USDA
United States Department of Agriculture

The Forest Service Safety Survey: Results from an Employee-Wide Safety Attitude Survey

Vanessa R. Lane, Ken Cordell, Stanley J. Zarnoch, Gary T. Green, Neelam Poudyal, and Susan Fox

Forest Service
Research & Development
Southern Research Station
e-General Technical Report SRS-191

The Authors:

Vanessa R. Lane, Assistant Professor of Wildlife Ecology and Management, Abraham Baldwin Agricultural College, Forest Resources Department; **Dr. Ken Cordell**, Pioneering Research Scientist, U.S. Department of Agriculture Forest Service, Southern Research Station; **Stanley J. Zarnoch**, Mathematical Statistician, U.S. Department of Agriculture Forest Service, Southern Research Station; **Gary T. Green**, Associate Professor, University of Georgia, Warnell School of Forestry and Natural Resources; **Neelam Poudyal**, Assistant Professor, University of Georgia, Warnell School of Forestry and Natural Resources; **Susan Fox**, Program Director, U.S. Department of Agriculture Forest Service, Aldo Leopold Wilderness Research Institute, University of Montana.

Cover: A work crew from the Chequamegon-Nicolet National Forest and Michigan Department of Natural Resources secures a recently dropped tree to the Brule River bottom during a tree drop operation. (Photo by Al Barbian, Region 9, Chequamegon-Nicolet National Forest)

May 2014

Southern Research Station
200 W.T. Weaver Blvd.
Asheville, NC 28804

www.srs.fs.usda.gov

The Forest Service Safety Survey: Results from an Employee-Wide Safety Attitude Survey

Vanessa R. Lane, Ken Cordell, Stanley J. Zarnoch, Gary T. Green, Neelam Poudyal, and Susan Fox

Contents

Executive Summary

The Forest Service, U.S. Department of Agriculture launched its Safety Journey in 2011 aimed at elevating safety consciousness and practice in the Agency. In part, the Safety Journey applies principles and lessons learned from other agencies, organizations, and corporations that have demonstrated notable success in maintaining solid safety records. These principles and lessons learned were the basis for an 8-hour facilitated safety session held for employees at various locations across the country. All employees were required to attend a session, and the content and format were the same at all session locations. In September 2011, employees were asked to respond to an online survey that mostly focused on the contents of the facilitated session. Forty-nine statements were posed and responding employees were asked whether they agreed or disagreed with each statement by using a 5-point Likert scale. Some of the statements were consistent with the session contents; some were not. Demographic data were also obtained, and at the end an opportunity was offered for comment. A total of 11,980 completed surveys were received between September 15, 2011, and March 7, 2012. Almost 3,200 comments were posted, representing 27 percent of respondents and 10 percent of all full-time, part-time, or term Forest Service employees. This report focuses only on the surveys submitted by employees after they had participated in one of the engagement sessions.[1]

The Safety Survey had four main objectives: (1) *describe current employee attitudes (including perceptions and behaviors) toward safety and the Safety Journey;* (2) *assess employees' overall perceptions of changes resulting from initiation of the Safety Journey* and summarize their suggestions for improving safety philosophy, policy, and operations; (3) build *a baseline of data on employee attitudes* toward workplace safety so that trends (change) resulting from implementation of successive phases of the Safety Journey can be detected; and (4) *evaluate the Safety Survey instrument* in order to create a more efficient standardized survey instrument for periodic use in monitoring changes in employee attitudes, perceptions, and behaviors.

Discovering the Underlying Dimensions of Safety Attitudes

A data analysis technique called "factor analysis" was employed to identify five primary dimensions within safety survey responses based on 21 of the original 49 Likert-scale questions. The analysis showed that the other 28 questions were redundant, and thus they were not used. The five dimensions were: (1) managers' involvement and feedback, (2) employee perceptions of management's commitment, (3) employee-supervisor relationships, (4) personal responsibility, and (5) feelings toward the Safety Journey.

Across Agency employees, the lowest scores were posted for dimensions 1 and 5. It appears that some employees believe that local managers should increase their involvement in promoting and providing feedback on safety. It also appears that many are unsure whether the Safety Journey will be a lasting program. Employees felt a strong personal responsibility for their own safety and coworkers' safety (dimension 4), but were less certain of the Forest Service's commitment to their personal safety (dimension 2). Apparently there are concerns over budgets and personnel cuts. In general, employee-supervisor relationships were seen as positive by employees (dimension 3).

Discovering Groupings of Employees with Similar Safety Attitudes

Employees were classified into four groups based on cluster analysis of their perceptions of the Safety Journey and their demographics. Groups identified through the cluster analysis ranged from being supportive of or cautiously optimistic about the Safety Journey, to being skeptical or very skeptical. Most employees (65 percent) were supportive or cautiously optimistic, including most Job Corps and Northeastern Area employees (88 percent and 83 percent, respectively). Younger employees (<40 years old) were cautiously optimistic about the Safety Journey; older employees (>50 years) tended to be the most supportive. Most employees 40-59 years old were skeptical of the Safety Journey.

Refining Understanding through Analysis of Employee Comments

Most comments (55 percent) indicated at least partial approval of the Safety Journey and the safety engagements. Employees who fully approved commented that the Safety Journey appears to represent a sincere effort toward greater safety. Employees who partially approved were hopeful about the Safety Journey, but had

[1] Complete respondent anonymity was promised to responding employees. The survey data were accumulated and analyzed by the University of Georgia.

a number of doubts. Employees who did not approve of the Safety Journey were concerned that safety has been overemphasized and that overall employees are becoming numb to continual discussions about safety. Concerns included remote work site safety, fleet adequacy, sufficient law enforcement, and overly complicated safety rules and protocols.

Suggestions from Employees

Employees offered many suggestions relevant to employee work safety. Suggestions included reduction of workloads, easing off of production target-based funding, devoting more funding to safety, mentoring new employees, and hiring employees with proper qualifications. Employees also suggested using bottom-up advising in formulating safety strategies; protecting employees who raise safety concerns, including wellness and fitness; acknowledging local safety successes; and giving greater emphasis to risk management approaches.

Observations

In general, although most employees were at least cautiously optimistic about the Safety Journey, some degree of skepticism was present in every Agency division. Future efforts should give more emphasis to making the Safety Journey more applicable to office worker, Law Enforcement and Investigations, Washington Office, and Research and Development employees. A significant number of employee comments called for more follow-through by Agency leaders, particularly by providing more financial resources; hiring highly qualified personnel; assuring adequate safety equipment; and offering more relevant safety training, such as peer-to-peer mentoring and job-specific training.

Athens Forestry Sciences Laboratory workers spread mulch around the buildings, Athens, GA. (Photo by USDA Forest Service)

Clockwise from top left: A firefighting team from the Chequamegon-Nicolet National Forest (Wisconsin) sets off to set up lines during a controlled burn operation; Prescribed Burn Boss Matthew Ellis with Law Enforcement Officers Mike Harrison and Jimmy Hoskins; Information Assistant Wendy Cowsert answers the phone in the reception area (Harrisburg, IL); Officer Weldon Young on a patrol horse; Recreation Program Manager Pat York holding fishing poles at the Fish Tales Program at Shawnee National Forest (Illinois). (All photos by the USDA Forest Service)

The Forest Service Safety Survey: Results from an Employee-Wide Safety Attitude Survey

Vanessa R. Lane, Ken Cordell, Stanley J. Zarnoch, Gary T. Green, Neelam Poudyal, and Susan Fox

Abstract

The Forest Service, U.S. Department of Agriculture launched a Safety Journey in 2011 aimed at elevating safety consciousness and practice in the Agency. All employees were required to attend an engagement session during the year to introduce them to the Safety Journey. In September, a survey was launched to help Forest Service leadership better understand employee views concerning the Safety Journey, and generally of safety in the Agency. The survey included 49 statements relating to the content of the engagement sessions. Demographic questions were also included, as well as an opportunity to comment. A total of 11,980 completed surveys were received between September 15, 2011, and March 7, 2012. In general, findings showed that most employees were cautiously optimistic about the Safety Journey, but some degree of skepticism was present in every Agency division. Future efforts should give more emphasis to making the Safety Journey more applicable to office worker, Law Enforcement and Investigations, Washington Office, and Research and Development employees. A significant number of employee comments called for more follow-through by Agency leaders, particularly by providing more financial resources; hiring better qualified personnel; assuring adequate safety equipment; and offering more relevant safety training, such as peer-to-peer mentoring and job-specific training.

Keywords: Employee safety attitudes, employee survey, safety attitude differences, safety attitude dimensions, safety attitude survey, Safety Journey, U.S. Forest Service

Introduction: It's About Employee Perceptions and Attitudes

Companies, agencies, and other organizations in the United States and abroad have recognized that fully integrating a safety mindset from "top to bottom" is crucial to their long-term, overall success. Making everyone in an agency aware, sensitive, and caring about safety and implementing best safety practices in job assignments and operations are obvious and essential ingredients for success. When employees feel confident and empowered, they are more productive.

Federal agencies, such as the Forest Service, U.S. Department of Agriculture, have recognized the importance of providing a safe working environment—one that is as free as possible from hazards and that also complies with existing State and Federal laws. Effective safety training helps reduce the number of injuries and possible deaths, as well as reducing legal liability, compensation claims, and time missed from work. But training in safety standards and work practices may

Note to reader: To lessen the necessity for repetitive multiple terms to capture the full scope of employee positions on safety, in this research paper we use the term "attitude" to represent not only attitudes, but also beliefs, perceptions, understanding, values, and the like. Hogg and Vaughan (2005) defined attitude as "a relatively enduring organization of beliefs, feelings, and behavioral tendencies towards socially significant objects, groups, events or symbols." For this research, the beliefs, feelings, and behavioral tendencies of interest are toward Agency and workforce safety. The term "employee" is meant to represent all employees at any level from office or field personnel to the person occupying the highest-level position in the Washington Office.

BAER Specialists Barry Hill and Mary Flores measure streamflow to ensure sufficient flow in the Clavey River, California, for the protection of fish habitat. (Photo by Louis Haynes, USDA Forest Service)

not be enough. Fostering a culture in which employees believe that safety is equal to productivity and that taking personal responsibility for their own and others' safety is a core value.

Although many agencies (such as the Forest Service) have implemented and continue extensive safety improvement efforts, few have directly evaluated how well they are doing to improve employee awareness, attitudes, and working practices. A key ingredient in such evaluations is creation of a baseline of data for monitoring change as agency safety programs evolve. Such a baseline should not only include accident and incident records, but also include employee attitudes, perceptions, and behaviors toward safe work.

Over the last 5 years, the Forest Service has been working to improve safety through what the Agency has termed the "Safety Journey." In large part, the Safety Journey has been modeled after the successes of other organizations in improving their safety record. Particularly useful were the experiences of world-class organizations which recognized the importance of engaging their workforce by tapping into their collective knowledge, experience, and observations. These organizations also sought to instill in their employees a sense of personal responsibility and commitment to taking care of the safety of themselves and their fellow workers.

In studying the success of other organizations, the Forest Service recognized several important challenges. For example, one perceived challenge was that employees may see productivity and safety in their work as two separate and competing goals. Under this perception, some employees would assume that increasing production would mean cutting corners with safety, particularly in tough economic times when there may be personnel and equipment shortages. Other challenges were in overcoming the view some employees have expressed that the current push on safety is just another initiative, or that the Safety Journey goal of "zero serious accidents and fatalities" is unrealistic. Hence, despite the Forest Service's acceptable safety record, the Safety Journey has sought to challenge and overcome these mindsets and to markedly improve the Agency's record.

Evaluation of the current conditions and monitoring change over time are critical to the success of any program. Evaluation enables identification of needed changes, while monitoring allows determination of whether steps taken have actually resulted in the change desired. Thus, in September 2011, the Forest Service initiated an evaluation of the Safety Journey and the employee engagement sessions through an online survey. This baseline evaluation survey focused mostly on the current state of employee safety attitudes, perceptions, beliefs, and behaviors. The original design was to implement the survey prior to and then after employees had attended an 8-hour facilitated "engagement session." Engagement sessions were held at locations around the country and were designed to acquaint employees with the purposes, philosophy, and goals of the Safety Journey. However, because of scheduling differences at different locations, engagement sessions occurred throughout 2011. Thus, the data from the online Safety Survey represented an uncontrolled mixture of pre- and post-engagement responses.

Notifications to take the survey were emailed to employees in September 2011 and again in January 2012. Two reminders were sent as follow-up for each of these participation calls. A total of 11,980 employees completed the safety survey between September 15, 2011, and March 7, 2012. Almost 3,200 comments were posted by survey respondents, representing about 27 percent of the survey respondents and 10 percent of the Forest Service employee population. In this report, only post-engagement survey results are reported.

Clockwise from top left: Chequamegon-Nicolet National Forest Washburn Ranger District foresters roller-drum chop the Moquah Barrens (Wisconsin); Tom Davidson prepares samples in the Forestry Services Laboratory in Athens, GA; Osborne firefinder is used in a fire lookout tower on the San Bernardino National Forest (California) (photo by John Miller); soil scientist measures the depth of the soil that has been burned on the Rim Fire, Stanislaus National Forest (California); Art Johnson in the field in Wisconsin. (Remaining photos provided by the USDA Forest Service)

Literature Review

History of Safety Culture

Organizational safety culture has received a great deal of attention in the past two decades. The term "safety culture" was first introduced by the International Nuclear Safety Advisory Group (INSAG) following the Chernobyl accident in 1986. It denotes the internal management and organizational conditions that are the primary determinants of workplace safety (INSAG 1986, 1988). The idea of safety culture evolved from extensive discussions of organizational culture and climate in the 1970s and 1980s. Since its inception, the concept of organizational safety culture has become appealing as a global umbrella concept for all that surrounds safety in an organization.

Although safety culture is a subset of organizational culture (Cooper 2000), safety culture models have rarely been integrated into general models of organizational culture (Choudhry and others 2007). Organizational culture is made up of those deeply rooted assumptions and expressions about human nature, human activities, and social relationships that are shared by members of an organization. Safety culture, on the other hand, is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to and the style and proficiency of an organization's health and safety management (ACSNI 1993).

A work crew from the Chequamegon-Nicolet National Forest and Michigan Department of Natural Resources secures a recently dropped tree to the Brule River bottom during a tree drop operation. (Photo by Al Barbian, Region 9, Chequamegon-Nicolet National Forest)

Safety culture has been examined at length since the 1980s, but a standard definition has yet to be adopted. Of 27 studies selected by Choudhry and others (2007), only 8 defined safety culture. Most of these definitions were similar in the psychological dimension (e.g., beliefs concerning safety) and tended to imply that safety culture may be something an organization "is" rather than "has." In general, a positive safety culture is composed of the following: (1) management commitment to safety; (2) genuine management concern for the workforce; (3) mutual trust and credibility between management and employees; (4) workforce empowerment; and (5) continuous monitoring, corrective actions, review of systems, and continuous improvements to safety at the work site (Choudhry and others 2007, Guldenmund 2000, Hale 2000).

Assessing Safety Culture via Safety Climate: Where the Rubber Meets the Road

Despite the lack of a unified theoretical model surrounding safety culture (Guldenmund 2000), safety culture as a general concept is widely used as a proactive management tool and considered quite important in health, industry, and other occupations (Coyle and others 1995). However, because safety culture is an abstract concept which consists of underlying attitudes, perceptions, and values that are resistant to change and difficult to measure, Cox and Flin (1998) suggested using the term safety climate as an alternative. A snapshot of an organization's safety climate may be thought of as "safety weather" (Lee 1998) when questionnaires are used to examine safety culture at a given point in time (ACSNI 1993, Hale and Hovden 1998, HSE 1999). Although safety culture and safety climate have been used synonymously in the past, underlying safety culture is much more difficult to measure; thus periodic measures of safety climate are sometimes used to make assumptions about changes in organizational safety culture.

Understanding current theory and interacting variables regarding safety climate and culture are critical considerations when designing assessment tools and analyzing collected data. Although a plethora of survey instruments have been developed to examine organizational safety climate, only a few questionnaires have been tested independently for construct validity (Dedobbeleer and Béland 1991, Kho and others 2005). Currently no standardized survey instrument exists

to measure safety climate, but the ad hoc instruments developed are often similar and provide an organizational foundation for researchers (Flin and others 2000, Nieva and Sorra 2003). In general, instrument development follows these steps: (1) determine if the study is to be exploratory, descriptive, or explanatory; (2) define the population to be sampled or perspective (e.g., management, employees, or census); (3) conduct a literature search to identify a set of measurable themes; (4) conduct focus groups and in-person interviews at a worksite to determine particular issues that may be unique to the organization; and finally, (5) develop and implement a customized survey instrument. The order of survey instrument development may differ depending upon the type of study being conducted. For example, most safety culture and climate studies describe the current status of safety perceptions and attitudes. The methods described above work well for descriptive studies. In contrast, experimental or durational studies may examine changes in safety climate over time in response to particular safety training or accidents that occurred because of weaknesses in organizational safety culture (e.g., the loss of the space orbiter Challenger). In these situations, the event may occur before a recognized need to assess safety climate.

Considering the broad array of safety risks and issues in industry, health, construction, and other types of organizations, a standardized and universal employee safety survey instrument may not be entirely warranted. Many studies have been unable to replicate safety climate factors when using identical survey instruments, even from within the same type of organization (Cox and Flin 1998, Coyle and others 1995, Dedobbeleer and Béland 1991), although there are a few notable exceptions (Glendon and Litherland 2001, Kho and others 2005).

With the relative lack of guidance in safety climate survey construction, companies, agencies, and independent contractors are left with the challenge of identifying important constructs to use in development of their survey instruments. Due to the wide variety of organizations and safety climate questionnaires, and equally disparate interpretations of results, hundreds of constructs have been identified. Thankfully, considerable effort has been given recently to summarizing these results, and several common themes have emerged.

Although researchers have not reached consensus about the underlying safety culture constructs these themes may truly represent, they should still be considered when designing questionnaires. Flin and others (2000) identified 6 common themes from 18 questionnaires they examined. These themes were: management (72 percent), safety system (67 percent), risk (67 percent), work pressure (33 percent), competence (33 percent), and procedures/rules (which they did not directly measure but considered important following Guldenmund [2000]). Because questionnaires mainly appear to measure employee perceptions and evaluations of management, Guldenmund (2007) reorganized themes from both his earlier paper and Flin and others' (2000) into nine generic safety management processes: risks, hardware design and layout, maintenance, procedures, manpower planning, competence, commitment, communication, and monitoring and change. Guldenmund (2007) further explains the characteristics of these nine processes at organizational, group, and individual levels. This is a useful separation when considering the issues surrounding data aggregation (explained below). Although constructs identified in factor or principal components analyses may not explicitly fall within these processes, they nonetheless may represent underlying and unifying features of safety climate across organizations (International Atomic Energy Agency 2002). Additionally, they are useful to consider when attempting comparisons of results across organizations, companies, or even departments.

One of the most challenging aspects of safety survey data analysis is how to aggregate the data. For example, Cooper (2000) observed that safety climate studies frequently aggregate across multiple locations rather than focusing on location-specific examples. Although this level of aggregation increases sample sizes, people can better respond to survey questions in relation to where they work, more so than across organizations or departments. Guldenmund (2007) further explains that many studies aggregate data to the level of the organization, which may overshadow important cultural differences at the group or individual levels. Clarke (2000) recommends analyzing at a group level because of the limitations of analyzing at the organizational level, and because variability at the individual level may obscure important characteristics of an organization's safety climate.

Achieving Positive Changes in Safety Climate

The success of any safety management program is wholly reliant upon the program's scope, whether employees have knowledge of it, and whether employees are committed to it (Lee and Harrison 2000). Therefore, proper marketing is necessary to maximize impact in terms of improving safety climate and ensuring the target audience receives a consistent and desired message (Vecchio-Sadus and Griffiths 2004). Although not typically seen as a marketing tool, repeated use of surveys not only enables assessment of change in organizational safety climate over time, but also gives employees an opportunity to provide feedback. This process can help employees feel that management is taking a safety initiative seriously.

