
Bureau of Land Management

**Fire Training Needs Assessment &
Leadership Survey**

Draft Report

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Executive Summary

In the spring of 2002, a BLM Leadership Academy Team (LAT) initiated an effort aimed at assessing the effectiveness of fire leadership training for Line Managers (LMs). The LAT, working with human factors and industrial organizational psychologists from the University of Idaho, developed a LM leadership survey from the competencies found in the *Standards for Fire and Aviation Operations 2001*. Members of the LAT and domain experts from within the BLM condensed the 27 competency areas to create mutually exclusive dimensions. Behavioral examples representing excellent, acceptable and poor levels of performance were developed for each of the condensed competencies and incorporated into a Web-based survey. There were nine questions representing six competency dimensions. Additionally, the LAT included a two-dimension leadership scale adapted from a measure of business leadership. The survey was administered to a sample of BLM sites in the Great Basin and out of the Great Basin. Both FMOs and LMs completed the survey. Later during the administration, the survey was offered to all sites.

Analysis of the FMO ratings of LMs showed that that LMs performed at acceptable levels in five of the competency areas: safety, reviews, preparedness, resources management and oversight. Ratings of LMs by FMOs in the area of prescribed fire were, on average, below the acceptable threshold. Ratings by LMs of their own performance were consistently higher than those made by FMOs. Data from the two-dimension leadership scale revealed significant differences between FMO ratings of LMs and LM ratings of themselves for both the task and people oriented leadership areas. This difference only occurred in the Great Basin. Ratings by FMOs and LMs outside of the Great Basin did not differ significantly. Possible explanations are discussed.

With the exception of the prescribed fire area, LMs that had and had not completed the national leadership course scored at or above the acceptable threshold. The similarities in ratings between these two groups might suggest that the training at the national leadership course does not advantage LMs. The data suggest that LMs obtain their skills from sources other than the national course. It might also be the case that the survey tool was not sufficiently sensitive to detect differences. Training implications are discussed.

Introduction

The increasing complexity of wildland fire has created unique demands on administrators within the Bureau of Land Management (BLM). The need for administrators and line managers to actively supervise fire personnel and approve prescribed burn plans has recently been punctuated by prescribed burns resulting in undesirable outcomes. The confluence of changes in national fire policy and the changing demographics of line managers and administrators has created, in some instances, a mismatch between managers' skills and fire demands. Training programs, both geographically and nationally, have been developed to equip managers with the skills needed to effectively manage fire programs. The objective of this project was to review fire management leadership training strengths and limitations. Under the direction of participants in a BLM Leadership Academy Team (LAT), an assessment survey was designed with the assistance of Teresa Rice and Drs. Curt Braun and Todd Thorsteinson from the University of Idaho to determine the current level of manager proficiency with regard to the required competencies listed in the *Standards for Fire and Aviation Operations 2001*.

Assessment Development

The 27 Field Office Manager Performance Requirements listed in chapter 2 of the *Standards for Fire and Aviation Operations 2001* (i.e., the RedBook) served as the starting point for the assessment tool. Currently the BLM Director, State Directors, and Field Office Managers are obligated to meet these requirements called competencies. An initial review of the competencies revealed that many characterized similar aspects of job performance and as such did not represent unique dimensions of the job. To create a useful assessment tool, the LAT worked to condense the 27 competencies into mutually exclusive dimensions of performance.

Groups of similar competencies were created using a card-sorting task. Twelve participants from various BLM divisions and the LAT were given a stack of 27 index cards, each of which displayed one of the current RedBook competencies. Participants were instructed to consider any possible similarities between the competencies and organize them into groups. Participants were allowed to create as many or few groups as deemed necessary. Next, the participants were instructed to label each group by writing the characteristic that best described the competencies within the group. Finally, participants rated each group based on its relative level of importance. The importance of a group was determined by distributing 100 points among all of the groups created.

The data from this assessment were analyzed using Ward's method in hierarchical cluster analysis. Five distinctive clusters resulted (see Appendix A). The mean ratings of importance were calculated for each cluster to create a rank ordering of competency groups. The means and standard deviations for each cluster are shown in Table 1 below. The results of the cluster analysis were presented to the LAT a meeting in Boise, Idaho on April 9-10, 2002. At this meeting, the LAT was led through a critical incident analysis of 10 of the 27 RedBook competencies [i.e. competencies 1, 5, 9, 10, 12, 14, 18, 19, 26 & 27 (combined)]. Of those 10 competencies, at least one came from each of the five clusters resulting from the hierarchical cluster analysis.

Table 1. Clusters identified in the analysis, cluster members, and means and standard deviations for the importance ratings.

Rank	Resulting Clusters	RedBook Competencies	Means	Standard Deviations
1	Safety Operations & Planning	12, 14, 16, 18, 20, 23, 26, 27	28.61	7.24
2	Prescribed & Wildland Fire Preparedness	10, 11, 15, 22, 25	20.83	3.70
3	Reviews & Administration	4, 5, 6, 7, 24	20.44	5.29
4	Annual Meetings & Management Oversight	8, 13, 17, 19, 21	19.22	2.44
5	Resource Management	1, 2, 3, 9	17.89	4.03

The critical incident technique is a tool used to identify behavioral examples that characterize unique levels of performance. This technique is commonly used in the development of work-related assessment tools. To begin the critical incident process, members of the LAT generated one poor, acceptable, and excellent example relating to each of the 10 competencies. Then, each member of the LAT confidentially rated the importance of the collective actions of the group based on a scale from 1 to 5 (1 = not at all important, 5 = extremely important). Average importance values were computed and one to two items were selected for each level of proficiency (e.g., Poor, Acceptable, Excellent) (see Appendix B). One behavioral example from each competency was then selected. The combined items for the five competency areas (see Table 1) were developed into a nine-item survey that was presented to Line Managers (LMs) and Fire Management Officers (FMOs) via the Worldwide Web. The behavioral examples within each item were presented in random order to control for possible order effects. In addition to the competency items, 20 leadership questions were developed to assess how FMOs and LMs perceive the leadership skills of LMs. These questions were adapted from an existing leadership survey that measured two aspects of leadership: task-oriented and people-oriented leadership (see Appendix C).

The survey was launched via e-mail on Wednesday, July 10, 2002. Each participant received e-mail with a letter from Larry Hamilton, Director of the Office of Fire and Aviation, asking for their participation (see Appendix D). All e-mails contained a link to the survey web page. LMs were instructed to complete the survey with regard to their own fire management behaviors and leadership skills. FMOs were instructed to complete the survey with regard to their particular LM's fire management behaviors and leadership skills. Additionally, two e-mail reminders were sent to participants as a reminder to complete the survey: one on Wednesday, July 24 and another on Monday, August 5. All e-mail reminders included the same letter from Larry Hamilton, as encouragement to complete the survey. On Friday, August 9, subsequent to the third e-mail reminder, a list of incomplete sample sites was sent to the LAT. During the week of August 12-16, members of the LAT called each individual who had not completed the survey to solicit their participation. Each unfinished participant was called until he/she was contacted, but no more than three times. The final day for survey completion was Friday, August 16, 2002, 37 days after commencement.

Survey Administration

Participants

The BLM 2002 Fire and Aviation Directory lists a total of 67 sites within the BLM. Overall, the population contained 134 individuals (67 FMOs; 67 LMs). The population of sites was subdivided according to location, those within the Great Basin and those outside the Great Basin (33 Great Basin sites; 34 Non-Great Basin sites). The Great Basin states included Idaho, Nevada, Oregon, Utah, and Wyoming. Non-Great Basin states were Alaska, Arizona, California, New Mexico, Colorado, and Montana. A simple random sample of sites was drawn for each subgroup. At the direction of the LAT, the proportion sampled for the Great Basin (75%) was larger than the proportion outside the Great Basin (66%). Of the sample, 43 sites completed the survey [21 Great Basin sites (84% completion); 22 Non-Great Basin sites (96% completion)]. Of the 21 Great Basin sites to complete the survey, there were 15 matched sites (i.e., both the FMO and LM from that site finished the survey) and 10 unmatched sites (i.e., only one participant from that site completed the survey). Of the 22 Non-Great Basin sites to complete the survey, there were 14 matched and 9 unmatched sites.

An early fire season in much of the west threatened to reduce the total number of respondents. To address this potential, the survey was offered to every site in the directory. In all, 92 of 134 participants (69%) from 57 sites completed the survey. Of those participants, 46 were FMOs (21 Great Basin; 25 Non-Great Basin) and 46 were LMs (22 Great Basin; 24 Non-Great

Basin). With the exception of data for one item, the data provided by individuals outside the sample were not significantly different from that of the sampled sites. Therefore, the data were combined into one data set.

Line Manager Demographics

The means for years of fire experience for all participants are listed below in Table 2. For all responding FMOs, the mean years of experience was 7.34. For LM, the mean years of experience was 5.56 years. Table 3 outlines the training and fire experience of LMs only. Overall, 54 percent of respondents reported attending a local fire management leadership course. Of the surveyed LMs, 65.2 percent attended a national leadership course. Eighty-seven percent of LMs had participated in a prescribed fire and 54.4 percent have worked as a member of a fire crew. Table 4 describes the specific fire training of LMs. Overall, 58.7 percent of LMs reported attending rookie training and 40 percent completed S-290. The proportion of LMs completing courses in intermediate fire behavior, the incident command system, and fire effects was lower at 23.9, 30.4, and 8.7 percent, respectively. Table 5 outlines where LMs received their training. For LMs in the Great Basin, the largest number received their training in the Northwest, while those outside the Great Basin received their training in the Northwest and Alaska.

