	3 (4)
Nebraska	3 (1)	—	—	—	3 (4)
Massachusetts	2 (1)	—	—	—	2 (3)
New Jersey	2 (1)	—	—	—	2 (3)
Ohio	2 (1)	—	—	—	2 (3)
South Dakota	2 (1)	—	2 (3)	—	—
Virginia	2 (1)	—	—	2 (2)	—
Wisconsin	2 (1)	—	1 (2)	—	1 (1)
Arkansas	1 (0)	—	—	—	1 (1)
Illinois	1 (0)	—	—	—	1 (1)
Kentucky	1 (0)	—	—	1 (1)	—
New York	1 (0)	—	1 (2)	—	—
Oklahoma	1 (0)	—	—	—	1 (1)
Vermont	1 (0)	—	—	1 (1)	—
West Virginia	1 (0)	—	—	1 (1)	—
Total	308 (100)	72 (100)	65 (100)	96 (100)	75 (100)

Note: Dash in cells means no survey respondents. Percentages are rounded to the nearest integers.

Table A2.7—Values managers attach to wilderness

Table A2.7a—Number and percentage of respondents rating each wilderness value as very or extremely important

Wilderness Value	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Knowing future generations will have Wilderness Areas	153 (97)	35 (95)	35 (100)	54 (98)	26 (96)
Preserving unique wild plants & animals	148 (94)	36 (97)	33 (94)	50 (91)	26 (96)
Protecting water quality	133 (85)	29 (79)	32 (91)	47 (85)	23 (85)
Protecting of wildlife habitat	132 (84)	31 (84)	32 (92)	44 (80)	22 (81)
Protecting rare and endangered species	124 (79)	32 (87)	28 (80)	42 (76)	20 (74)
Knowing that Wilderness Areas exists	108 (69)	24 (65)	25 (72)	37 (67)	19 (70)
Providing scenic beauty	101 (64)	23 (62)	25 (72)	34 (62)	18 (66)
Protecting air quality	101 (64)	22 (59)	21 (60)	39 (71)	17 (63)
Having option to visit Wilderness Areas in future	100 (64)	21 (56)	21 (60)	43 (78)	14 (52)
Providing spiritual inspiration	100 (63)	24 (64)	23 (66)	36 (66)	16 (60)
Preserving natural areas for science	94 (59)	19 (51)	25 (71)	31 (57)	17 (63)
Providing recreation opportunities	91 (58)	21 (57)	17 (48)	36 (66)	17 (63)
Providing income for tourism industry	15 (10)	4 (11)	3 (8)	4 (7)	4 (14)

* Respondents were provided a five point Likert-type scale (not at all important to extremely important) to rate the importance of each wilderness value. This table summarizes the number and percentage of respondents that rated the wilderness values very or extremely important. Percentages are rounded to the nearest integers.

Table A2.7b—Comparison of percentages of the managers and the public rating each value as very or extremely important

Wilderness Values	Managers *2013	The public** 2008
Knowing future generations will have WA	97	90
Preserving unique wild plants & animals	94	84
Protecting water quality	85	93
Protecting of wildlife habitat	84	89
Protecting rare and endangered species	79	83
Knowing that WA exists	69	78
Providing scenic beauty	64	80
Protecting air quality	64	93
Having option to visit WA in future	64	79
Providing spiritual inspiration	63	60
Preserving natural areas for science	59	67
Providing recreation opportunities	58	72
Providing income for tourism industry	10	38

* Respondents were provided a five-point Likert-type scale (not at all important to extremely important) to rate the importance of each wilderness value. This table summarizes the percentage of respondents that rated the wilderness values statements very or extremely important.

**Data for ranking wilderness values by the public were based on the National Survey on Recreation and the Environment (NSRE) conducted in 2008.

Table A2.7c—Number and percentage of respondents by all agencies and each agency rating each wilderness value

a. For future generations

Level of Importance	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Extremely important	127 (81)	30 (81)	32 (91)	40 (73)	22 (81)
Very important	26 (16)	5 (14)	3 (9)	14 (25)	4 (15)
Moderately important	3 (2)	2 (5)	0 (0)	1 (2)	1 (4)
Slightly important	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)
Not at all important	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	157 (100)	37 (100)	35 (100)	55 (100)	27 (100)

b. For scientific study

Level of Importance	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Extremely important	32 (20)	6 (16)	10 (28)	9 (17)	6 (22)
Very important	62 (39)	13 (35)	15 (43)	22 (40)	11 (41)
Moderately important	51 (33)	16 (43)	9 (26)	18 (33)	7 (26)
Slightly important	9 (6)	2 (6)	1 (3)	3 (5)	3 (11)
Not at all important	3 (2)	0 (0)	0 (0)	3 (5)	0 (0)
Total	157 (100)	37 (100)	35 (100)	55 (100)	27 (100)

c. Future option to visit

Level of Importance	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Extremely important	41 (26)	8 (21)	11 (31)	17 (31)	4 (15)
Very important	59 (38)	13 (35)	10 (29)	26 (47)	10 (37)
Moderately important	51 (32)	14 (38)	14 (40)	9 (16)	12 (44)
Slightly important	5 (3)	1 (3)	0 (0)	3 (6)	1 (4)
Not at all important	1 (1)	1 (3)	0 (0)	0 (0)	0 (0)
Total	157 (100)	37 (100)	35 (100)	55 (100)	27 (100)

d. Income for tourism industry

Level of Importance	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Extremely important	3 (2)	0 (0)	0 (0)	1 (2)	2 (7)
Very important	12 (8)	4 (11)	3 (8)	3 (5)	2 (7)
Moderately important	54 (34)	15 (41)	11 (31)	20 (36)	5 (19)
Slightly important	63 (40)	13 (35)	15 (43)	24 (44)	11 (41)
Not at all important	25 (16)	5 (13)	6 (17)	7 (13)	7 (26)
Total	157 (100)	37 (100)	35 (100)	55 (100)	27 (100)

e. Just knowing it exists

Level of Importance	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Extremely important	58 (37)	11 (30)	16 (46)	19 (34)	9 (33)
Very important	50 (32)	13 (35)	9 (26)	18 (33)	10 (37)
Moderately important	37 (24)	11 (30)	7 (20)	11 (20)	8 (30)
Slightly important	8 (5)	1 (3)	2 (5)	5 (9)	0 (0)
Not at all important	4 (3)	1 (3)	1 (3)	2 (4)	0 (0)
Total	157 (100)	57 (100)	35 (100)	55 (100)	27 (100)

f. Preserving ecosystems

Level of Importance	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Extremely important	107 (68)	26 (70)	25 (71)	39 (71)	16 (59)
Very important	41 (26)	10 (27)	8 (23)	11 (20)	10 (37)
Moderately important	6 (4)	1 (3)	1 (2)	3 (5)	1 (4)
Slightly important	3 (2)	0 (0)	1 (3)	2 (4)	0 (0)
Not at all important	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	157 (100)	37 (100)	35 (100)	55 (100)	27 (100)

g. Protecting air quality

Level of Importance	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Extremely important	54 (34)	13 (35)	10 (29)	23 (42)	6 (22)
Very important	47 (29)	9 (24)	11 (31)	16 (29)	11 (41)
Moderately important	43 (27)	8 (22)	12 (34)	14 (25)	8 (30)
Slightly important	9 (6)	5 (14)	2 (6)	0 (0)	2 (7)
Not at all important	4 (3)	2 (5)	0 (0)	2 (4)	0 (0)
Total	157 (100)	37 (100)	35 (100)	55 (10)	27 (100)

h. Protecting water quality

Level of Importance	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Extremely important	77 (49)	18 (49)	15 (43)	32 (58)	10 (37)
Very important	56 (36)	11 (30)	17 (48)	15 (27)	13 (48)
Moderately important	19 (12)	5 (13)	2 (6)	7 (13)	4 (15)
Slightly important	4 (3)	3 (8)	1 (3)	1 (2)	0 (0)
Not at all important	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)
Total	157 (100)	37 (100)	35 (100)	55 (100)	27 (100)

i. Protection for endangered species

Level of Importance	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Extremely important	66 (42)	18 (49)	15 (43)	22 (40)	9 (33)
Very important	58 (37)	14 (38)	13 (37)	20 (36)	11 (41)
Moderately important	26 (17)	3 (8)	7 (20)	10 (18)	5 (19)
Slightly important	5 (3)	1 (3)	0 (0)	2 (4)	2 (7)
Not at all important	2 (1)	1 (3)	0 (0)	1 (2)	0 (0)
Total	157 (100)	37 (100)	35 (100)	55 (100)	27 (100)

j. Protection of wildlife habitat

Level of Importance	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Extremely important	73 (46)	19 (51)	17 (49)	22 (40)	13 (48)
Very important	59 (38)	12 (33)	15 (43)	22 (40)	9 (33)
Moderately important	20 (13)	3 (8)	3 (8)	9 (16)	5 (19)
Slightly important	4 (3)	3 (8)	0 (0)	1 (2)	0 (0)
Not at all important	1 (1)	0 (0)	0 (0)	1 (2)	0 (0)
Total	157 (100)	37 (100)	35 (100)	55 (100)	27 (100)

k. Providing spiritual inspiration

Level of Importance	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Extremely important	49 (31)	12 (32)	9 (26)	19 (35)	8 (30)
Very important	51 (32)	12 (32)	14 (40)	17 (31)	8 (30)
Moderately important	40 (25)	9 (25)	9 (26)	14 (25)	7 (26)
Slightly important	15 (10)	4 (11)	3 (8)	4 (7)	3 (11)
Not at all important	2 (1)	0 (0)	0 (0)	1 (2)	1 (3)
Total	157 (100)	37 (100)	35 (100)	55 (100)	27 (100)

l. Recreation opportunities

Level of Importance	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Extremely important	31 (20)	10 (27)	5 (14)	12 (22)	4 (15)
Very important	60 (38)	11 (30)	12 (34)	24 (44)	13 (48)
Moderately important	50 (32)	15 (40)	15 (43)	15 (27)	4 (15)
Slightly important	15 (10)	1 (3)	2 (6)	4 (7)	6 (22)
Not at all important	1 (1)	0 (0)	1 (3)	0 (0)	0 (0)
Total	157 (100)	37 (100)	35 (100)	55 (100)	27 (100)

m. Scenic beauty

Level of Importance	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Extremely important	44 (28)	11 (30)	9 (26)	17 (31)	6 (22)
Very important	57 (36)	12 (32)	16 (46)	17 (31)	12 (44)
Moderately important	47 (30)	12 (32)	9 (26)	19 (34)	7 (26)
Slightly important	7 (4)	2 (6)	0 (0)	2 (4)	2 (8)
Not at all important	2 (1)	0 (0)	1 (3)	0 (0)	0 (0)
Total	157 (100)	37 (100)	35 (100)	55 (100)	27 (100)

Table A2.8—Level of potential threats over the next 20 years to the wilderness resource or visitor experiences

a. Adjacent land management and use

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	77 (22)	21 (28)	22 (29)	13 (12)	20 (22)
High	77 (22)	15 (20)	18 (23)	27 (25)	16 (18)
Moderate	116 (33)	23 (31)	22 (29)	37 (34)	33 (37)
Slight	68 (19)	13 (17)	14 (18)	28 (26)	13 (15)
None	13 (4)	3 (4)	1 (1)	3 (3)	6 (7)
Not sure	1 (0)	0 (0)	0 (0)	0 (0)	1 (1)
Total*	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

*3 respondents belonged to other combination. Hence row total and column total are not equal.
Percentages are rounded to the nearest integer.

b. Administrative access, facilities, or other administrative exceptions

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	25 (7)	5 (7)	6 (8)	7 (6)	6 (7)
High	54 (15)	10 (13)	19 (24)	19 (18)	5 (6)
Moderate	105 (30)	23 (31)	26 (34)	30 (28)	26 (29)
Slight	140 (40)	34 (45)	26 (34)	40 (37)	39 (44)
None	21 (6)	2 (3)	0 (0)	10 (9)	9 (10)
Not sure	7 (2)	1 (1)	0 (0)	2 (2)	4 (4)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

c. Visitor use of advanced technology and electronic equipment for navigation or communication

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	40 (12)	9 (12)	9 (12)	15 (14)	6 (7)
High	61 (17)	9 (12)	14 (18)	26 (24)	11 (12)
Moderate	103 (29)	19 (26)	25 (32)	37 (34)	21 (24)
Slight	113 (32)	30 (40)	21 (27)	23 (21)	39 (44)
None	27 (8)	4 (5)	7 (9)	6 (6)	10 (11)
Not sure	8 (2)	4 (5)	1 (1)	1 (1)	2 (2)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

d. Air quality impacts

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	37 (11)	6 (8)	11 (14)	14 (13)	4 (4)
High	72 (20)	11 (15)	19 (25)	23 (21)	18 (21)
Moderate	107 (30)	17 (23)	25 (33)	43 (40)	22 (25)
Slight	102 (29)	29 (39)	15 (19)	24 (22)	34 (38)
None	25 (7)	10 (13)	4 (5)	4 (4)	7 (8)
Not sure	9 (3)	2 (2)	3 (4)	0 (0)	4 (4)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

e. Aircraft noise and airspace reservations

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	59 (59)	2 (3)	23 (30)	20 (19)	12 (13)
High	71 (20)	12 (16)	19 (25)	24 (22)	16 (18)
Moderate	120 (34)	26 (35)	25 (32)	35 (32)	33 (37)
Slight	87 (25)	31 (41)	10 (13)	24 (22)	22 (25)
None	10 (3)	3 (4)	0 (0)	4 (4)	3 (3)
Not sure	5 (1)	1 (1)	0 (0)	1 (1)	3 (3)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

f. Fragmentation and isolation of wilderness as ecological islands

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	55 (16)	12 (16)	15 (19)	15 (14)	13 (15)
High	76 (22)	16 (21)	15 (19)	28 (26)	17 (19)
Moderate	83 (23)	20 (27)	19 (25)	27 (25)	15 (17)
Slight	106 (30)	20 (27)	17 (22)	33 (30)	35 (39)
None	25 (7)	6 (8)	8 (10)	5 (5)	6 (7)
Not sure	7 (2)	1 (1)	3 (4)	0 (0)	3 (3)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

g. Increasing or changing non-commercial recreation

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	50 (14)	4 (5)	6 (8)	28 (26)	10 (11)
High	75 (21)	16 (21)	17 (22)	28 (26)	14 (16)
Moderate	114 (32)	22 (29)	30 (39)	31 (29)	31 (35)
Slight	90 (26)	30 (40)	20 (26)	16 (15)	23 (26)
None	17 (5)	2 (3)	3 (4)	3 (3)	9 (10)
Not sure	6 (2)	1 (1)	1 (1)	2 (2)	2 (2)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

h. Increasing or changing commercial recreation

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	29 (8)	0 (0)	11 (14)	11 (10)	6 (7)
High	59 (17)	12 (16)	12 (16)	20 (19)	15 (17)
Moderate	131 (37)	28 (37)	25 (32)	48 (44)	28 (31)
Slight	102 (29)	31 (41)	25 (32)	24 (22)	22 (25)
None	27 (8)	4 (5)	3 (4)	5 (5)	15 (17)
Not sure	4 (1)	0 (0)	1 (1)	0 (0)	3 (3)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

i. Lack of political and financial support for wilderness protection and management

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	153 (43)	24 (32)	37 (48)	63 (58)	26 (29)
High	110 (31)	22 (29)	25 (32)	33 (30)	30 (34)
Moderate	50 (14)	13 (17)	12 (16)	6 (6)	19 (21)
Slight	29 (8)	12 (16)	3 (4)	4 (4)	10 (11)
None	4 (1)	1 (1)	0 (0)	1 (1)	2 (2)
Not sure	6 (2)	3 (4)	0 (0)	1 (1)	2 (2)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

j. Legislation designating wilderness with compromised wilderness conditions or special provisions for management