Because safety culture is an underlying set of beliefs, identifying changes in safety climate over time may indicate employee adoption of safety values discussed during safety initiatives and thus an evolving safety culture. Surveys provide an opportunity for management-employee interaction. However, only a few published studies have examined pre- and post-program changes or provided long-term, repeated assessments (Lee 1998, Nieva and Sorra 2003). As Lee (1998) has observed, many attitudinal studies are unpublished because they detail internal causes of low morale that organizations are reluctant to disclose.

Effecting positive change in employee perceptions and attitudes requires two conditions: (1) there is room for improvement in an organization's safety, and (2) managers are prepared to face the possibility that attitudes they believe employees have may not coincide with actual attitudes (Blum and Naylor 1968). With the latter condition, management must also be prepared to face some hard truths and be able to actively address concerns that are discovered. Implementing new regulations or technical solutions may be necessary, but frequently employees in large organizations are drowning in a sea of over-regulation, which adversely affects overall morale and creates the perception that managers are more interested in protecting their own backs than in actually improving safety for employees. Creating new regulations falls back on the traditional, retrospective approach to safety which first involves seeking the primary cause of a specific accident and then deciding whether the cause was an unsafe act or an unsafe condition (Booth and Lee 1995). Although this approach is sometimes necessary, it is less effective at creating positive changes in safety culture than more proactive employee-management feedback loops (Pidgeon 1991).

The Nuclear Regulatory Commission defines safety culture "as the core values and behaviors resulting from collective commitment by leaders and employees to emphasize safety over competing goals to ensure protection of people and the environment" (USNRC 2013). Improving safety culture and environment are dependent upon the relationship between employees and management. Canned safety programs may not be the sole or even best answer to improved safety performance, i.e., reduction in accidents and injuries. In fact, sometimes safety programs and safety performance have been found to be only weakly correlated (Clarke 2006). As agencies, organizations, and their workforces change, safety challenges may actually increase over time. For example, Clarke (2000) suggests that the move away from a permanent staff to more contract-contingent workers may have significant implications for the development of safety culture. Ultimately, the safety goal of any agency or organization is to create a safe work environment and to engender a culture that highly values safety.

Clockwise from top left: Woodsy Owl and Conservation Education Coordinator Tim Williams visit school children at Head Start in Oakland, CA; “Ranger Tim” poses with Junior Ranger at the Healthy Parks Healthy People Festival in Fremont, CA; Region 5 Forest Service employees offer educational materials; Forest Service Region 5 recruiter assists with employment information. (Photos by the USDA Forest Service)

Profile of Forest Service Employees

The Forest Service has a long history stretching back more than 100 years. In fact, the founding of the National Forest System and of the Forest Service in the U.S. Department of Agriculture has its first roots in the late 1800s (USDA Forest Service 2012). National forests (at first called forest reserves) began with the Forest Reserve Act of 1891, which allowed the President to establish forest reserves from timber-covered public land. Early leaders and visionaries, Presidents (especially Theodore Roosevelt), scientific and conservation organizations, and newly trained forestry professionals led the successful effort in retaining millions of acres of Federal forest land for future generations.

Currently, there are 155 National forests, 20 National grasslands, and 222 research and experimental forests, as well as other special areas, covering more than 192 million acres of public land nationwide. The Forest Service has grown into an agency with more than 30,000 employees. National forests are managed for many uses, including recreation, timber, wilderness, minerals, water, grazing, fish, and wildlife.

The Forest Service includes a number of divisions as follows:

Job Corps—The Job Corps Program is designed to help vulnerable youth by treating each enrolled student as a uniquely valuable individual. Job Corps provides a safe living and learning environment; skills training to adapt to the ever-changing types of work available; and encouragement to become capable, educated, and productive.

Law Enforcement and Investigations (LE&I)—Law enforcement personnel, line officers, and staff work to prevent, investigate, and enforce laws and regulations. Law enforcement personnel operate as full partners within the organization in carrying out the Agency's mission, especially in upholding Federal laws and regulations that protect natural resources, Agency employees, and the public.

Northeastern Area State and Private Forestry (NE Area)—The Northeastern Area State and Private Forestry division serves the 20 Midwestern and Northeastern States, plus the District of Columbia. This division works with State forestry agencies and many other partners toward promotion of wise management, protection, and sustainable use of urban and rural natural resources, especially on private forest land.

National Forest System offices (NFS)—The National Forest System includes 155 National forests and a total of around 192 million acres. This system includes forests, grasslands, and other land types. Approximately 74 percent of Forest Service employees work in this division and do clerical, legal, field, fire, and many other types of work. The NFS organization includes the Washington Office, regional offices, Forest Supervisor's offices, and Ranger District office. The primary charge is to manage the National forests.

Research and Development (Research)—Research and Development is the science component of the Agency. There are five research stations, plus the International Institute for Tropical Forestry and the Forest Products Laboratory. Most Research employees work at field locations and in forestry sciences laboratories. This Forest Service division represents about 7 percent of Agency employees.

Washington Office (WO)—The Washington Office houses the national office of the Chief, Division Deputy Chiefs, and a variety of support staff groups representing all the divisions of the Forest Service, plus a number of functional areas, such as civil rights and information technology. This division represents about 11 percent of the Agency work force.

Clockwise from top left: A Public Information Officer shares updates with local business owners in California (photo by Jean Hawthorne); Conservation Director Craig Thomas of the Sierra Forest Legacy and Silviculturist Romiro Rojas of the Sierra National Forest (California) discuss the age of trees; two Forest Service employees inspect a seedling planted on the San Bernardino National Forest (California); Angeles National Forest Team (California) around the fire truck; Forest Service Air Quality Specialist Ricardo Cisneros takes samples to monitor air quality in the Sierra National Forest. (Remaining photos by the USDA Forest Service)

Survey Objectives and Methods

Objectives

In conducting the Safety Survey, there were four main objectives:

- *Describe current employee attitudes (including perceptions and behaviors) toward safety and the Safety Journey.*
- *Assess employees' overall perceptions of changes resulting from initiation of the Safety Journey* and summarize their suggestions for improving safety philosophy, policy, and operations.
- *Build a baseline of data on employee attitudes* toward workplace safety so that trends (change) resulting from implementation of successive phases of the Safety Journey can be detected.
- *Evaluate the Safety Survey instrument* in order to create a more efficient standardized survey instrument for periodic use in monitoring changes in employee safety attitudes, perceptions, and behaviors.

Study Design and the Survey Instrument

A survey instrument was designed consisting mainly of 49 statements for respondent evaluation. These statements represented aspects of the six primary Safety Journey constructs provided by the Forest Service Leadership Council:

1. Relationship between Productivity and Safety (6 statements)
2. Nature of Safety Outcomes and Safety Journey (6 statements)
3. Personal Role and Responsibility (9 statements)
4. Supervisors' and Leaders' Roles and Responsibilities (13 statements)
5. Safety as a Program, Priority, or Core Value (6 statements)
6. Emphasis on Compliance or Learning (9 statements)

The original design for employee sampling was to implement the survey before employees participated in the mandatory safety orientation sessions and then to follow up with an after-participation round of surveying a—pre-post design. For many reasons, the survey could not be deployed in a time-controlled manner to effectively and efficiently capture pre- and post-session participation. Time control was an issue in part because the orientation sessions were scheduled across several months, from May through December 2011. This report presents only post-session respondent survey data.

Land Between the Lakes forester measures trees. (Photo by USDA Forest Service)

The study and survey were a collaborative effort between the Warnell School of Forestry and Natural Resources of the University of Georgia (UGA) and the Forest Service Southern Research Station's Athens Forestry Sciences Laboratory (FSL). The survey instrument design and testing phase was a joint effort between UGA and the FSL. Employees were notified and requested to participate through the Forest Service Associate Chief's Office and Athens FSL scientists. The survey was implemented via SurveyMonkey® (www.surveymonkey.com). Resulting survey data were compiled by cooperating UGA scientists. The analysis and reporting phase was a collaborative effort between UGA and the Forest Service.

The survey instrument was developed, tested, and refined between June and August 2011. A near-final draft was constructed by mid-July 2011 and tested by using SurveyMonkey.® The final survey went live on SurveyMonkey® on September 15, 2011. Unfortunately, by this date, a sizeable proportion of employees had completed participation in a safety engagement session, thus precluding having those employees participate in the pre-session round of surveying.

The final survey instrument was composed of 85 items (app. A). It included 4 introductory questions; forty-nine 5-point Likert-scale statements, some consistent and

some not consistent with the engagement sessions' content (response options ranged from "strongly disagree" to "strongly agree", with a "neither agree nor disagree" midpoint); 2 questions assessing awareness of the Safety Journey; 5 questions asking about change since initiation of the Safety Journey; 1 question asking about accidents or near misses in the last 5 years; 23 questions defining official position and personal demographics; and 1 question providing an opportunity for open-ended comment.

The four questions used to engage employees at the beginning of the survey asked whether they had participated in an engagement session and, if so, when and where. Thus, respondents self-identified whether they were in the pre-engagement or post-engagement sample. There were 3,091 pre-engagement respondents and 8,889 post-engagement respondents, making a total of 11,980 respondents overall.

Six or more statements were developed around each of the six Safety Journey constructs. A mixture of "consistent" and "inconsistent" statements was created to enable testing for respondent attentiveness to each of the statements. Data were removed for respondents who provided a repetitive response pattern. For example, a respondent might strongly agree with all statements, indicating that the employee likely was not carefully reading the statements before responding.

An example of statements developed around the six constructs follows (all others are presented in appendix A). Shown are the six statements (questions) designed to explore construct 1, which is "The Relationship between Productivity and Safety." The intention of this construct was to examine if safety always comes first and is inseparable from success and productivity. The six statements and an indication of their consistency (+ or -) with the Safety Journey construct of the relationship between productivity and safety were:

1. Reducing accidents and otherwise improving safety will come at the expense of getting the job done on time. (-)
2. All jobs should be designed and implemented so they can be accomplished safely; otherwise they are not worth doing. (+)
3. When push comes to shove, I am expected to cut safety corners to meet targets. (-)
4. Sometimes the benefits of an assigned work task are great enough to make it worth taking associated safety risks. (-)
5. My supervisors consider safety to be an inseparable part of getting all jobs done. (+)
6. We can achieve both improved safety and increased productivity at work. (+)

Following the Likert-scale items was a question asking whether the respondent was aware of the Safety Journey. This was followed by a multiple-choice question offering four statements, only one of which accurately described the intention of the Safety Journey. After these multiple-choice statements, five statements were listed to detect whether respondents had noticed changes in safety climate in general since initiation of the Safety Journey. The dimensions covered by these five statements were communication, personal responsibility, integration of safety and work productivity, individual accountability, and employee comfort level about raising concerns. The statements concerning these dimensions used a 5-point Likert scale for rating change, ranging from much worse to much better than before the Safety Journey, with a no-change midpoint. As described earlier, respondents were asked whether they had experienced an accident or near miss over the last 5 years. The 23 demographic questions asked for information such as gender, age, race, length of service, and job type. The survey concluded with an opportunity to offer open-ended comments: "Do you have any comments regarding this survey or its safety theme?"

Data Analysis

We conducted the following primary analysis steps in order to accomplish the four study objectives:

Data set cleaning—Data cleaning is almost always an essential first analytical step. For this study, individual

Partner field crews in the U.S.-affiliated Pacific Islands join Forest Inventory and Analysis crews to monitor the status and trends in tropical forests. Here a crew member uses a laser rangefinder to estimate the height of trees on a forest inventory field plot. (Photo by USDA Forest Service)

A field crew member celebrates a safe and successful day's end on Yap, Micronesia. (Photo by USDA Forest Service)

surveys were examined to ensure they were sufficiently complete. Surveys that did not include at least one complete set of questions for at least one construct were removed from consideration. We also removed responses where individuals gave the same response for all Likert-scale questions, regardless of reversed scaling, and removed pre-engagement responses for individuals who completed both pre- and post-engagement surveys and provided email addresses. We assumed all surveys without email addresses were unique. Throughout all of the analysis phases described below, the focus is on post-engagement respondents.

Data weighting—Data weighting was applied as appropriate for each analysis phase (as noted in descriptions of each below). Multivariate weights were used to adjust for over- or under-representation of the numbers of responding employees among different demographic groups. Because different respondents had provided different levels of demographic information (i.e., perhaps had not answered all the demographics questions), each one received a weight tailored to the demographic information the employee had provided for the selected weighting variables. Weighting variables were selected on the basis of having a potential statistical relationship to the safety attitude variables and on the basis of availability of demographic parameters from the official Forest Service employee database. The Agency's Human Resources Division maintains an up-to-date employee-wide database which was used in creating weights for the Safety Survey data set.

Weighting variables were Agency division (e.g., Law Enforcement and Investigations), age, gender, and race. Data from these variables were used to create ratio weights representing proportions of the workforce relative to proportions of survey respondents. To adjust for missing data on any one or more of the four demographic variables, the procedure was to use a mean value based on employee responses in which all four of the demographic questions used as weighting variables had been answered. A minor adjustment at the end made the weights add up to the population total, as they should.

Factor analysis—Factor analysis was used to identify unifying dimensions based on analysis of the 49 Likert-scale questions formed around the 6 original Safety Journey constructs. Factor analysis is a data-reduction statistical procedure designed to identify underlying, unobservable latent variables that are reflected in the observed variables. The underlying dimensions found are described in the Results section, along with definitions and a listing of the correlated questions. Principal axis factoring was employed with a Varimax rotation (with Kaiser normalization) to create uncorrelated dimensions for easier interpretation of the results (Tabachnick and Fidell 1996).

This analysis resulted in identification of five factors (dimensions). Variable loading values represent correlations between each variable (question) and the factor it loaded to. The higher the load, the more relevant is each question in defining a factor. The analysis was set up to restrict question loading so that no question could load onto more than one of the five attitude dimensions (factors). Cronbach alphas (indicating factor internal reliability) were examined for each of the five factors (values >0.7 are considered acceptable). Done solely as a validity check, independent factor analysis results were compared between pre-engagement and post-engagement respondents. Results were found to be consistent across pre- and post-groups.

Demographic and attitudinal dimension associations—Analysis was next performed to identify employee demographics associated with each of the five attitude dimensions resulting from the factor analysis. We used various tests, such as analysis of variance (ANOVA), to look for evidence of relationships between employee safety attitudes and demographics, such as race, age, gender, and Agency division. The data were weighted by using the multivariate weights described above to ensure that different demographic groups were somewhat proportionately represented. Because we knew the population size of the Forest Service employee base, we applied a finite population correction which provides more accurate standard errors, and thus more statistical power for determining differences. Due to small sample sizes for some racial groups, we combined Asians and Whites into a collective White category, and American Indian, Alaskan Native, Native Hawaiian, and Other Pacific Islander into an "Other" category.

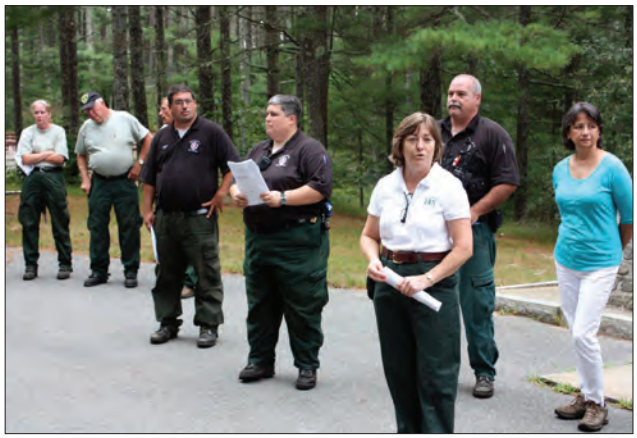
The analysis of variance model consisted of Agency division, age class, gender, and race with all possible two-way interactions. To handle the complexities of survey data, PROC SURVEYREG in SAS® (SAS Institute, Cary, NC) was used with the finite population correction and the multivariate weights. The results for each of the five dimensions are shown in the next section. Because of the number of demographic-by-dimension associations that were found to be statistically significant, this report displays only a select few least squares means and line graphs in the tables and figures in the Results section.

Examination of possible respondent groups—Analysis was then conducted to identify whether employees fit into different groups based on their safety attitude scoring and on their demographic characteristics. Cluster analysis is a statistical procedure for grouping respondents so that within-group similarity is maximized while also maximizing dissimilarity between groups. This procedure is similar to factor analysis.

While many types of cluster analysis are available and may create different results, we applied a hierarchical cluster analysis by using Ward's method with squared Euclidean distance as our similarity measure (Johnson 1967). Hierarchical cluster analysis is a commonly used method that is useful when researchers are unsure how many groups may be present across respondents.

Hierarchical cluster analysis is a four-step procedure:

1. An exploratory cluster analysis is run to determine how many clusters may be present in the data.
2. A follow-through cluster analysis then restricts the number of clusters to the number identified in step one.
3. Analysis to identify significant differences between groups is run by using analysis of variance and chi-square tests.
4. Finally, resulting clusters (groupings of respondents) are examined to see if they make sense and then are given names.



U.S. Forest Service Northeastern Area Cooperative Fire Program Acting Director Maureen Brooks (white shirt) talks about the Forest Service's role in fire safety at an interagency event in Carver, MA. (Photo by USDA Forest Service)

Questions about possible impacts of the Safety Journey—Questions asking about change since initiation of the Safety Journey were summarized to identify percentages of respondents who perceived change in safety-related communications, taking of personal responsibility, integration of safety and work productivity, individual accountability, and employee comfort level with raising safety concerns. The primary interest was to identify whether employees perceived change in the safety climate and whether the change represented a better or worse climate since initiation of the Safety Journey. From the total of 11,384 respondents, 8,312 (73 percent) answered all 5 of these Likert-scale questions.

Qualitative analysis—The final phase consisted of applied qualitative analysis of the comment data. Five hundred comments were randomly selected by the primary analyst for development of a framework for categorizing comments. To test this framework, three additional raters were each provided 150 comments randomly selected from the entire comment pool. These raters worked independently to test the applicability of the framework and to improve category definitions.

Clockwise from upper left: Public Affairs Specialist John Miller issued a ticket for parking on the San Bernardino National Forest (California) without a day pass or adventure pass (photo by John Heil); Modoc National Forest Supervisor Stan Sylva and his horse, Holly, stand in front of the ash plume known as “Peaches and Cream” in the South Warner Wilderness (California); packing in supplies during the Yolla Bolly Complex fire, June 2005; Forest Service employees in Region 5 making repairs on a boardwalk. (Remaining photos by the USDA Forest Service)

Results

Employees

Employees serve in a wide variety of types of jobs across the six divisions of the Forest Service. Examples of job types are office work, front desk or other customer relations, research laboratory work or fieldwork, forest management fieldwork, forest maintenance (e.g., timber removal, trail maintenance), recreation visitor management (e.g., recreation sites, interpretation), law enforcement, professional safety work, work in the backcountry away from roads (e.g., monitoring wildlife plots or streams), firefighting, smoke jumping, and forest inventory fieldwork. Table 1 shows estimated percentages and numbers of full-time and part-time employees by job type, as indicated by employee survey responses. Estimates show that by far the greatest number of employees across the Agency works in offices. Only a little over one-third do no office work. Forest management fieldwork is the second most common job type (32

U.S. Forest Service Smokejumper Garrit Craig (ballcap) helps a boy don a fire response suit during a public event featuring Smokey Bear at Myles Standish State Forest, Cape Cod, MA. (Photo by USDA Forest Service)

Table 1—Estimated percentage and number of employees across the Forest Service (based on survey results) by job type and status as full-, part-, or no time.