Table 2. FMO and LM mean years of experience by location.

Location	Position					
	FMO			LM		
	N	Means	Standard Deviations	N	Means	Standard Deviations
Great Basin	21	7.80	6.99	22	5.45	3.96
Non-Great Basin	25	6.96	6.00	24	5.66	4.76
Total population	46	7.34	6.41	46	5.56	4.34

Table 3. Number of LMs attending training, participating in prescribed fire, and participating in fire crews by location.

Training & Fire Experience	Great Basin		Non Great Basin	
	Yes	No	Yes	No
Have attended local Fire Mgt. Leadership	11 (50.0%)	11 (50.0%)	14 (58.3%)	10 (41.7%)
Have attended National Fire Mgt. Leadership	17 (77.3%)	5 (22.7%)	13 (54.2%)	11 (45.8%)
Have participated in prescribed fire implementation	21 (95.4%)	1 (4.6%)	19 (79.2%)	5 (20.8%)

Have been a member of a fire crew	14 (66.7%)	7 (33.3%)	11 (47.8%)	12 (52.2%)
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Table 4. Training history for LMs by location*.

Fire Training	Great Basin (n = 22)	Non Great Basin (n = 24)
Rookie Training or Guard School or Basic Training (I-110, S-190, S-130)	15 (68.2%)	12 (50.0%)
S-290 (Fire Behavior)	9 (40.9%)	8 (33.3%)
S-390 (Intermediate Fire Behavior)	7 (31.8%)	4 (16.7%)
I-100, I-200 (Incident Command System)	9 (40.9%)	5 (20.8%)
RX 234 or 90 (Fire Effects)	2 (9.1%)	2 (8.3%)

* It is possible for one individual to report completing more than one training program.

Table 5. Geographic region where LM training was received by location.

Geographic Region of Local Fire Mgt. Leadership	Great Basin	Non Great Basin
Northwest	5	4
Northern California	0	3
Southern California	0	1
Alaska	2	4
Southwest	2	0
Western Great Basin	1	3
Eastern Great Basin	1	0

Results

The competency data from this survey were analyzed by comparing the mean responses of FMOs to those of LMs in the Great Basin and outside of the Great Basin. An alpha level of .05 was used for all statistical analyses. Of the six leadership categories, LM ratings were higher than FMO ratings in five areas: Safety, Resource Management, Reviews, Prescribed Fire, and Oversight. Each of the competency items was analyzed separately and is discussed in the Competency Item Analysis Section below.

Competency Item Analysis

Safety Items 1 & 2

Concerning safety, there was consistency in the ratings of FMOs and LMs for the first safety question (see Figure 1). This was not the case for the second safety question (see Figure 2) where LM ratings were significantly higher than those of FMOs, $p < .01$. A closer examination of the behavioral examples suggests that the first item focuses on communication while the latter focuses on participation. The difference between response patterns for those two questions suggests that LMs convey safety concerns but might not be actively engaged with members of the fire staff.

Safety Item #1

Select the option below that best describes how you have (your line manager has) addressed fire safety concerns in the recent past:

Excellent (rating = 5): Line Manager (LM) communicates expectations for firefighter safety in planning, pre and post-season briefings, training, and visits to the fire. LM maintains contact with Incident Commander (IC) as fire progresses and holds IC accountable for compliance with rules. LM works closely with communities to identify protection zones, and supports suppression actions that ensure firefighter and public safety above other objectives.

Acceptable (rating = 3): LM communicates safety expectations and requires Fire Management Officer (FMO) to talk about safety at briefings. LM encourages use safe tactics on the fire line. FMO has responsibility for encouraging reduction of fuels hazards near communities.

Poor (rating = 1): LM relies on safety officer and FMO to work with communities to develop a safety plan. FMO and IC are expected to monitor firefighter and public safety concerns.

Safety Item #2

Select the option that best describes how you have (your line manager has) addressed fire safety concerns in the recent past:

Excellent (rating = 5): LM participates in pre-season discussions with fire staff on safety requirements and concerns. LM, FMO, and IC work together to develop safety policy and plans that promote firefighter and public safety first, and determine how requirements (e.g., work/rest) will be implemented on the incident. LM ensures that all actions are conducted in a safe work environment.

Acceptable (rating = 3): LM ensures that risk assessments are completed for fire staff activities. LM meets with fire staff to review safety policies; Emphasizes safety in pre-season briefings and follows up on deficiencies. Supervisors are responsible for corrective actions.

Poor (rating = 1): LM relies on fire staff to communicate safety issues to firefighters and only discusses safety when an accident occurs. LM relies on FMO to complete risk assessments for fire related activities.

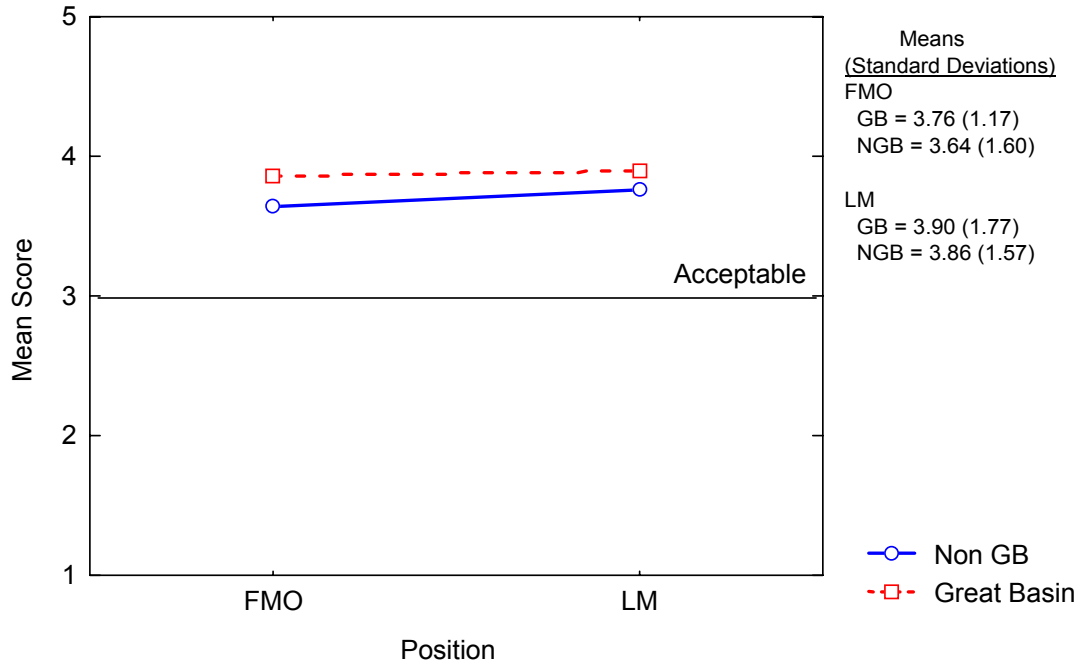


Figure 1. Mean ratings for safety item number 1 by position and location.

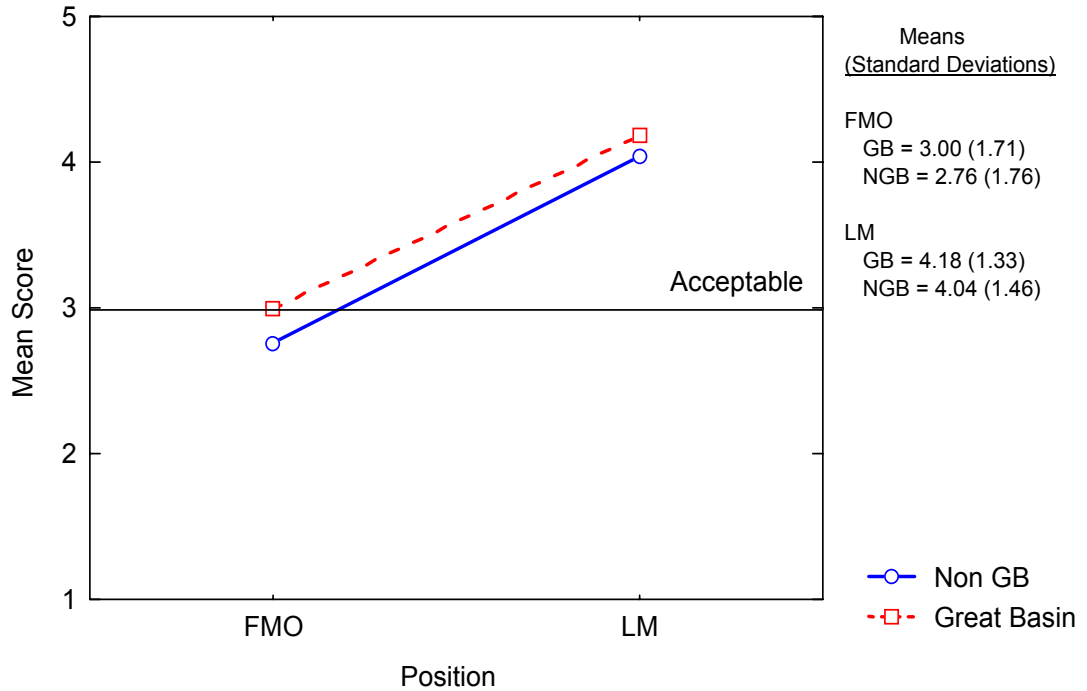


Figure 2. Mean ratings for safety item number 2 by position and location.