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	61 (17)	14 (19)	15 (19)	18 (17)	11 (12)
High	86 (24)	15 (20)	17 (22)	38 (35)	16 (18)
Moderate	74 (21)	14 (19)	21 (27)	19 (18)	20 (22)
Slight	70 (20)	16 (21)	13 (17)	19 (18)	22 (25)
None	40 (11)	12 (16)	4 (5)	12 (11)	12 (13)
Not sure	21 (6)	4 (5)	7 (9)	2 (2)	8 (9)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

k. Livestock grazing

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	20 (6)	6 (8)	3 (4)	10 (9)	1 (1)
High	41 (12)	10 (13)	11 (14)	15 (14)	5 (6)
Moderate	72 (20)	27 (36)	11 (14)	27 (25)	5 (6)
Slight	79 (22)	25 (33)	20 (26)	24 (22)	9 (10)
None	134 (38)	7 (9)	30 (39)	32 (30)	65 (73)
Not sure	6 (2)	0 (0)	2 (3)	0 (0)	4 (4)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

l. Energy development and resource extraction

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	51 (14)	9 (12)	15 (19)	14 (13)	13 (15)
High	44 (13)	8 (11)	12 (16)	11 (10)	12 (13)
Moderate	64 (18)	17 (23)	14 (18)	21 (19)	12 (13)
Slight	91 (26)	19 (25)	9 (12)	42 (39)	19 (21)
None	91 (26)	19 (25)	26 (34)	17 (16)	29 (33)
Not sure	11 (3)	3 (4)	1 (1)	3 (3)	4 (5)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

m. Motorized and mechanical equipment trespass and illegal use

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	53 (15)	16 (21)	8 (10)	21 (19)	6 (7)
High	81 (23)	22 (29)	9 (12)	31 (29)	18 (20)
Moderate	125 (36)	20 (27)	33 (43)	39 (36)	33 (37)
Slight	75 (21)	17 (23)	20 (26)	14 (13)	24 (27)
None	15 (4)	0 (0)	7 (9)	3 (3)	5 (6)
Not sure	3 (1)	0 (0)	0 (0)	0 (0)	3 (3)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

n. Invasive species

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	87 (25)	18 (24)	24 (31)	17 (16)	27 (30)
High	109 (31)	27 (36)	32 (42)	35 (32)	14 (16)
Moderate	115 (32)	20 (27)	18 (23)	46 (43)	30 (34)
Slight	36 (10)	10 (13)	3 (4)	8 (7)	15 (17)
None	2 (1)	0 (0)	0 (0)	2 (2)	0 (0)
Not sure	3 (1)	0 (0)	0 (0)	0 (0)	3 (3)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

o. Risk of wildfire damage (outside wilderness) originating in wilderness

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	45 (13)	14 (19)	8 (10)	16 (15)	6 (7)
High	64 (18)	16 (21)	15 (19)	21 (19)	11 (12)
Moderate	114 (32)	21 (28)	30 (39)	37 (34)	26 (29)
Slight	95 (27)	21 (28)	16 (21)	29 (27)	28 (31)
None	28 (8)	1 (1)	6 (8)	5 (5)	16 (18)
Not sure	6 (2)	2 (3)	2 (3)	0 (0)	2 (2)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

p. Private inholdings and their uses

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	14 (4)	4 (5)	2 (3)	3 (3)	4 (4)
High	39 (11)	14 (19)	9 (12)	11 (10)	4 (4)
Moderate	99 (28)	20 (27)	21 (27)	36 (33)	22 (25)
Slight	110 (31)	26 (35)	24 (31)	34 (31)	25 (28)
None	82 (23)	10 (13)	18 (23)	24 (22)	30 (34)
Not sure	8 (2)	1 (1)	3 (4)	0 (0)	4 (4)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

q. Pressure on threatened and endangered species management

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	30 (9)	7 (9)	7 (9)	7 (6)	9 (10)
High	57 (16)	11 (15)	13 (17)	19 (18)	12 (13)
Moderate	117 (33)	25 (33)	26 (34)	44 (41)	21 (24)
Slight	113 (32)	21 (28)	25 (32)	34 (31)	33 (37)
None	26 (7)	8 (11)	5 (6)	3 (3)	10 (11)
Not sure	9 (3)	3 (4)	1 (1)	1 (1)	4 (5)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

r. Urbanization and encroaching development

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	41 (12)	10 (13)	7 (9)	13 (12)	10 (11)
High	56 (16)	14 (19)	12 (16)	19 (18)	10 (11)
Moderate	86 (24)	15 (20)	23 (30)	30 (28)	17 (19)
Slight	106 (30)	19 (25)	22 (29)	36 (33)	29 (33)
None	63 (18)	17 (23)	13 (17)	10 (9)	23 (26)
Not sure	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

s. Water projects facilities

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	21 (6)	3 (4)	6 (8)	10 (9)	1 (1)
High	46 (13)	8 (11)	16 (21)	14 (13)	6 (7)
Moderate	60 (17)	12 (16)	11 (14)	23 (21)	14 (16)
Slight	107 (30)	33 (44)	23 (30)	28 (26)	23 (26)
None	103 (29)	16 (21)	19 (24)	29 (26)	39 (44)
Not sure	15 (4)	3 (4)	2 (3)	4 (4)	6 (7)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

t. Water quality impacts

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	31 (9)	4 (5)	7 (9)	8 (7)	11 (12)
High	49 (14)	7 (9)	8 (10)	14 (13)	19 (21)
Moderate	103 (29)	13 (18)	23 (30)	41 (38)	25 (28)
Slight	126 (36)	34 (46)	29 (38)	37 (34)	26 (29)
None	40 (11)	16 (21)	9 (12)	8 (7)	7 (8)
Not sure	3 (1)	1 (1)	1 (1)	0 (0)	1 (1)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

u. Wildland fire suppression and management

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	66 (19)	14 (19)	15 (19)	28 (26)	8 (9)
High	70 (20)	19 (25)	11 (14)	33 (31)	5 (6)
Moderate	99 (28)	23 (31)	25 (32)	28 (26)	23 (26)
Slight	77 (22)	15 (20)	21 (27)	13 (12)	28 (31)
None	33 (9)	2 (3)	4 (5)	6 (6)	21 (24)
Not sure	7 (2)	2 (3)	1 (1)	0 (0	4 (4)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

v. Disconnected urban audiences

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	95 (27)	14 (19)	23 (30)	35 (32)	20 (22)
High	93 (26)	15 (20)	25 (32)	28 (26)	25 (28)
Moderate	77 (22)	15 (20)	18 (23)	28 (26)	16 (18)
Slight	53 (15)	18 (24)	6 (8)	10 (9)	19 (21)
None	18 (5)	8 (11)	4 (5)	1 (1)	5 (6)
Not sure	16 (5)	5 (6)	1 (1)	6 (6)	4 (4)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

w. Disruption of wildlife corridors

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	45 (13)	10 (13)	12 (16)	9 (8)	12 (13)
High	55 (16)	10 (13)	14 (18)	17 (16)	13 (15)
Moderate	104 (30)	22 (29)	20 (26)	37 (34)	25 (28)
Slight	101 (29)	23 (31)	21 (27)	32 (30)	25 (28)
None	41 (12)	9 (12)	9 (12)	9 (8)	14 (16)
Not sure	6 (2)	1 (1)	1 (1)	4 (4)	0 (0)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

x. Sea level rise; coastal erosion

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	33 (9)	1 (1)	7 (9)	1 (1)	24 (27)
High	22 (6)	5 (7)	4 (5)	4 (4)	9 (10)
Moderate	40 (11)	6 (8)	12 (16)	9 (8)	12 (13)
Slight	54 (15)	11 (15)	12 (16)	17 (16)	12 (13)
None	185 (53)	44 (59)	40 (52)	71 (66)	30 (34)
Not sure	18 (5)	8 (11)	2 (3)	6 (5)	2 (2)
Total	352 (100)	75 (100)	77 (100)	108 (100)	89 (100)

Appendix 3. Training and Research

Table A3.1—Level of need for manager training during the next 20 years related to general wilderness management competencies within your agency

a. Wilderness history, law, regulation and policy

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	76 (22)	15 (20)	23 (30)	24 (23)	12 (13)
High	125 (36)	25 (33)	25 (32)	40 (38)	34 (38)
Moderate	124 (35)	29 (39)	24 (31)	35 (33)	36 (40)
Slight	22 (6)	5 (7)	4 (5)	6 (6)	7 (8)
None	2 (1)	1 (1)	0 (0)	1 (1)	0 (0)
Not sure	1 (0)	0 (0)	1 (1)	0 (0)	0 (0)
Total*	350 (100)	75 (100)	77 (100)	106 (100)	89 (100)

*3 respondents belonged to other combinations. Hence row total and column total are not equal.
Percentages are rounded to the nearest integer.

b. Wilderness planning

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	71 (20)	15 (20)	24 (31)	17 (16)	15 (17)
High	131 (37)	23 (31)	31 (40)	48 (45)	27 (30)
Moderate	127 (36)	33 (44)	19 (25)	36 (34)	38 (43)
Slight	17 (5)	3 (4)	2 (3)	4 (4)	8 (9)
None	2 (1)	1 (1)	0 (0)	1 (1)	0 (0)
Not sure	2 (1)	0 (0)	1 (1)	0 (0)	1 (1)
Total	350 (100)	75 (100)	77 (100)	106 (100)	89 (100)

c. Visitor use management and monitoring

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	92 (26)	17 (23)	26 (34)	33 (31)	15 (17)
High	103 (29)	21 (28)	21 (27)	39 (37)	21 (24)
Moderate	124 (35)	27 (36)	28 (36)	28 (26)	40 (45)
Slight	27 (8)	10 (13)	1 (1)	5 (5)	11 (12)
None	2 (1)	0 (0)	0 (0)	1 (1)	1 (1)
Not sure	2 (1)	0 (0)	1 (1)	0 (0)	1 (1)
Total	350 (100)	75 (100)	77 (100)	106 (100)	89 (100)

d. Natural and cultural resources management and monitoring

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	69 (20)	10 (13)	27 (35)	15 (14)	14 (16)
High	108 (31)	23 (31)	24 (31)	33 (31)	28 (31)
Moderate	129 (37)	31 (41)	23 (30)	45 (42)	30 (34)
Slight	36 (10	10 (13)	0 (0)	10 (9)	16 (18)
None	4 (1)	0 (0)	1 (1)	3 (3)	0 (0)
Not sure	4 (1)	1 (1)	2 (3)	0 (0)	1 (1)
Total	350 (100)	75 (100)	77 (100)	106 (100)	89 (100)

e. Management skills related to communication, problem-solving, decision-making, and organizational management.

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	94 (27)	20 (27)	25 (32)	30 (28)	18 (20)
High	104 (30)	22 (29)	19 (25)	35 (33)	27 (30)
Moderate	112 (32)	25 (33)	30 (39)	34 (32)	22 (25)
Slight	34 (10)	8 (11)	2 (3)	4 (4)	20 (22)
None	4 (1)	0 (0)	0 (0)	3 (3)	1 (1)
Not sure	2 (1)	0 (0)	1 (1)	0 (0)	1 (1)
Total	350 (100)	75 (100)	77 (100)	106 (100)	89 (100)

f. Managing special provisions

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	46 (13)	8 (11)	16 (21)	13 (12)	8 (9)
High	84 (24)	23 (31)	19 (25)	23 (22)	17 (19)
Moderate	149 (43)	28 (37)	31 (40)	48 (45)	42 (47)
Slight	52 (15)	12 (16)	7 (9)	12 (11)	21 (24)
None	10 (3)	3 (4)	1 (1)	6 (6)	0 (0)
Not sure	9 (2)	1 (1)	3 (4)	4 (4)	1 (1)
Total	350 (100)	75 (100)	77 (100)	106 (100)	89 (100)

g. Wilderness field skills

Level of Threats	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Very high	68 (19)	11 (15)	14 (18)	34 (32)	9 (10)
High	82 (23)	19 (25)	18 (23)	33 (31)	11 (12)
Moderate	119 (34)	29 (39)	28 (36)	26 (25)	34 (38)
Slight	66 (19)	13 (17)	14 (18)	11 (10)	28 (31)
None	7 (2)	0 (0)	2 (3)	2 (2)	3 (3)
Not sure	8 (2)	3 (4)	1 (1)	0 (0)	4 (5)
Total	350 (100)	75 (100)	77 (100)	106 (100)	89 (100)

Table A3.2—Adequacy and availability of science-based information for decision-making

a. Air quality protection

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	40 (12)	16 (21)	4 (5)	8 (8)	10 (11)
Somewhat	70 (20)	20 (27)	14 (18)	19 (18)	17 (20)
Moderate	71 (21)	12 (16)	18 (24)	31 (30)	10 (11)
Good	78 (23)	9 (12)	27 (36)	22 (21)	19 (22)
Excellent	20 (6)	1 (1)	6 (8)	8 (8)	5 (6)
Don't know	65 (19)	17 (23)	7 (9)	15 (15)	26 (30
Total*	344 (100)	75 (100)	77 (100)	103 (100)	89 (100)

*3 respondents belonged to other combinations. Hence row total and column total are not equal.
Percentages are rounded to the nearest integer.

b. Cultural resources protection

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	33 (10)	5 (7)	14 (18)	8 (8)	5 (6)
Somewhat	70 (20)	17 (23)	15 (20)	17 (17)	21 (24)
Moderate	91 (27)	23 (31)	18 (24)	30 (30)	18 (21)
Good	103 (30)	17 (23)	26 (34)	37 (37)	23 (26)
Excellent	20 (6)	8 (11)	2 (3)	6 (6)	4 (5)
Don't know	26 (8)	4 (5)	1 (1)	5 (5)	16 (18)
Total	343 (100)	74 (100)	76 (100)	103 (100)	87 (100)

c. Fire and fuels management

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	24 (7)	7 (9)	4 (5)	10 (10)	3 (3)
Somewhat	52 (15)	11 (15)	12 (16)	18 (18)	11 (13)
Moderate	103 (30)	28 (38)	19 (25)	33 (32)	22 (25)
Good	98 (29)	17 (23)	26 (34)	29 (28)	25 (29)
Excellent	34 (10)	8 (11)	12 (16)	8 (8)	5 (6)
Don't know	31 (9)	3 (4)	3 (4)	4 (4)	21 (24
Total	342 (100)	74 (100)	76 (100)	102 (100)	87 (100)

d. Fish and wildlife management

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	15 (4)	3 (4)	2 (3)	8 (8)	2 (2)
Somewhat	57 (17)	15 (20)	14 (19)	19 (18)	7 (8)
Moderate	104 (30)	25 (33)	25 (33)	31 (30)	22 (25)
Good	126 (37)	22 (29)	26 (35)	36 (35)	42 (48)
Excellent	22 (6)	6 (8)	6 (8)	4 (4)	6 (7)
Don't know	19 (6)	4 (5)	2 (3)	5 (5)	8 (9)
Total	343 (100)	75 (100)	75 (100)	103 (100)	87 (100)

e. Forest and vegetation resources protection

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	20 (6)	4 (5)	3 (4)	9 (9)	1 (1)
Somewhat	50 (15)	15 (20)	10 (14)	12 (12)	13 (15)
Moderate	110 (32)	24 (32)	25 (34)	36 (36)	25 (29)
Good	116 (34)	24 (32)	27 (36)	36 (36)	29 (33)
Excellent	14 (4)	4 (5)	6 (8)	2 (2)	2 (2)
Don't know	30 (9)	4 (5)	3 (4)	6 (6)	17 (20)
Total	340 (100)	75 (100)	74 (100)	101 (100)	87 (100)

f. Grazing management

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	45 (13)	19 (25)	6 (8)	15 (15)	4 (5)
Somewhat	36 (10)	11 (15)	7 (9)	12 (12)	5 (6)
Moderate	65 (19)	16 (21)	13 (17)	24 (23)	12 (14)
Good	72 (21)	23 (31)	14 (18)	21 (20)	13 (15)
Excellent	19 (6)	3 (4)	8 (11)	6 (6)	2 (2)
Don't know	106 (31)	3 (4)	28 (37)	25 (24)	50 (58)
Total	343 (100)	75 (100)	76 (100)	103 (100)	86 (100)

g. Historic resources protection

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	28 (8)	5 (7)	10 (13)	6 (6)	6 (7)
Somewhat	61 (18)	10 (13)	11 (15)	23 (23)	17 (20)
Moderate	96 (28)	26 (35)	18 (24)	33 (32)	19 (22)
Good	103 (30)	24 (32)	24 (32)	31 (30)	23 (27)
Excellent	19 (6)	5 (7)	5 (7)	4 (4)	5 (6)
Don't know	34 (10)	5 (7)	7 (9)	5 (5)	16 (19)
Total	341 (100)	75 (100)	75 (100)	102 (100)	86 (100)

h. Information and education for visitors and public

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	39 (11)	8 (11)	11 (14)	12 (12)	7 (8)
Somewhat	56 (16)	16 (21)	17 (22)	10 (10)	13 (15)
Moderate	109 (32)	32 (43)	18 (24)	33 (32)	25 (29)
Good	102 (30)	14 (19)	24 (32)	34 (33)	29 (34)
Excellent	21 (6)	3 (4)	4 (5)	12 (12)	2 (2)
Don't know	16 (5)	2 (2)	2 (3)	2 (2)	10 (12)
Total	343 (100)	75 (100)	76 (100)	103 (100)	86 (100)

i. Managing field staff

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	49 (14)	13 (17)	11 (14)	14 (14)	10 (12)
Somewhat	76 (22)	21 (28)	19 (25)	18 (18)	16 (19)
Moderate	84 (25)	16 (21)	16 (21)	32 (31)	20 (24)
Good	91 (27)	17 (23)	20 (26)	32 (31)	22 (26)
Excellent	12 (4)	3 (4)	3 (4)	3 (3)	3 (4)
Don't know	29 (8)	5 (7)	7 (9)	3 (3)	14 (16)
Total	341 (100)	75 (100)	76 (100)	102 (100)	85 (100)

j. Scenic quality protection

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	41 (12)	9 (12)	10 (14)	11 (11)	9 (11)
Somewhat	80 (24)	24 (32)	22 (30)	18 (18)	16 (19)
Moderate	97 (29)	24 (32)	19 (26)	33 (33)	21 (25)
Good	72 (21)	13 (18)	12 (16)	27 (27)	20 (23)
Excellent	12 (4)	3 (4)	4 (5)	3 (3)	2 (2)
Don't know	35 (10)	1 (1)	7 (9)	9 (9)	17 (20)
Total	337 (100)	74 (100)	74 (100)	101 (100)	85 (100)

k. Visitor management (controlling use, managing conflict, mitigating impacts, etc.)