	Work time in each job type[a]				
	Full-time		Part-time		No time
Job type	Percent	Estimated no.	Percent	Estimated no.	Percent
Office	29	9,539	36	11,841	34
Front desk	1	329	6	1,974	93
Laboratory	0	0	3	987	97
Research fieldwork	1	329	10	3,289	89
Forest fieldwork	6	1,974	26	8,552	68
Forest maintenance	2	658	12	3,947	86
Visitor services	1	329	8	2,631	91
Law enforcement	1	329	4	1,316	95
Safety	1	329	3	987	96
Backcountry	0	0	2	658	98
Fire	9	2,960	15	4,934	76
Forest inventory	1	329	6	1,974	93
Other	6	1,974	6	1,974	88

Note: Estimates are based on weighted survey data. Percentages add to 100 percent across rows. Some employees may work more than one job type in their part-time capacities; thus, adding numbers across job types will double-count many.)

[a] Full-time, part-time, and no time represent the amount of time spent in the job type listed.

percent of all employees), followed by fire (24 percent), forest maintenance (14 percent), and research fieldwork (11 percent). Law enforcement (5 percent), safety (4 percent), laboratory work (3 percent), and backcountry work (2 percent) are the least common job types. About 1,300 employees work full- or part-time directly in safety positions, about 1,650 work full- or part-time in law enforcement and investigations, and almost 8,000 work full- or part-time in firefighting and management. Appendix B shows numbers and percentages of employees who work some of their time in each job type by division of the Forest Service.

One-third of Forest Service employees are in the age group 50 to 59. In some divisions, however, the percentage in this age group is quite a bit higher: 42, 46, and 45 percent in Job Corps, Northeastern Area, and Washington Office, respectively (table 2). Generally, Law Enforcement employees are younger than employees in other divisions (31 percent under 40, 71 percent under 50). Washington Office employees are the oldest division with nearly 60 percent age 50 or older. Except for Job Corps, years as a Forest Service employee are about the same across divisions, around 16 years.

More than 90 percent of employees in all divisions are permanent, except for Research, which has slightly less with 9 percent as temporary or term employees. A temporary appointment is for a limited period of time with a specific not-to-exceed date determined by the authority under which the appointment is made. A term appointment is from 1 to 4 years, with termination upon completion of the project.

The percentage of employees who are supervisors (table 2) is substantially higher in the National Forest System than in other divisions—41 percent versus 21 to 32 percent for other divisions. A slight majority of employees are male in most divisions, although the number of females in management and research ranks has risen substantially in recent years. Agency-wide, the ratio is 1.1 males to 1.0 female. Around three-quarters of employees are non-Hispanic White, with the highest proportion being in Research (80 percent) and the lowest proportion being in Law Enforcement (68 percent). African Americans make up about 3 percent of the work force, and Hispanics make up about 5 percent. American Indians/Alaskan Natives make up about 4 percent.

The final characteristic for describing employees was to examine their reports of accidents or near misses in the last 5 years in response to this question: "In the last 5 years (or since you started with the Forest Service if less than 5), how many accidents or near misses have you experienced on the job that could have, but did not result in serious injury or health effects?" (table 3). Accidents and near misses were reported by almost half of all employees who took the survey (48 percent). The division reporting the highest percentage of employees having experienced an accident or near miss was Law Enforcement and Investigations (62 percent), followed by the National Forest System (52 percent). Fourteen percent of responding Law Enforcement employees had experienced five or more accidents in the last 5 years. The divisions with the highest percentage of employees reporting no accidents or near misses were Job Corps, Research, and Washington Office employees. Accidents and near misses were most uncommon among responding Washington Office/Washington Office Detached employees, with only 28 percent indicating at least one accident or near miss.

With these statistics in mind, we now turn our attention to what the Safety Survey has indicated about Forest Service employees' attitudes toward safety at the workplace and their reactions to the Safety Journey.

Response Rates

The survey team received 11,980 completed pre- and post-engagement surveys between September 15, 2011, and March 7, 2012. Of these, 3,091 (26 percent) were done prior to participating in an engagement session and 8,889 were done after the required engagement session. Of these post-engagement employees, 7,775 provided demographic data. Table 4 shows estimated number of employees Agency-wide and number and percentage responding by division. Almost 3,200 of those completing the survey provided comments that were included in the content analysis. This number represented 27 percent of the survey respondents and 10 percent of the total Forest Service population. Primary analysis phases were conducted on post-engagement survey respondents only.

Percentages of employees responding were roughly equivalent to the percentages of employees by divisions in the Agency, although employees of National Forest System (regional, Forest Supervisor, and Ranger District offices), Research, and Northeastern Area responded in somewhat higher proportions than did other divisions.

Attitude Dimensions Identified through Factor Analysis

Five factors underlying agreement responses to the 49 attitude statements/questions were extracted through factor analysis. These five factors were based on the 21 of 49 statements that were ultimately retained after 11

Table 2—Estimated percentage of employees by demographics, employment status, and division of the Forest Service, 2012[a]

Demographics	Job Corps	Law Enforcement & Investigations	Northeastern Area	National Forest System	Research	Washington Office/ Washington Office-Detached	Total
Age groups by age class (%)							
Under 30 years	5	4	1	7	6	4	6
30-39 years	10	27	9	18	16	11	15
40-49 years	26	40	30	23	22	24	20
50-59 years	42	23	46	39	37	45	33
60-69 years	14	3	9	11	14	14	10
70+ years	1	0	0	1	1	0	1
No answer	2	3	6	1	3	1	15
Avg. years with Forest Service	9	14	15	17	16	15	16
Status (%)							
Permanent	91	97	94	95	88	96	93
Temp/term	5	1	2	3	9	2	4
Volunteer	0	0	0	0	0	0	0
Cooperator	0	0	0	0	0	0	0
Contractor	1	0	0	0	1	1	1
Other	2	0	0	1	1	0	1
No answer	1	2	4	1	1	0	1
Supervisor (%)							
Yes	32	26	27	41	31	21	36
No	67	72	69	58	67	78	63
No answer	1	2	4	1	1	0	1
Gender (%)							
Male	47	55	49	49	50	43	49
Female	49	37	37	44	42	52	44
No answer	4	8	14	7	8	5	7
Ethnicity (%)							
American Indian/ Alaskan Native	5	7	0	4	1	4	4
Asian	0	2	1	1	1	3	1
African Amer.	6	6	4	2	4	3	3
Hispanic/Latino	1	8	2	6	4	11	5
Native Hawaiian/ Other Pacific Islander	1	1	1	1	1	1	1
White	79	68	71	76	80	73	77
No answer	8	8	20	10	10	5	9

[a] Post-engagement responses only; 1,696 respondents did not give demographic information.

Table 3—Percentages of survey respondents reporting accidents or near misses by division of the Forest Service

Division	Accidents or near misses					
	0	1	2	3	4	≥5
	percent					
Job Corps	60	23	9	5	1	2
Law Enforcement & Investigations	38	16	27	3	2	14
Northeastern Area	50	32	8	5	1	4
National Forest System	48	21	13	7	2	9
Research	58	22	12	3	1	4
Washington Office/Detached	72	15	5	2	1	5
All Forest Service	52	20	13	6	1	8

Table 4—Number of respondents with complete work unit demographics data, and number of employees and response rates (percentages responding) by division of the Forest Service

Type	Job Corps	Law Enforcement and Investigations	Northeastern Area	National Forest System	Research	Washington Office or Washington Office-Detached	Total
Number of respondents	128	100	94	6,047	935	471	**7,775**[a]
Percent of total respondents	2	1	1	78	12	6	100
Estimated total employees	1,645	745	144	24,466	2,300	3,593	**32,893**
Percentage of employees	5.0	2.3	0.4	74.4	7.0	10.9	100

[a]Post-engagement respondents only.

iterations using principal axis factoring. This approach results in minimally correlated factors. Loading values for each of the 21 questions retained ranged from 0.443 to 0.777. Cronbach alphas across the factors ranged from 0.715 to 0.862. Total variance explained by the final factor solution was 47.5 percent.

Using factor analysis as described above helps in understanding large, complex data sets. Instead of needing to summarize employee survey responses across all of the original 49 safety attitude questions, we needed to focus only on the five attitude dimensions. These attitude dimensions (factors) are described below. In setting up the factor analysis, abbreviated names were assigned to each question, e.g., Leader5. These abbreviations referred to Safety Journey construct and question number under each of the constructs. We refer to these question names in the later tables where descriptive and analysis statistics, such as means and standard deviations, are presented.

Respondents provided their level of agreement to each question by using a scale between -2 (strongly disagree) and +2 (strongly agree). Negative questions (those inconsistent with written or presented materials describing the Safety Journey) were reverse coded so that all the Likert-scale attitude data reflected consistent disagreement-to-agreement scoring for all questions. Means of agreement responses (from -2 to +2) for the 21

retained questions ranged between -0.37 and +1.34. The mean of the means for the questions making up each of the five attitude dimensions ranged between -0.04 and 1.22. These means and their standard deviations are shown in parentheses following the name of each dimension in the listing below. A total of 10,492 observations were employed in the factor analysis. The five safety attitude dimensions and the question variables that define them are shown below. Questions inconsistent with the presented content of the safety engagements are denoted by a (-) sign in parentheses just after the variable name.

Dimension 1. Management Involvement and Feedback in Safety (mean of means = -0.0429, sd = 0.6322)

Leader5: "My supervisor or manager actively oversees dangerous operations to make sure we work as safely as possible." (0.09, 0.955)

Leader6: "Reprimands for unsafe behaviors are consistently applied where I work." (-0.31, 0.874)

Leader11: "I am rewarded for taking quick action when I identify a safety problem." (0.02, 0.903)

Learn3: "Safety protocols are routinely evaluated by management and, as needed, modified to improve safety." (0.26, 0.883)

Learn9: "There is a good feedback system to let me know that a safety concern I bring up has been reviewed and what action has been taken to address it." (-0.16, 0.969)

Dimension 2. Employee Perceptions of Management's Commitment to the Safety Journey (mean of means = 0.7185, sd = 0.7445)

Core1: "My safety is important to the Forest Service." (1.02, 0.828)

Core3: "Employee safety is a top priority to the Forest Service." (0.75, 0.939)

Core5: "The Forest Service is moving toward a future where safety is viewed as essential to successfully accomplishing our work." (0.66, 0.812)

Core6: "Forest Service senior leadership is fully committed to developing a culture where we all go home safe every night." (0.57, 0.965)

Dimension 3. Perceived Relationship between Employees and Supervisors (mean of means = 0.8443, sd = 0.7421)

ProdSaf3R (-): "When push comes to shove, I am expected to cut safety corners to meet targets." (0.99, 1.043)

Tailgate safety meetings are an important part of Forest Inventory and Analysis crew preparation for plot work. (Photo by USDA Forest Service)

Leader7R (-): "Supervisors sometimes 'punish' employees if they seem too cautious about taking risks to get the job done." (0.67, 0.893)

Leader9R (-): I do not have support from my supervisor or manager to improve safety where I work." (1.04, 0.868)

Leader10R (-): "Sometimes it is not a good idea to report safety concerns because there is a possibility of retaliation from supervisors and managers." (0.80, 1.010)

Dimension 4. Personal Responsibility toward Safety (mean of means = 1.2245, sd = 0.5211)

PersResp5: "It is up to me to know and understand the safety rules at my place of work." (1.23, 0.708)

PersResp7: "I have the responsibility to pause and discuss any work activity that looks or feels unsafe." (1.37, 0.629)

PersResp8: "I take personal responsibility for my own and my coworkers' safety at work." (1.31, 0.653)

PersResp9: "I take pride in the safety record of my unit." (0.96, 0.834)

Dimension 5. Employee Perceptions of the Safety Journey (mean of means = 0.0944, sd = 0.7621)

SafeOut4: "It is possible for the Forest Service to closely approach zero serious accidents and fatalities." (0.32, 1.144)

SafeOut6R (-): "The safety engagements are just the latest safety initiative, it too will pass." (-0.34, 1.015)

PersResp4R (-): "Accidents will happen eventually, there is not much more I can do to prevent them." (0.68, 0.942)

Core2R (-): "The current emphasis on safety is just another Forest Service program that will change when we get a new Chief." (-0.04, 1.040)

Table 5 shows Eigenvalues and percentage of variance explained after the final rotation. As mentioned earlier, the five final attitude dimensions accounted for more than 47 percent of total variance across the 21 retained questions. Extraction factors beyond 5 added marginally very little to the explanatory power of the final 5-factor model. The scree plot (fig. 1) shows the rapid decay of difference between successive Eigenvalues as each additional factor beyond 5 was considered.

Table 5—Eigenvalue and percent of variance used in final 5-factor model

Extraction sums of squared loadings			
Factor	Total	Percent of variance	Cumulative percent
1	6.364	30.304	30.304
2	1.452	6.913	37.218
3	0.980	4.667	41.885
4	0.602	2.869	44.754
5	0.576	2.741	47.494

Differences in Safety Attitude Dimensions by Agency Division

Attitude dimension scores differed across Agency divisions (based on average scores across variables making up the five defined factors). In fact, ANOVA results comparing divisions were significant for all of the five attitude dimensions (p-values were all <0.001). For example, Law Enforcement had the lowest scoring for all dimensions, and Job Corps, the highest (table 6). These results may indicate that employees in Law Enforcement have a more skeptical attitude about the Safety Journey, whereas those with Job Corps seem more supportive. Perhaps significant numbers of Job Corps employees are "early adopters" of the Safety Journey, while Law Enforcement may be more hesitant, perhaps reflecting different training and job requirements (e.g., dealing with dangerous situations).

Overall, employee scores were lowest for Dimensions 1 and 5. The slightly negative Forest Service-wide scoring for Dimension 1 (Management Involvement and Feedback in Safety) likely indicates that employees see room for improvement in local management's active involvement in promoting safety and providing feedback. It also may indicate that employees are unsure whether the Safety Journey will persist over time (table 6). Apparently employees perceive a need for managers to update and improve safety protocols, make rules more relevant to local work conditions, modify rules so that they improve rather than compromise safety, provide a more efficient feedback system and more responsiveness to safety

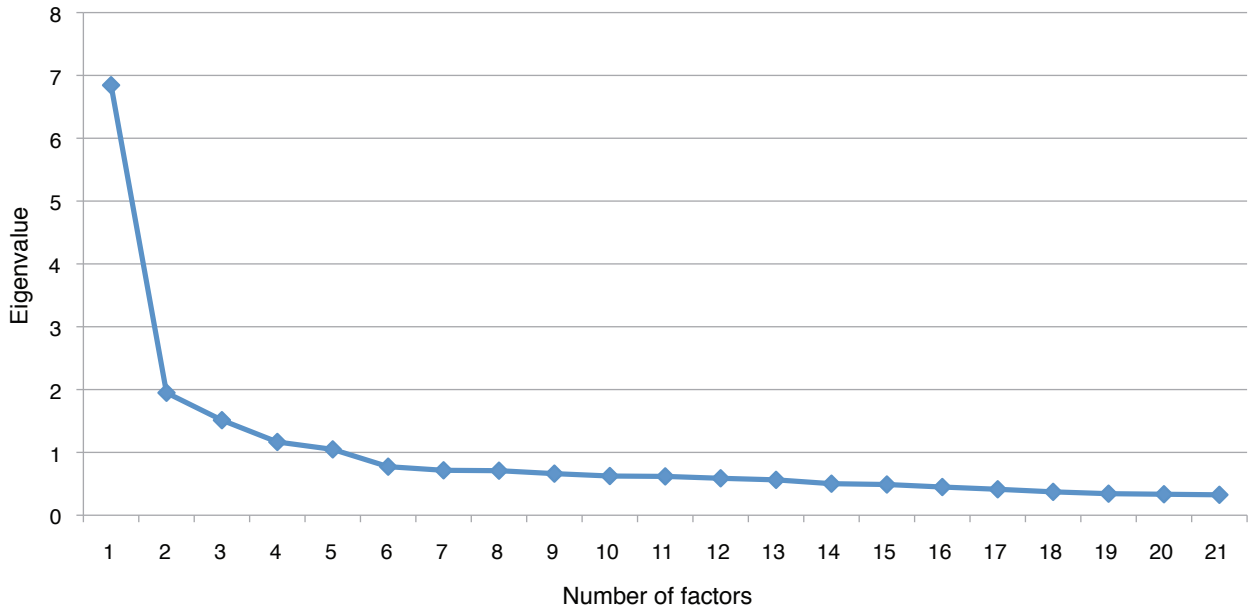


Figure 1—Scree plot-p of Eigenvalues.

Table 6—Descriptive statistics and *p*-values for the five attitude dimensions by division of the Forest Service

Agency Division	Dimension 1		Dimension 2		Dimension 3		Dimension 4		Dimension 5	
	Mean[a]	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
Job Corps	0.23A[b]	0.07	1.09A	0.05	0.91AB	0.07	1.40A	0.04	0.68A	0.06
Law Enforcement	-0.15B	0.06	0.31B	0.10	0.61A	0.09	1.11B	0.05	-0.34B	0.07
Northeastern Area	0.05AB	0.06	0.80ACD	0.08	0.83AB	0.07	1.16B	0.05	0.28C	0.07
National Forest System	-0.06B	0.01	0.69C	0.01	0.84A	0.01	1.22B	0.01	0.02D	0.01
Research	0.04A	0.02	0.87D	0.02	0.96B	0.02	1.24B	0.02	0.29C	0.02
Washington	-0.07B	0.03	0.75C	0.04	0.82A	0.03	1.22B	0.02	0.33C	0.03
	$p < 0.001$		$p < 0.001$		$p < 0.001$		$p < 0.001$		$p < 0.001$	
Agency-wide	-0.04	0.01	0.72	0.01	0.84	0.01	1.23	0.01	0.09	0.01

S.E. = Standard error.

[a] Multivariate weighted means that include only the post-engagement group.

[b] Means within a dimension followed by the same letter are not significantly different based on the Bonferroni t-test at the 0.05 experiment-wide level (each comparison was tested at the 0.05/15=0.003 level)

concerns, and be more visible in overseeing potentially dangerous operations. These results may also indicate employees see a need for more financial and equipment resources as a demonstration that the Safety Journey is a sincere effort.

Dimension 4 (Personal Responsibility toward Safety) had the highest positive scores, showing that employees, especially Job Corps employees, feel a personal responsibility for their own safety and coworkers' safety. Employees seem less certain of the Forest Service's commitment to their personal safety (Dimension 2, Employee Perceptions of Management's Commitment to the Safety). This seems especially the case with Law Enforcement and Investigations personnel (table 6). These lower scores likely are reflecting perceptions that budget and personnel cuts can compromise safety. These reductions can come across as asking employees "to do more with less." An important finding is that employee-supervisor relationships are generally seen as positive by employees.

Differences in Safety Attitude Dimensions by Demographics

In table 7, *p*-values, indicating significance, are listed for a series of comparisons to identify differences in safety attitude scoring between Agency divisions and demographic strata across the workforce. Included in demographic comparisons were five age groups, gender, and three race groups. Gender had few effects on attitude dimensions. Most differences occurred between Agency divisions, division*race interactions, and employee age groups.

In general, with regard to age differences (statistics for age groups not shown in table 8), employees between 40 and 59 seemed the most skeptical about the Safety Journey, whereas those younger than 40 seemed cautiously optimistic. Employee race differences were significant for all dimensions except Dimension 4, Personal Responsibility toward Safety. Blacks, Hispanics, and Whites seemed to have more positive attitudes toward safety than those included in the "Others" race category for Dimensions 1-3. Blacks had more positive attitude scoring for the Safety Journey, Dimension 5. There were very few significant gender differences, but females

seemed to have a more positive attitude toward the Safety Journey than did men.

Included below are selected figures illustrating significant interactions between Agency division and age for Dimensions 1–3 and 5, as identified in table 7. Figures 2 through 5 show that scoring tended toward a more positive attitude with age, although there were differences in this trend between Agency divisions. For example, the youngest employees in the Job Corps, Law Enforcement, and Northeastern Area divisions rated employee and supervisor relationships (Dimension 3) lower than did other divisions (fig. 4). Thus, improving mentoring andtraining opportunities for the younger employees in these three divisions may help move attitudes toward a more positive view of safety and the Safety Journey over time.