Resource Management

Mean ratings of resource management by FMOs and LMs differed significantly for both Great Basin and Non-Great Basin respondents, $p < .01$ (see Figure 3). LMs rated their behavior higher than did the FMOs. Ratings by both groups were at or above the acceptable threshold. There was no difference associated with location.

Resource Management

Select the option that best describes how you have (your line manager has) addressed resource management objectives, the fire management plan, and the most efficient level of funding and personnel (MEL):

Excellent (rating = 5): LM and FMO, together with resource and fire staff, identify protection zones to meet resource needs, safety concerns, and local economic and social requirements in completion of the FMP. LM provides input in the development of the MEL, engages field office into an interdisciplinary team, and ensures that the FMP is fully implemented at the given funding level. Resource objectives are communicated to the FMO, fire staff, and crew. LM ensures that state and local governments are involved in fire planning.

Acceptable (rating = 3): LM participates in development of resource management objectives through the FMP process and implementation of MEL fire organization. LM ensures that fire staff can implement management objectives. LM relies on fire program to complete FMP and MEL process, directs resources staff to support the process, and reviews completed FMP.

Poor (rating = 1): LM relies on FMO to develop and implement FMP. Resource objectives are not well defined and are not available for initial attack, or no MEL organization is made.

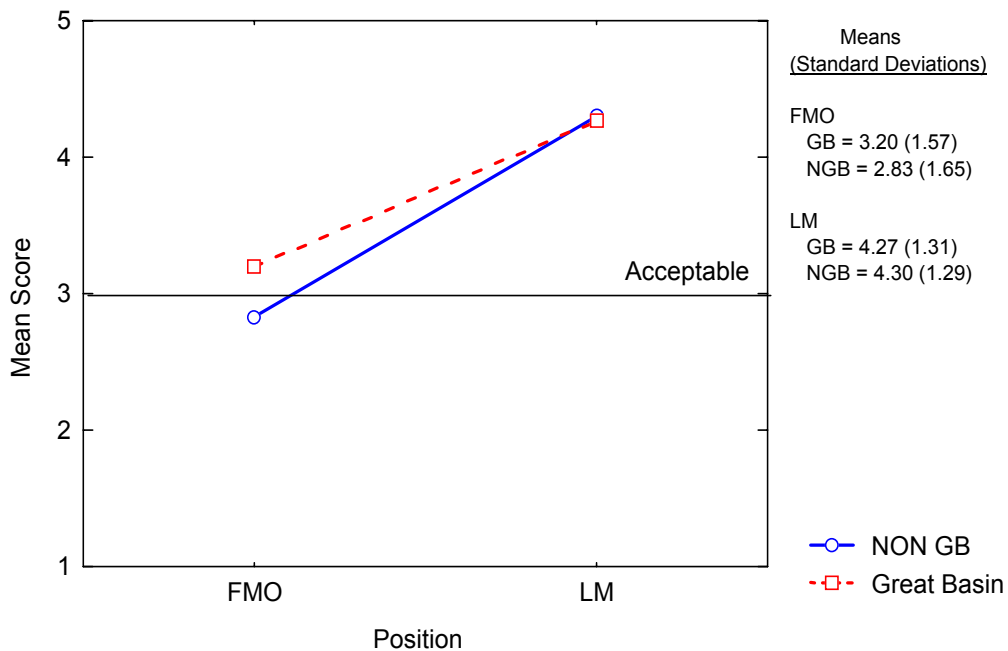


Figure 3. Mean ratings for resource management item by position and location.

Reviews

Mean ratings for review by FMOs and LMs differed significantly for Non-Great Basin respondents, $p < .01$ but not for the Great Basin (see Figure 4). Outside the Great Basin, LMs rated their behavior higher than did the FMOs. Ratings by FMOs outside the Great Basin were below the acceptable threshold while FMO responses in the Great Basin were above the acceptable threshold.

Reviews
 Select the option that best describes how you have (your line manager has) addressed follow-up actions to program review, fire preparedness review, fire and aviation safety review, fire critiques, and post-season reviews:

Excellent (rating = 5): LM supports and takes part in pre- and post-season fire reviews and critiques, stressing safety and other critical issues, and takes an active part in follow-up action items ensuring completion in a timely manner. LM ensures follow-up occurs through establishment of a clear guidance document and monitors issues from the start of fire season through post-season fire critiques and operational meetings.

Acceptable (rating = 3): LM takes active role in and encourages field office and fire staff to make time for pre- and post-season reviews and closeouts; ensures that action items are assigned to staff for completion. Fire staff prepares action plan to complete corrections. LM relies on FMO to follow-up on actions items.

Poor (rating = 1): LM delegates all fire responsibilities to FMO, including reviews and critiques for post-season evaluations. Fire staff prepares corrective report to send to the review team.

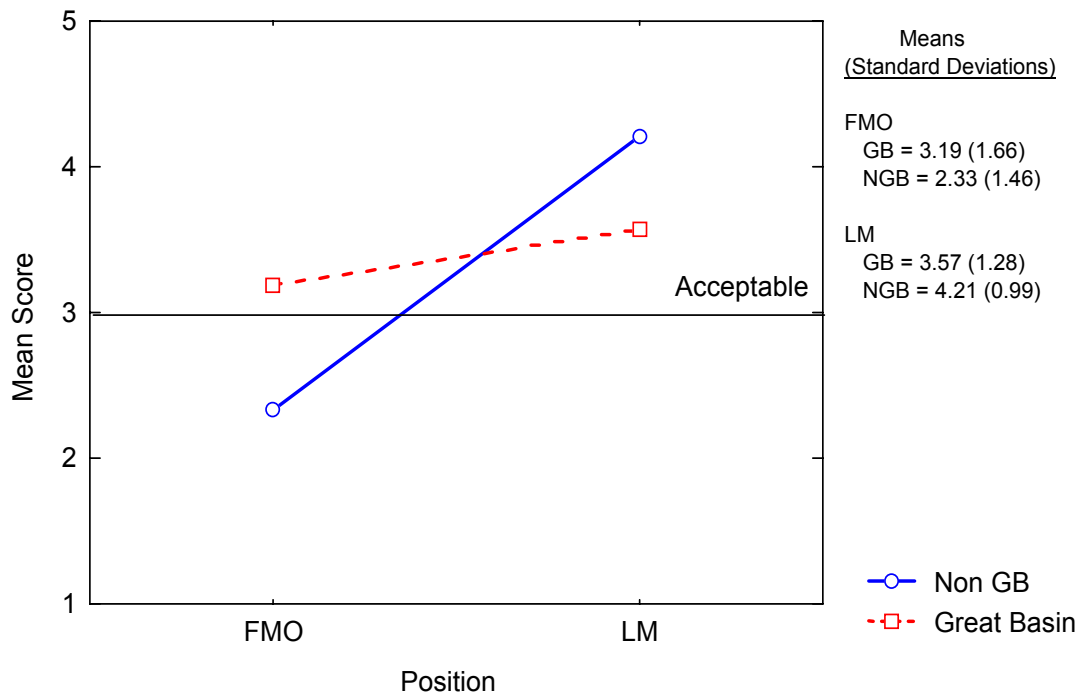


Figure 4. Mean ratings for review item by position and location.

Prescribed Fire Items 1 & 2

Of the differences between FMO and LM ratings, the largest occurred in prescribed fire. The two prescribed fires items addressed the oversight of and participation in a prescribed fire program. In both areas, LMs rated their performance higher than FMOs. In the area of prescribed fire oversight, FMO ratings of LMs approached the acceptable threshold (see Figure 5). For participation, however, FMO ratings of LMs were lower than the acceptable threshold (see Figure 6).

Prescribed Fire #1

Select the option that best describes how you have (your line manager has) addressed prescribed fire plans:

Excellent (rating = 5): Line Manager assigns fire lead and a resource lead to form an interdisciplinary team to develop a prescribed fire plan and ensures fire plan adheres to the current Land Use Plan and NEPA requirements. LM understands and reviews complexity rating and possible risks, ensuring that mitigation measures are in place. LM provides briefings to county/local publics and state agency representatives. LM and FMO develop a Risk Assessment that outlines go/no-go situations.

Acceptable (rating = 3): Prior to approving plan, LM participates with fire, resource, and safety staff in development of plan, considering risk management as a means of mitigating hazards (fuels, weather, terrain, etc). LM clearly understands risks and objectives and communicates prescription and safety expectations.

Poor (rating = 1): LM relies on the fire staff and FMO to develop and implement prescription burn plan and ensure that the prescription burn plan follows the LUP efforts and NEPA requirements. Resource issues are not clearly stated in the plan. LM review of plan is cursory.