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	46 (13)	10 (13)	9 (12)	12 (12)	14 (16)
Somewhat	77 (22)	20 (27)	25 (33)	17 (17)	15 (17)
Moderate	105 (31)	23 (31)	22 (29)	40 (39)	19 (22)
Good	75 (22)	14 (19)	15 (20)	23 (22)	22 (25)
Excellent	16 (5)	5 (7)	2 (3)	6 (6)	3 (3)
Don't know	24 (7)	3 (4)	3 (4)	4 (4)	14 (16)
Total	343 (100)	75 (100)	76 (100)	102 (100)	87 (100)

l. Water resources protection

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	35 (10)	9 (12)	5 (7)	6 (6)	14 (16)
Somewhat	65 (19)	16 (21)	16 (21)	18 (18)	13 (15)
Moderate	93 (27)	24 (32)	17 (22)	35 (34)	17 (20)
Good	89 (26)	13 (17)	26 (34)	29 (28)	21 (24)
Excellent	18 (5)	4 (5)	7 (9)	5 (5)	2 (2)
Don't know	43 (13)	9 (12)	5 (7)	9 (9)	20 (23)
Total	343 (100)	75 (100)	76 (100)	102 (100)	87 (100)

m. Wilderness monitoring protocol

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	51 (15)	8 (11)	17 (22)	14 (14)	11 (13)
Somewhat	65 (19)	18 (24)	19 (25)	15 (15)	13 (15)
Moderate	80 (24)	17 (23)	22 (29)	23 (23)	18 (21)
Good	105 (31)	26 (35)	13 (17)	37 (37)	28 (33)
Excellent	21 (6)	4 (5)	4 (5)	9 (9)	3 (4)
Don't know	18 (5)	2 (3)	1 (1)	3 (3)	12 (14)
Total	340 (100)	75 (100)	76 (100)	101 (100)	85 (100)

n. Wilderness planning

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	38 (11)	6 (8)	13 (17)	12 (12)	6 (7)
Somewhat	76 (22)	17 (23)	18 (24)	23 (23)	18 (21)
Moderate	101 (30)	23 (31)	18 (24)	33 (32)	27 (32)
Good	96 (28)	25 (33)	24 (32)	29 (29)	16 (19)
Excellent	9 (3)	1 (1)	3 (4)	2 (3)	3 (4)
Don't know	20 (6)	3 (4)	0 (0)	2 (2)	15 (18)
Total	340 (100)	75 (100)	76 (100)	101 (100)	85 (100)

o. Public attitudes toward intervention to adapt to climate change influences

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	104 (31)	27 (36)	25 (34)	28 (28)	22 (26)
Somewhat	89 (27)	22 (29)	16 (22)	28 (28)	23 (27)
Moderate	35 (10)	3 (4)	10 (14)	9 (9)	12 (14)
Good	14 (4)	4 (5)	6 (8)	2 (2)	2 (3)
Excellent	2 (1)	0 (0)	0 (0)	0 (0)	2 (3)
Don't know	91 (27)	19 (25)	16 (22)	33 (33)	23 (27)
Total	335 (100)	75 (100)	73 (100)	100 (100)	84 (100)

p. Public attitudes toward ecological restoration (fire, vegetation, wildlife, etc.) activities

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	79 (23)	19 (25)	12 (16)	29 (28)	18 (21)
Somewhat	100 (29)	26 (35)	30 (40)	26 (25)	18 (21)
Moderate	63 (19)	13 (17)	10 (13)	20 (20)	18 (21)
Good	35 (10)	5 (7)	10 (13)	8 (8)	12 (14)
Excellent	5 (1)	4 (5)	0 (0)	0 (0)	1 (1)
Don't know	58 (17)	8 (11)	13 (18)	19 (19)	18 (21)
Total	340 (100)	75 (100)	75 (100)	102 (100)	85 (100)

q. Relative value of wilderness benefits to stakeholder groups

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	74 (22)	18 (25)	15 (20)	20 (20)	19 (22)
Somewhat	100 (29)	22 (30)	25 (33)	28 (27)	25 (29)
Moderate	69 (20)	11 (15)	16 (21)	26 (25)	16 (19)
Good	46 (14)	16 (22)	8 (11)	14 (14)	8 (9)
Excellent	5 (1)	0 (0)	2 (3)	2 (2)	1 (1)
Don't know	46 (14)	6 (8)	10 (13)	12 (12)	17 (20)
Total	340 (100)	73 (100)	76 (100)	102 (100)	86 (100)

r. Managing subsistence activities and resources

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	25 (7)	5 (7)	5 (7)	6 (6)	9 (11)
Somewhat	75 (22)	16 (22)	22 (29)	25 (25)	12 (14)
Moderate	57 (17)	13 (18)	11 (15)	19 (19)	12 (14)
Good	32 (9)	10 (14)	6 (8)	6 (6)	10 (12)
Excellent	5 (1)	1 (1)	3 (4)	0 (0)	1 (1)
Don't know	144 (43)	28 (38)	28 (37)	46 (45)	41 (48)
Total	338 (100)	73 (100)	75 (100)	102 (100)	85 (100)

s. Stewardship of spiritual values and uses

Science-Based Information	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
Not adequate	84 (24)	21 (28)	18 (24)	24 (23)	19 (22)
Somewhat	67 (20)	18 (24)	21 (28)	17 (17)	10 (12)
Moderate	58 (17)	12 (16)	13 (17)	22 (22)	11 (13)
Good	27 (8)	6 (8)	6 (8)	9 (9)	6 (7)
Excellent	1 (0)	1 (1)	0 (0)	0 (0)	0 (0)
Don't know	105 (31)	14 (23)	18 (24)	30 (29)	40 (47)
Total	342 (100)	75 (100)	76 (100)	102 (100)	85 (100)

Appendix 4. Accomplishment of the 1995 NWPS Strategic Plan Objectives

Table A4.1—Preservation of natural and biological values

a. Manage wilderness within the context of larger landscapes to ensure the protection and integrity of natural and biological processes

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	3 (2)	0 (0)	2 (6)	1 (2)	0 (0)
Slight	37 (24)	10 (27)	3 (9)	19 (35)	4 (15)
Moderate	61 (39)	16 (43)	14 (40)	21 (38)	9 (35)
High	28 (18)	7 (19)	8 (23)	7 (13)	6 (23)
Very high	13 (8)	3 (8)	4 (11)	3 (5)	3 (12)
Don't know or N/A	14 (9)	1 (3)	4 (11)	4 (7)	4 (15)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

b. Inventory wilderness ecosystems to collect baseline data. Identify indicators and develop monitoring standards for those elements critical to ecological integrity. Develop monitoring strategies for high priority indicators and provide feedback for adaptive management. Where appropriate, establish long-term research programs.

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	8 (5)	3 (8)	1 (3)	3 (5)	0 (0)
Slight	55 (35)	13 (35)	13 (37)	21 (38)	8 (31)
Moderate	51 (33)	12 (32)	10 (29)	20 (36)	9 (35)
High	21 (13)	4 (11)	5 (14)	5 (9)	6 (23)
Very high	9 (6)	3 (8)	3 (9)	3 (5)	0 (0)
Don't know or N/A	12 (8)	2 (5)	3 (9)	3 (5)	3 (12)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

c. Restore wilderness ecosystems damaged by humans to the degree feasible. Identify the processes needed to assess, restore, or mitigate human-induced change.

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	6 (4)	0 (0)	1 (3)	3 (5)	1 (4)
Slight	54 (35)	15 (41)	7 (20)	24 (44)	8 (31)
Moderate	57 (37)	12 (32)	19 (54)	16 (29)	9 (35)
High	19 (12)	5 (14)	5 (14)	6 (11)	3 (31)
Very high	7 (4)	4 (11)	0 (0)	3 (5)	0 (0)
Don't know or N/A	13 (8)	1 (3)	3 (9)	3 (5)	5 (19)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

d. Restore fire to its natural role in the ecosystem.

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	13 (8)	5 (14)	2 (6)	6 (11)	0 (0)
Slight	54 (35)	13 (35)	10 (29)	20 (36)	9 (35)
Moderate	48 (31)	12 (32)	11 (31)	19 (35)	6 (23)
High	18 (12)	2 (5)	8 (23)	6 (11)	2 (8)
Very high	6 (4)	3 (8)	0 (0)	1 (2)	2 (8)
Don't know or N/A	17 (11)	2 (5)	4 (11)	3 (5)	7 (27)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

e. Implement integrated exotic plant and animal management which includes preservation, education, detection, quick elimination of spot infestations, and control of major occurrences.

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	5 (3)	3 (8)	0 (0)	2 (4)	0 (0)
Slight	46 (30)	13 (35)	10 (29)	17 (31)	5 (19)
Moderate	55 (35)	11 (30)	13 (37)	21 (38)	10 (38)
High	24 (15)	4 (11)	7 (20)	7 (13)	6 (23)
Very high	10 (6)	4 (11)	2 (6)	3 (5)	1 (4)
Don't know or N/A	16 (10)	2 (5)	3 (9)	5 (9)	4 (15)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

f. Exchange, purchase, or retire uses adversely affecting wilderness values where rights-holders are willing.

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	6 (4)	2 (5)	2 (6)	2 (4)	0 (0)
Slight	41 (26)	8 (22)	8 (23)	21 (38)	4 (16)
Moderate	41 (26)	13 (35)	6 (17)	14 (25)	8 (31)
High	19 (12)	5 (14)	4 (11)	7 (13)	2 (8)
Very high	6 (4)	3 (8)	2 (6)	1 (2)	0 (0)
Don't know or N/A	43 (28)	6 (16)	13 (37)	10 (18)	12 (46)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

g. Pursue acquisition or exchange of inholdings, subsurface rights, and adjacent lands critical to wilderness protection.

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	4 (3)	1 (3)	0 (0)	3 (5)	0 (0)
Slight	39 (25)	8 (22)	11 (31)	15 (27)	5 (19)
Moderate	45 (29)	12 (32)	6 (17)	19 (35)	8 (31)
High	18 (12)	7 (19)	3 (9)	3 (5)	4 (15)
Very high	12 (8)	6 (16)	2 (6)	4 (7)	0 (0)
Don't know or N/A	38 (24)	3 (8)	13 (37)	11 (20)	9 (35)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

Table A4.2—Management of social values

a. Evaluate all existing and proposed structures and installations to minimize the impact on wilderness values

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	5 (3)	1 (3)	0 (0)	3 (5)	1 (4)
Slight	43 (28)	14 (38)	8 (23)	15 (27)	5 (19)
Moderate	62 (40)	9 (24)	19 (54)	25 (45)	8 (31)
High	22 (14)	8 (22)	5 (14)	5 (9)	4 (15)
Very high	5 (3)	1 (3)	1 (3)	1 (2)	2 (8)
Don't know or N/A	19 (12)	4 (11)	2 (6)	6 (11)	6 (23)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

b. Emphasize opportunities outside wilderness for recreation activities that are not dependent on a wilderness setting

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	3 (2)	2 (5)	0 (0)	1 (2)	0 (0)
Slight	30 (19)	5 (14)	9 (26)	13 (24)	3 (12)
Moderate	68 (44)	16 (43)	16 (46)	25 (45)	10 (38)
High	29 (19)	9 (24)	5 (14)	10 (18)	5 (19)
Very high	6 (4)	3 (8)	1 (3)	2 (4)	0 (0)
Don't know or N/A	20 (13)	2 (5)	4 (11)	4 (7)	8 (31)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

c. Coordinate with neighboring agencies and interests on wilderness use restrictions (such as campsite and fire regulations) and on the establishment of policies for limits such as group size and numbers of packstock

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	8 (5)	3 (8)	2 (6)	3 (5)	0 (0)
Slight	44 (28)	8 (22)	11 (31)	16 (29)	7 (27)
Moderate	50 (32)	17 (46)	9 (26)	20 (36)	4 (15)
High	26 (17)	6 (16)	8 (23)	8 (15)	4 (15)
Very high	5 (3)	1 (3)	1 (3)	3 (5)	0 (0)
Don't know or N/A	23 (15)	2 (5)	4 (11)	5 (9)	11 (42)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

d. Coordinate with Department of Defense agencies and the Federal Aviation Administration to develop procedures and guidelines to avoid or mitigate low-level overflights

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	31 (20)	13 (35)	3 (9)	13 (24)	2 (8)
Slight	54 (35)	12 (32)	13 (37)	19 (35)	8 (31)
Moderate	30 (19)	5 (14)	8 (23)	12 (22)	5 (19)
High	17 (11)	3 (8)	6 (17)	6 (11)	2 (8)
Very high	3 (2)	1 (3)	2 (6)	0 (0)	0 (0)
Don't know or N/A	21 (13)	3 (8)	3 (9)	5 (9)	9 (35)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

e. Develop, identify, and distribute information on new or evolving recreation management tools and techniques

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	10 (6)	2 (5)	1 (3)	5 (9)	2 (8)
Slight	42 (27)	7 (19)	11 (31)	14 (25)	10 (38)
Moderate	56 (36)	19 (51)	12 (34)	20 (36)	4 (15)
High	27 (17)	4 (11)	5 (14)	13 (24)	4 (15)
Very high	5 (3)	3 (8)	1 (3)	1 (2)	0 (0)
Don't know or N/A	16 (10)	2 (5)	5 (14)	2 (4)	6 (23)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

f. Establish an interagency national information network to provide wilderness information for public and agency use

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	6 (4)	1 (3)	2 (6)	2 (4)	1 (4)
Slight	21 (13)	4 (11)	6 (17)	10 (18)	1 (4)
Moderate	40 (26)	8 (22)	10 (29)	16 (29)	5 (19)
High	37 (24)	9 (24)	7 (20)	14 (25)	7 (27)
Very high	32 (21)	12 (32)	5 (14)	9 (16)	5 (19)
Don't know or N/A	20 (13)	3 (8)	5 (14)	4 (7)	7 (27)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

g. Assess impacts of new and emerging technologies on traditional wilderness values. Develop public information and education programs to address these effects and mitigate any unacceptable impacts

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	17 (11)	4 (11)	3 (9)	7 (13)	2 (8)
Slight	65 (42)	18 (49)	14 (40)	23 (42)	9 (35)
Moderate	45 (29)	9 (24)	12 (34)	18 (33)	6 (23)
High	7 (4)	2 (5)	1 (3)	2 (4)	2 (8)
Very high	5 (3)	2 (5)	1 (3)	2 (4)	0 (0)
Don't know or N/A	17 (11)	2 (5)	4 (11)	3 (5)	7 (27)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

Table A4.3—Administrative policy and interagency coordination

a. Maintain strong and professional leadership in wilderness stewardship at all levels. Each agency will: have a national wilderness coordinator; and require wilderness stewardship performance elements for those managing wilderness

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	3 (2)	0 (0)	1 (3)	2 (4)	0 (0)
Slight	46 (29)	3 (8)	11 (31)	21 (38)	9 (35)
Moderate	42 (27)	13 (35)	7 (20)	15 (27)	7 (27)
High	36 (23)	14 (38)	9 (26)	8 (15)	5 (19)
Very high	17 (11)	5 (14)	4 (11)	6 (6)	2 (8)
Don't know or N/A	12 (8)	2 (5)	3 (9)	3 (5)	3 (12)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

b. Create a National Interagency Steering Committee made up of the national wilderness coordinators of each agency to improve interagency understanding and consistency in managing the National Wilderness Preservation System, including: developing common guidelines, policies, and regulations on key wilderness issues; and identifying and coordinating research priorities for the Aldo Leopold Wilderness Research Institute, and training priorities with the Arthur Carhart Training Center

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	3 (2)	0 (0)	0 (0)	3 (5)	0 (0)
Slight	16 (10)	2 (5)	4 (11)	8 (15)	1 (4)
Moderate	41 (26)	15 (41)	9 (26)	14 (25)	2 (8)
High	56 (36)	10 (27)	14 (40)	19 (35)	13 (50)
Very high	18 (12)	5 (14)	3 (9)	7 (13)	3 (12)
Don't know or N/A	22 (14)	5 (14)	5 (14)	4 (7)	7 (27)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

c. Coordinate multiple-unit wildernesses to insure consistent administration

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	5 (3)	0 (0)	2 (6)	1 (2)	1 (4)
Slight	35 (22)	8 (22)	8 (23)	16 (29)	3 (12)
Moderate	44 (28)	13 (35)	10 (29)	17 (31)	4 (15)
High	22 (14)	6 (16)	3 (9)	10 (18)	3 (12)
Very high	9 (6)	3 (8)	2 (6)	3 (5)	1 (4)
Don't know or N/A	41 (26)	7 (19)	10 (29)	8 (15)	14 (54)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

d. Expand the emphasis of research to include natural and biological wilderness resources, and psychological and social values