Grouping Employees with Similar Attitudes toward the Safety Journey

We identified four groupings of employees by using cluster analysis of mean Likert-scale attitude scores across the five attitude dimensions. Identified groups were named supportive, cautiously optimistic, skeptical, and very skeptical based on their mean scores for the attitude dimensions. As before, negative scoring for questions inconsistent with content of the safety engagement sessions was reverse scaled. Percentages for the four groups identified among the post-engagement survey respondents were as follows:

Cluster 1—Supportive: 43 percent

Cluster 2—Cautiously Optimistic: 22 percent

Cluster 3—Skeptical: 24 percent

Cluster 4—Very Skeptical: 11 percent

Means for each of the five dimensions and for each of the employee groups, standard deviations, and significance statistics from the cluster analysis are shown in table 5. *P*-values indicated associations between the identified employee groupings and the attitude dimensions resulting from the factor analysis. The Tukey's test of differences between means indicated that comparisons between clusters for each dimension were all significant (p <0.001), and that these comparisons served well in distinguishing groupings of employees with safety attitudes ranging from skeptical to supportive.

Table 7—Effects (*p*-values) of employee demographics on the five dimensions

Demographic	df[a]	Dimension 1	Dimension 2	Dimension 3	Dimension 4	Dimension 5
Unit	5	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**
Age	4	**0.0157**	**0.0131**	**<0.0001**	**0.0042**	**<0.0001**
Gender	1	0.3025	0.9299	0.7140	0.1790	**0.0391**
Race	2	**0.0046**	**0.0003**	**0.0005**	0.5534	**0.0047**
U*A[b]	20	**0.0354**	**0.0007**	**<0.0001**	0.0837	**<0.0001**
U*G	5	0.7005	**0.0477**	0.5483	0.2907	**0.0027**
U*R	10	**<0.0001**	**<0.0001**	**0.0015**	**<0.0001**	0.1056
A*G	4	**0.0149**	0.0881	0.3496	**0.0034**	**0.0042**
A*R	8	**0.0301**	0.0921	**0.0024**	0.0905	0.3933
G*R	2	0.7423	0.1288	0.9547	0.5811	0.2557

Note: Significant effects are shown in bold.

[a]df = degrees of freedom.

[b]U = Unit or division, A = age, G = gender, R = race. Asterisk indicates an interaction term between two demographic variables.

Those Supportive of the Safety Journey
(43 percent of employees)—

- This group generally held the most positive of attitudes across the five safety attitude dimensions.
- This group includes 89 percent of responding Job Corps, 59 percent of Law Enforcement and Investigations, 80 percent of Northeastern Area, 45 percent of National Forest System, 28 percent of Research, and 28 percent of Washington Office employees (see table 9).
- The "supportive group" employees are older, with 85 percent being over 50 years of age (table 10).
- Sixty-five percent of this group is African American, which is higher than the percentage for any of the other groups (table 11). Relatively high percentages of Whites (43 percent) and nearly half of Others (47 percent) are in this supportive group. The percentages of the supportive and cautiously optimistic groups who are Hispanic/Latino are about the same, 41 and 42 percent, respectively (table 11).

Table 8—Clustering of employee respondents' attitude scores by dimension values

Dimension	Cluster	N	Mean	SD	F	P	Tukey's Test[a]
1	Supportive	3,034	0.23	0.56	661.96	<0.001	D
	Cautiously optimistic	1,515	-0.03	0.58			C
	Skeptical	1,650	-0.13	0.53			B
	Very skeptical	775	-0.75	0.58			A
2	Supportive	3,034	1.13	0.53	1188.93	<0.001	D
	Cautiously optimistic	1,515	0.77	0.63			C
	Skeptical	1,650	0.59	0.64			B
	Very skeptical	775	-0.27	0.68			A
3	Supportive	3,034	1.16	0.59	369.76	<0.001	D
	Cautiously optimistic	1,515	0.95	0.62			C
	Skeptical	1,650	0.81	0.61			B
	Very skeptical	775	-0.17	0.71			A
4	Supportive	3,034	1.37	0.51	45.14	<0.001	C
	Cautiously optimistic	1,515	1.21	0.48			B
	Skeptical	1,650	1.18	0.45			B
	Very skeptical	775	0.93	0.54			A
5	Supportive	3,034	0.58	0.62	382.99	<0.001	D
	Cautiously optimistic	1,515	-0.02	0.71			C
	Skeptical	1,650	-0.09	0.67			B
	Very skeptical	775	-0.61	0.58			A

[a] Tukey's means separation test examining which clusters within a factor are different. Different letters indicate differences at $\alpha = 0.05$.

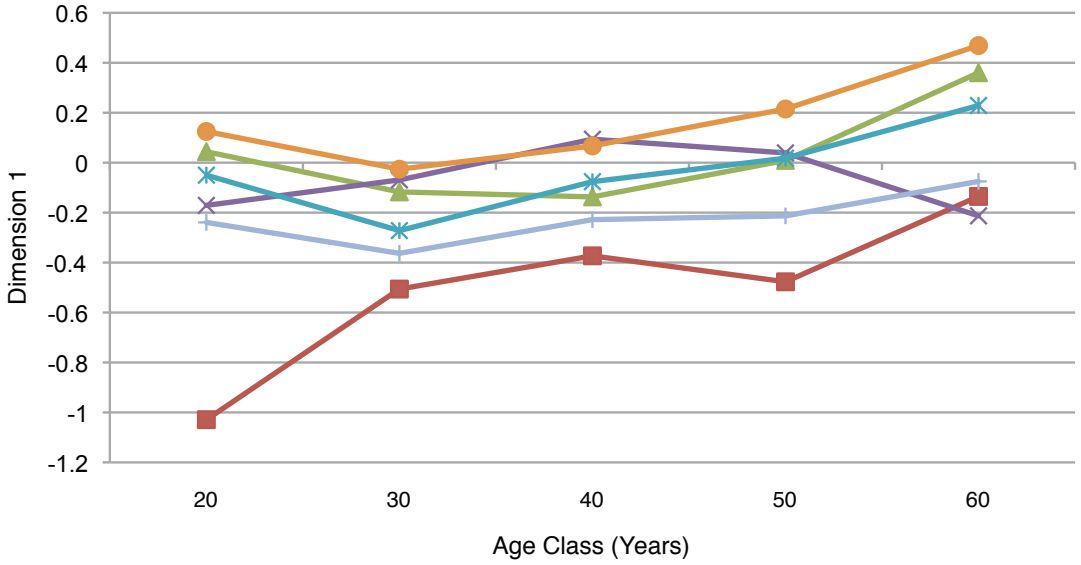


Figure 2—Interaction for Agency division and age class for Dimension 1, "Management Involvement and Feedback in Safety." Vertical axis values range from 2 = "most positive perceptions" to -2 = "most negative perceptions."

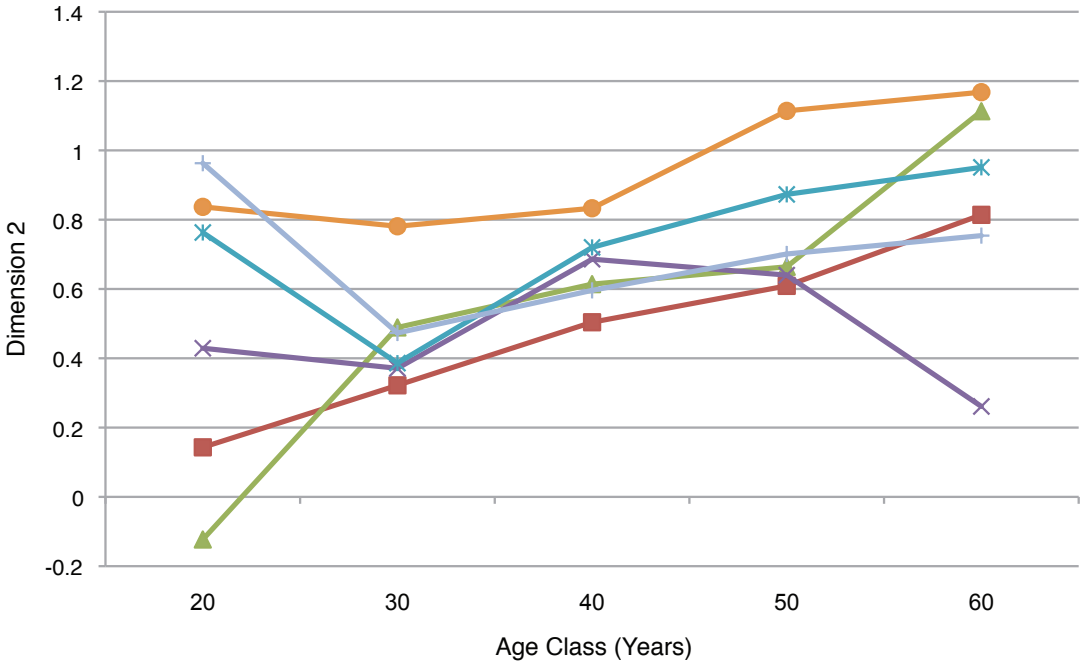
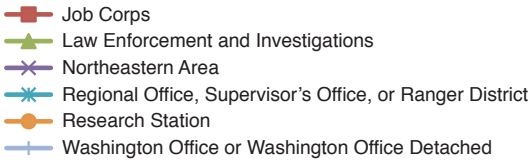


Figure 3—Interaction for division and age class for Dimension 2, "Perceptions of Management's Commitment to Safety." Vertical axis values range from 2 = "most positive perceptions" to -2 = "most negative perceptions."



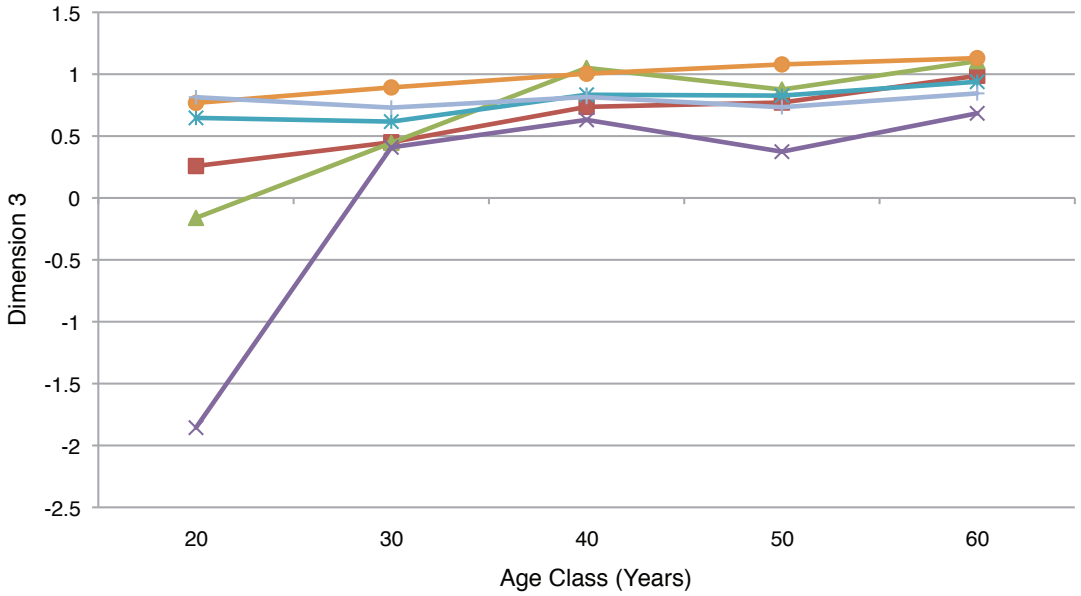


Figure 4—Interaction for division and age class for Dimension 3, "Perceived Relationship between Employees and Supervisors." Vertical axis values range from 2 = "most positive perceptions" to -2 = "most negative perceptions."

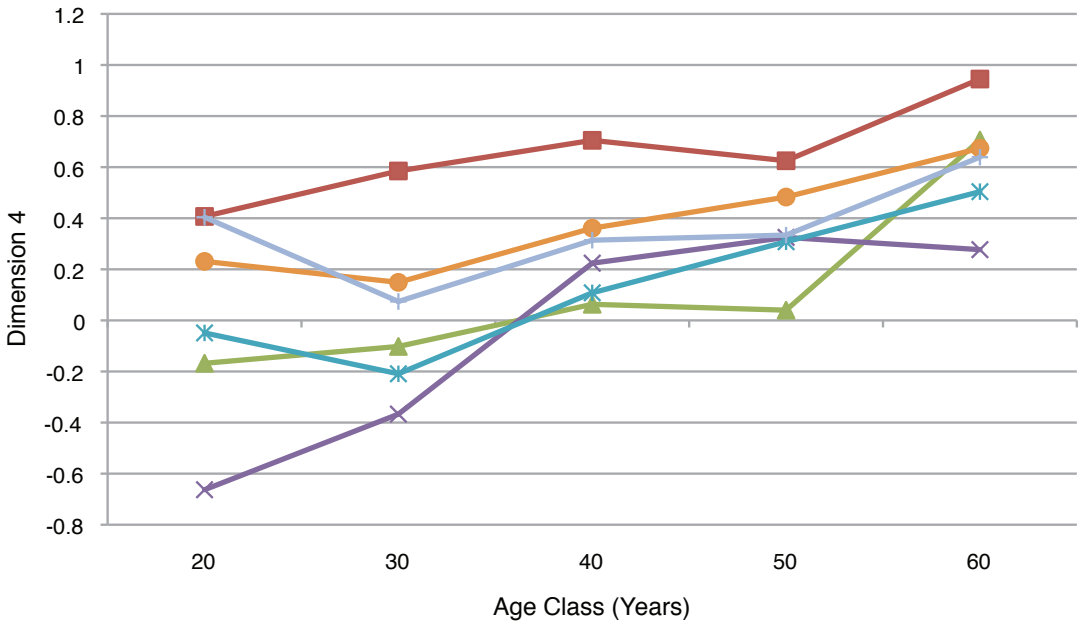
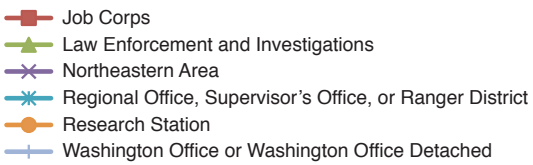


Figure 5—Interaction for division and age class for Dimension 5, "Employee Perceptions of the Safety Journey." Vertical axis values range from 2 = "most positive perceptions" to -2 = "most negative perceptions."



Those Cautiously Optimistic about the Safety Journey (22 percent)—

- We labeled "cautiously optimistic" the group expressing the second most positive of attitudes about the likely success of the Safety Journey.
- About one-fourth of National Forest System and of Research employees fell into this group, along with 15 percent of Washington Office employees (table 9).
- Most employees in this group were younger than 39 years (94 percent, table 10).
- More than 40 percent of cautiously optimistic employees are Hispanic, less than one-quarter are Black, just over 20 percent are White, and 13 percent are in the Other race category (table 11).

Those Skeptical of the Safety Journey (24 percent)—

- This group includes those who expressed a mild degree of skepticism and lower attitude scores than the former two groups across the five attitude dimensions.
- Included are relatively high percentages of responding Research and Washington Office (48 and 58 percent, respectively), some National Forest System (18 percent), and only a few Northeastern Area employees.
- A high percentage of employees over 40 years old are in this group (96 percent).
- One quarter of Whites and of Others fell into this group. Blacks and Hispanics were sparsely represented.

Those Very Skeptical of the Safety Journey (11 percent)—

- This group of employees appears to be the most skeptical across all dimensions of the Safety Journey.
- This group includes 41 percent of Law Enforcement and Investigations, 11 percent of Job Corps, 15 percent of Northeastern Area, and 13 percent of National Forest System respondents. Very few Research employees (3 percent) and no Washington Office employees were in this group.
- There is no apparent association between being in the very skeptical group and age. The only race with a somewhat higher percentage in this group was the Other race group. Remaining races were more or less evenly distributed within this group.

In general, more employees were supportive of or showed cautious optimism for a successful Safety Journey (65 percent) than not. Most of the employees older than 49 years were very supportive of the Safety Journey, while most 39 or under were cautiously optimistic. Higher percentages of Law Enforcement and Investigations, Research, and Washington Office employees were skeptical than were employees in other divisions. Eighty-nine and 80 percent of Job Corps and Northeastern Area employees, respectively, were supportive. It appears that greater opportunities for realizing the ideals of the Safety Journey may be found by paying more attention to Agency division differences. For example, future efforts could emphasize making the Safety Journey more applicable to Law Enforcement and Investigations, Washington Office, and Research employees.

Table 9—Percentage of employees within each division of the Forest Service belonging to each attitude group

	Employee attitude groups			
Division	Supportive	Cautiously optimistic	Skeptical	Very skeptical
Job Corps	89[a]	0	0	11
Law Enforcement	59	0	0	41
Northeastern Area	80	3	3	15
National Forest System	45	24	18	13
Research	28	21	48	3
Washington Office	28	15	58	0
All Forest Service	43	22	24	11

[a]Percentages within each cluster are unweighted. Cluster analysis does not allow weighting.

Table 10—Percentage of employees within each age group belonging to each attitude group

	Employee attitude groups			
Age (years)	Supportive	Cautiously optimistic	Skeptical	Very skeptical
<30	1	91	0	8
30-39	2	84	2	12
40-49	25	6	60	10
50-59	67	0	20	13
>59	85	0	6	10
Total	43	22	24	11

Table 11—Percentage of employees within each race belonging to each attitude group

	Employee attitude groups			
Race	Supportive	Cautiously optimistic	Skeptical	Very skeptical
Black	65	22	4	9
Hispanic/Latino	41	42	8	8
White	43	21	25	11
Other	47	13	22	19
Total	43	22	24	11

Employee Perceptions of Change

As follow-up to the Likert-scale questions designed to help describe attitudes, survey respondents were asked whether they perceived change since initiation of the Safety Journey. Although there does not seem to be a definite start time in employees' minds, most employees seemed aware that the Forest Service had embarked on a Safety Journey. Of the 82 percent answering that they were aware of it, the following statements and percentages indicate what they perceived the Safety Journey to be:

Pick the one statement below that best describes the Forest Service Safety Journey.

- It is a program run out of the Chief's office aimed at reducing accidents and fatalities. (17.5 percent)
- It is the ongoing engagement of all employees at all levels and others we work with aimed at changing the way we think, talk, and act regarding safety. (75.0 percent)
- It is a series of safety training sessions aimed at improving employee recognition of risks. (4.8 percent)
- It is a long-term program for teaching employees how to better follow rules and safety protocols. (2.7 percent)

The second statement most agrees with the description provided by the Forest Service.

Five questions were asked to determine whether employees perceived change associated with the Safety Journey. Response frequencies and percentages are shown in tables 12 through 16. Most employee respondents (between 56 and 76 percent across the five questions) indicated they had not perceived change. Noteworthy, however, is that more employees perceived some change toward a better safety climate than perceived change toward a worse climate. In fact, with regard to employees' comfort level with raising safety concerns with higher-level supervisors or managers, almost 41 percent felt that things were better.

Table 12—How has the amount and openness of communication about safety changed within your work unit since the start of the Safety Journey?

Safety conditions	Frequency	Percent
Much worse	27	0.3
Worse	87	1.0
No change	5,342	64.3
Better	2,659	32.0
Much better	197	2.4

Table 13—With the Chief's renewed emphasis on safety, how have people in your unit changed their approach to taking personal responsibility for safety?

Safety conditions	Frequency	Percent
Much worse	21	0.3
Worse	54	0.6
No change	5,599	67.4
Better	2,499	30.1
Much better	139	1.7

Table 14—How has the integration of safety with consideration of work productivity changed within your work unit since the start of the Safety Journey?