Prescribed Fire #2

Select the option that best describes how you have (your line manager has) addressed prescribed fire monitoring and follow-up:

Excellent (rating = 5): LM is on-site during action and conducts reviews after each day's activities, encourages local publics to be present, and ensures that monitoring is based on local resource objectives. LM is involved in follow-up on prescribed burn plans and post burn critiques, ensuring all processes were followed and documentation occurred during and after burn completion. LM has interdisciplinary team (ID) team evaluate burn area to assess meeting initial fire and resource objectives.

Acceptable (rating = 3): LM is on-site during the burn and ensures that resource objectives are being met during the burn. LM communicates with resource advisor, FMO and IC during burn. LM is involved with initial process of prescription burn implementation and ensures that follow-up and monitoring is completed in a timely manner.

Poor (rating = 1): LM relies on FMO and fire staff to implement the prescription burn, as well as to complete monitoring and documentation. LM relies on resources staff to monitor and report any problems.

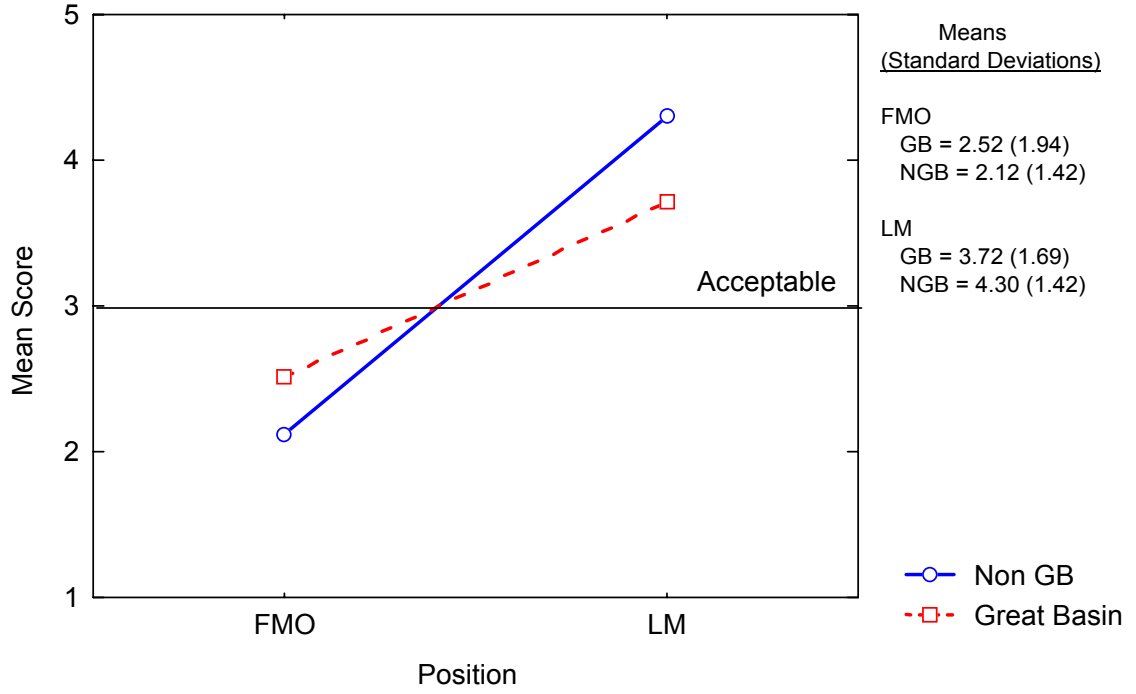


Figure 5. Mean ratings for prescribed fire item number 1 by position and location.

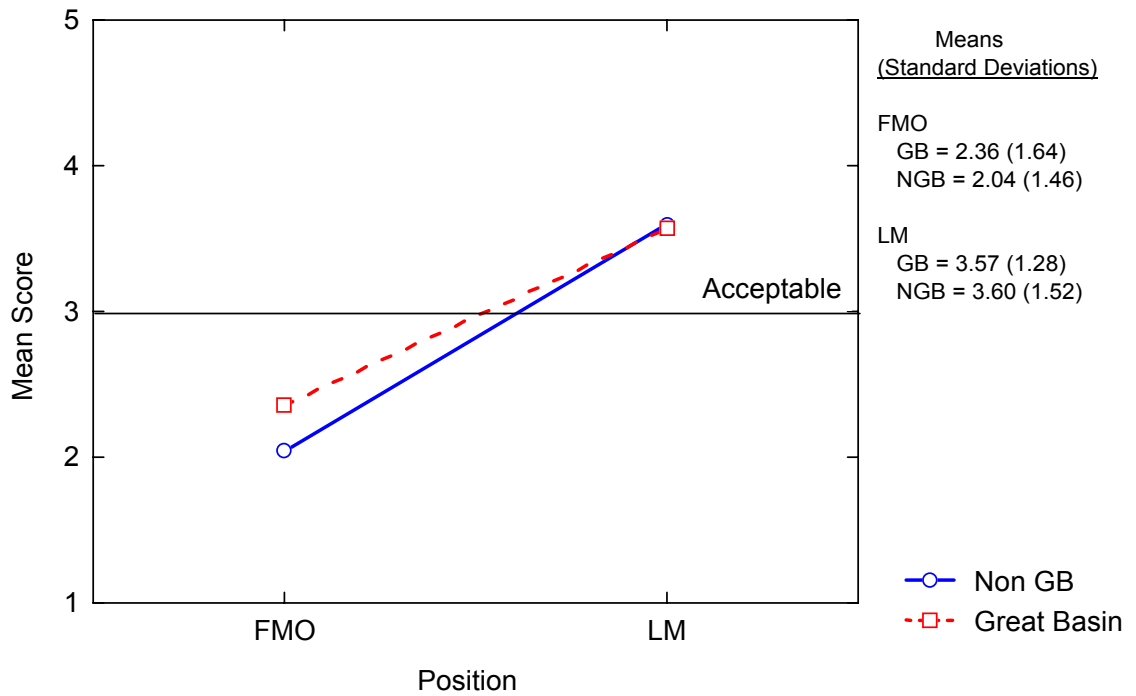


Figure 6. Mean ratings for prescribed fire item number 2 by position and location.

Preparedness 7 & 8

Ratings provided by FMOs and LMs did not differ significantly, $p < .05$. Moreover, ratings provided from the two locations did not differ significantly, $p < .05$

Preparedness Item #1

Select the option that best describes how you (your line manager has) have addressed the completion and approval of the Wildland Fire Situation Analysis (WFSA).

Excellent (rating = 5): WFSA is thoroughly completed at incident site with input from Line Manager, Resource Advisor, and IC. Completed WFSA is given to incoming overhead team prior to the team's first operational period. LM reads WFSA, flies over or looks at fire, evaluates selected alternatives, ensures completeness, and makes comments before signing WFSA.

Acceptable (rating = 3): LM is very supportive of WFSA completion and makes sure staff are experienced and available. LM delegates fire staff to look out for resource values.

Poor (rating = 1): WFSA completed as a paperwork exercise by FMO, IC, and RA, with little or no management input. LM has little experience or interest in WFSA.

Preparedness Item #2

Select the option that best describes how you (your line manager has) have provided incident management objectives, written delegations of authority, and line officer briefings to incident management teams.

Excellent (rating = 5): LM prepares briefing for the overhead team regarding local issues/concerns and provides upfront information about things to do and watch out for. The Delegation of Authority (DA) is prepared with input from FMO, RA, and safety officer prior to arrival of the incident management team (IMT). DA includes rehabilitation and suppression objectives and is in compliance with Field Office management plans. LM and resources staff is available to answer questions at briefings and updates.

Acceptable (rating = 3): LM personally communicates to the IMT any expectations for incident management and concerning objectives. Written DA prepared by FMO and IC for LM.

Poor (rating = 1): RA and IC develop management objectives with little or no management input. Resource objectives are not thoroughly included in IMT briefings. IMT briefing given by the FMO and RA. DA copied directly from Redbook. LM feels there is no need

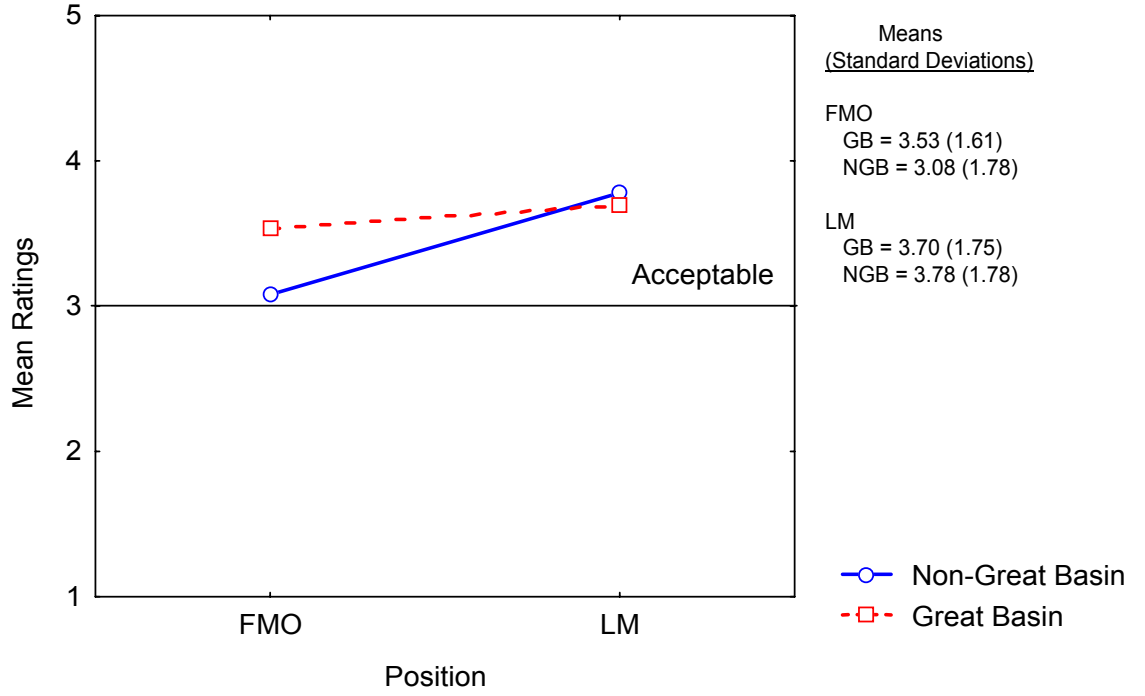


Figure 7. Mean ratings for preparedness item number 1 by position and location.