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	6 (4)	2 (5)	1 (3)	2 (4)	1 (4)
Slight	46 (29)	14 (38)	9 (26)	13 (24)	8 (31)
Moderate	53 (34)	11 (30)	15 (43)	22 (40)	5 (19)
High	19 (12)	2 (5)	4 (11)	8 (15)	5 (19)
Very high	6 (4)	3 (8)	2 (6)	1 (2)	0 (0)
Don't know or N/A	26 (17)	5 (14)	4 (11)	9 (16)	7 (27)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

e. Aggressively seek new partnerships with diverse groups to support wilderness values and goals

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	5 (3)	1 (3)	1 (3)	2 (4)	1 (4)
Slight	49 (31)	11 (30)	9 (26)	18 (33)	10 (38)
Moderate	51 (33)	16 (43)	13 (37)	15 (27)	6 (23)
High	15 (10)	2 (5)	3 (9)	8 (15)	2 (8)
Very high	12 (8)	4 (11)	2 (6)	6 (11)	0 (0)
Don't know or N/A	24 (15)	3 (8)	7 (20)	6 (11)	7 (27)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

f. Participate in local government planning efforts to represent the wilderness resource

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	13 (8)	4 (11)	3 (9)	4 (7)	2 (8)
Slight	68 (44)	19 (51)	9 (26)	29 (53)	11 (42)
Moderate	28 (18)	5 (14)	11 (31)	5 (9)	6 (23)
High	15 (10)	5 (14)	5 (14)	4 (7)	1 (4)
Very high	8 (5)	2 (5)	0 (0)	6 (11)	0 (0)
Don't know or N/A	24 (15)	2 (5)	7 (20)	7 (13)	6 (23)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

g. Ensure fiscal accountability in the budget process by identifying & tracking funding sources & accomplishments in the wilderness program

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	19 (12)	3 (8)	3 (9)	6 (11)	6 (23)
Slight	47 (30)	10 (27)	11 (31)	20 (36)	6 (23)
Moderate	31 (20)	10 (27)	7 (20)	11 (20)	3 (12)
High	25 (16)	11 (30)	4 (11)	8 (15)	2 (8)
Very high	8 (5)	2 (5)	1 (3)	5 (9)	0 (0)
Don't know or N/A	26 (17)	1 (3)	9 (26)	5 (9)	9 (35)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

h. Allow flexible spending of fire funding to cover prescribed fire

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	17 (11)	4 (11)	3 (9)	8 (15)	1 (4)
Slight	32 (21)	5 (14)	8 (23)	15 (27)	4 (15)
Moderate	34 (22)	8 (22)	7 (20)	10 (18)	9 (35)
High	6 (4)	1 (3)	3 (9)	0 (0)	2 (8)
Very high	3 (2)	0 (0)	0 (0)	3 (5)	0 (0)
Don't know or N/A	64 (41)	19 (51)	14 (40)	19 (35)	10 (38)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

Table A4.4—Training of agency personnel

a. Identify the core competencies required for wilderness rangers, wilderness managers, and line officers with wilderness management responsibilities. Identify tools, methods, and techniques to master the needed abilities

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	11 (7)	2 (5)	2 (6)	4 (7)	3 (12)
Slight	31 (20)	9 (24)	11 (31)	9 (16)	2 (8)
Moderate	58 (37)	11 (30)	11 (31)	22 (40)	13 (50)
High	39 (25)	10 (27)	8 (23)	15 (27)	6 (23)
Very high	9 (6)	3 (8)	2 (6)	3 (5)	0 (0)
Don't know or N/A	8 (5)	2 (5)	1 (3)	2 (4)	2 (8)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

b. Integrate wilderness into other program training and vice versa. Develop basic wilderness orientation training for presentation to all agency personnel

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	8 (5)	1 (3)	2 (6)	4 (7)	1 (4)
Slight	70 (45)	18 (49)	13 (37)	25 (45)	12 (46)
Moderate	49 (31)	13 (35)	11 (31)	17 (31)	8 (31)
High	14 (9)	2 (5)	7 (20)	3 (5)	2 (8)
Very high	7 (5)	3 (8)	0 (0)	4 (7)	0 (0)
Don't know or N/A	8 (5)	0 (0)	2 (6)	2 (4)	3 (12)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

c. Develop common understanding and training on wilderness principles such as the minimum tool concept

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	3 (2)	0 (0)	1 (3)	1 (2)	1 (4)
Slight	42 (27)	13 (35)	9 (26)	14 (25)	6 (23)
Moderate	61 (39)	12 (32)	14 (40)	23 (42)	10 (38)
High	35 (22)	8 (22)	7 (20)	14 (25)	6 (23)
Very high	10 (6)	4 (11)	3 (9)	2 (4)	1 (4)
Don't know or N/A	5 (3)	0 (0)	1 (3)	1 (2)	2 (8)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

d. Continue to develop, utilize, and support wilderness training programs

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	2 (1)	0 (0)	0 (0)	1 (2)	1 (4)
Slight	37 (24)	8 (22)	8 (23)	17 (31)	4 (15)
Moderate	70 (45)	16 (43)	20 (57)	21 (38)	11 (42)
High	30 (19)	8 (22)	3 (9)	12 (22)	7 (27)
Very high	12 (8)	5 (14)	3 (9)	3 (5)	1 (4)
Don't know or N/A	5 (3)	0 (0)	1 (3)	1 (2)	2 (8)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

e. Each agency will support the Arthur Carhart Training Center and the Aldo Leopold Wilderness Research Institute

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	1 (1)	0 (0)	0 (0)	1 (2)	0 (0)
Slight	13 (8)	2 (5)	5 (14)	5 (9)	1 (4)
Moderate	42 (27)	4 (11)	11 (31)	18 (33)	8 (31)
High	51 (33)	15 (41)	10 (29)	17 (31)	8 (31)
Very high	20 (13)	9 (24)	3 (9)	5 (9)	3 (12)
Don't know or N/A	29 (19)	7 (19)	6 (17)	9 (16)	6 (23)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

f. Establish partnerships with colleges and universities to recruit volunteers, participate in curriculum development, provide training, and conduct research

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	3 (2)	0 (0)	0 (0)	3 (5)	0 (0)
Slight	47 (30)	10 (27)	6 (17)	19 (35)	10 (38)
Moderate	63 (40)	20 (54)	18 (51)	17 (31)	8 (31)
High	15 (10)	0 (0)	7 (20)	7 (13)	1 (4)
Very high	7 (5)	4 (11)	0 (0)	3 (5)	0 (0)
Don't know or N/A	21 (13)	3 (8)	4 (11)	6 (11)	7 (27)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

Table A4.5—Public awareness and understanding

a. Evaluate wilderness education programs to determine their effectiveness

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	15 (10)	5 (14)	2 (6)	5 (9)	3 (12)
Slight	68 (44)	17 (46)	15 (43)	22 (40)	12 (46)
Moderate	34 (22)	6 (16)	7 (20)	19 (35)	2 (8)
High	6 (4)	2 (5)	2 (6)	2 (4)	0 (0)
Very high	4 (3)	2 (5)	1 (3)	1 (2)	0 (0)
Don't know or N/A	29 (19)	5 (14)	8 (23)	6 (11)	9 (35)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

b. Identify strategies to communicate wilderness education messages to diverse cultural, geographical, and sociological groups, including non-recreation users

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	12 (8)	1 (3)	1 (3)	6 (11)	4 (15)
Slight	70 (45)	20 (54)	15 (43)	24 (44)	9 (35)
Moderate	31 (20)	7 (19)	7 (20)	13 (24)	4 (15)
High	13 (8)	3 (8)	3 (9)	5 (9)	2 (8)
Very high	7 (4)	3 (8)	2 (6)	2 (4)	0 (0)
Don't know or N/A	23 (15)	3 (8)	7 (20)	5 (9)	7 (27)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

c. Develop a wilderness curriculum for grades K through 12. Encourage state agencies to establish curricula for environmental/wilderness education in schools

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	16 (10)	3 (8)	5 (14)	5 (9)	3 (12)
Slight	43 (28)	11 (30)	8 (23)	18 (33)	5 (19)
Moderate	33 (21)	8 (22)	5 (14)	16 (29)	3 (12)
High	15 (10)	1 (3)	3 (9)	7 (13)	4 (15)
Very high	7 (4)	3 (8)	2 (6)	2 (4)	0 (0)
Don't know or N/A	42 (27)	11 (30)	12 (34)	7 (13)	11 (42)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

d. Continue to support "Leave No Trace" as the official program for minimum impact recreation

Level of Accomplishment	All Agencies	Bureau of Land Management	National Park Service	U.S. Forest Service	U.S. Fish and Wildlife Service
			number (percent)		
None	1 (1)	0 (0)	1 (3)	0 (0)	0 (0)
Slight	11 (7)	3 (8)	3 (9)	2 (4)	3 (12)
Moderate	40 (26)	8 (22)	9 (26)	15 (27)	7 (27)
High	70 (45)	15 (41)	17 (49)	27 (49)	11 (42)
Very high	25 (16)	11 (30)	3 (9)	7 (13)	2 (8)
Don't know or N/A	9 (6)	0 (0)	2 (6)	4 (7)	3 (12)
Total	156 (100)	37 (100)	35 (100)	55 (100)	26 (100)

Appendix 5. Qualitative Analysis Results

The National Wilderness Manager Survey 2014 asked a number of open-ended questions in order to identify major challenges in wilderness stewardship and planning, needs for training and research, and major problems likely to face the NWPS in the future. Respondents could list up to five major challenges, five specific training needs, five research needs for resource and visitor management, and two most important problems. At the end of the survey, responding managers were given the opportunity to provide any final comments about the survey or about the strategic planning process.

Contents of responses to each of the open-ended questions were coded to assist in interpreting and grouping the diversity of responses and comments. The coding was done through NVivo which is a qualitative data coding and analysis software (http://www.qsrinternational.com/default.aspx). This software is widely used for coding, analyzing and summarizing qualitative data, such as that produced by the open-ended question in the WMS. Initial groupings were based on analyst interpretations within NVivo, and were read and crosschecked manually to see if the groupings made sense and to identify whether there were similarities in contents within groups. In many cases, contents of more complex responses were sufficiently diverse to cover multiple topics and thus fell into more than one group. Hence, the count of responses or comments typically exceeded the number of respondents. In other cases, responses to the WMS open-ended questions were very brief, sometimes just one word (e.g., fire, technology, management). In these cases, analyst judgment was relied on for placement in categories and for interpretation.

A5.1 Major challenges

Respondents were asked to indicate up to five major challenges they were likely to face over the next 20 years in wilderness stewardship or planning. A total of 1355 responses were collected from 368 respondent managers. These challenges were coded into six broad categories, as shown below in Figure A5.1. For detail category to these challenges, please see Table A5.1.

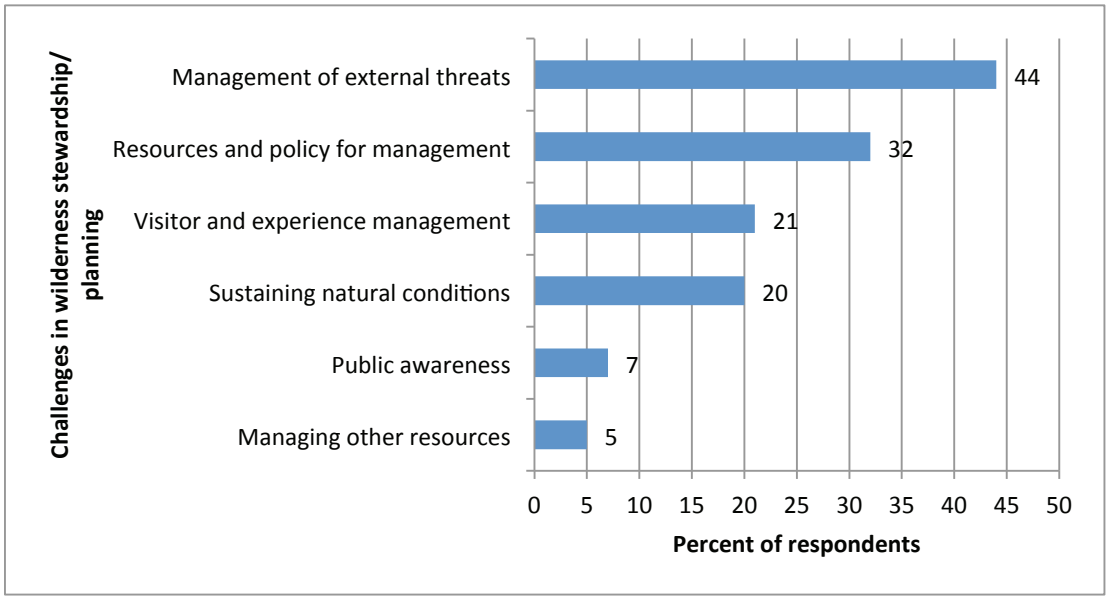

Figure A5.1—Major challenges in wilderness stewardship or planning

Table A5.1—Major challenges

Categorization of challenges (Figures A5.1, A5.1-1 – A5.1-5)	Number	Percent
a. Management of external threats	594	44
- Encroachment	139	
- Wildfire	130	
- Climate change/adaptation to climate change	126	
- Controlling of invasive/endangered species	93	
- Maintaining wilderness characters/impact on wilderness resources (due to fire, visitors, weather cycle, etc.)	60	
- Pressure to use wilderness for different reasons (e.g., commercial activities)	24	
- Grazing management	11	
- Pollution	11	
b. Management of resources and policy	431	32
- Staff/budget/funding	253	
- Law enforcement	72	
- Agency policy and priority	45	
- Improving legal and physical access	24	
- Use of science in planning and management	15	
- Managing conflicting objectives (agency level)	12	
- Ground level knowledge	10	
c. Visitor and experience management	287	21
- Visitor management	130	
- Maintaining wilderness values	93	
- Protecting visitors' experiences and wilderness characters	45	
- Dealing with new technology (used by visitors)	19	
d. Sustaining natural conditions	274	20
- Restoring of natural conditions (in face of climate change, wildfire, encroachment, etc.)	115	
- Natural resource management (water, wildlife, etc.)	83	
- Stewardship responsibility	39	
- Monitoring wilderness characters	37	
e. Public awareness	91	7
- Gaining public supports & public education and awareness	91	
f. Managing other resources	67	5
- Trail maintenance	51	
- Managing or maintaining cultural resources	16	
Total frequencies 1744		
Total responses 1355		

Note: Some responses fit into multiple categories. Hence, total frequencies are greater than total respondents and percentage total is greater than 100.

Management of external threats, which included all references to encroachment, wildfire, controlling of invasive species, climate change, etc., contained the largest number of specific challenges. This was followed by items coded as resources and policy for management, which included references to staff/budget/funding, law enforcement, agency policy and priority, etc., visitor and experience management, which included visitor management, maintaining wilderness values, protecting visitors' experiences and wilderness character, etc., sustaining natural condition (restoring natural conditions, natural resource management, stewardship responsibility), and public awareness (gaining public support). All other challenges listed were coded as managing other resources, such as trails, cultural resource, etc.

Below, each challenges category is explained with examples of items coded into that category of response:

a. Management of External Threats: External threats to wilderness come from different sources outside the wilderness and management of these threats could be a challenge in wilderness stewardship or planning in the next 20 years.

Encroachment of wilderness resources (from neighboring land owners, motorists, and urbanization) was the most common external threat listed in this category; followed by wildfire; climate change; controlling invasive species or protecting endangered species; managing wilderness character in the face of climate change, wildfire, excessive visitation, and weather cycles; pressure to use wilderness for different reasons (e.g., commercial activities); grazing management; and pollution (Figure A5.1-1).

b. Resources and Policy for Management: Many respondents indicated that resources and policies are a major category of challenges in wilderness stewardship or planning for the next 20 years.

Management of staff/budget/funding to protect wilderness and to conduct research was by far the most frequent set of items in this category. Law enforcement, managing conflicting policies, improving legal and physical access to maintain wilderness character, use of science in planning and management, and improving ground level knowledge are the other miscellaneous resources and policy management related challenges listed by respondents (Figure A5.1-2).

c. Visitor and Experience Management: Visitor management issues dominated this category of challenges listed by managers. Maintaining wilderness values among the public, protecting visitors' experiences and wilderness characteristics, and dealing with new technology used by visitors are also seen as challenges over the next 20 years (Figure A5.1-3).