Safety conditions	Frequency	Percent
Much worse	25	0.3
Worse	135	1.6
No change	6,275	75.5
Better	1,773	21.3
Much better	104	1.3

Table 15—How has individual accountability for following procedures changed within your work unit since the start of the Safety Journey?

Safety conditions	Frequency	Percent
Much worse	32	0.4
Worse	90	1.1
No change	6,273	75.5
Better	1,806	21.7
Much better	111	1.3

Table 16—How has employee comfort level with raising safety concerns with higher-level supervisors or managers changed within your work unit since the start of the Safety Journey?

Safety conditions	Frequency	Percent
Much worse	58	0.7
Worse	184	2.2
No change	4,684	56.4
Better	3,112	37.4
Much better	274	3.3

Analysis of Employee Comments

A rather unexpectedly large, but welcomed, number of survey respondents submitted comments (3,194 of 11,980, 27 percent) that varied from one or two words to several-hundred-word short essays. The contents of all comments provided were read in detail and then categorized by using a content analysis framework of common themes (fig. 6). To test this framework, raters worked independently to apply the framework and improve theme category definitions. Final multi-rater reliability scores (percentage of comments assigned to the same categories by all raters) were between 77 and 96 percent, with a mean score of 93 percent across raters.

The framework consists of 5 first-order theme categories, 8 second-order categories (fig. 6), and 14 third-order categories. Three of the first-order categories identified whether comments were indicating approval, partial approval, or disapproval of the safety engagements and the overall Safety Journey. A fourth first-order category identified comments critiquing the survey itself. Comments that did not fall into any of the above four categories were included in a catch-all "other" category. We considered the approved, partially approved, disapproved, and other categories as mutually exclusive so that applicable comments would fit into only one of those categories.

Comments in each of the four comment categories were then separately sorted among the eight second-order categories if sufficient information had been given to support this second layer of sorting. The second-order categories were: (1) opinions regarding the safety engagements specifically, (2) Agency use or distribution of monetary and material resources, (3) perceived relationship between higher-level management and field personnel, (4) perceived needs for follow-through and putting words into action, (5) morale concerns, (6) satisfaction with current safety records and procedures, (7) views of the Chief's goal of zero accidents and fatalities, and (8) applicability of the Safety Journey or safety engagements to the respondent's position and type of work. These categories were not mutually exclusive; therefore, comments could apply to one or more of the second-order categories.

Due to the complexity of 4 of the second-order categories, 14 third-order categories were created to help further define concerns covered by the second-order categories. Under (1) disapproval of the safety engagements, we considered three third-order categories: 1(a) disapproval of the engagements due to cost during times of fiscal hardship, 1(b) engagements seeming to be redundant with already existing safety programs, and 1(c) other reservations. Under (2) poor use or distribution of resources, we considered four third-order categories: 2(a) issues regarding adequacy of equipment, 2(b) safety concerns resulting from travel restrictions, 2(c) safety concerns resulting from personnel cuts and limited hiring, and 2(d) other reservations. Under (3) concerns with management, we identified: 3(a) concerns about how well upper-level management is in touch with current safety procedures and concerns of field personnel, 3(b) concerns about relationships between employees and supervisors, 3(c) specific hiring concerns, and 3(d) other reservations. Under (4) waiting for follow-through, we identified: 4(a) concerns that the Safety Journey may be just the latest program that will change under new leadership, 4(b) adopting a "wait and see" attitude regarding the Safety Journey, and 4(c) a need for follow-up to the safety engagements and the Safety Journey. Similar to the second-order categories, third-order categories were not mutually exclusive. All comments were assigned to appropriate first-, second-, and third-order categories. Categorized comments based on this framework were compared between demographic strata (age, sex, work type, division, years employed by the Forest Service).

A third of employee comments indicated at least partial support for the Safety Journey, including the safety engagements (fig. 7). Of the 2,334 comments in the final analysis, we judged 280 (12 percent) as expressing full approval, 467 (20 percent) as expressing partial approval, and 632 (27 percent) as not approving. There were 955 comments (41 percent) that indicated neither approval nor disapproval. Employees who fully approved commented that the Safety Journey appears to represent a sincere effort to develop a better safety culture, and found the engagements to be stimulating and worthwhile. Employees who expressed partial approval were hopeful that the Safety Journey would take root, but expressed reservations. Employees who did not approve were concerned that safety has been overemphasized to the point that some employees are perhaps becoming numb to ongoing discussions. This group of commenters indicated that greater financial and personnel commitments may help overcome this perception and lead to improved morale and safety awareness.

For comments with sufficient detail to enable second-order categorization, we assigned 23 percent to management concerns, 18 percent to disapproving of the safety engagements, 16 percent to being satisfied with current safety programs and records, 15 percent to poor use of resources, 10 percent to requesting follow-through, 7 percent to considering zero accidents and fatalities unrealistic, 6 percent to considering the Safety Journey not applicable to them, and 5 percent to morale concerns, (fig. 8). We removed "Other" comments from

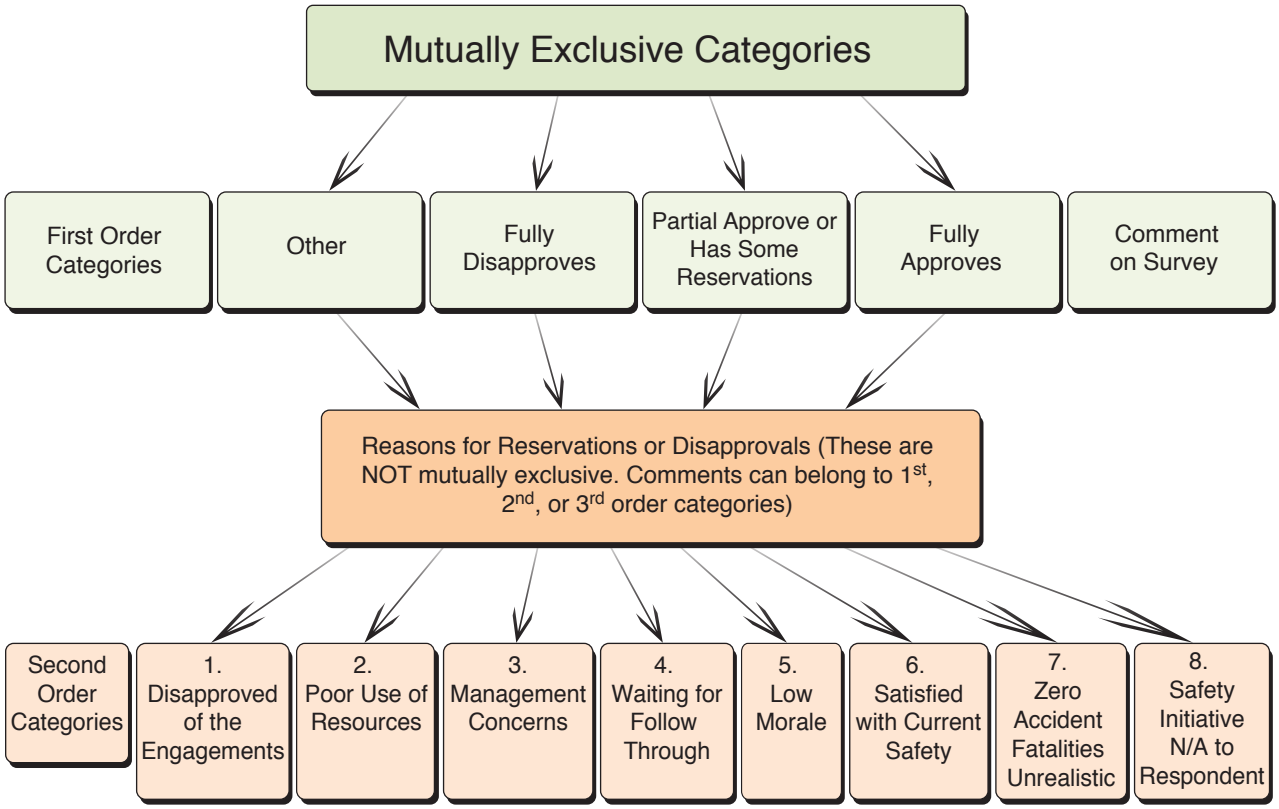


Figure 6—Flow chart of framework for analyzing employee comments describing first- and second-order categories used in qualitative content analysis.

all percentages shown in figure 8 because these comments did not clearly express approval or disapproval. Results for third-order categories will be discussed later, after discussion of their parent second-order categories.

Level of approval of the Safety Journey and/or safety engagements appeared to differ by division of the Agency (table 17). Job Corps was the only division to have a majority of commenters expressing full approval of the Safety Journey (73 percent), although sample size was small (n=22). Northeastern Area employees were evenly split between full and no approval (45 percent in each category). This result may also be a reflection of a small sample size (n=11). Many of the commenting employees in Law Enforcement and Investigations, National Forest System, Research, and Washington Office disapproved (43-49 percent) of the Safety Journey and the safety engagements.

Office work was the most common type of work identified by those posting comments that could be classified as full, partial, or no approval (n=855). The next most common were forest fieldwork (n=461) and fire management (n=356). Backcountry was the least common type (n=35), followed by safety specialist (49), and laboratory work (54). Percentages across types of work predominantly expressed partial to no approval of the Safety Journey and/or engagements, with disapproval varying from 32 to 56 percent. Law enforcement, visitor services, and backcountry workers showed more partial approval than disapproval (45 percent partial approval versus 40 percent disapproval; 42 versus 41 percent; and 53 versus 32 percent, respectively).

Employees identifying themselves as supervisors had approval percentages for the Safety Journey and/or engagements very similar to those of non-supervisory employees (table 17). Forty-six percent of supervisors and 44 percent of non-supervisors did not approve of the Safety Journey and/or the engagements. Twenty and 21 percent of supervisors and non-supervisors, respectively, approved. Male and female commenters had similar approval percentages with 46 percent and 43 percent, respectively, not approving. Thirty-four percent of both males and females were partially approving.

Median age of respondents posting comments was 50-59 years. As shown in figure 9, approval level was associated with age. With the exception of the age group 70 or older, as age increased, generally the percentage expressing full approval increased from around 13 percent for those under 30 to more than 30 percent for those 60-69 years old. The percentage expressing partial approval generally declined with age, going from percentages in the mid- to high-30s for the youngest age groups to <20 percent for those 70 or older. Disapproval percentages went from >50 percent for the youngest two age groups down to just over 40 percent for those 50-69 years old.

There were modest to no correlations between number of years employees had worked for the Forest Service and percentages approving or disapproving. R^2 values (coefficient of determination) between number of years with the Forest Service and percentages approving or disapproving ranged from 0.0 to 0.1.

Common themes across many of the comments are summarized below:

Evaluations of the Safety Engagements—We received 473 comments specifically giving feedback on the safety engagements (fig. 8). The apparent cost of the engagements was the greatest specific concern, followed by comments that the safety engagements may not have sufficiently given credit to the successes of existing safety practices and programs.

Concerns Regarding Monetary and Material Resources—We received 396 comments that expressed concerns regarding the use or distribution of money and material resources (fig. 8). Of the 1,085 comments that either partially approved or disapproved of the Safety Journey, 190 (18 percent) expressed concerns about adequacy of resources. An additional 194 comments initially assigned to the first-order "Other" category and 12 "Full Approval" comments also expressed some concerns regarding available resources. The perceived failure to hire qualified new employees, particularly in the context of greater workloads, was most frequently identified by responding employees as contributing to stress, morale levels, and safety risks (157, percentages not given because third-order categories were not mutually exclusive), followed by lack of funds to procure equipment or maintain existing buildings and equipment (115). Travel caps were identified as a concern because they could cause more employees to travel late into the evening to avoid lodging expenses (85 comments). Finally, 194 comments noted other concerns, primarily worries associated with declining or low budgets.

Views on Relationships between Management and Field Personnel—We received 595 comments concerning perceived relations between higher-level management and on-the-ground field personnel (fig. 8). Of the 1,085 comments that either partially approved or disapproved of the Safety Journey, 349 (32 percent) expressed some of these concerns. An additional 222 comments initially assigned to the first-order "Other" category and 7 "Full Approval" comments also expressed some concerns about management and employee relations. Employees most frequently indicated that upper-level management could perhaps be better informed about safety procedures already being followed by field personnel (262 comments). Relationships between supervisors and employees, particularly trust issues and fear of retribution, were also mentioned (107 comments), followed by concerns that hiring to meet needed skill levels and training was important to safety

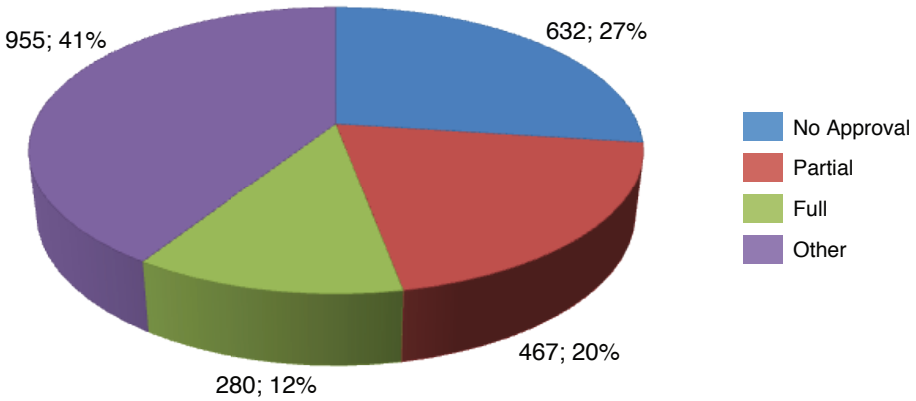


Figure 7—Number and percentage of respondent comments by level of approval of the Safety Journey (first-order, mutually exclusive categories).

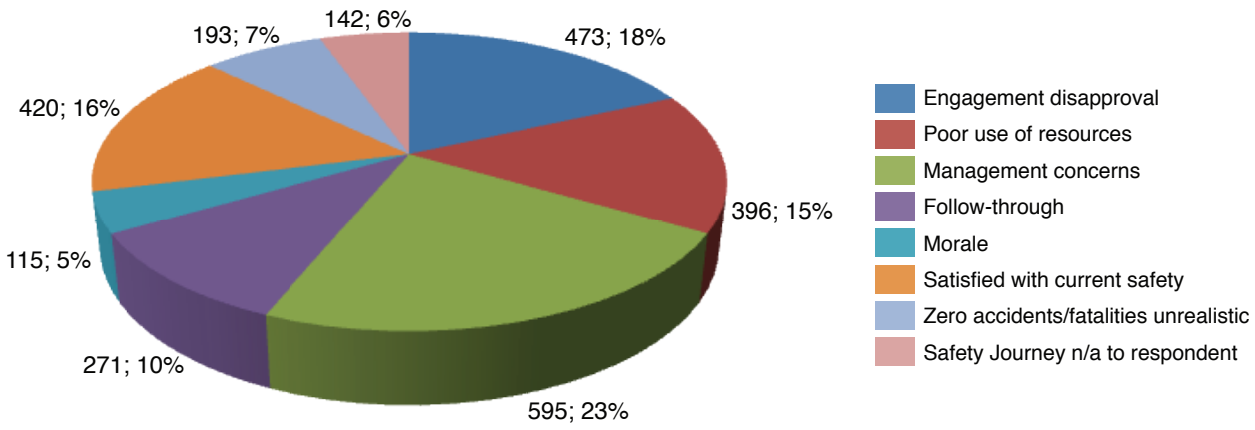


Figure 8—Number of comments assigned to each second-order category. Note: Second-order categories were not mutually exclusive; comments could be assigned to one or more second-order categories. Percentages are calculated with the total number of comments (with repetition) assigned to second-order categories.

(95). Finally, 184 comments expressed other concerns regarding management, such as level of management commitment to localized safety programs and availability of specialized training.

Comments Regarding Follow-Through and Putting Words into Action—We received 271 comments that directly asked the Agency to follow up the safety engagements in concrete ways (fig. 8). Of the 1,085 comments that either partially approved or disapproved of the Safety Journey, 189 (17 percent) emphasized a need for follow-through with the goals and intentions being expressed. An additional 26 comments initially assigned to the first-order "Other" category and 54 "Full Approval" comments also requested follow-through. One of the most often requested forms of follow-through was provision of better financial and managerial support. We received 146 comments that expressed some doubts about the longevity and success of the Safety Journey, with 78 respondents indicating they have taken a "wait and see" attitude regarding success, and 68 indicating doubts that the Safety Journey will survive transitions among upper-level management.

Comments around Low Morale, Satisfaction, Zero Accidents, and Applicability of Safety Journey—We received 115 comments that indicated morale is a concern among some employees (fig. 8). Of the 1,085 comments that either partially approved or disapproved, 75 (7 percent) indicated morale is not as high as it could be. One "Full Approval" comment and 39 "Other" comments also indicated morale concerns.

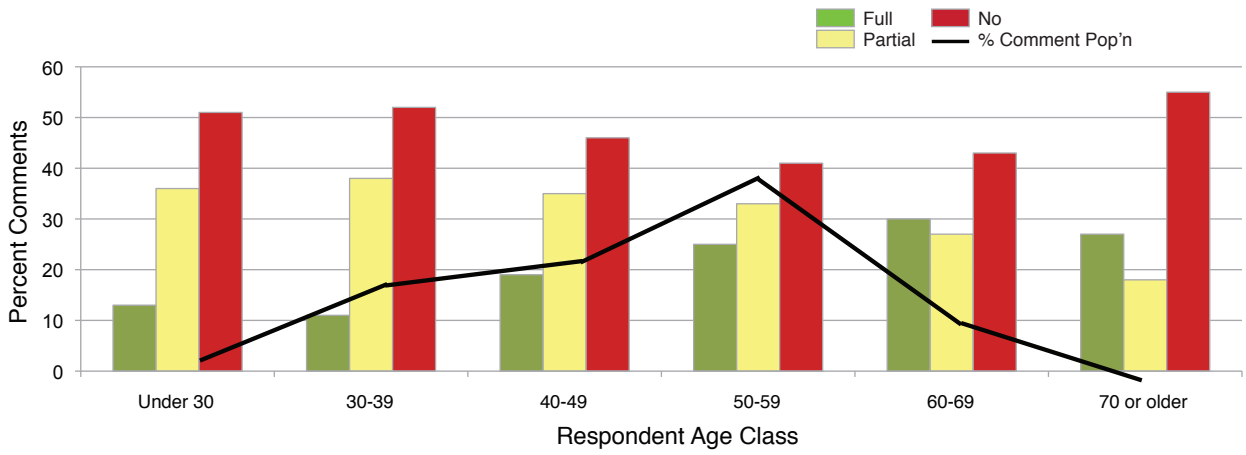


Figure 9—Percentage of comments assigned to full, partial, or no approval of the Safety Journey and/or safety engagements and proportion of those making comments by respondent age class.

Table 17—Total number and percentage of comments assigned to full, partial, and no approval first-order categories by division of the Forest Service, type of work, status as supervisor, and gender

Comments by category	Number providing comments	Level of approval		
		Full	Partial	No
		percent		
All Comments	1368	21	34	45
Division				
Job Corps	22	73	9	18
Law Enforcement & Investigations	25	17	39	43
Northeastern Area	11	45	9	45
National Forest System	1,110	19	35	46
Research	133	22	29	49
Washington Office or Washington Office-Detached	78	23	33	44
Type of Work				
Office	855	23	34	43
Front desk	75	26	30	44
Laboratory	54	24	20	56
Research fieldwork	157	17	28	55
Forest fieldwork	461	14	35	51
Forest maintenance	168	13	32	55
Visitor services	137	17	42	41
Law enforcement	83	15	45	40
Safety specialist	49	24	22	53
Backcountry	35	15	53	32
Fire	356	12	37	51
Forest inventory	119	14	34	52
Supervisor				
Yes	559	21	35	44
No	820	20	33	47
Gender				
Male	752	20	34	46
Female	570	23	34	43

Note: Comments assigned to “Other” were excluded from calculations in this table.