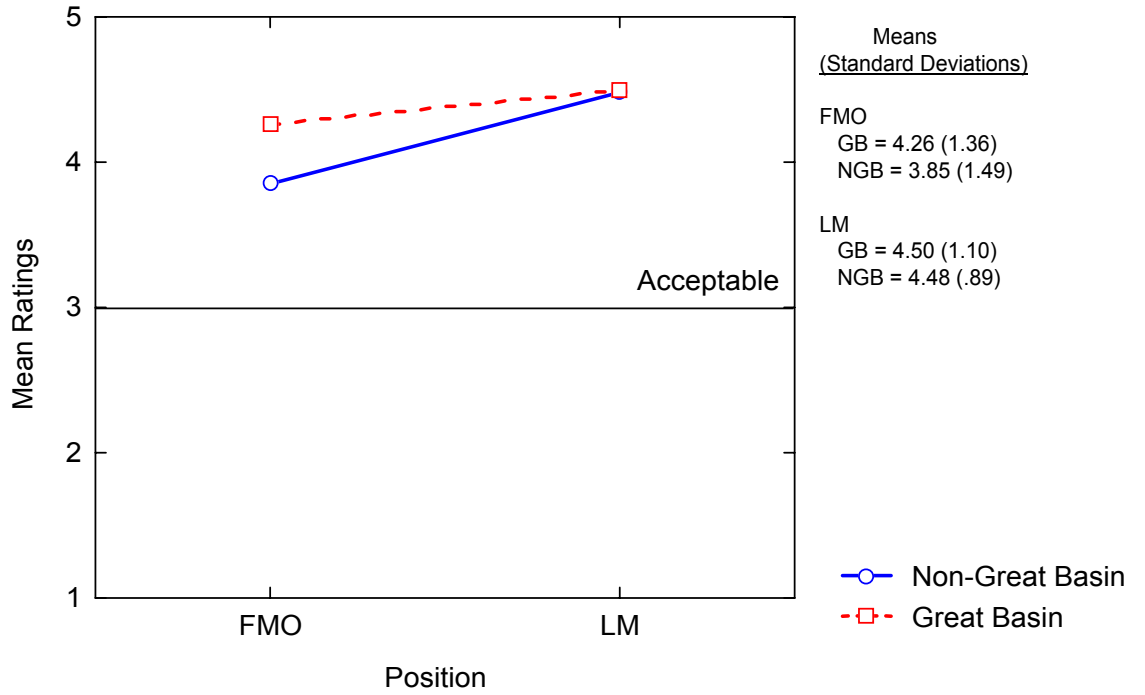


Figure 8. Mean ratings for preparedness item number 2 by position and location.

Oversight

Mean ratings of oversight varied significantly by position (i.e., FMO, LM) but not for location (see Figure 9). As has been seen in prior items, LM ratings were significantly higher than those provided by FMOs, $p < .01$. Average ratings were at or above the acceptable threshold.

Oversight
Select the option that best describes how you have (your line manager has) provided oversight during periods of critical fire activity/situations of high-risk:

Excellent (rating = 5): Line Manager is aware of fire activity and conditions in area, requests general briefing before/during fire season on general fuel conditions, and visits fires in person. LM establishes working relationship with fire staff and incident management team (IMT) and is available from the start of the incident through its closeout. LM becomes part of the fire program during periods of critical fire risk and activity and ensures ongoing communications with fire staff, stressing safety and crew considerations.

Acceptable (rating = 3): LM has continuous contact with fire staff (IC, RA, FMO). LM visits fire initially and as the incident changes to observe operations, oversee safety requirements, and protect resource values.

Poor (rating = 1): LM relies entirely on fire staff and FMO to oversee fire situation, handle fire activity and IMT, and monitor condition and safety. LM only involved with fire when critical issue occurs.

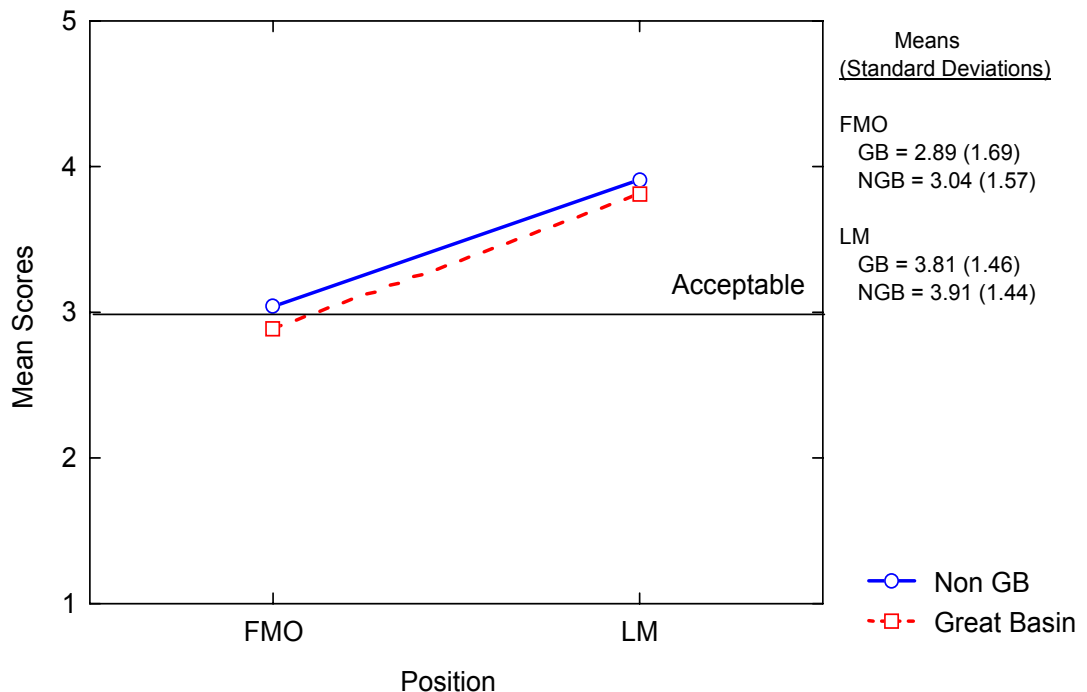


Figure 9. Mean ratings for oversight item by position and location.

Leadership Item Analysis

The 20-item leadership survey evaluated two aspects of leadership, tasks and relationships (see Table 5). Scores for both aspects of leadership ranged from moderately low to very high levels. As has been seen before, the mean ratings by LMs for task and relationship leadership were consistently higher than those provided by the FMOs (see Figures 10). This was particularly true for task leadership in the Great Basin where LMs consistently provided ratings that were higher than those from FMOs. The difference between LM and FMO ratings of task-oriented leadership was significant, $p < .01$. The largest differences in task leadership ratings occurred on items such as “Develop a well-outlined fire management plan”, “Provide clear standards of performance for group members”, and “Develop a plan of action for incidents.” Ratings by FMOs and LMs outside the Great Basin were much closer. Table 6 details the differences in ratings between FMOs and LMs. Positive difference scores indicate that LM provided higher ratings than FMOs.

For the relationship component of the leadership scale (see Figure 11), ratings by FMOs and LMs followed a pattern similar to that of the task-oriented scores. FMO ratings of LM were significantly lower than LM ratings of themselves in the Great Basin. In the Great Basin, the largest differences were found for items such as, “Help others feel comfortable in every situation”, “Facilitate good relationships between employees”, and “Communicate actively with fire staff.” Outside the Great Basin, the largest difference in ratings occurred for the item, “Treat all employees impartially.” The difference between FMO and LM ratings out of the Great Basin was not significant.

Table 6. Leadership items and mean difference values by location. Positive difference values indicate higher ratings by LMs.