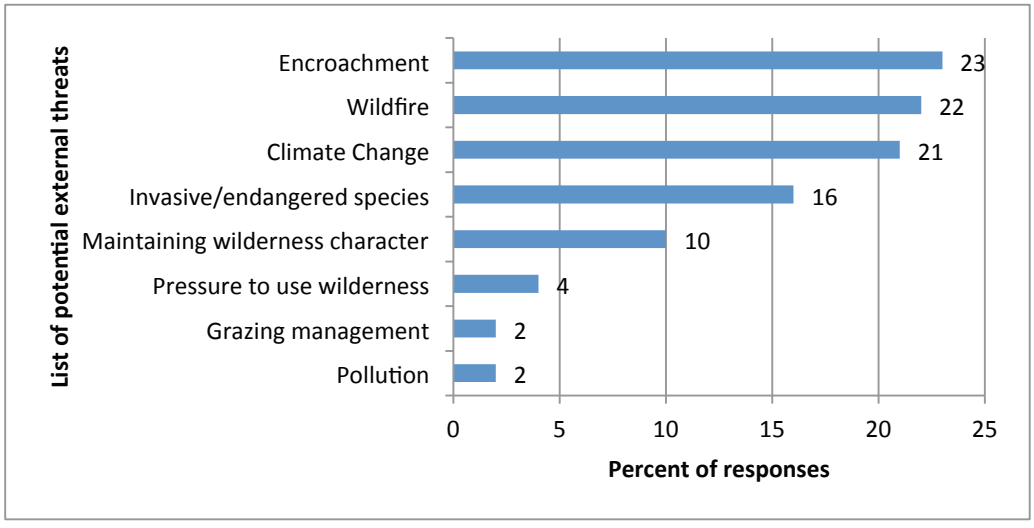

Figure A5.1-1—Potential sources of external threats

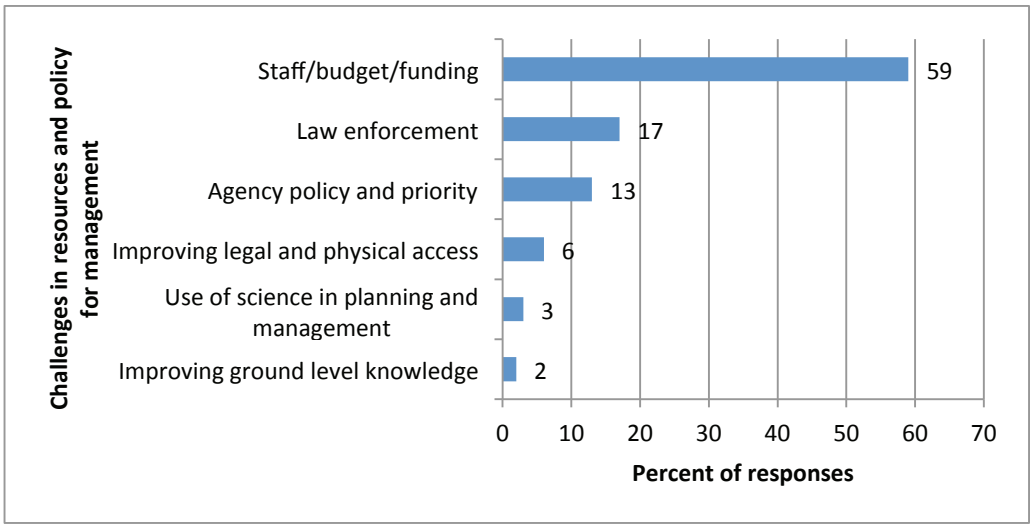

Figure A5.1-2—Challenges in resources and policy for management

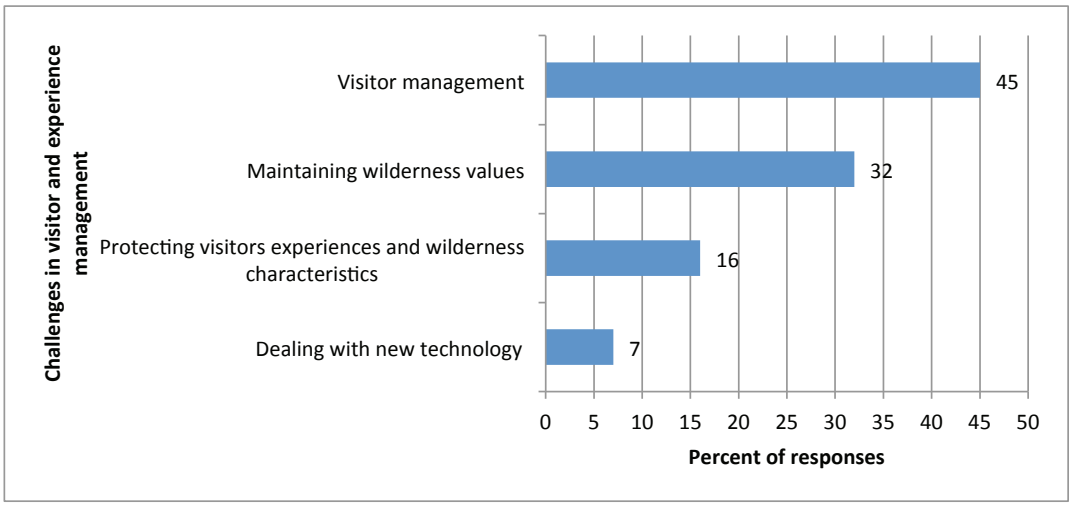

Figure A5.1-3—Challenges in visitors and experience management

d. Sustaining Natural Conditions: Restoring natural condition in the face of climate change uncertainties, wildfire, encroachment; management of natural resources (e.g., water, wildlife, etc.); the changing role in stewardship responsibility (gradually shifting stewardship responsibility toward the public); and monitoring wilderness characteristics are the major categories of challenges listed by managers to sustain natural condition over the next 20 years (Figure A5.1-4).

e. Public Awareness: A small proportion of respondents specifically mentioned gaining public support and maintaining public education and awareness as a major challenge over the next 20 years (Figure A5.1)

f. Managing Other Resources: Most of the other resources challenges were about trail maintenance and managing or maintaining cultural resources over the next 20 years (Figure A5.1-5).

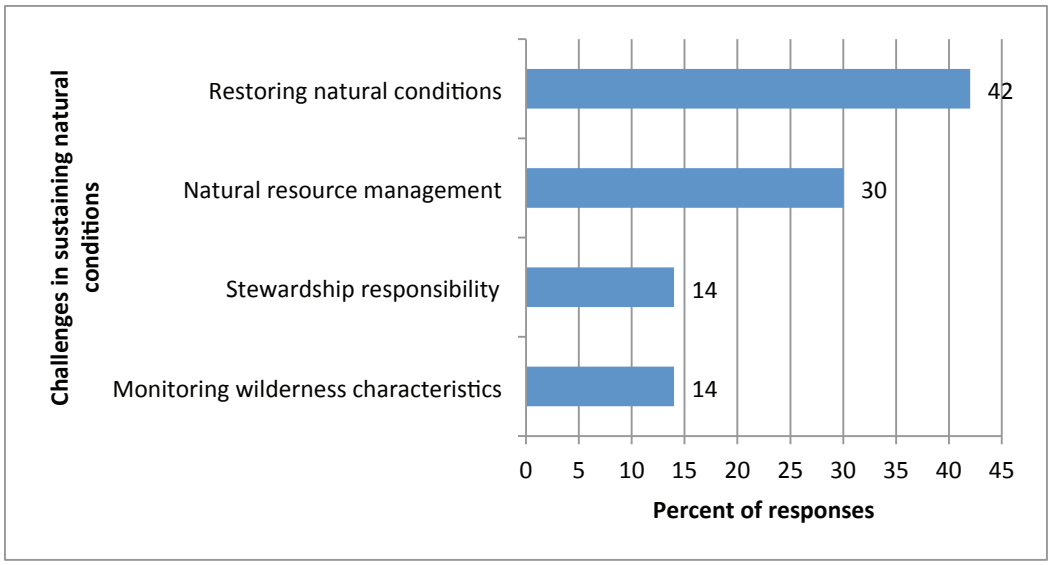

Figure A5.1-4—Challenges in sustaining natural conditions

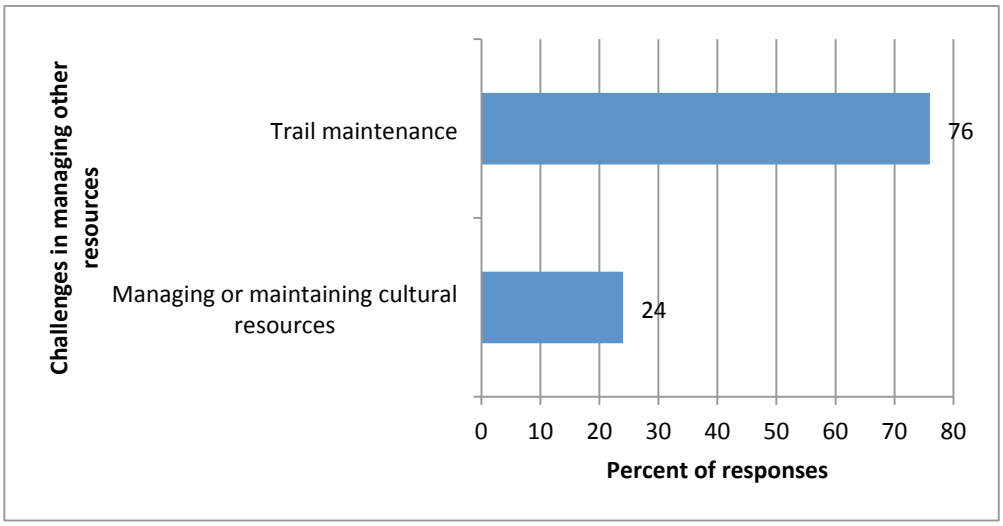

Figure A5.1-5—Challenges in managing other resources

A5.2 Two most important problems

Respondents were asked to describe the two most important problems managers and agencies need to collectively address in strategic planning to protect wilderness qualities in the coming 20 years. A total of 632 responses were collected from 368 responding managers and were grouped into five broad categories, shown in Figure A5.2. Appendix 5 (Table A5.2) provides a more detailed listing of the types of items included in these categories and/or wording provided by respondents.

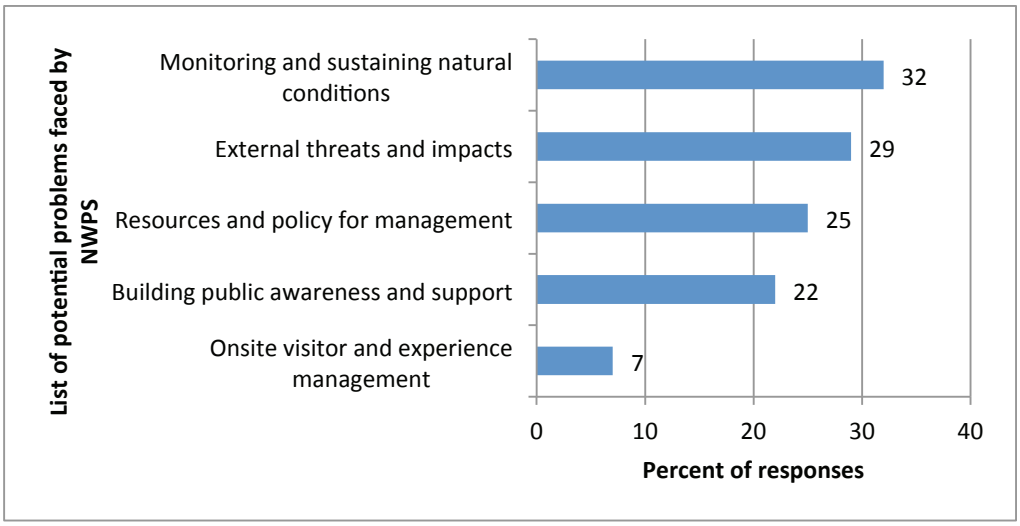

Figure A5.2—Potential problems faced by NWPS

Table A5.2—Two most important problems in NWPS

Categorization of problems in NWPS (Figures A5.5, A5.5-1 – A5.5-5)	Number	Percent
a. Monitoring and sustaining natural conditions	201	32
- Resource management (wilderness resource management in face of climate change, wildfire, invasive species, budget and staff cuts, population growth and urbanization or encroachment, etc.)	60	
- Protecting wilderness character (in face of climate change, budget/staff cuts)	34	
- Fire management	23	
- Scientific monitoring wilderness character (in face of budget/staff cuts)	19	
- Air and water quality maintaining and monitoring	18	
- Wildlife management (in face of climate change, increased visitation, improper grazing)	17	
- Maintaining ecological function/ecological restoration	13	
- Habitat conservation and preservation (endangered species, native species)	9	
- Protect the integrity of the wilderness act	8	
b. External threats and impacts	181	29
- Climate change and wilderness resources (e.g., invasive species, water, air)	61	
- Impact of human and nonhuman factors on Wilderness (human impact on the landscape, population growth, energy development, climate change)	30	
- Encroachment (population growth, urbanization, technological changes, motorized access)	27	
- Invasive species and weed controls	24	
- Adjacent land use	10	
- Disconnection to the natural world	9	
- Controlling illegal activities (e.g., marijuana growing operation, woodcutting, illegal motorized incursion, etc.)	7	
- Commercial activities management (commercial filming, commercial fishing, etc.)	7	
- Lack of political supports to wilderness	6	

(continued)

Table A5.2—Continued.

Categorization of problems in NWPS (Figures A5.5, A5.5-1 – A5.5-5)	Number	Percent
c. Management Resources and Policy	155	25
- Protecting wilderness values (upper level management understanding wilderness values, better communication with different groups - public, top management)	28	
- Funding/budget/resources	64	
- Staff/workforce	45	
- Use of science in decision making	7	
- Train managers (skill development, management trainings to older managers)	11	
d. Building public awareness and supports	137	22
- Increasing public awareness (on wilderness and wilderness stewardship, communicating the value of wilderness to the public, gaining public supports on wilderness stewardship)	85	
- Educating public (importance of wilderness)	18	
- Engaging urban population to wilderness	12	
- Engaging public on wilderness stewardship and management	8	
- Developing partnership (with people, volunteers)	8	
- Connecting youth to wilderness	6	
e. On-Site visitor and experience management	46	7
- Visitor management (increase in visitor use, conflict management)	25	
- Increased visitation in wilderness	11	
- Increased visitor access to wilderness	10	
Total frequencies	720	
Total responses	632	

Note: Some responses fit into multiple categories. Hence, total frequencies are greater than total respondents and percentage total is greater than 100.

The category of **monitoring and sustaining natural conditions** included a broad category of wilderness resource management (in the face of such threats as climate change, wildfire, invasive species, budget and staff cuts, population growth, urbanization, and encroachment), protecting wilderness character (in the face of climate change, budget/staff cuts), fire management, the need for more scientific monitoring of wilderness character, and maintaining/monitoring air and water quality (Figure A5.2-1). Lesser topics included those related to wildlife management, restoration, habitat conservation and protecting the integrity of the Wilderness Act.

The importance of focus on **external threats and impacts** for strategic planning was largely focused on climate change issues and protection of wilderness resources (e.g., invasive species, water, air, etc.), impacts (human impact on landscape, population growth, energy development, and climate change), encroachment (population growth, urbanization, technological change and motorized access), invasive species and weed control, and adjacent land-uses (Figure A5.2-2). Managers also listed a range of specific issues affecting them, including problems that are illegal activities, commercial exceptions, and lack of political support.

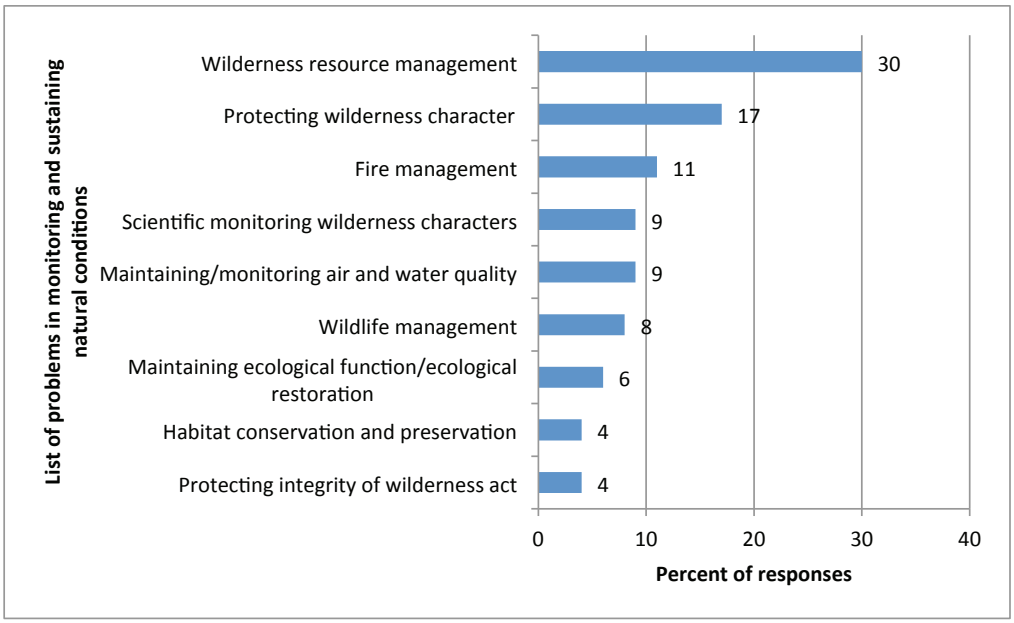

Figure A5.2-1—Problems in monitoring and sustaining natural conditions

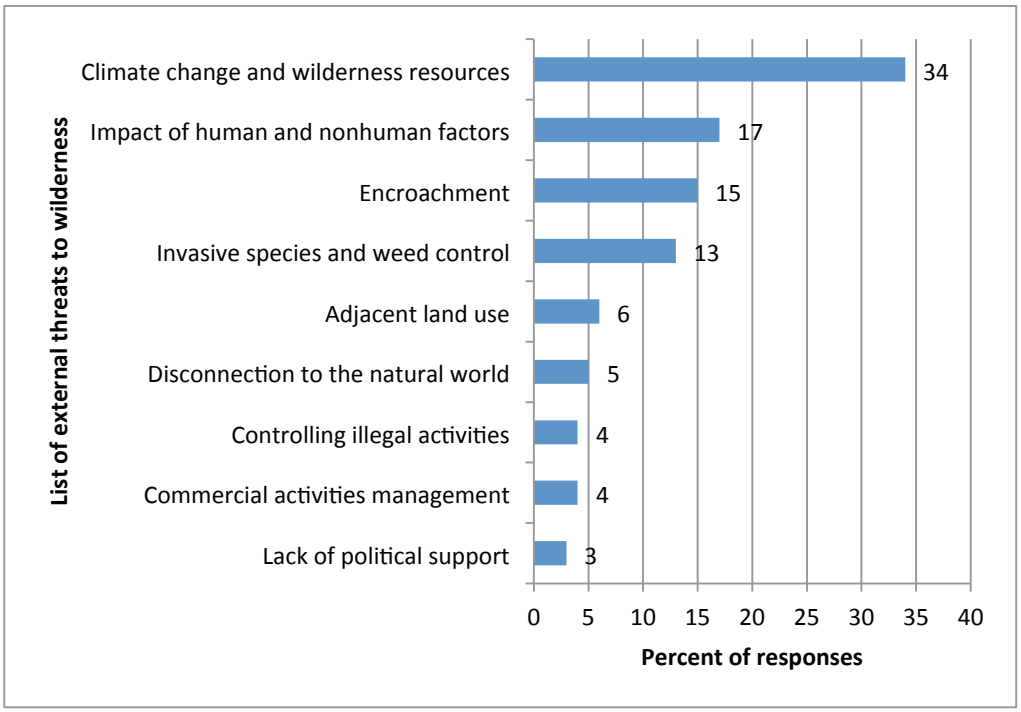

Figure A5.2-2—External threats to wilderness

Managers listed many important strategic planning issues that were categorized into **resources and policy for management**. These included protecting wilderness values (improving understanding of wilderness values among upper level management, better communicating wilderness values to different publics and top level management), funding, budgets, staffing, use of science in decision making, and training managers (on using new technology) (Figure A5.2-3).