We received 420 comments expressing satisfaction with the effectiveness of existing safety programs and procedures, and thus questioning what more the Safety Journey can achieve. Of the 1,085 comments that either partially approved or disapproved, 171 (16 percent) raised this question. An additional 39 "Full Approval" and 141 "Other" comments also indicated sufficient satisfaction with the current situation.

We received 193 comments indicating a belief that the Chief's goal of zero accidents and fatalities is unrealistic. Of the 1,085 comments that either partially approved or disapproved, 121 (11 percent) questioned whether achieving zero accidents and fatalities is possible. An additional 10 "Full Approval" and 62 "Other" comments also indicated this skepticism.

We received 142 comments from employees who thought the Safety Journey, as currently structured, did not apply to their particular jobs (e.g., office workers, front desk personnel). Of the 1,085 comments that either partially approved or disapproved, 65 (6 percent) indicated that the Safety Journey and/or engagements did not apply to them. One additional "Full Approval" and 76 "Other" comments indicated that employees felt the Safety Journey and/or engagements as designed were not applicable to them.

Lakewood-Laona District Ranger Jeff Seefeldt talks with local journalists during a media tour of a recently cleared marijuana growing site found on the Chequamegon-Nicolet National Forest in Wisconsin. (Photo by Dave Melancon, Region 9, Chequamegon-Nicolet National Forest)

Clockwise from top left: Forest Inventory and Analysis crews exchange expertise with local forestry staff in the Pacific Islands; Area Supervisor Eric Martinez and Student Trainee Michael McManus install an antenna, Mendocino National Forest (California); U.S. Forest Service employee with Boy Scout troop about to take their Junior Wilderness Ranger Pledge, Bitterroot National Forest (Montana); Service Area Technician Scott Finck and other Forest Service employees install a fire crew shelter, Wenatchee National Forest (Washington). (Photos by USDA Forest Service, Northern Region)

Clockwise from top left: Forest Service employee, Matt Dickinson, plants a seedling in the Angora Fire area (California) with another employee (photo by Lisa Herron); Glenn Moore, Hoopa/Yurok Cultural Practitioner arranges fish on skewers while Merv George, Region 5 Tribal Relations Manager addresses an audience in California; Six Rivers National Forest Mad River Trail (California) Economic Recovery and Reinvestment Act Project; neighborhood activist Vilma Aquino, Forest Service employee Amanda Cundiff, lead garden volunteer Tom Bilbo, and "Global Center for Success" Job Training Center Director Sister Elvie, Grand Opening, Vallejo, CA; Capitol Christmas Tree Coordinator Maria Benech is interviewed by KCRA-NBC Stockton, CA . (Photo by John Heil, remaining photos by the USDA Forest Service)

Summary and Discussion

In conducting this 2011 Safety Survey, there ultimately were four closely related objectives:

- *Describe current employee attitudes (including perceptions and behaviors) toward safety and the Safety Journey.*
- *Assess employees' overall perceptions of changes resulting from initiation of the Safety Journey* and summarize their suggestions for improving safety philosophy, policy and operations.
- *Build a baseline of data on employee attitudes* toward workplace safety so that trends (change) resulting from implementation of successive phases of the Safety Journey can be detected.
- *Evaluate the Safety Survey instrument* with the final goal of creating a more efficient standardized survey instrument for periodic use in monitoring changes in employee safety attitudes, perceptions, and behaviors.

U.S. Forest Service Southern Research Station Safety Engagement at Flinchum's Phoenix in Athens, GA. (Photo by Yongqiang Liu, Southern Research Station, Forestry Sciences Laboratory)

The Safety Survey

In 2011, all Forest Service employees were required to attend an 8-hour safety engagement session. One of the intentions of these engagements was to attempt to shift from traditional, rule-based safety compliance to a greater emphasis on safety as an internalized core value.

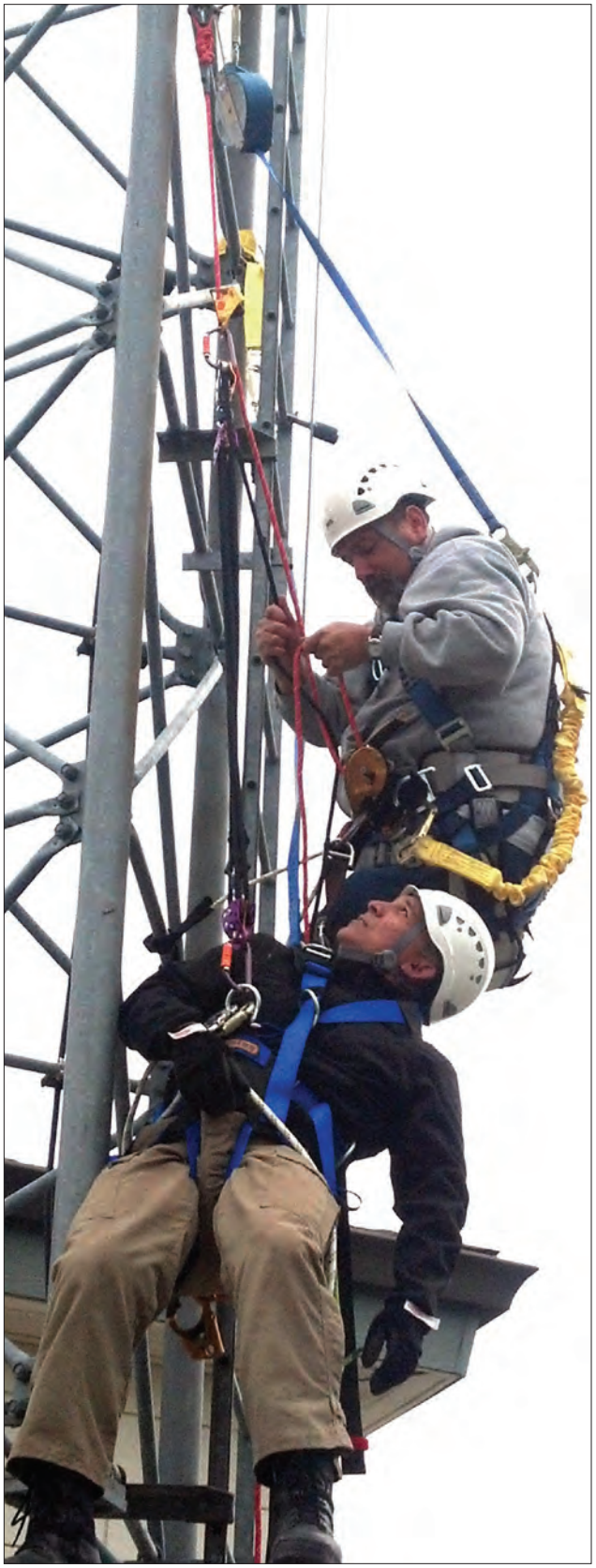
Christie Stegall and Evelyn Wenk measure *Trillium reliquum* plants on the Chattahoochee-Oconee National Forest in Georgia. (Photo by USDA Forest Service)

As a follow-up to these sessions, an employee Safety Survey was implemented in September 2011, using an online survey service (SurveyMonkey®). An additional survey is planned for 2013 to assess progress in the continued Safety Journey over time.

The 2011 Safety Survey sample netted nearly one-third of the Forest Service work force. This sample was sufficient in size and representativeness for rigorous statistical analysis and reporting. In addition, nearly 3,200 respondents (about 27 percent of the sample, 10 percent of the workforce) volunteered comments. Many of these comments dealt with ideas about future directions for the Forest Service Safety Journey. Thus, in discussing the results of the Forest Service Safety Survey, substantial attention was given to results from analysis of comments.

Discovering the Underlying Dimensions of Employee Safety Attitudes

We used a statistical procedure called factor analysis to identify groups of questions which best represented the underlying dimensions of employee safety survey response patterns. By applying factor analysis, the survey team was able to identify 5 principal safety attitude dimensions based on just 21 of the original 49 questions. Results for each of the original 49 questions can be found



Tony Martinez and Eric Martinez participate in a tower climbing safety and rescue class held at the Mendocino National Forest Supervisor's Office in Willows, CA. (Photo by USDA Forest Service)

in appendix C. The dimensions resulting from the factor analysis are as follows:

1. Management Involvement and Feedback in Safety (5 questions)
2. Perceptions of Management's Commitment to Safety (4 questions)
3. Perceived Relationship between Employees and Supervisors (4 questions)
4. Personal Responsibility toward Safety (4 questions)
5. Employee Perceptions of the Safety Journey (4 questions)

Differences between Agency Divisions

There were a few differences among the Agency's divisions regarding their position on the above five dimensions. For example, Law Enforcement had the lowest scoring for each safety attitude dimension, whereas Job Corps showed the highest scoring. Job Corps employees may be "early adopters" of the Safety Journey, while Law Enforcement may be more hesitant, perhaps because of different training and perspectives (e.g., dealing with dangerous situations rather than environmental and equipment safety issues).

Over all employees, scores were lowest for Dimensions 1 and 5, probably because employees see room for improvement of local management's active involvement in promoting and providing feedback regarding safety. The scores may also indicate that employees are unsure whether the Safety Journey will persist over time. Among other options, there may be a need for managers to better demonstrate their active involvement in updating and improving safety protocols, making rules more compatible with local work conditions, identifying rules that may actually compromise rather than improve safety, providing a more efficient feedback system that clearly signals responsiveness to safety concerns, and being more visibly involved in overseeing potentially dangerous operations. Employees may be looking for allocation of financial and equipment resources as evidence that the Safety Journey is a sincere effort. Employees strongly feel a personal responsibility for their own and coworkers' safety (Dimension 4), but are less certain of the Forest Service's commitment to their own safety (particularly with the Law Enforcement division). There are concerns that cutting the budget and personnel can compromise safety because it comes across as asking employees "to do more with less." An important positive finding is that employee-supervisor relationships are generally seen as positive by employees.

Field crews are thoroughly immersed in the U.S. Forest Service safety culture and first aid training to ensure appropriate actions and response for managing risks in remote locations. Photographed in the Pacific Islands. (Photo by USDA Forest Service)

Varying Employee Support

Analysis helped reveal that employees could be grouped by their level of support for the Safety Journey. In general, most employees were supportive or cautiously optimistic (65 percent). Most employees who were supportive were older than 49 years (85 percent), and included some of those in the division where employees were most skeptical (Law Enforcement and Investigations). Almost all employees younger than 39 years were either supportive or optimistic. In addition, high percentages of Job Corps and Northeastern Area employees were supportive (89 percent and 80 percent, respectively). Forty-one percent of Law Enforcement and Investigations employees, but small percentages of Job Corps, Northeastern Area, National Forest System, and Research employees were very skeptical of the Safety Journey. It appears there may be payoff in making the Safety Journey more applicable to Law Enforcement and Investigations, Washington Office, and Research employees.

Employee Comments in Brief

All comments were read and analyzed by using a content analysis framework that enabled tracking general themes across the comment data base. Most employee comments indicated at least partial approval of the Safety Journey and/or the safety engagements (55 percent). Employees who "Fully approved" commented that the Safety Journey appears to represent a sincere effort to develop a better safety culture and found the engagements to be stimulating and worthwhile. Employees who expressed "Partial approval" were hopeful that the Safety Journey would take root but expressed some reservations and doubts. Employees who "Did not approve" of the Safety Journey were concerned that safety has been overemphasized to the point that some employees are becoming numb to ongoing discussions on improving safety. This group of employee commenters indicated that greater financial and personnel commitments may help overcome this feeling and lead to improved morale and safety awareness.

Employee commenters offered the following observations regarding four key safety concerns:

1. Remote terrain safety concerns
   - Unreliable radio communication.
   - Need for proper footwear and safety boots.
   - Inability to work in pairs due to budget and personnel cuts.
   - Worries about encountering illegal drug activities.
   - Risks normally taken by Forest Service employees are now being shouldered by contractors who may have less stringent safety practices
   - Need for improved helicopter assistance, particularly with streamlining emergency rescue and using helicopters to replace smoke jumping.

2. Vehicle fleet concerns
   - Newer vehicles resemble Border Patrol vehicles, potentially putting border-area Forest Service employees at risk.
   - Lighter, more fuel-efficient vehicles are not appropriate for all jobs, and may not perform well while hauling heavy loads, towing, or going off road.
   - New fire engines are too heavy, long, and complicated to maintain.
   - Utility vehicles are seen as too top-heavy and too wide to operate along narrow trails, such as fire control lines.
   - There is a need to purchase and install headache racks (protective grill between bed and cab) in field and work trucks.

3. Inadequate Law Enforcement or vacant Safety Office positions
   - Budget/personnel cuts require officers to cover large areas, which reduces support for field employees and potentially places the public at risk.

- Front desk workers in high-risk areas request bulletproof glass, hot buttons, and additional security.
- Communication between law enforcement and field-going employees needs to be improved. Radios and dispatchers are needed, as well as better communication about dangerous locations (e.g., marijuana growing sites or drug cartel areas).
- Replace Forest Protection Officer positions with armed law enforcement officers.

4. Safety rules, protocols, procedures, and Web sites too numerous and complicated.

- Need for consolidation and simplification of safety standards.
- Redundant certifications training to operate essential field equipment.
- Employee input should be considered prior to implementing new rules to check if the rules are necessary.

Employees also gave 10 general suggestions for improving safety within the Forest Service:

1. Reduce workloads.
2. Revise target-based funding so that employees are not tempted to cut safety corners in order to meet targets in the face of reduced personnel and budgets.
3. Increase funding for safety programs and equipment.
4. Encourage mentoring of new employees.
5. Hire more employees and focus on their being fully qualified.

At the Garden of the Gods Recreation Area, Sue Hirsch, Jennifer Parrish, and Wendy Cowsert sell outlet items and offer information about the forest. (Photo by USDA Forest Service)

6. Adopt a bottom-up approach to safety programs, incorporating employee input for improving Agency-wide safety programs.
7. Provide a more anonymous method to help employees feel more comfortable in reporting safety violations.
8. Incorporate office health, wellness, and fitness in future safety discussions. Many employees felt the current Safety Journey has given little attention to the safety and health issues faced by office workers.
9. Acknowledge good safety records to improve employee morale and provide successful templates for other locations in the Forest Service.
10. Shift emphasis from rule-based safety to risk management. "Accidents happen; prepare for the worst" may be a better philosophy than trying to avoid accidents altogether.

Revising the Safety Survey Instrument and Methods

One of the objectives of this research was to evaluate the Safety Survey instrument (survey) for possible improvements in efficiency. Surveying in the future will occur simultaneously across all employees rather than in stages.

In addition to an evaluation of comments concerning the survey, the primary tool for designing a more efficient instrument for upcoming rounds of the Safety Survey was factor analysis of the 49 Likert-scale attitude questions. Through this analysis approach, 5 data-defined dimensions based on 21 of the 49 original attitude questions were identified. Factor analysis isolates underlying, unobservable latent dimensions of a survey data set that best capture the essence of the observed variables. From factor analysis of the 2011 survey, the following 21 questions (statements), in addition to demographic questions, were included in the 2013 survey in order to replicate the 2011 survey sufficiently for tracking trends.

1. When push comes to shove, I am expected to cut safety corners to meet targets.
2. It is possible for the Forest Service to closely approach zero serious accidents and fatalities.
3. The safety engagements are just the latest safety initiative; it too will pass.
4. Accidents will happen eventually; there is not much more I can do to prevent them.
5. It is up to me to know and understand the safety rules at my place of work.

6. I have the responsibility to pause and discuss any work activity that looks or feels unsafe.
7. I take personal responsibility for my own and my coworkers' safety at work.
8. I take pride in the safety record of my unit.
9. My supervisor or manager actively oversees dangerous operations to make sure we work as safely as possible.
10. Reprimands for unsafe behaviors are consistently applied where I work.
11. Supervisors sometimes "punish" employees if they seem too cautious about taking risks to get the job done.
12. I do not have support from my supervisor or manager to improve safety where I work.
13. Sometimes it is not a good idea to report safety concerns because there is a possibility of retaliation from supervisors and managers.
14. I am rewarded for taking quick action when I identify a safety problem.
15. My safety is important to the Forest Service.
16. The current emphasis on safety is just another Forest Service program that will change when we get a new Chief.
17. Employee safety is a top priority to the Forest Service.
18. The Forest Service is moving toward a future where safety is viewed as essential to successfully accomplishing our work.
19. Forest Service senior leadership is fully committed to developing a culture where we all go home safe every night.
20. Safety protocols are routinely evaluated by management and, as needed, modified to improve safety.
21. There is a good feedback system to let me know that a safety concern I bring up has been reviewed and what action has been taken to address it.

Observations

The results of this survey leave little doubt that employees feel strongly about safety, about the safety engagements and Safety Journey, and about the current state of safety within the Forest Service. Nearly a third of survey respondents felt strongly enough about safety to write comments detailing their own experiences and perceptions of safety within the Agency. Employees have given valuable information and suggestions, and have identified safety concerns they feel should be considered by management.

Pack animals are lead to the Oregon Butte Lookout Tower on the Nez Perce/Clearwater National Forest in Idaho carrying batteries that need to be replaced in the radio equipment. (Photo by USDA Forest Service)

Acknowledgments

The authors would like to thank the following people for providing the photos in this publication: thank you to Susan Blake, Elizabeth Bunzendahl, Wendy Cowsert, Joseph Donnegan, David Melancon, Denise Ottaviano, Glen Rosenholm, Denise Schmittou, James Vogt, and Evelyn Wenk.

Literature Cited

Advisory Committee on the Safety of Nuclear Installations (ACSNI). 1993. Organising for safety: human factors study group, third report. Sudbury, Suffolk, UK: HSE Books. 99 p.

Blum, M.L.; Naylor, J.C. 1968. Industrial psychology: its theoretical and social foundations. New York: Harper & Row. 633 p.

Booth, R.T.; Lee, T.R. 1995. The role of human factors and safety culture in safety management. Proceedings of the Institution of Mechanical Engineers Part B. Journal of Engineering Manufacture. 209(52): 393-400.

Choudhry, R.M.; Dongping, F.; Mohamed, S. 2007. Developing a model of construction safety culture. Journal of Management in Engineering. 23(4): 207-212.

Clarke, S. 2000. Safety culture: under-specified and overrated? International Journal of Management Reviews. 2: 65-90.

Clarke, S. 2006. The relationship between safety climate and safety performance: a meta-analytic review. Journal of Occupational Health Psychology. 11: 315–327.

Cooper, M.D. 2000. Towards a model of safety culture. Safety Science. 36: 111-136.

Cox, S.; Flin, R. 1998. Safety culture: philosopher's stone or man of straw? Work & Stress. 12: 189-201.

Coyle, I.R.; Sleeman, S.D.; Adams, N. 1995. Safety climate. Journal of Safety Research. 26: 247-254.

Dedobbeleer, N.; Béland, F. 1991. A safety climate measure for construction sites. Journal of Safety Research. 22: 97-103.

Flin, R.; Mearns, K.; O'Connor, P.; Brydan, R. 2000. Measuring safety climate: identifying the common features. Safety Science. 34: 177-192.

Glendon, A.I.; Litherland, D.K. 2001. Safety climate factors, group differences and safety behaviour in road construction. Safety Science. 39: 157-188.

Guldenmund, F.W. 2000. The nature of safety culture: a review of theory and research. Safety Science. 34: 215-257.

Guldenmund, F.W. 2007. The use of questionnaires in safety culture research - an evaluation. Safety Science. 45: 723-743.

Hale, A.R. 2000. Culture's confusions. Safety Science. 34(1-3): 1-14.

Hale, A.; Hovden, J. 1998. Management and culture: the third age of safety. A review of approaches to organisational aspects of safety, health and environment. In: Feyer, A.; Williamson, A., eds. Occupational injury: risk prevention and intervention. London: Taylor & Francis: 129-165.