Item No.	Task Leadership Items	Mean Differences	
		Great Basin	Non-Great Basin
1	Clearly articulates expectations for FMOs, firefighters, managers, and IMTs.	.600	-.111
3	Provide clear standards of performance for group members.	.800	.368
5	Offer suggestions about how to solve fire-related problems.	.200	-.105

7	As a LM, make my perspective clear to others.	.462	.158
9	Develop a plan of action for incidents.	.786	.733

Table 5 continued

11	Clearly define responsibilities for FMOs, firefighters, managers, and IMTs.	.533	-.063
13	As a LM, make clear my role in each situation.	.429	.412
15	Develop a well-outlined Fire Management Plan.	1.167	.167
17	Provide observable measures for employee expectations	.417	.278
10	Encourage all employees to perform exceptional work.	.214	0.00
Mean Difference		.561	.184
	People-Oriented Leadership (Relationship)	Great Basin	Non-Great Basin
2	Courteous with employees.	0.333	0.158
4	Help others feel comfortable in every situation.	0.786	0.105
6	Support employees' new ideas.	0.067	0.158
8	Treat all employees impartially.	0.600	0.579
10	Behave in an expected manner toward group members.	0.143	0.053
12	Communicate actively with fire staff.	0.467	0.053
14	Emphasize concern for the safety of others.	0.267	0.263
16	Show flexibility in decision-making.	0.333	0.211
18	Disclose thoughts and feelings to group members.	0.214	0.00
20	Facilitate good relationships among employees.	0.538	0.444
Mean Difference		.375	.202

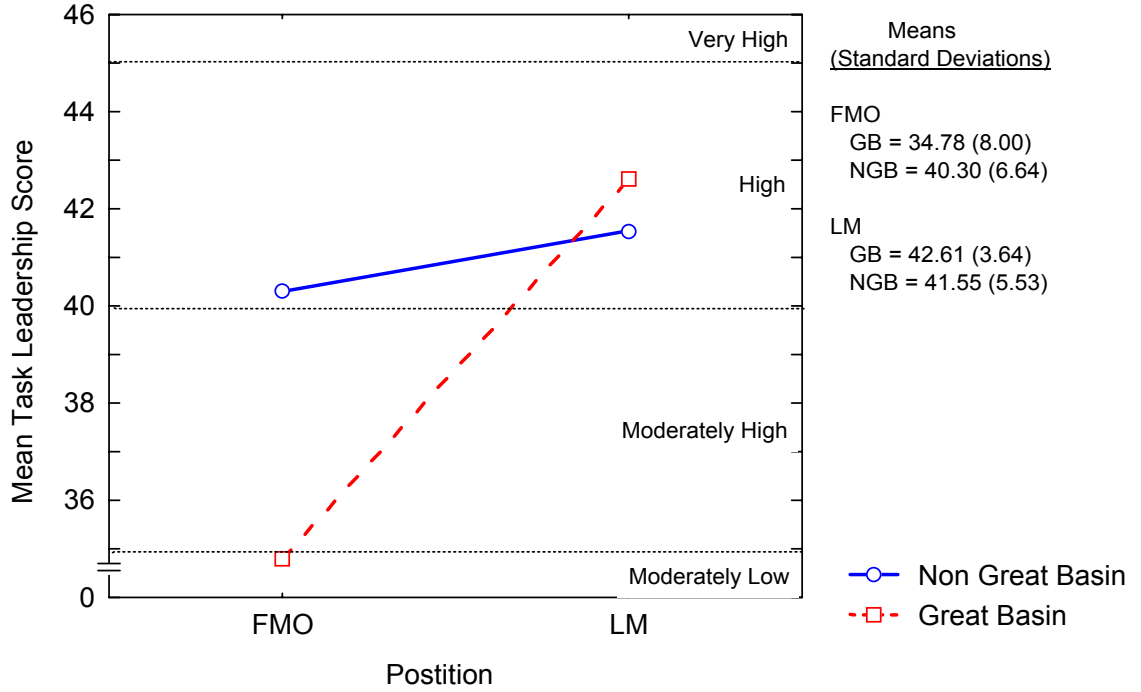


Figure 10. Mean task (task-oriented) leadership scores by position and location.

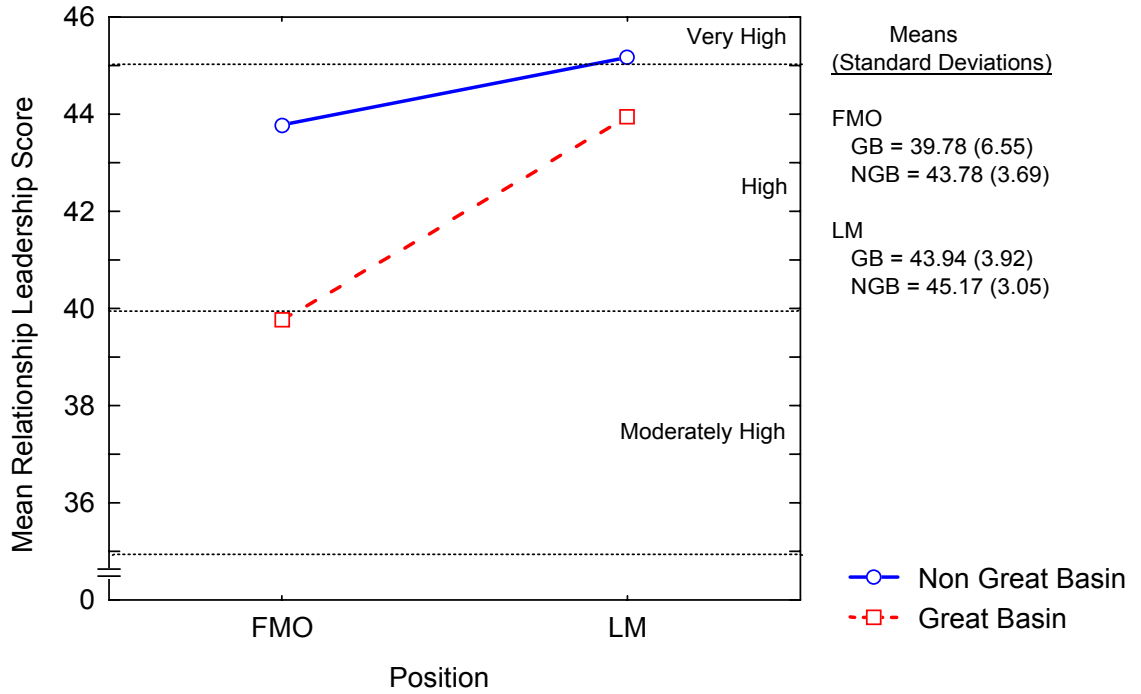


Figure 11. Mean relationship (people-oriented) leadership scores by position and location

LM & FMO Comments

LMs and FMOs were given an opportunity to suggest changes or improvements to the fire training they have received. Unfortunately, a problem with the survey tool truncated some of the response. The individual responses by position are summarized below.

Line Managers

In general, LMs reported that they would like to attend more fire-related management training, and take it upon themselves to seek further education with regarding to their position. Several participants mentioned the possibility of requiring attendance at a local fire management leadership course or refresher course every few years. Additionally, LMs would like to see the definition of their roles to be continually refined and evaluated. One individual suggested a joint training class for LMs and FMOs so that each position may better understand the roles and responsibilities of the other.

Fire Management Officers

Overall, FMOs feel the fire-related training they have received has been quite good, although most FMOs recognize the need for additional fire training. Individuals report that training should include a balance of prescribed fire and wildland fire issues, and would like to see leadership training and human factors addressed in greater detail. As a suggestion, one individual reported that the use of simulators and/or scenarios in identifying strengths and weaknesses for training purposes. Additionally, FMOs would like to see fire management training keep a truly inter-agency perspective, encouraging members of all agencies to continue their fire-related education.

Discussion

Differences between ratings by managers and subordinates are not unique to this assessment effort. Other survey efforts comparing supervisors and subordinates have shown similar differences. Rating differences between FMOs and LMs in competency areas such as oversight, resource management, safety, and to some extent reviews must be interpreted carefully. Although differences exist, mean ratings for all but one competency, prescribed fire, met or exceeded the acceptable threshold.

Of the differences between FMO and LM ratings, the largest occurred in prescribed fire. The two prescribed fires items addressed the oversight of and participation in a prescribed fire

program. In both areas, LMs rated their performance higher than FMOs. In the area of prescribed fire oversight (i.e., Prescribed Fire #1), FMO ratings of LMs were below the acceptable threshold. Looking only at the sampled sites, 50 percent (n = 7) of FMOs in the Great Basin gave their LM a poor rating in the area of prescribed fire oversight. It is important to note, however, that 42.9 percent of FMOs in this group gave excellent ratings for their LM on this item. Fifty percent (n = 9) of FMOs outside the Great Basin gave poor ratings for their LMs. The distributions of ratings for the participation aspect of prescribed fire (i.e., Prescribed Fire #2) were similar to those discussed earlier. For the sampled sites in the Great Basin, 50 percent (n = 8) of FMOs gave their LMs a poor rating. Only 18.75 percent (n = 3) of the FMOs in this location gave excellent ratings to their LMs. As for respondents outside the Great Basin, 52.9 percent (n = 9) of FMOs gave poor ratings to their LMs while only 11.8 percent (n = 2) gave excellent ratings. It is possible that the poor ratings from FMOs in the area of prescribed fire are reflected in the task component of the leadership assessment.