Increasing public awareness (of wilderness and wilderness stewardship, the values of wilderness, and gaining public support), engaging urban populations to wilderness, and developing partnerships (with publics, volunteers, etc.) were also combined into a category interpreted as **building public awareness and support** (Figure A5.2-4). Those suggestions about the need to address how to connect youth to wilderness were also included in this category.

Visitor use management (in the face of increased use and user conflicts) and threats to wilderness resources from increased visitation and visitor access were coded into the broad category of **onsite visitor and experience management** (Figure A5.2-5).

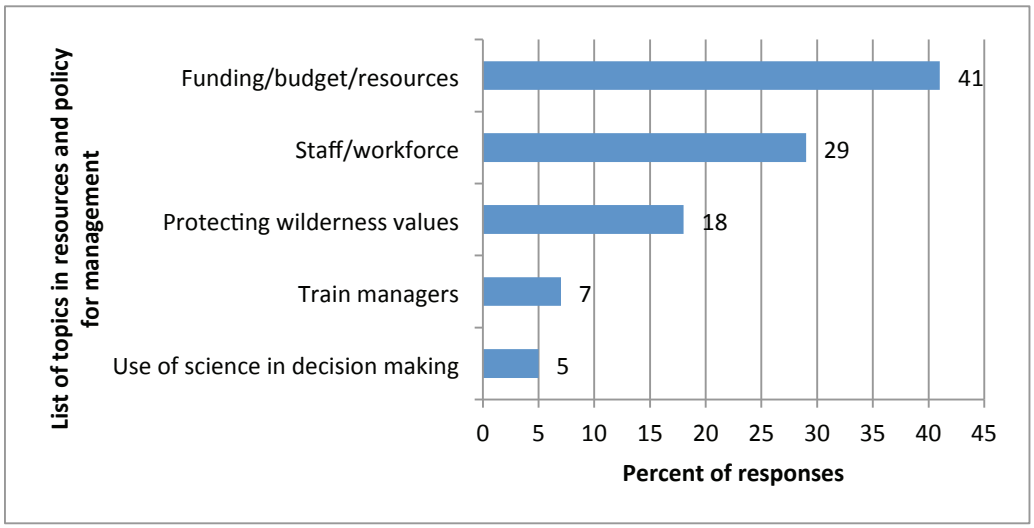

Figure A5.2-3—Problems in resources and policy for management

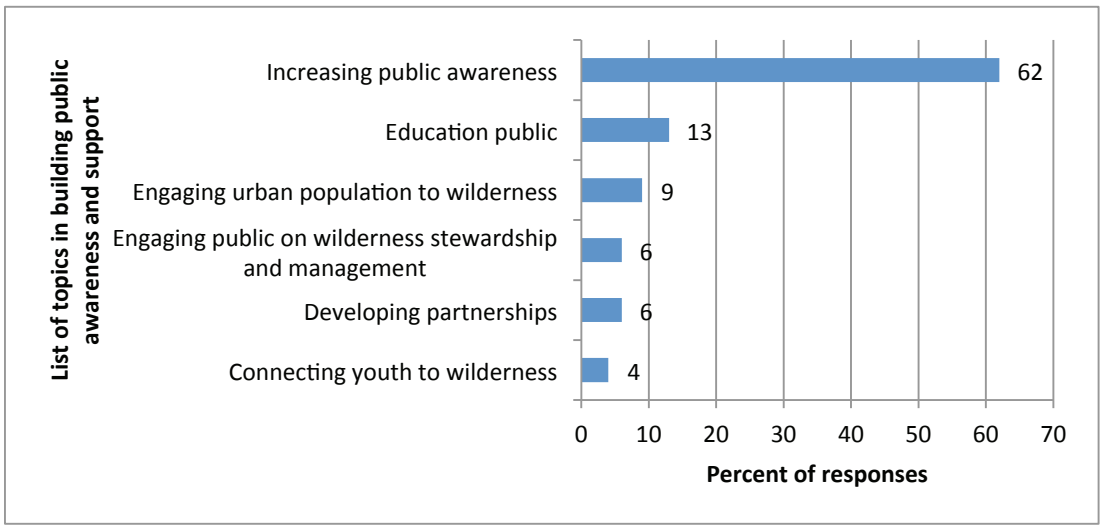

Figure A5.2-4—Problems in building pub lic awareness and support

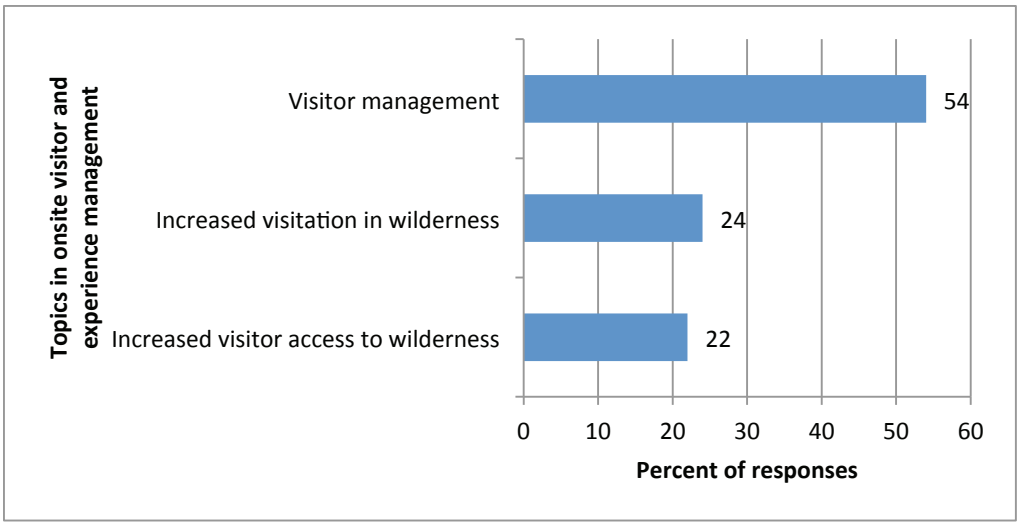

Figure A5.2-5—Problems in onsite visitor and experience management

A5.3 Specific training needs

The WMS asked respondents to indicate the top 5 specific training needs for wilderness managers. A total of 1272 responses were received from 368 respondent managers. The training needs suggested by managers have been grouped into six broad categories, as shown below in Figure A5.3.

A general category labeled wilderness resource management included the greatest number of suggested training topics; followed by skills, technology and analytics; threats management; building partnership and education; law, regulation and policy; and wilderness recreation management (Figure A5.3). Please see Table A5.3 for details on these categories of training needs, as described below.

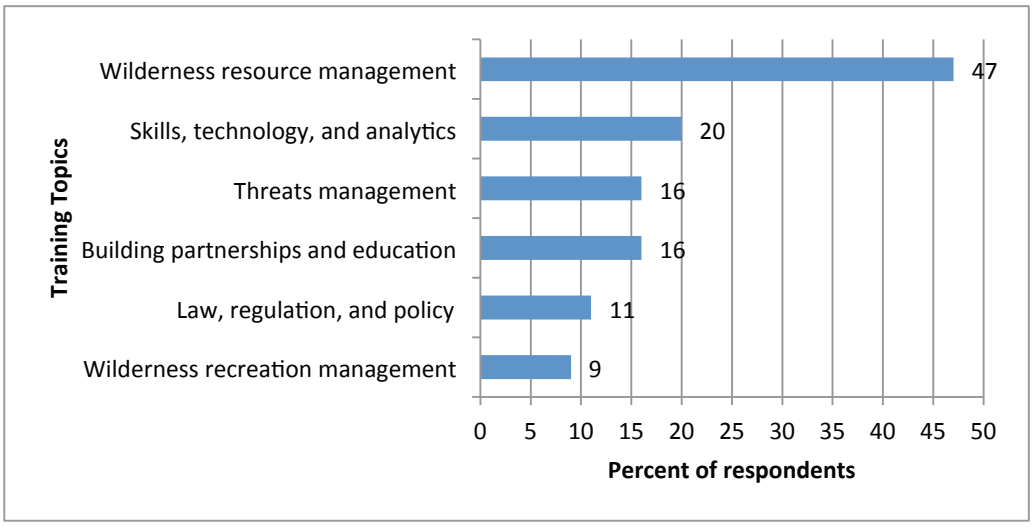

Figure A5.3—Training needs for wilderness managers

Table A5.3—Areas of specific training needs

Categorization of need for training (Figures A5.3, A5.3-1 – A5.3-6)	Number	Percent
a. Wilderness resource management	601	47
- Resource management (economic and non-economic resources including adjustment with budget/staff cuts)	189	
- Resource use (natural and non-natural - resource baseline monitoring and management, dealing with growing resource extraction pressure, visual resource management)	116	
- Wilderness monitoring	56	
- Maintaining/communicating wilderness character/values	54	
- Fire management	47	
- Sanitation and waste management	34	
- Conflicts management (conflict with other resource management, e.g., grazing)	27	
- Protection (landscape, species)	26	
- Wildlife management	18	
- Wilderness stewardship	18	
- Assessment and monitoring water, air quality	16	
b. Skills, technology and analytics	260	20
- Skills (field, traditional skills, mass communication)	61	
- Incorporating science into decision making	47	
- Information technology	45	
- Emerging technology and use	42	
- Minimum requirement analysis/decision guide	35	
- Primitive or traditional skills	16	
- GPS/GIS	9	
- Funding opportunities and grant writing	5	
c. Threat management	199	16
- Responding to climate change influences	86	
- Managing invasive species	81	
- Soundscape protection	18	
- Restoration wilderness (e.g., weed control)	14	
d. Building partnerships and education	198	
- Building partnership (inside and outside constituencies for wilderness)	82	
- Public education and outreach/communication with different public groups	72	
- Communicating wilderness values (with different stockholders)	21	
- Consultation, partnership, communication with tribal groups	18	
- Responding to political pressure	5	
e. Law, regulation and policy	143	11
- Wilderness law and regulation	40	
- Wilderness policy	34	
- Wilderness planning	34	
- Improve understanding (wilderness acts, policies)	22	
- Legal and policy context (including ANILCA wilderness)	13	
f. Wilderness recreation management	112	9
- Visitor management training (excessive visitation, capacity issues relative to permits and fees)	52	
- Commercial use of wilderness (commercial filming, managing commercial services to preserve wilderness characters, need assessment for commercial use)	29	
- Search and rescue and safe access to people with disabilities	10	
- Controlling of motorized activities	8	
- Understanding carrying capacity training	7	
- Communicating and transferring wilderness ethnics to visitors (e.g., leave no trace)	6	
Total frequencies	1513	
Total responses	1272	

Note: Some responses fit into multiple categories. Hence, total frequencies are greater than total respondents and percentage total is greater than 100.

a. Wilderness Resource Management: The top five training needs in the very large category of wilderness resource management are human resource management (economic and non-economic resources including adjustment with staff/budget cuts), resource use (natural and non-natural – resource baseline monitoring and management, dealing with growing resource extraction pressure, visual resource management), wilderness monitoring, maintaining/communicating wilderness values/characteristics, and fire management (Figure A5.3-1).

b. Skills, Technology and Analytics: With much less items coded into this category, skill development (field, traditional/primitive skills, mass communication, etc.), incorporating science into decision making, information technology, emerging technology and use, and minimum requirement analysis/decision guides are all one general type of suggested training needs (Figure A5.3-2).

c. Threat Management: Managers suggested the need for more training in threats management including managing/responding to threats resulting from climate change, managing invasive species, soundscape protection, and restoration (e.g., weed control) (Figure A5.3-3).

d. Building Partnerships and Education: Managers identified training needs related to building partnerships (inside and outside constituencies for wilderness); in public education and outreach to communicate wilderness values (to different groups); to do consultation, partnership and communication with tribal groups; and in responding to political pressure (Figure A5.3-4).