Health and Safety Executive (HSE). 1999. Reducing error and influencing behavior, HSG48. 2nd ed. Sudbury, Suffolk, UK: HSE Books. 88 p.

Hogg, M.A.; Vaughan, G.M. 2005. Social psychology: an introduction. New York: Prentice Hall. 550 p.

International Atomic Energy Agency. 2002. Self-assessment of safety culture in nuclear installations: highlights and good practices. http://www-pub.iaea.org/MTCD/publications/PDF/te_1321_web.pdf. [Date accessed: March 21, 2013].

International Nuclear Safety Advisory Group (INSAG). 1986. The Chernobyl accident: updating of INSAG-1, Safety Series No. 75-INSAG-7. http://www-pub.iaea.org/MTCD/publications/PDF/Pub913e_web.pdf. [Date accessed: December 21, 2012].

International Nuclear Safety Advisory Group (INSAG). 1988. Safety culture, Safety Series No. 75-INSAG-4. http://www-pub.iaea.org/MTCD/publications/PDF/Pub882_web.pdf. [Date accessed: December 21, 2012].

Johnson, S.C. 1967. Hierarchical clustering schemes. Psychometrika. 32(3): 241-254.

Kho, M.E.; Carbone, J.M.; Lucas, J.; Cook, D.J. 2005. Safety climate survey: reliability of results from a multicenter ICU survey. Quality and Safety in Health Care. 14: 273-278.

Lee, T. 1998. Assessment of safety culture at a nuclear reprocessing plant. Work & Stress. 12: 217-237.

Lee, T.; Harrison, K. 2000. Assessing safety culture in nuclear power stations. Safety Science. 34: 61-97.

Nieva, V.F.; Sorra, J. 2003. Safety culture assessment: a tool for improving patient safety in healthcare organizations. Quality and Safety in Health Care. 12: ii17-ii23.

Pidgeon, N.F. 1991. Safety culture and risk management in organizations. Journal of Cross-Cultural Psychology. 22: 129-140.

Tabachnick, B.G.; Fidell, L.S. 1996. Principal components and factor analysis. In: Tabachnick, B.G.; Fidell, L.S., eds. Using multivariate statistics. 3rd ed. New York: Harper Collins: 635-708.

U.S. Department of Agriculture (USDA) Forest Service. 2012. History. http://www.fs.fed.us/aboutus/history/. [Date accessed: December 21, 2012].

U.S. Nuclear Regulatory Commission (USNRC). 2013. Safety culture policy statement. http://www.nrc.gov/about-nrc/regulatory/enforcement/safety-culture.html#policy. [Date accessed: December 13, 2013.]

Vecchio-Sadus, A.M.; Griffiths, S. 2004. Marketing strategies for enhancing safety culture. Safety Science. 42: 601-619.

Appendix A—Survey Instrument

Forest Service Safety Survey

Survey Instrument, September 6, 2011
(Note, respondents could not see text in green.)

Introduction
This survey is intended to provide a better understanding of safety in the Forest Service. The Chief has asked all Forest Service employees to complete this survey as promptly as possible. Please take a few minutes to answer all the survey questions.

Each question will need to be answered before the survey will advance to the next one. All information you provide will be kept in strictest confidence. Your identity and responses will not be released to anyone. Data will be used only to develop summaries for reporting back to you and Forest Service leadership.

We appreciate your participation in helping the Forest Service become a safer place to work.

1. Have you participated in one of our Forest Service Safety Engagement sessions being conducted for all FS employees this calendar year?

   ☐ Yes

   ☐ No (survey skips to Q 5)

2. What was the month for your safety engagement session?

   Session Month____(A drop-down menu will be presented to the respondent.)

3. In what city and state was your safety session held?

   State (Drop-down menu)

   City _____

4. What type of safety engagement session was that? (Check one. Most employees take the 8-hour session.)

   ☐ Catalyst orientation

   ☐ Cadre 1 session and orientation

   ☐ Cadre 2 session and orientation

   ☐ Employee 8-hour Safety Engagement dialog

Introduction to Questions 5 through 10:

■ FOREST SERVICE SAFETY SITUATION

The following few questions explore a number of statements about safety in the Forest Service. Indicate whether you disagree or agree with each one.

(A "+" or "-" following a question indicates whether the question is phrased consistent with, or inconsistent with, the intention of the FS Safety Journey.)

5. Indicate your level of disagreement or agreement with each of the following statements about the relationship between getting work done and safety.
   (Relationship between Production and Safety)

   ☐ Reducing accidents and otherwise improving safety will come at the expense of getting the job done on time. (-)

   ☐ All jobs should be designed and implemented so they can be accomplished safely; otherwise they are not worth doing. (+)

   ☐ When push comes to shove, I am expected to cut safety corners to meet targets. (-)

   ☐ Sometimes the benefits of an assigned work task are great enough to make it worth taking associated safety risks. (-)

   ☐ My supervisors consider safety to be an inseparable part of getting all jobs done. (+)

   ☐ We can achieve both improved safety and increased productivity at work. (+)

6. Indicate your level of disagreement or agreement with the following statements about improving safety. (Nature of Safety Outcomes and Journey)

- ☐ Our work is inherently dangerous, so we have to accept that employees may sometimes be seriously injured or killed on the job. (-)
- ☐ Management contributes to and participates in safety training with me. (+)
- ☐ The Forest Service's renewed emphasis on safety will help us become more aware of and learn how to improve our work safety. (+)
- ☐ It is possible for the Forest Service to closely approach zero serious accidents and fatalities. (+)
- ☐ Forest Service managers and employees actively cooperate to assure work safety. (+)
- ☐ The safety engagements are just the latest safety initiative, it too will pass. (-)

7. Indicate your level of disagreement or agreement with the following statements about your role in safety. (Personal Role and Responsibility)

- ☐ My active participation in discussions about how to safely complete work assignments makes a difference. (+)
- ☐ It is primarily the supervisors' role to make sure work conditions are safe. (-)
- ☐ I report near misses and safety hazards to supervisors and managers. (+)
- ☐ Accidents will happen eventually, there is not much more I can do to prevent them. (-)
- ☐ It is up to me to know and understand the safety rules at my place of work. (+)
- ☐ I hold my supervisor and coworkers responsible and accountable for safety mistakes at my work sites. (-)
- ☐ I have the responsibility to pause and discuss any work activity that looks or feels unsafe. (+)
- ☐ I take personal responsibility for my own and my coworkers' safety at work. (+)
- ☐ I take pride in the safety record of my unit. (+)

8. Indicate your level of disagreement or agreement with the following statements about supervisors' and the Forest Service's role in safety. (Leadership first module. Second Leadership module is Q 9.)

- ☐ Many times safety instructions are so detailed that you can't understand them. (-)
- ☐ Supervisors will stand by me if I stop or refuse a work assignment I have safety concerns about. (+)
- ☐ My supervisor or manager does not understand the safety risks where I work. (-)
- ☐ There is not much point in reporting safety concerns because supervisors wouldn't take them seriously. (-)
- ☐ My supervisor or manager actively oversees dangerous operations to make sure we work as safely as possible. (+)
- ☐ Reprimands for unsafe behaviors are consistently applied where I work. (+)

9. Indicate your level of disagreement or agreement with the following statements about supervisors' and the Forest Service's role in safety. (Leadership Continued)

- ☐ Supervisors sometimes "punish" employees if they seem too cautious about taking risks to get the job done. (-)
- ☐ Supervisors and managers actions are sometimes not consistent with their words about safety. (-)
- ☐ I do not have support from my supervisor or manager to improve safety where I work. (-)
- ☐ Sometimes it is not a good idea to report safety concerns because there is a possibility of retaliation from supervisors and managers. (-)
- ☐ I am rewarded for taking quick action when I identify a safety problem. (+)
- ☐ Supervisors tend to blame employees when accidents occur. (-)
- ☐ Supervisors and managers listen to me when I share my experiences (e.g., near misses) and observations (e.g., hazards) during day-to-day work. (+)

10. Indicate your level of disagreement or agreement with the following statements about the Forest Service.
(Program, Priority, or Core Value)

- ☐ My safety is important to the Forest Service. (+)
- ☐ The current emphasis on safety is just another Forest Service program that will change when we get a new Chief. (-)
- ☐ Employee safety is a top priority to the Forest Service. (+)
- ☐ Employees at all levels of the Forest Service are committed to safe work practices. (+)
- ☐ The Forest Service is moving toward a future where safety is viewed as essential to successfully accomplishing our work. (+)
- ☐ Forest Service senior leadership is fully committed to developing a culture where we all go home safe every night. (+)

11. Indicate your level of disagreement or agreement with the following statements about safety information.
(Compliance and Learning)

- ☐ Supervisors and managers are interested in learning from bad safety outcomes to improve safety conditions where I work. (+)
- ☐ People who take dangerous risks do not need to be held accountable for their actions as long as we learn from those actions. (-)
- ☐ Safety protocols are routinely evaluated by management and, as needed, modified to improve safety. (+)
- ☐ All employees understand Forest Service policy regarding rewards for being safe or consequences of being unsafe. (+)
- ☐ Supervisors and managers openly share information that could improve safety at work. (+)
- ☐ There are consequences of unsafe practices at work (e.g., getting reprimanded verbally or in writing, etc.). (+)
- ☐ More carefully sticking to safety rules and protocols is the most important path to improving safety. (+)
- ☐ Nothing is more important than learning how to design and implement jobs so they can be accomplished safely. (+)
- ☐ There is a good feedback system to let me know that a safety concern I bring up has been reviewed and what action has been taken to address it. (+)

12. Are you aware of the Forest Service Safety Journey?

- ☐ Yes (Q 12 pops up)
- ☐ No (Skip to Q 14)

13. Pick the one statement below that best describes the Forest Service Safety Journey.

- ☐ It is a program run out of the Chief's office aimed at reducing accidents and fatalities.
- ☐ It is the ongoing engagement of all employees at all levels and others we work with aimed at changing the way we think, talk and act regarding safety.
- ☐ It is a series of safety training sessions aimed at improving employee recognition of risks.
- ☐ It is a long-term program for teaching employees how to better follow rules and safety protocols.

14. For each question below, please indicate how you think agency safety has changed since the start of the Safety Journey.
(The scale for these questions is from much worse to much better.)

- ☐ How has the amount and openness of communication about safety changed within your work unit since the start of the Safety Journey?
- ☐ With the Chief's renewed emphasis on safety, how have people in your unit changed their approach to taking personal responsibility for safety?
- ☐ How has the integration of safety with consideration of work productivity changed within your work unit since the start of the Safety Journey?
- ☐ How has individual accountability for following procedures changed within your work unit since the start of the Safety Journey?
- ☐ How has employee comfort level with raising safety concerns with higher-level supervisors or managers changed within your work unit since the start of the Safety Journey?

15. In the last 5 years (or since you started with the Forest Service if less than 5) how many accidents or near misses have you experienced on the job that could have or did result in serious injury or health effects? (This question will tell us if employees have had an accident or near miss in the past 5 years, then allow us to correlate their beliefs and behaviors to their accident history.)

- ☐ None
- ☐ One
- ☐ Two
- ☐ Three
- ☐ Four
- ☐ Five or more

■ EMPLOYEE PROFILING: UNIT, LOCATION, JOB SERIES, DEMOGRAPHICS

The remaining questions describe employees' place in the Forest Service in terms of organization, location, tenure, age, type of job, etc. These data are crucial to understanding differences across units and types of jobs in the Forest Service. These data are also critical to a rigorous statistical analysis and weighting the data to correct for differences in response rates across sample strata. Post-sample strata weighting is a standard and required procedure in survey research. After weighting, data may be analyzed and summarized across strata.

Please answer all questions in this section. Your individual responses will not in any way be associated with you. No individual or location data will be released to anyone. Responses will only be used in summary reporting across regions, stations, area and the Agency.

16. In which unit do you work?

- ☐ Job Corps (Go to Q 17)
- ☐ Law Enforcement & Investigations (LE&I) (Go to Q 18)
- ☐ Northeastern Area (Go to Q 19)
- ☐ Regional Office (RO), Supervisor's Office (SO), or Ranger District (Go to Q 20)
- ☐ Research Station (Go to Q 22)
- ☐ Washington Office (WO) or WO Detached (Go to Q 24)

Job Corps

17. Please specify your Job Corps level. (Survey skips to Q 38)

- ☐ National Office
- ☐ Center
- ☐ Other

Law Enforcement and Investigations

18. Please specify where you work.

- ☐ Washington Office (WO)
- ☐ R1 Northern
- ☐ R2 Rocky Mountain
- ☐ R3 Southwest
- ☐ R4 Intermountain
- ☐ R5 Pacific Southwest
- ☐ R6 Pacific Northwest
- ☐ R8 Southern
- ☐ R9 Eastern
- ☐ R10 Alaska

Northeastern Area

19. At what level do you work? (Survey skips to Q38)

- ☐ Headquarters
- ☐ Field Office
- ☐ Grey Towers
- ☐ Other

Regional Office, Supervisor's Office, or Ranger District

20. For which region do you work?

- ☐ R1 Northern
- ☐ R2 Rocky Mountain
- ☐ R3 Southwest
- ☐ R4 Intermountain
- ☐ R5 Pacific Southwest
- ☐ R6 Pacific Northwest
- ☐ R8 Southern
- ☐ R9 Eastern
- ☐ R10 Alaska

21. At what level do you work? (Survey skips to Q 38)

- ☐ Regional Office (RO)
- ☐ Supervisor's Office (SO)
- ☐ Ranger District
- ☐ Other

Research Station

22. Please specify the Research Station where you work.

- ☐ Forest Products Laboratory
- ☐ International Institute of Tropical Forestry
- ☐ Northern
- ☐ Pacific Northwest
- ☐ Pacific Southwest
- ☐ Rocky Mountain
- ☐ Southern

23. At what level do you work? (Survey skips to Q 38)

- ☐ Headquarters
- ☐ Lab
- ☐ Experimental Forest
- ☐ Other

Washington Office or Washington Office Detached

24. Please specify where you work.

- ☐ Washington Office (WO)
- ☐ Washington Office (WO) Detached

25. In which Deputy Area do you work?

- ☐ Chief
- ☐ Business Operations (CIO, AQM, HRM, B&F, etc.)
- ☐ National Forest System
- ☐ Research and Development
- ☐ State and Private Forestry
- ☐ Other

26. What is your employment status?

- ☐ Permanent
- ☐ Temporary/term
- ☐ Volunteer
- ☐ Cooperator
- ☐ Contractor
- ☐ Other, please describe _____

27. Which of the following types of work do you mainly do for the Forest Service? (More than one may be checked.)

- ☐ Office work
- ☐ Front desk or other customer relations
- ☐ Laboratory work
- ☐ Research field work
- ☐ Forest management field work
- ☐ Forest maintenance (e.g., timber removal, trail maintenance)
- ☐ Visitor management (e.g., recreation sites, interpretation, etc.)
- ☐ Law enforcement
- ☐ Safety professional
- ☐ Work in the back country away from roads (e.g., trail maintenance, wildlife plots, stream monitoring, etc.)
- ☐ Fire fighting/Smoke jumper
- ☐ FIA, forest health or other inventory field work
- ☐ Other, please describe_____

_____

28. What is your age?

- ☐ Under 30
- ☐ 30–39
- ☐ 40–49
- ☐ 50–59
- ☐ 60–69
- ☐ 70 or older

29. How long have you worked with the Forest Service?

Years_____ **(If less than one year, Months**_____ **)**

30. Are you a supervisor?

- ☐ Yes
- ☐ No (If no, skip Q 35)

31. How many employees do you supervise?

_____Number

32. Do you supervise others who are supervisors?

- ☐ Yes
- ☐ No

33. Check the appropriate level of Forest Service position if your job in that unit is at or above the level listed. **(Check just one.)**

- ☐ *If you are NFS*, Deputy Regional Forester
- ☐ *If you are Research*, Assistant research station, FPL or Institute Director
- ☐ *If you are Washington Office (including detached),* WO Staff Assistant Director
- ☐ *If you are Northeastern Area*, NE Area Assistant Director
- ☐ *If you hold any* other position equivalent to *any of* the above, name of position_____

34. Are you the line officer in charge of your local unit (e.g., forest supervisor, district ranger, research project leader, research team leader, administrative group leader, or other group leader)

- ☐ Yes
- ☐ No

35. What is your gender?

- ☐ Male
- ☐ Female

36. Which of these best describes your race?

- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Hispanic or Latino
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White

37. What is your duty station zip code? _____

38. Please list your OFFICIAL email address if you would like to receive a copy of the results of this survey. (Your identity is confidential, and your email address will not be shared under any circumstances.)

_____

39. Do you have any comments regarding this survey or its safety theme? Please type them in the spaces provided below.

_____

_____

_____

_____

If you would like additional information or have questions about this survey, please contact:

Dr. Vanessa Lane
lanev@warnell.uga.edu
Postdoctoral Researcher
Warnell School of Forestry and Natural Resources
University of Georgia

Thank you!

Appendix B

Multivariate weighted percentages of respondents who performed each type of work, shown by Agency division. (Percentages are given only for full-time and part-time employees for each type of work. Not shown is the remaining percentage who do not perform that type of work.)