The analyses of the task and relationship components of the leadership questionnaire suggest that FMOs in the Great Basin perceive their LMs to have less leadership skills than their non-Great Basin counterparts. Outside the Great Basin, FMO and LM ratings of leadership did not differ significantly. Although the difference in leadership between FMOs and LM is fairly robust, the results must be interpreted with caution. The leadership scale used in this effort was adapted from the business environment and was edited to include language germane to fire. It is not clear if the edited questionnaire items represented the essential aspects of LM leadership in fire. In other words, it is possible that the leadership items did not adequately represent the types of task leadership necessary for LMs. With this caveat in mind, the differences in task leadership ratings between respondents in and out of the Great Basin and between FMOs and LMs deserve further attention.

Recall that differences in task leadership ratings outside the Great Basin were smaller than those inside the Great Basin. Explaining this difference is complicated by the fact that a larger proportion of LM in the Great Basin had completed the national leadership training than LMs out of the Great Basin. (One would expect that LMs who completed the national leadership course would perform better.) One possible explanation for this location difference is that FMOs in areas with active fire programs have higher expectations of their LMs than FMOs with fewer fire responsibilities. This assumes that sites out of the Great Basin have smaller or less active fire programs overall than those in the Great Basin. Similarly, it is possible that the skill level of a LM only becomes visible in a fire active area. LMs that oversee less active fire programs might not have the opportunity to demonstrate the presence or absence of task related leadership. Finally, it is possible that leadership training received by LMs out of the Great Basin is more consistent with the demands in that area than it is in the Great Basin.

Implications for Training

The objective of this survey was to assess the effectiveness of existing LM fire training programs. Given the criteria developed by the LAT, it would appear that LMs perform near acceptable levels in all but one area. This appears to be true for LMs who have and have not completed the national leadership course. Figure 12 below depicts that average rating of LMs by FMOs. The figure depicts two lines. The dotted line shows the FMO ratings of LMs that have attended the national leadership training. The solid line shows FMO ratings of LMs that have not attended training. The means suggest that the national leadership training does not significantly advantage its attendees over non-attendees. Differences in the area of safety and preparedness are not significantly different by the statistical definition (i.e., $p < .05$). In the areas of resource management, reviews, prescribed fire, and oversight, LMs who attended the national leadership course were not rated higher than those who did not attend. The similarities in the mean ratings in these areas might suggest that the skills LMs possess were obtained from sources other than the national leadership course. Additionally, it is possible that the survey tools was too insensitive to detect differences.

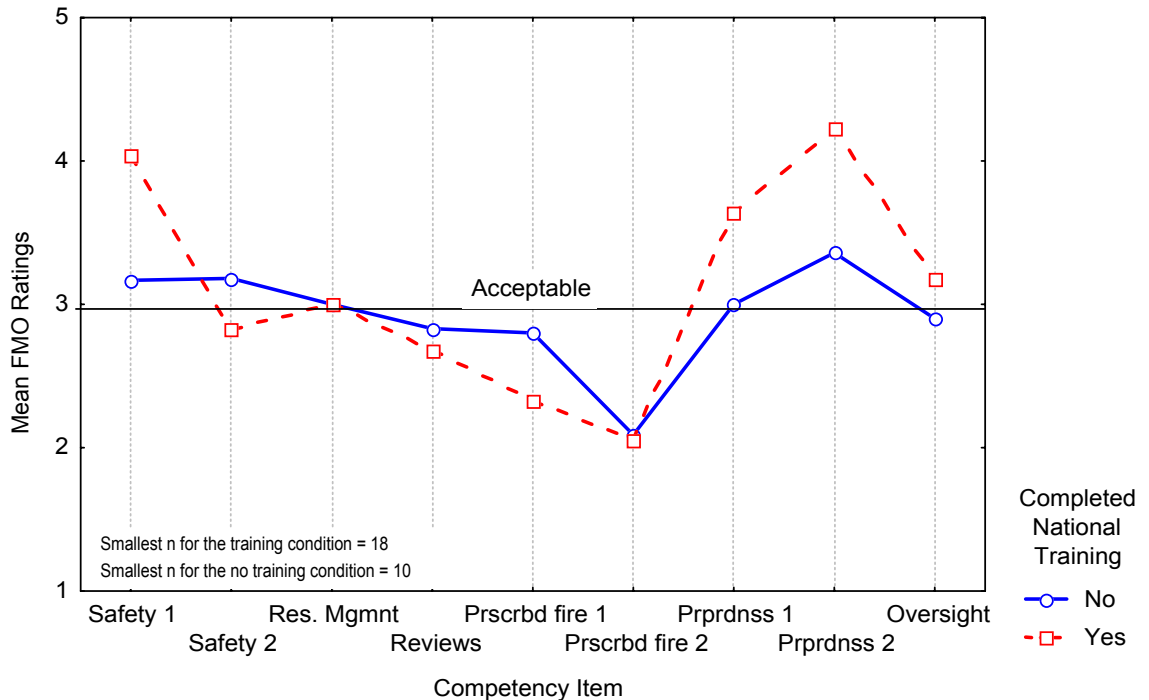



Figure 12. Mean FMO ratings of LMs on the six competency areas by training.

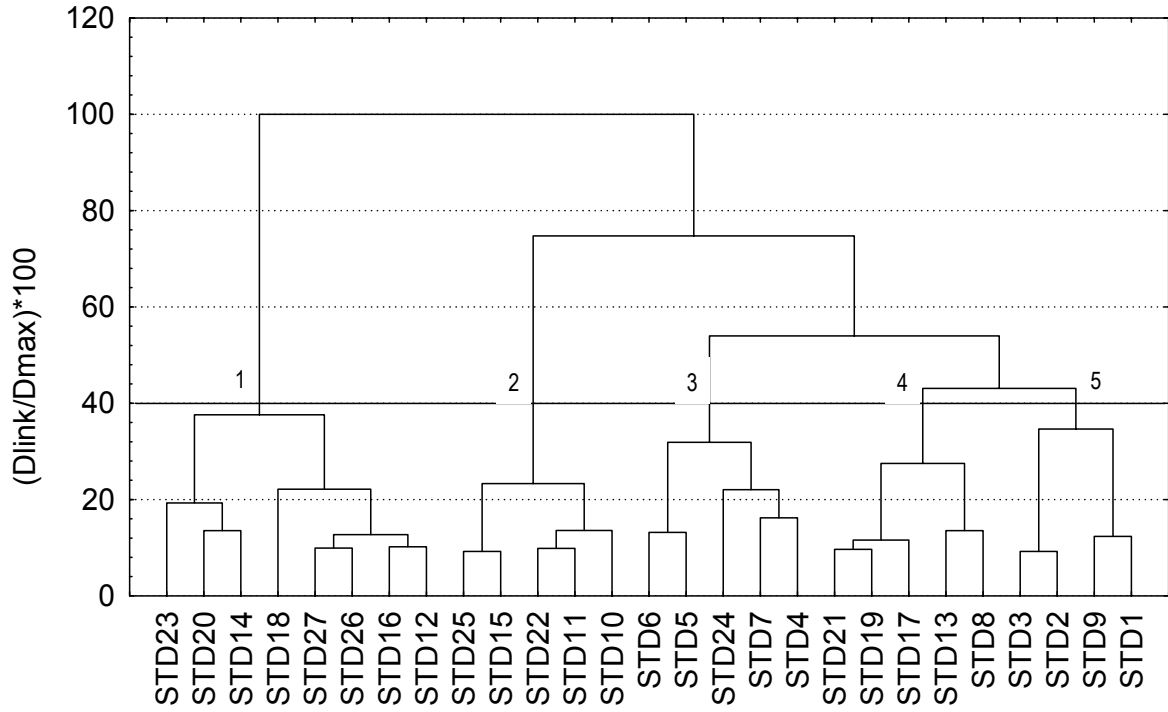
Training developers might want to consider the outcome of this effort when creating or modifying existing courses. Moreover, developers should entertain the comments of

respondents. Given the challenges and obstacles overcome by the LAT in this effort, the development of an effective training program that will enhance the skills of LMs will be a difficult, but not insurmountable task. The development of any new training program might best be facilitated by a cooperative effort between domain experts and expert training developers.



Appendix A: Cluster Analysis

Hierarchical cluster analysis of the 27 BLM Management Performance Requirements for Fire Operations.



Standards for Fire Operations 2001

Appendix B: Critical Incident Results

Leadership Academy Project: Critical Incident Results

LEADERSHIP ACADEMY PROJECT: CRITICAL INCIDENT RESULTS

COMPETENCY 1**Excellent (5.0±0.0)**

Communicate expectations for firefighter safety in planning, pre-season briefings and trainings, and through visits to the fires. Hold supervisor accountable for compliance with work/rest, LCES, 10&18, etc. Support supervisor in decisions to pull back or change tactics for safety reasons. Recognize them for doing so. Participate in post fire critiques.

OR

Excellent (5.0±0.0)

Manager is familiar with general fire safety requirements. Ensures all managers & employees understand his/her commitment to three continual discussions at management team meeting, all employees meetings and internal memos. Stays in constant communications with fire staff and employees and addresses safety concerns at every opportunity. Ensures through public outreach that the safety message is getting out to local publics & politicians. Personally meets with local political groups and stresses to them that he/she is committed to safety as the #1 priority. When public complaints arise related to suppression actions, the manager verbally supports suppression action that are based on firefighter and public concerns. Talks the talk & walks the walk.....

Acceptable (2.8±0.836)

Actively communicates safety expectations. Requires FMO to talk about safety at briefings.