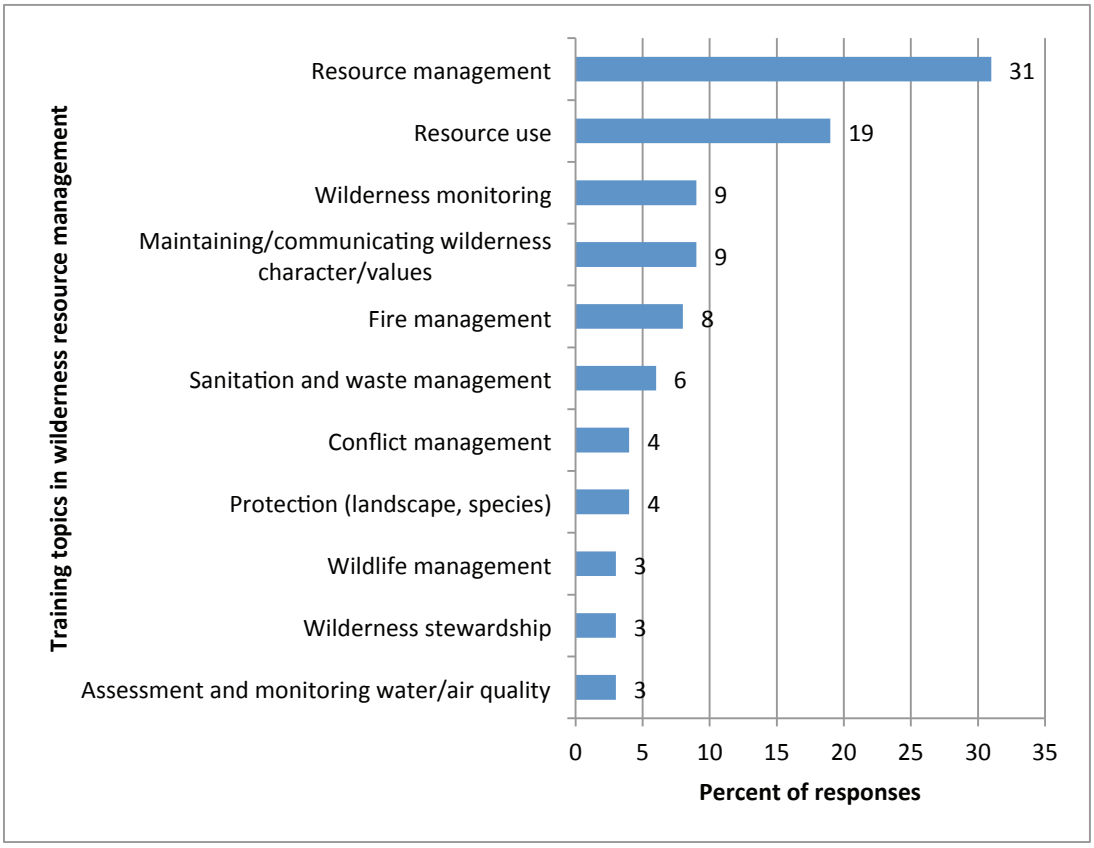

Figure A5.3-1—Training needs in wilderness resource management

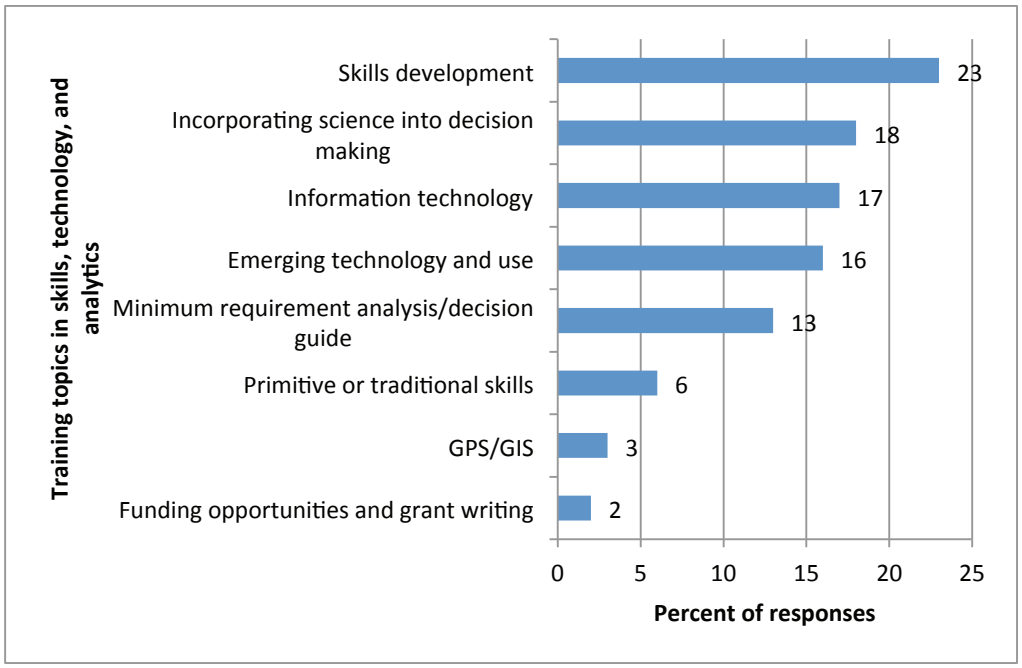

Figure A5.3-2—Training needs in skill, technology, and analytics

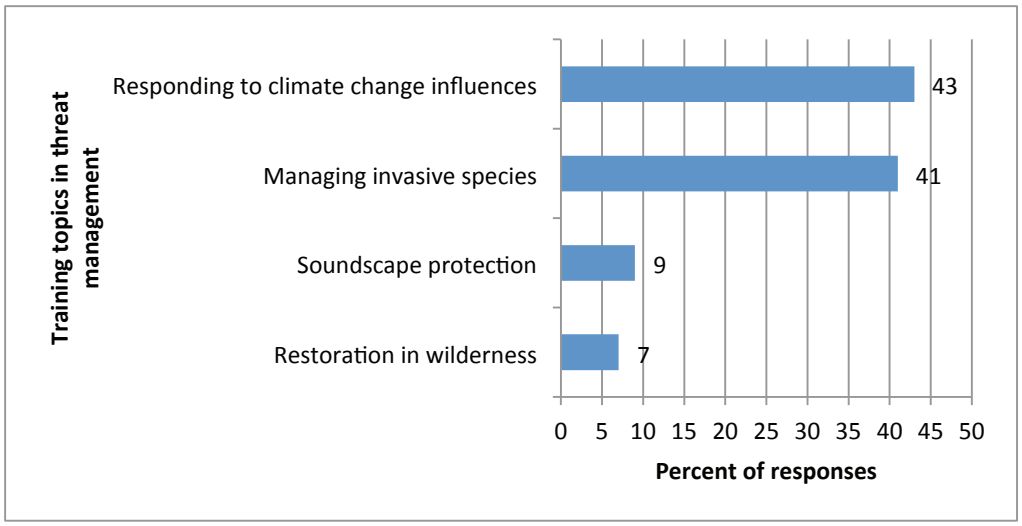

Figure A5.3-3—Training needs in threat management

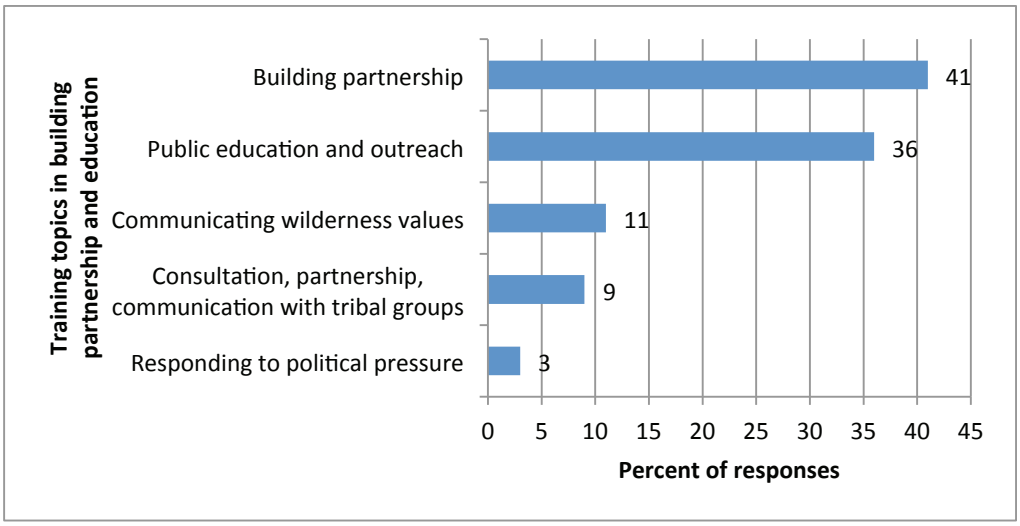

Figure A5.3-4—Training needs in building partnership and education

e. Law, Regulation and Policy: Areas for training needs in wilderness law, regulation, and policy include trainings to improve knowledge and understanding of various laws and regulations in wilderness, wilderness policy, wilderness planning, wilderness acts, and legal and policy context (including ANILCA wilderness) (Figure A5.3-5).

f. Wilderness Recreation Management: Some specific training topics in wilderness recreation management emerged, including general visitor management issues, like capacity issues relative to permits and fees, visitor conflicts and excessive visitation management. Managers also indicated interest in training about commercial uses of wilderness (commercial filming, managing commercial services and preserve wilderness characters, need assessment for commercial use), search and rescue operations and providing safe access to people with disabilities, controlling motorized activities, carrying capacity training, and communicating wilderness ethics to visitors (e.g., leave no trace) (Figure A5.3-6).

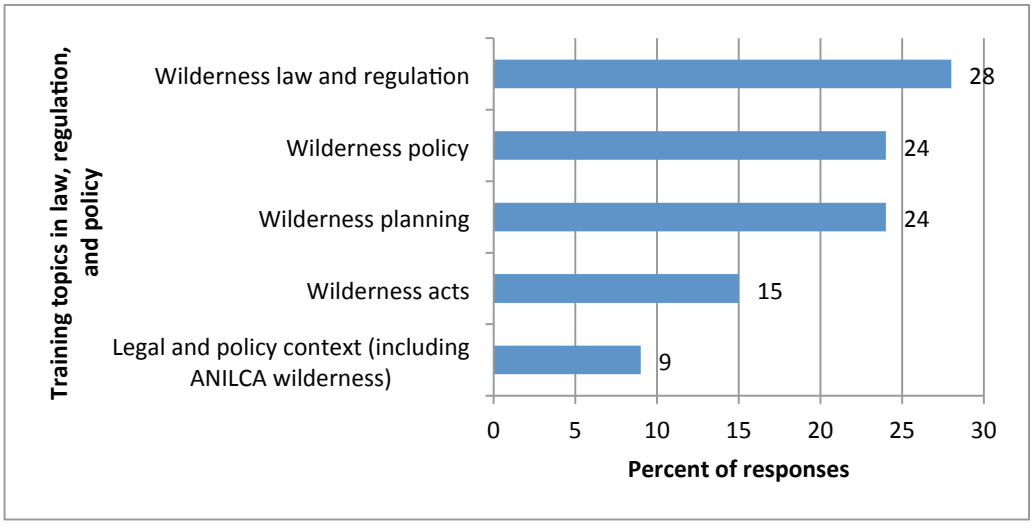

Figure A5.3-5—Training needs in wilderness law and regulation

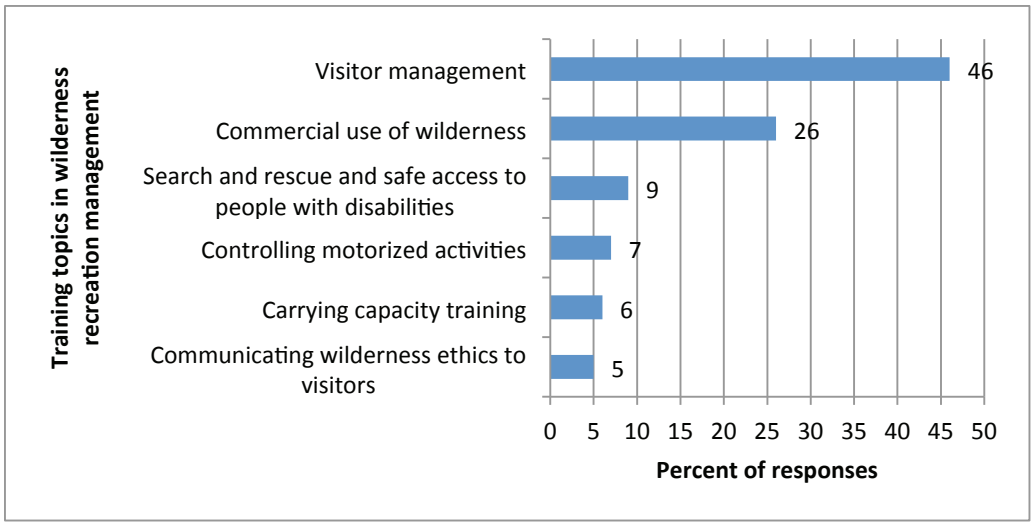

Figure A5.3-6—Training needs in wilderness recreation management

A5.4 Five specific research needs

Respondents were asked to identify their top five research needs for resource and visitor management in wilderness areas. A total of 1173 responses were collected from 368 respondent managers. These responses have been grouped into four very general categories, shown below in Figure A5.4. In the broadest sense, these research needs were described as threats and impact management, wilderness resource management, building partnerships and education, and wilderness recreation management. Please see Table A5.4 for details about these categories.

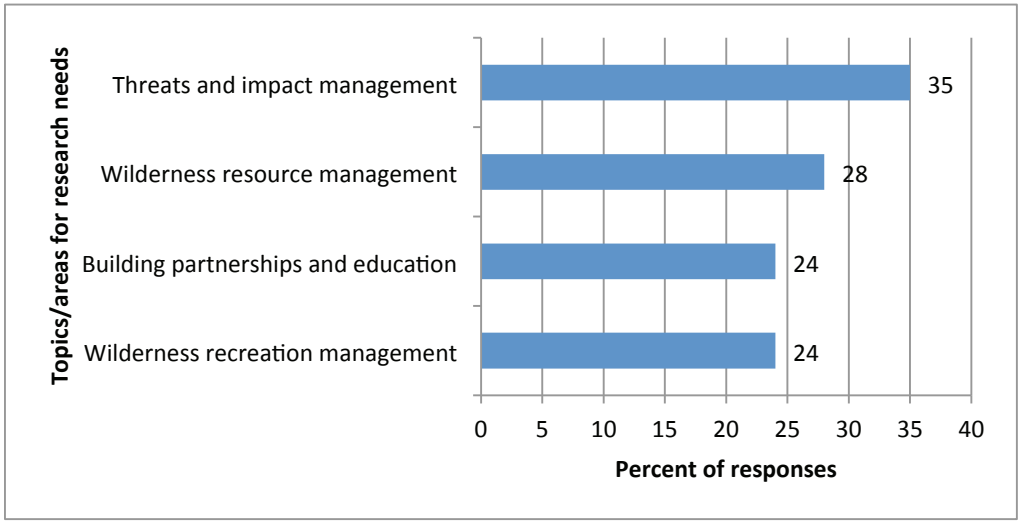

Figure A5.4—Research needs in resource and visitor management

Table A5.4—Areas of specific research needs

Categorization to research need (Figures A5.4, A5.4-1 – A5.4-4)	Number	Percent
a. Threats and impact management	412	35
- Impact assessment (impact on wilderness resources and solitude due to human and nonhuman/natural factors)	109	
- Invasive species (survey, impact assessment, etc.)	104	
- Climate change impacts on wilderness characters	54	
- Soundscape (monitoring soundscape, preserving soundscapes and ecosystem integrity)	33	
- Land use, land management	25	
- Managing wilderness character (in face of technological changes, internal/external threats)	23	
- Ecosystem fragmentation and ecosystem health	20	
- Urban encroachment	15	
- Weed management (e.g., controls)	11	
- Impacts from improper grazing (livestock, wild horse, and wildlife)	10	
- Impact of commercial activities (including visitor attitude toward commercial services in wilderness)	8	
b. Wilderness resource management	333	28
- Technological changes (emerging technology to monitor wilderness, emerging technology visitor can use to gain access to wilderness areas, impact on wilderness character, etc.)	84	
- Incorporating scientific information into decision-making	52	
- Fire (impact, fire history, post fire effects, and natural fire regime)	42	
- Water resources (quality/quantity assessment and monitoring)	32	
- Wilderness restoration (ecosystem, habitat, etc.)	28	
- Wildlife management	22	
- Resource management (natural resources, cultural/heritage to preserve wilderness character)	20	
- Inventories of wilderness resources (e.g., species, flora and fauna, etc.)	15	
- Ecological changes (e.g., monitoring)	12	
- Native species (e.g., survey, stock, impact assessment)	9	
- Landscape archaeological research	9	
- Island ecology	8	
c. Building partnerships and education	287	24
- Human resource development	80	
- Communicating wilderness values (with different public groups)	54	
- Partnership building (with different groups - locals/government officials, etc.)	39	
- Understanding wilderness values (public attitude, ecological values, benefit of wilderness)	29	
- Understanding public needs - to get wilderness experience, etc.	27	
- Tribal access and consultations	21	
- Attitude toward wilderness (public and employees)	18	
- Wilderness benefits (intangible benefits of wilderness)	11	
- Social values (social values of wilderness)	8	
d. Wilderness recreation management	285	24
- Visitor management (overuse of wilderness, user group conflict, visitor use monitoring, use of new technology to monitor wilderness/in face of new technology used by visitors)	158	
- Sanitation and waste management	40	
- Conflict management (visitor to visitor conflicts, human-wildlife conflicts)	31	
- Wilderness character and visitor impacts (due to excessive use of wilderness resources)	23	
- Capacity analysis (carrying capacity of wilderness areas/resources)	15	
- User charges (fees to charge)	12	
- Visitor demographics (user group demographics)	6	
Total frequencies	1317	
Total responses	1173	

Note: Some responses fit into multiple categories. Hence, total frequencies are greater than total respondents and percentage total is greater than 100.

a. Threats and Impact Management: Impact assessments (gauging the impact on wilderness resources and solitude from human and nonhuman/natural forces), invasive species surveys, climate change impact on wilderness characteristics, soundscape (monitoring soundscapes, preserving soundscapes and ecosystem integrity), and land-use and land management impacts are the top five research needs identified by respondent and placed in this general category (Figure A5.4-1).

b. Wilderness Resource Management: Technological changes (emerging technology to monitor wilderness, emerging technology visitors can use to gain access to wilderness areas, impact on wilderness characteristics), incorporating scientific information into decision-making, fire (impact, fire history, post-fire effects, and natural fire regime), water resources (quality/quantity assessment and monitoring), and wilderness restoration (ecosystem, habitat) research questions were all gathered into wilderness resource management (Figure A5.4-2).

c. Building Partnerships and Education: Science to support human resource development, communicating wilderness values (with different public groups), partnership building (with different groups – locals/government officials), understanding wilderness values, and understanding public needs (to get wilderness experience) are one large category of research needs identified (Figure A5.4-3).