	Job Corps		Law Enforcement and Investigations		NE Area		National Forest System		Research		Washington Office/ Detached		All Respondents	
Type of work	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
Office	37	22	8	26	47	29	23	41	33	39	76	13	29	36
Front desk	0	6	0	4	0	5	1	7	0	3	0	2	1	6
Lab	0	3	0	0	0	6	0	1	3	21	0	1	0	3
Research fieldwork	0	2	0	1	1	11	0	9	7	38	0	2	1	10
Forest fieldwork	0	1	0	3	11	17	7	33	0	6	0	5	6	26
Forest maintenance	1	3	0	2	0	6	2	15	0	3	0	1	2	12
Visitors	0	5	0	5	0	5	1	10	0	1	0	1	1	8
Law	0	0	62	28	0	2	0	4	0	0	1	0	1	4
Safety	3	10	0	2	0	0	1	3	1	2	1	1	1	3
Backcountry	0	0	0	4	0	1	0	2	0	0	0	0	0	2
Fire	1	4	1	2	1	5	11	19	0	3	0	1	9	15
Forest Inventory and Analysis	0	0	0	0	2	5	1	7	5	9	0	2	1	6
Other	34	12	0	3	4	8	4	6	3	4	8	5	6	6

Appendix C

Results indicating level of agreement with each safety attitude question

The Relationship between Productivity and Safety (6 Questions)

1. Reducing accidents and otherwise improving safety will come at the expense of getting the job done on time.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	2,314	20.3	20.3
Disagree	4,588	40.3	60.6
Neither disagree or agree	2,375	20.9	81.5
Agree	1,733	15.2	96.7
Strongly agree	374	3.3	100.0
Total	11,384	100.0	

2. All jobs should be designed and implemented so they can be accomplished safely, otherwise they are not worth doing.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	469	4.1	4.1
Disagree	734	6.4	10.6
Neither disagree or agree	1,052	9.2	19.8
Agree	4,933	43.3	63.1
Strongly agree	4,196	36.9	100.0
Total	11,384	100.0	

3. When push comes to shove, I am expected to cut safety corners to meet targets.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	4,268	37.5	37.5
Disagree	4,359	38.3	75.8
Neither disagree or agree	1,521	13.4	89.1
Agree	897	7.9	97.0
Strongly agree	339	3.0	100.0
Total	11,384	100.0	

4. Sometimes the benefits of an assigned work task are great enough to make it worth taking associated safety risks.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	2,659	23.4	23.4
Disagree	3,999	35.1	58.5
Neither disagree or agree	1,883	16.5	75.0
Agree	2,417	21.2	96.3
Strongly agree	426	3.7	100.0
Total	11,384	100.0	

5. My supervisors consider safety to be an inseparable part of getting all jobs done.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	523	4.6	4.6
Disagree	743	6.5	11.1
Neither disagree or agree	1,531	13.4	24.6
Agree	5,120	45.0	69.5
Strongly agree	3,467	30.5	100.0
Total	11,384	100.0	

6. We can achieve both improved safety and increased productivity at work.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	408	3.6	3.6
Disagree	986	8.7	12.2
Neither disagree or agree	2,054	18.0	30.3
Agree	5,321	46.7	77.0
Strongly agree	2,615	23.0	100.0
Total	11,384	100.0	

The Nature of Safety Outcomes and the Safety Journey (6 Questions)

1. Our work is inherently dangerous, so we have to accept that employees may sometimes be seriously injured or killed on the job.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	2,624	23.0	23.5
Disagree	3,267	28.7	52.8
Neither disagree or agree	1,765	15.5	68.6
Agree	2,698	23.7	92.8
Strongly agree	803	7.1	100.0
Subtotal	11,157	98.0	
No answer	227	2.0	
Total	11,384	100.0	

2. Management contributes to and participates in safety training with me.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	370	3.3	3.3
Disagree	949	8.3	11.8
Neither disagree or agree	1,674	14.7	26.8
Agree	6,010	52.8	80.7
Strongly agree	2,154	18.9	100.0
Subtotal	11,157	98.0	
No answer	227	2.0	
Total	11,384	100.0	

3. The Forest Service's renewed emphasis on safety will help us become more aware of and learn how to improve our work safety.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	687	6.0	6.2
Disagree	1568	13.8	20.2
Neither disagree or agree	2,919	25.6	46.4
Agree	4,615	40.5	87.7
Strongly agree	1,368	12.0	100.0
Subtotal	11,157	98.0	
No answer	227	2.0	
Total	11,384	100.0	

4. It is possible for the Forest Service to closely approach zero serious accidents and fatalities.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	830	7.3	7.4
Disagree	2,173	19.1	26.9
Neither disagree or agree	2,109	18.5	45.8
Agree	4,663	41.0	87.6
Strongly agree	1,382	12.1	100.0
Subtotal	11,157	98.0	
No answer	227	2.0	
Total	11,384	100.0	

5. Forest Service managers and employees actively cooperate to assure work safety.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	263	2.3	2.4
Disagree	1,038	9.1	11.7
Neither disagree or agree	2,146	18.9	30.9
Agree	6,227	54.7	86.7
Strongly agree	1,483	13.0	100.0
Subtotal	11,157	98.0	
No answer	227	2.0	
Total	11,384	100.0	

6. The safety engagements are just the latest safety initiative, it too will pass.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	451	4.0	4.0
Disagree	1,675	14.7	19.1
Neither disagree or agree	4,127	36.3	56.0
Agree	3,465	30.4	87.1
Strongly agree	1,439	12.6	100.0
Subtotal	11,157	98.0	
No answer	227	2.0	
Total	11,384	100.0	

Personal Role and Responsibility toward Safety (9 Questions)

1. My active participation in discussions about how to safely complete work assignments makes a difference.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	322	2.8	2.9
Disagree	912	8.0	11.3
Neither disagree or agree	2,503	22.0	34.2
Agree	5,835	51.3	87.5
Strongly agree	1,363	12.0	100.0
Subtotal	10,935	96.1	
No answer	449	3.9	
Total	11,384	100.0	

2. It is primarily the supervisors' role to make sure work conditions are safe.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	2,294	20.2	21.0
Disagree	5,765	50.6	73.7
Neither disagree or agree	1,314	11.5	85.7
Agree	1,231	10.8	97.0
Strongly agree	331	2.9	100.0
Subtotal	10,935	96.1	
No answer	449	3.9	
Total	11,384	100.0	

3. I report near misses and safety hazards to supervisors and managers.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	134	1.2	1.2
Disagree	729	6.4	7.9
Neither disagree or agree	2,099	18.4	27.1
Agree	6,611	58.1	87.5
Strongly agree	1,362	12.0	100.0
Subtotal	10,935	96.1	
No answer	449	3.9	
Total	11,384	100.0	

4. Accidents will happen eventually, there is not much more I can do to prevent them.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	1,774	15.6	16.2
Disagree	5,403	47.5	65.6
Neither disagree or agree	2,271	19.9	86.4
Agree	1,285	11.3	98.2
Strongly agree	202	1.8	100.0
Subtotal	10,935	96.1	
No answer	44	3.9	
Total	11,384	100.0	

5. It is up to me to know and understand the safety rules at my place of work.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	89	0.8	0.8
Disagree	211	1.9	2.7
Neither disagree or agree	554	4.9	7.8
Agree	6,277	55.1	65.2
Strongly agree	3,804	33.4	100.0
Subtotal	10,935	96.1	
No answer	449	3.9	
Total	11,384	100.0	

6. I hold my supervisor and coworkers responsible and accountable for safety mistakes at my work sites.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	781	6.9	7.1
Disagree	2,408	21.2	29.2
Neither disagree or agree	3,601	31.6	62.1
Agree	3,476	30.5	93.9
Strongly agree	669	5.9	100.0
Subtotal	10,935	96.1	
No answer	449	3.9	
Total	11,384	100.0	

7. I have the responsibility to pause and discuss any work activity that looks or feels unsafe.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	52	.5	.5
Disagree	84	.7	1.2
Neither disagree or agree	341	3.0	4.4
Agree	5,737	50.4	56.8
Strongly agree	4,721	41.5	100.0
Subtotal	10,935	96.1	
No answer	449	3.9	
Total	11,384	100.0	

8. I take personal responsibility for my own and my coworkers' safety at work.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	40	0.4	0.4
Disagree	115	1.0	1.4
Neither disagree or agree	644	5.7	7.3
Agree	5,819	51.1	60.5
Strongly agree	4,317	37.9	100.0
Subtotal	10,935	96.1	
No answer	449	3.9	
Total	11,384	100.0	

9. I take pride in the safety record of my unit.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	100	0.9	0.9
Disagree	271	2.4	3.4
Neither disagree or agree	2,625	23.1	27.4
Agree	4,890	43.0	72.1
Strongly agree	3049	26.8	100.0
Subtotal	10,935	96.1	
No answer	449	3.9	
Total	11,384	100.0	

Leadership (13 Questions)

1. Many times safety instructions are so detailed that you can't understand them.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	569	5.0	5.3
Disagree	3,710	32.6	39.8
Neither disagree or agree	3,566	31.3	73.0
Agree	2,437	21.4	95.7
Strongly agree	465	4.1	100.0
Subtotal	10,747	94.4	
No answer	637	5.6	
Total	11,384	100.0	

2. Supervisors will stand by me if I stop or refuse a work assignment I have safety concerns about.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	350	3.1	3.3
Disagree	839	7.4	11.1
Neither disagree or agree	2,466	21.7	34.0
Agree	5,370	47.2	84.0
Strongly agree	1,722	15.1	100.0
Subtotal	10,747	94.4	
No answer	637	5.6	
Total	11,384	100.0	

3. My supervisor or manager does not understand the safety risks where I work.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	2,351	20.7	21.9
Disagree	5,310	46.6	71.3
Neither disagree or agree	1,919	16.9	89.1
Agree	859	7.5	97.1
Strongly agree	308	2.7	100.0
Subtotal	10,747	94.4	
No answer	637	5.6	
Total	11,384	100.0	

4. There is not much point in reporting safety concerns because supervisors wouldn't take them seriously.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	2,700	23.7	25.1
Disagree	5,523	48.5	76.5
Neither disagree or agree	1,591	14.0	91.3
Agree	677	5.9	97.6
Strongly agree	256	2.2	100.0
Subtotal	10,747	94.4	
No answer	637	5.6	
Total	11,384	100.0	

5. My supervisor or manager actively oversees dangerous operations to make sure we work as safely as possible.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	564	5.0	5.2
Disagree	2,045	18.0	24.3
Neither disagree or agree	4,590	40.3	67.0
Agree	2,879	25.3	93.8
Strongly agree	669	5.9	100.0
Subtotal	10,747	94.4	
No answer	637	5.6	
Total	11,384	100.0	

6. Reprimands for unsafe behaviors are consistently applied where I work.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	1,096	9.6	10.2
Disagree	2,756	24.2	35.8
Neither disagree or agree	5,446	47.8	86.5
Agree	1,254	11.0	98.2
Strongly agree	195	1.7	100.0
Subtotal	10,747	94.4	
No answer	637	5.6	
Total	11,384	100.0	

7. Supervisors sometimes "punish" employees if they seem too cautious about taking risks to get the job done.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	1,781	15.6	17.0
Disagree	4,595	40.4	60.7
Neither disagree or agree	3,163	27.8	90.8
Agree	826	7.3	98.7
Strongly agree	136	1.2	100.0
Subtotal	10,501	92.2	
No answer	883	7.8	
Total	11,384	100.0	

8. Supervisors and managers actions are sometimes not consistent with their words about safety.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	702	6.2	6.7
Disagree	2,646	23.2	31.9
Neither disagree or agree	2,597	22.8	56.6
Agree	3,606	31.7	91.0
Strongly agree	950	8.3	100.0
Subtotal	10,501	92.2	
No answer	88	7.8	
Total	11,384	100.0	

9. I do not have support from my supervisor or manager to improve safety where I work.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	3,129	27.5	29.8
Disagree	5,420	47.6	81.4
Neither disagree or agree	1,353	11.9	94.3
Agree	400	3.5	98.1
Strongly agree	199	1.7	100.0
Subtotal	10,501	92.2	
No answer	883	7.8	
Total	11,384	100.0	

10. Sometimes it is not a good idea to report safety concerns because there is a possibility of retaliation from supervisors and managers.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	2,616	23.0	24.9
Disagree	4,775	41.9	70.4
Neither disagree or agree	1,820	16.0	87.7
Agree	998	8.8	97.2
Strongly agree	292	2.6	100.0
Subtotal	10,501	92.2	
No answer	883	7.8	
Total	11,384	100.0	

11. I am rewarded for taking quick action when I identify a safety problem.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	585	5.1	5.6
Disagree	1,936	17.0	24.0
Neither disagree or agree	5,108	44.9	72.7
Agree	2,405	21.1	95.6
Strongly agree	467	4.1	100.0
Subtotal	10,501	92.2	
No answer	883	7.8	
Total	11,384	100.0	

12. Supervisors tend to blame employees when accidents occur.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	795	7.0	7.6
Disagree	2,886	25.4	35.1
Neither disagree or agree	3,625	31.8	69.6
Agree	2,522	22.2	93.6
Strongly agree	673	5.9	100.0
Subtotal	10,501	92.2	
No answer	883	7.8	
Total	11,384	100.0	

13. Supervisors and managers listen to me when I share my experiences (e.g., near misses) and observations (e.g., hazards) during day-to-day work.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	264	2.3	2.5
Disagree	683	6.0	9.0
Neither disagree or agree	2,841	25.0	36.1
Agree	5,584	49.1	89.2
Strongly agree	1,129	9.9	100.0
Subtotal	10,501	92.2	
No answer	883	7.8	
Total	11,384	100.0	

Safety as a Program, Priority, or Core Value (6 Questions)

1. My safety is important to the Forest Service.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	181	1.6	1.7
Disagree	339	3.0	5.0
Neither disagree or agree	1,379	12.1	18.3
Agree	5,726	50.3	73.5
Strongly agree	2,749	24.1	100.0
Subtotal	10,374	91.1	
No answer	1,010	8.9	
Total	11,384	100.0	

2. The current emphasis on safety is just another Forest Service program that will change when we get a new Chief.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	650	5.7	6.3
Disagree	2,498	21.9	30.3
Neither disagree or agree	3,867	34.0	67.6
Agree	2,427	21.3	91.0
Strongly agree	932	8.2	100.0
Subtotal	10,374	91.1	
No answer	1,010	8.9	
Total	11,384	100.0	

3. Employee safety is a top priority to the Forest Service.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	263	2.3	2.5
Disagree	785	6.9	10.1
Neither disagree or agree	2,224	19.5	31.5
Agree	5,102	44.8	80.7
Strongly agree	2,000	17.6	100.0
Subtotal	10,374	91.1	
No answer	1,010	8.9	
Total	11,384	100.0	

4. Employees at all levels of the Forest Service are committed to safe work practices.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	281	2.5	2.7
Disagree	1534	13.5	17.5
Neither disagree or agree	3,186	28.0	48.2
Agree	4,520	39.7	91.8
Strongly agree	853	7.5	100.0
Subtotal	10,374	91.1	
No answer	1,010	8.9	
Total	11,384	100.0	

5. The Forest Service is moving toward a future where safety is viewed as essential to successfully accomplishing our work.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	153	1.3	1.5
Disagree	557	4.9	6.8
Neither disagree or agree	3,184	28.0	37.5
Agree	5,241	46.0	88.1
Strongly agree	1,239	10.9	100.0
Subtotal	10,374	91.1	
No answer	1,010	8.9	
Total	11,384	100.0	

6. Forest Service senior leadership is fully committed to developing a culture where we all go home safe every night.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	396	3.5	3.8
Disagree	797	7.0	11.5
Neither disagree or agree	3,223	28.3	42.6
Agree	4,395	38.6	84.9
Strongly agree	1,563	13.7	100.0
Subtotal	10,374	91.1	
No answer	1,010	8.9	
Total	11,384	100.0	

Compliance and Learning (9 Questions)

1. Supervisors and managers are interested in learning from bad safety outcomes to improve safety conditions where I work.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	160	1.4	1.6
Disagree	574	5.0	7.3
Neither disagree or agree	2,175	19.1	29.1
Agree	6,066	53.3	89.9
Strongly agree	1,013	8.9	100.0
Subtotal	9,988	87.7	
No answer	1,396	12.3	
Total	11,384	100.0	

2. People who take dangerous risks do not need to be held accountable for their actions as long as we learn from those actions.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	2,769	24.3	27.7
Disagree	5,605	49.2	83.8
Neither disagree or agree	1,324	11.6	97.1
Agree	246	2.2	99.6
Strongly agree	44	0.4	100.0
Subtotal	9,988	87.7	
No answer	1,396	12.3	
Total	11,384	100.0	

3. Safety protocols are routinely evaluated by management and, as needed, modified to improve safety.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	281	2.5	2.8
Disagree	1,658	14.6	19.4
Neither disagree or agree	3,698	32.5	56.4
Agree	3,892	34.2	95.4
Strongly agree	459	4.0	100.0
Subtotal	9,988	87.7	
No answer	1,396	12.3	
Total	11,384	100.0	

4. All employees understand Forest Service policy regarding rewards for being safe or consequences of being unsafe.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	790	6.9	7.9
Disagree	3,361	29.5	41.6
Neither disagree or agree	3,574	31.4	77.3
Agree	2,029	17.8	97.7
Strongly agree	234	2.1	100.0
Subtotal	9,988	87.7	
No answer	1,396	12.3	
Total	11,384	100.0	

5. Supervisors and managers openly share information that could improve safety at work.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	259	2.3	2.6
Disagree	1,188	10.4	14.5
Neither disagree or agree	2,592	22.8	40.4
Agree	5,185	45.5	92.4
Strongly agree	764	6.7	100.0
Subtotal	9,988	87.7	
No answer	1,396	12.3	
Total	11,384	100.0	

6. There are consequences of unsafe practices at work (e.g., getting reprimanded verbally or in writing, etc.).

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	439	3.9	4.4
Disagree	1,902	16.7	23.4
Neither disagree or agree	4,115	36.1	64.6
Agree	3,228	28.4	97.0
Strongly agree	304	2.7	100.0
Subtotal	9,988	87.7	
No answer	1,396	12.3	
Total	11,384	100.0	

7. More carefully sticking to safety rules and protocols is the most important path to improving safety.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	425	3.7	4.3
Disagree	1,949	17.1	23.8
Neither disagree or agree	2,919	25.6	53.0
Agree	3,983	35.0	92.9
Strongly agree	712	6.3	100.0
Subtotal	9,988	87.7	
No answer	1,396	12.3	
Total	11,384	100.0	

8. Nothing is more important than learning how to design and implement jobs so they can be accomplished safely.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	99	0.9	1.0
Disagree	663	5.8	7.6
Neither disagree or agree	2,373	20.8	31.4
Agree	5,184	45.5	83.3
Strongly agree	1,669	14.7	100.0
Subtotal	9,988	87.7	
No answer	1,396	12.3	
Total	11,384	100.0	

9. There is a good feedback system to let me know that a safety concern I bring up has been reviewed and what action has been taken to address it.

Measure of agreement	Frequency	Percent	Cumulative percent
Strongly disagree	936	8.2	9.4
Disagree	2,602	22.9	35.4
Neither disagree or agree	3,977	34.9	75.2
Agree	2,178	19.1	97.0
Strongly agree	295	2.6	100.0
Subtotal	9,988	87.7	
No answer	1,396	12.3	
Total	11,384	100.0	

Lane, V.; Cordell, K.; Zarnoch, S. [and others]. 2014. The Forest Service Safety Survey: results from an employee-wide safety attitude survey. e-Gen. Tech. Rep. SRS-191. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 58 p.

The Forest Service, U.S. Department of Agriculture launched a Safety Journey in 2011 aimed at elevating safety consciousness and practice in the Agency. All employees were required to attend an engagement session during the year to introduce them to the Safety Journey. In September, a survey was launched to help Forest Service leadership better understand employee views concerning the Safety Journey, and generally of safety in the Agency. The survey included 49 statements relating to the content of the engagement sessions. Demographic questions were also included, as well as an opportunity to comment. A total of 11,980 completed surveys were received between September 15, 2011, and March 7, 2012. In general, findings showed that most employees were cautiously optimistic about the Safety Journey, but some degree of skepticism was present in every Agency division. Future efforts should give more emphasis to making the Safety Journey more applicable to office worker, Law Enforcement and Investigations, Washington Office, and Research and Development employees. A significant number of employee comments called for more follow-through by Agency leaders, particularly by providing more financial resources; hiring better qualified personnel; assuring adequate safety equipment; and offering more relevant safety training, such as peer-to-peer mentoring and job-specific training.

Keywords: Employee safety attitudes, employee survey, safety attitude differences, safety attitude dimensions, safety attitude survey, Safety Journey, U.S. Forest Service

How do you rate this publication?

Scan this code to submit your feedback or go to www.srs.fs.usda.gov/pubeval

Non-Discrimination Policy

The U.S. Department of Agriculture (USDA) prohibits discrimination against its customers, employees, and applicants for employment on the bases of race, color, national origin, age, disability, sex, gender identity, religion, reprisal, and where applicable, political beliefs, marital status, familial or parental status, sexual orientation, or all or part of an individual's income is derived from any public assistance program, or protected genetic information in employment or in any program or activity conducted or funded by the Department. (Not all prohibited bases will apply to all programs and/or employment activities.)

To File an Employment Complaint

If you wish to file an employment complaint, you must contact your agency's EEO Counselor (click the hyperlink for list of EEO Counselors) within 45 days of the date of the alleged discriminatory act, event, or in the case of a personnel action. Additional information can be found online at http://www.ascr.usda.gov/complaint_filing_file.html.

To File a Program Complaint

If you wish to file a Civil Rights program complaint of discrimination, complete the USDA Program Discrimination Complaint Form, found online at http://www.ascr.usda.gov/complaint_filing_cust.html, or at any USDA office, or call (866) 632-9992 to request the form. You may also write a letter containing all of the information requested in the form. Send your completed complaint form or letter to us by mail at U.S. Department of Agriculture, Director, Office of Adjudication, 1400 Independence Avenue, S.W., Washington, D.C. 20250-99410, by fax (202) 690-7442 or email at program.intake@usda.gov.

Persons with Disabilities

Individuals who are deaf, hard of hearing or have speech disabilities and you wish to file either an EEO or program complaint please contact USDA through the Federal Relay Service at (800) 877-8339 or (800) 845-6136 (in Spanish).

Persons with disabilities who wish to file a program complaint, please see information above on how to contact us by mail directly or by email. If you require alternative means of communication for program information (e.g., Braille, large print, audiotape, etc.) please contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).