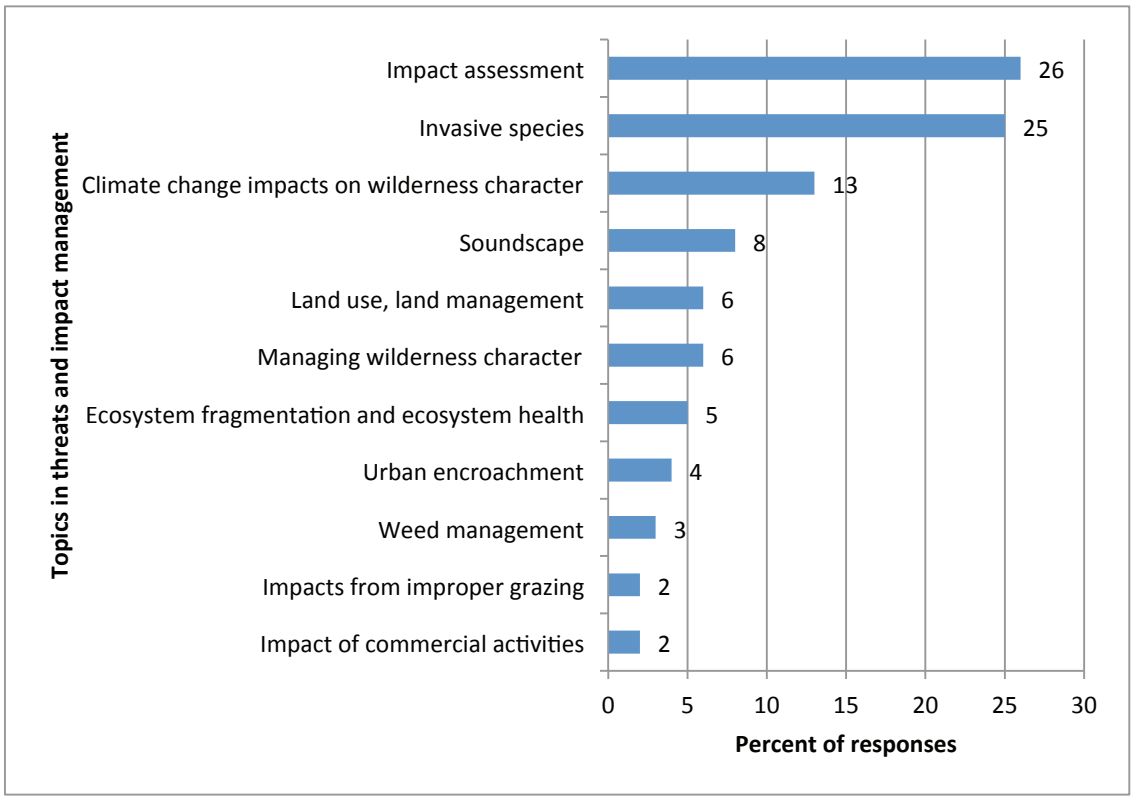

Figure A5.4-1—Research needs in threat and impact management

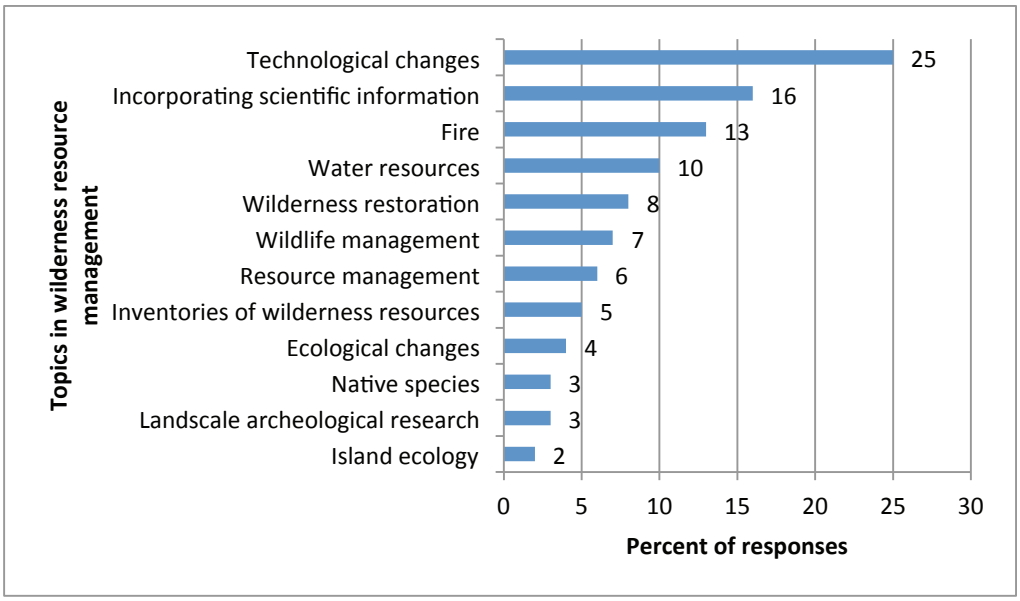

Figure A5.4-2—Research needs in wilderness resource management

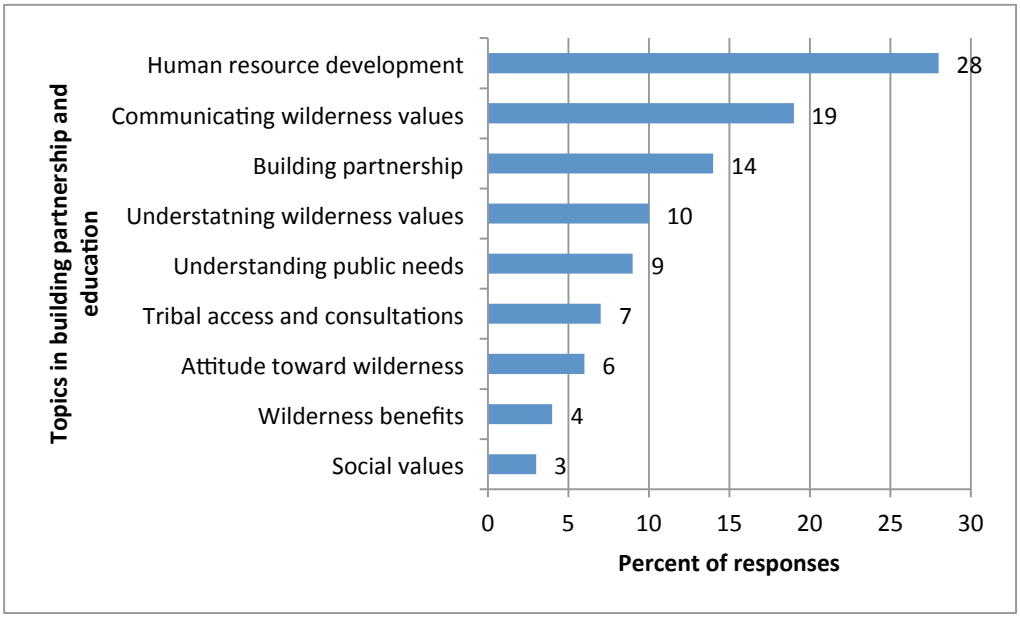

Figure A5.4-3—Research needs in building partnership and education

d. Wilderness Recreation Management: The long-standing wilderness research topics of visitor management, including issues of overuse of wilderness resources, user group conflicts, visitor use monitoring, monitoring wilderness using new technology/in face of new technology used by visitors, sanitation and waste management, other conflict management (e.g., human-wildlife conflicts), research about wilderness character and visitor impacts (due to excessive use of wilderness resources), and capacity analysis (carrying capacity of wilderness areas/resources) remain to have needs expressed by managers for information to guide decisions (Figure A5.4-4).

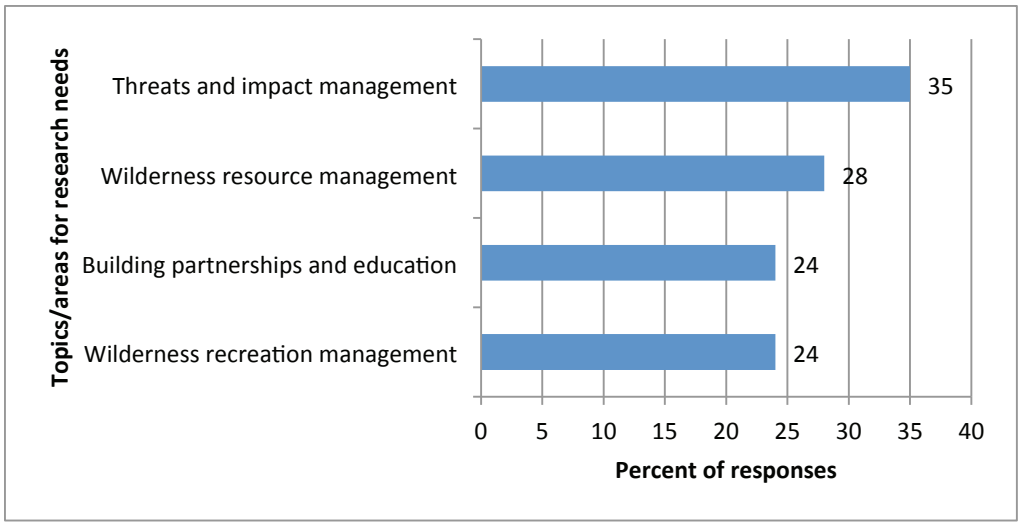

Figure A5.4-4—Research needs in wilderness recreation management

A5.5 Other threats (open ended responses)

Those taking the survey were also provided a single-line opportunity to describe any "other" threats they perceive to exist to wilderness over the next 20 years. Only 37 managers "wrote in" items and these responses fall into three broad categories, shown in Figure A5.5.

Managers mostly listed threats that result from human use of wilderness resources (e.g., encroachment, energy development, illegal activities, overuse of wilderness resources, etc.), lack of support for wilderness and wilderness management (lack of budget or funding, lack of political support, influence of interest groups, etc.), and natural threats (climate change, availability of water, etc.). Please see Table A5.5 for additional details about these categories.

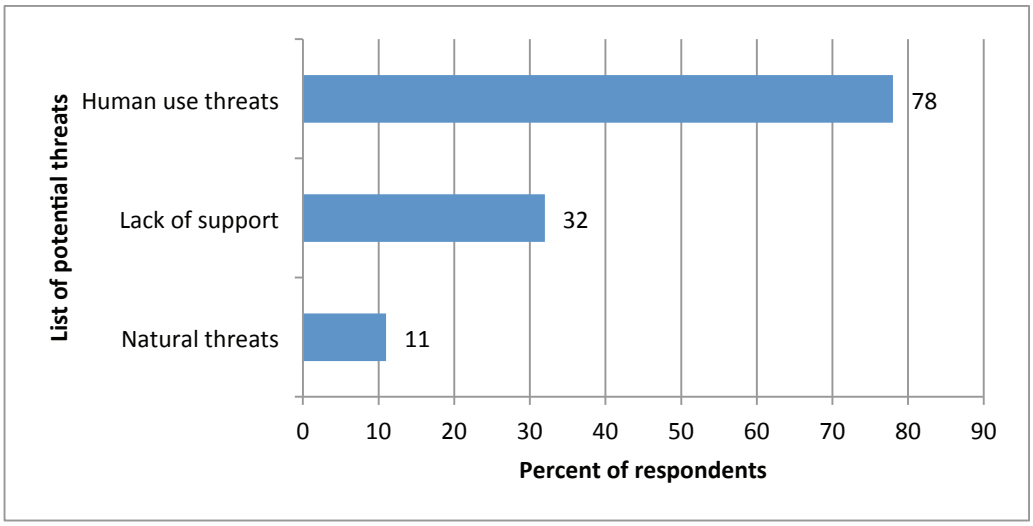

Figure A5.5—Potential threats to wilderness resources or visitor experience (open-ended responses)

Table A5.5—Other potential threats

Categorization of other potential threats (Figure A5.2)	Number	Percent
a. Human use threats	29	78
- Management related - over development of ranger stations in NPS wilderness areas, lack resource on ground, conflicting goals, lack of management supports, management intervention, lack of coordination among agencies, commercialization of wilderness areas	7	
- Encroachment - influence of human on wilderness resources	6	
- Illegal activities - marijuana plantations, trespassing, illegal border traffic	6	
- Wildlife management - unmanaged wild horse herds, non-native fish stocking	5	
- Overuse of wilderness resources - commercial fishing pressure, overuse of wilderness areas	3	
- Energy development - power line construction	1	
- Search and rescue operation	1	
b. Lack of supports	12	32
- Political supports - lack of congressional supports/ high level supports	4	
- Financial resources - lack of funding/budget	3	
- Maintaining wilderness character - decreasing value placed on wilderness	3	
- Influence of interest groups - lobbying of interest group and their influences of policy	2	
c. Natural Threats	4	11
- Climate change	2	
- Availability of water	2	
d. Survey related	2	
- Survey related - omission of some wilderness areas in the survey, wording of some questions	2	5
Total frequencies	47	
Total responses	37	

Note: Some responses fit into multiple categories. Hence, total frequencies are greater than total respondents and percentage total is greater than 100.

A5.6 Final comments

Respondents were provided an opportunity to provide any final comments about the survey or the strategic planning process. A total of 82 managers provided responses to this question, which fall into six broad categories, as shown below in Figure A5.6. Please see Table A5.6 for details about these categories.

Forty-four percent of comments are wilderness management related (e.g., connection to wilderness is no longer a necessary goal, continued emphasis from the Chief's Office with clear expectations is critical, better priority to get more budget, staffs, need to designate more lands, need for region specific survey, cohesive and coordinated approach to manage wilderness by 4 agencies is important, need to place priority on fire and resources, outreach to youth, utilize partnership to manage wilderness, etc.). Likewise, thirty-seven percent of the comments are survey related and respondents want to use survey findings in the formulation of wilderness policy (e.g., wording of some survey questions, some questions are not relevant to all respondents, appreciation for the survey, need to cover more ground level reality, etc.). The rest of the comments are personal experiences and appreciation for conducting the survey, budgets/staff/resource related, comments about wilderness values, public support, and appreciation (gaining public support – better communication with the public and with agencies, educating the public, conflict in priority – higher priority at the national level, but no priority at the field level, etc.), agency policy and priority (e.g., conflicting priority – higher priority at the national level, but no priority at the field level, need for wildfire emergency action plan, etc.).

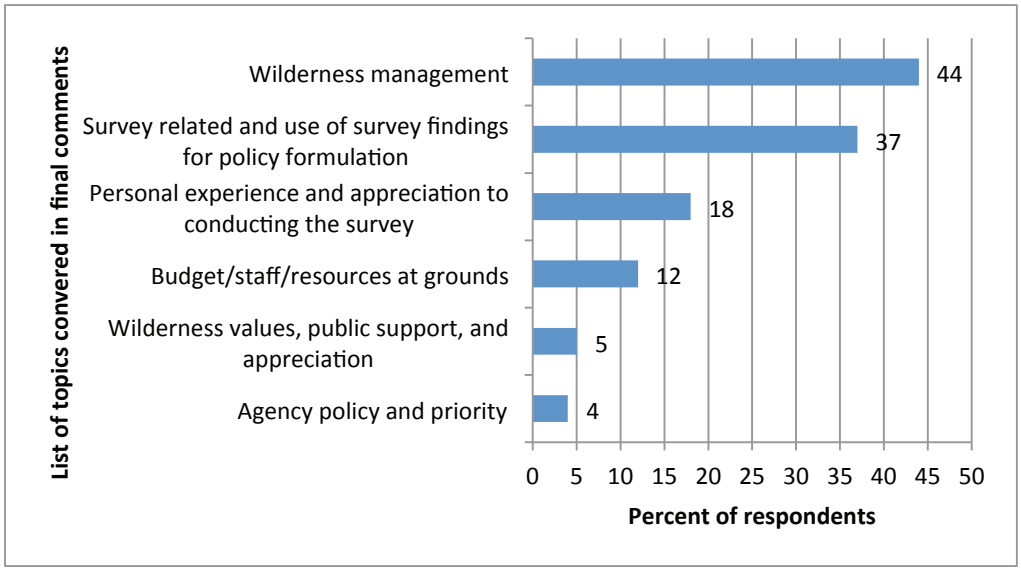

Figure A5.6—Categories of final comments

Table A5.6—Final comments

Categorization of final comments (Figure A5.6)	Number	Percent
a. Wilderness management	36	44
- Management related (connection to wilderness is no longer a necessary goal, continued emphasis from the Chief's Office with clear expectations is critical, better priority to get more budget, staffs, need to designate more lands, need for region specific survey, cohesive and coordinated approach to manage wilderness by the 4 agencies is important, place priority on fire and resources, outreach to youth, utilize partnership to manage wilderness, etc.)	34	
- Adaptation to climate change (climate smart change adaptation)	2	
b. Survey related and use of survey findings for policy formulation	30	37
- Survey related (make it simple and easily understandable, some questions are not relevant to all respondents, appreciation to the survey, need to cover more ground level problems, time is not suitable for the survey so send it early spring/late fall, future use of the survey findings, seasonal workforce are out of the survey, etc.)	26	
- Use of survey for policy (results of this survey must guide development of a new strategic plan for the NWPS and include measurable objectives)	4	
c. Personal experience and appreciation to conducing survey	15	18
- No comments (e.g., just thank you and appreciation to conducting the survey)	8	
- Personal experiences (different geographic regions have different problems or challenges, wilderness managers work in multiple wilderness so geo-specific question is misleading, etc.)	7	
d. Budget/staff/resources	10	12
- Lack of budget/staffs (need more hands and resources at grounds, funding, create more position at ground level, etc.)	10	
e. Wilderness values, public support, and appreciation	4	5
- Gaining public supports (better communication with the public and with agencies, educating the public, etc.)	3	
- Technology related (development of new apps and make it available for users to increase public attachment and appreciation)	1	
f. Agency policy and priority	3	4
- Agency policy (need for wildfire emergency action plan, no recognition of conservation component in the BLM)	2	
- Conflict in priority (higher priority at the national level, but no priority at the field level)	1	
Total frequencies	82	
Total responses	98	

Note: Some responses fit into multiple categories. Hence, total frequencies are greater than total respondents and percentage total is greater than 100.

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