Poor (1.0±0.0)

Does not attend trainings, briefings, staff meetings or fires. Does not get involved in fire-related activities.

COMPETENCY 5**Excellent (4.83±0.408)**

Management, resources staff and fire staff work together in identifying protection zones (weighted or prioritized) to meet resource need, safety concerns, local economic and social requirements. Based on the workload and focus to meet social and safety needs. Develop an organization that allows for success. All of the members of the planning team. Provide input in the development of the most efficient level (MEL) for success.

OR

Excellent (5.0±0.0)

Manager becomes involved with planning process from the start. Identifies his/her expectations of the final document. Establishes an I.D. Team consisting of resource and fire folks to ensure both resource and fire objectives that are meaningful, obtainable and justified. Meet with I.D. team occasionally throughout process; very active throughout review process. Once plan is approved, the manager insures that it is fully implemented at the given funding level. Administrative dollar support is limited to the legal cap.

Acceptable (2.67±0.516)

Manager relies on fire program to complete process. Directs resources areas to support the process, but does not make it a priority. Insures, after planning effort is approved, that the MEL organization is funded and supported.

Poor (1.0±0.0)

Manager is uninformed of resource management objectives and MEL. He/she really does not like dealing with fire issues for any number of reasons.

OR

Poor (1.0±0.0)

No plan is made and no MEL organization is made.

COMPETENCY 9**Excellent (4.83±0.408)**

Personally involved in pre-season discussions with managers and fire staff on safety requirements, concerns, and new Redbook changes for the year. As a group, work together to reach agreements on issues such as work/rest, and how that will be handled during incident. Communicates agreements and expectations internally and externally. Follows up.

Acceptable (3.0±0.63)

Manager ensures that JHAS are completed for staff. Emphasizes safety in pre-season and follows up on deficiencies.

Poor (1.17±0.408)

No safety program at all. Safety is only discussed when an accident occurs.

OR

Poor (1.0±0.0)

Manager is disconnected with fire issues of safety policies and procedures.

COMPETENCY 10**Excellent (4.8±0.408)**

Manager is aware of the need of the various types of reviewer and not only supports them but encourages they be done. The manager takes every opportunity to participate in actual reviews and critiques. When the manager participates in these reviews & critiques, they understand that they must get out a message for safety and other issues. Manager takes an active interest in all follow-up action items to ensure they are done.

Acceptable (2.5±0.836)

Manager takes active role in review process and ensures that action times are assigned to be completed. Does not formally follow through with implementation of these action items.

OR

Acceptable (3.83±0.408)

Manager actively participates in preparedness reviews or fire critiques. Makes completion of follow-up actions a priority. Encourages staff to make time for pre-season meetings and fire reviews. Hosts pre and post-season meetings with field office and fire staff.

Poor (1.17±0.408)

After the reviews occur, no plan of action is prepared. Reviews are put on a shelf and not looked at again.

OR

Poor (1.17±0.408)

Delegates responsibilities for reviews to FMO.

COMPETENCY 12**Excellent (4.83±0.408)**

Fire and resources work together on the development of a prescribed fire plan. Fire provides input from the Burn boss/Fuels Spec. Management identifies leads for project one from fire one from resources. An interdisciplinary team works on the plan/NEPA document. Briefings are given to county/local publics and state office reps. Management and fire develop a risk assessment with understanding of a go/no-go determination. Management (field) is on site during action with reviews after each days' activities. Flip charts are used to cover what went well and what to improve. Local publics are present. Build in monitoring based on objectives.

Acceptable (3.33±0.516)

Insure that resource objectives are being met during the burn. Talk to resource advisor and burn boss during burn. Insure follow-up; monitoring is done.

Poor (1.17±0.408)

Does not get involved in plans or critiques.

COMPETENCY 14**Excellent (4.78±0.345)**

WFSA/Team Transition Packet thoroughly completed and delegated to the Incoming Overhead Team prior to team's first operational shift. Line Officer involvement; both District Manager and Area Manager were involved with the development of these documents.

Acceptable (3.44±1.0)

Ensured staff and computer expertise and enthusiastic about WFSA completion (very supportive).

Poor (1.0±0.0)

Did not know what a WFSA was for. What help fire staff would need and did not provide it even when requested.

COMPETENCY 18**Excellent (5.0±0)**

Delegation of Authority is completed prior to Incident Management Team arrival. Manager involved; FMO, Resource Advisor and Safety Officer development of Delegation. Delegation includes rehab objectives as well as suppression objectives. Delegation is in compliance with FO, LUP & FMP other management plans. Manager and staff available at briefing to answer IMT's questions on resource values.

Acceptable (3.0±0.63)

Ensures IMTs are briefed on incident management objectives and provided written Delegation of Authority.

Poor (1.0±0.0)

IMT briefings are not done and Delegation of Authority not provided.

COMPETENCY 19**Excellent (5.0±0.0)**

Manager is available and interested in fire activity in his/her area. Requires general briefing before and during fire season to know what general fuel conditions are. During

ongoing incidents, require regular briefings and looks for opportunities to stress management concerns for safety and other issues to fire staff and IMTs. Visits fires either in person or in aircraft. Establishes a good working relationship with IMT and fire staff to better support and get safety message out. Is available and concerned about incident all the way through close out.

Acceptable (3.67±0.516)

Is expected to have continuous contact with fire staff (IC, Resource Advisor, FMO). Is available when important decisions need to be made. Visits fire initially and again as situation changes.

OR

Acceptable (3.67±0.516)

Communicate continually with IC and FMO and provide needed resources and support for safe operations. Requests additional resources when needed.

Poor (1.33±0.516)

During a critical risk situation, management takes over the situation showing no trust or support in staff. Management has little or no experience in fire and will not ask for help.

OR

Poor (1.33±0.816)

Manager seems to be discouraged with fire activity. They seem to not want to be bothered with details. This manager even seems to want to be gone during fire season. Delegates Line Manager findings and seems to just want the fire staff to take care of fires and make them go away.

COMPETENCY 26 & 27

Excellent (4.67±0.516)

Fire and resources work together on the development of a prescribed fire plan. Fire provides input from the Burn boss/Fuels Spec. Management identifies leads for project one from fire one from resources. An interdisciplinary team works on the plan/NEPA document. Briefings are given to county/local publics and state office reps. Management and fire develop a risk assessment with understanding of a go/no-go determination. Management (field) is on site during action with reviews after each days' activities. Flip charts are used to cover what went well and what to improve. Local publics are present. Build in monitoring based on objectives.

Acceptable (2.83±0.408)

All actions as above, but without county and local involvement. No monitoring identified.

Poor (1.0±0.0)

Manager says they are not qualified to sign off burns and asks another manager to do it. Does not have interest in long-term goals as he doesn't know if burning is here to stay.

OR

Poor (1.0±0.0)

Fire is the only part of the Burn plan without any NEPA. No review or follow-up.

Appendix C: Leadership Questionnaire

Leadership Questionnaire

Instructions: Read each item carefully and answer each question how you, as a Line Manager, engage in the described behavior. Indicate your response to each item by selecting one of the circles.

1 = Never

2 = Seldom

3 = Occasionally

4 = Often

5 = Always

1.	Clearly articulates expectations for FMOs, firefighters, managers, and IMTs.	1	2	3	4	5
2.	Courteous with employees.	1	2	3	4	5
3.	Provide clear standards of performance for group members.	1	2	3	4	5
4.	Help others feel comfortable in every situation.	1	2	3	4	5
5.	Offer suggestions about how to solve fire-related problems.	1	2	3	4	5
6.	Support employees' new ideas.	1	2	3	4	5
7.	As a LM, make my perspective clear to others.	1	2	3	4	5
8.	Treat all employees impartially.	1	2	3	4	5
9.	Develop a plan of action for incidents.	1	2	3	4	5
10.	Behave in an expected manner toward group members.	1	2	3	4	5
11.	Clearly define responsibilities for FMOs, firefighters, managers, and IMTs.	1	2	3	4	5
12.	Communicate actively with fire staff.	1	2	3	4	5
13.	As a LM, make clear my role in each situation.	1	2	3	4	5
14.	Emphasize concern for the safety of others.	1	2	3	4	5
15.	Develop a well-outlined Fire Management Plan.	1	2	3	4	5
16.	Show flexibility in decision-making.	1	2	3	4	5
17.	Provide observable measures for employee expectations	1	2	3	4	5
18.	Disclose thoughts and feelings to group members.	1	2	3	4	5
19.	Encourage all employees to perform exceptional work.	1	2	3	4	5
20.	Facilitate good relationships among employees.	1	2	3	4	5

SCORING: The style questionnaire is designed to measure two major types of leadership behaviors: task and relationship. Score the questionnaire by doing the following. First, sum the responses on the odd-numbered items. This is your task score. Second, sum the responses on the even-numbered items. This is your relationship score.

TOTAL SCORES: Task (task-oriented) _____ Relationship (people-oriented) _____

Scoring Interpretation:

- 45-50 Very High Range
- 40-44 High Range
- 35-39 Moderately High Range
- 30-34 Moderately Low Range
- 25-29 Low Range
- 20-24 Very Low Range

Appendix D: Participant Letter

Participant Letter from Larry Hamilton, Director, Office of Fire and Aviation

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Office of Fire and Aviation
3833 S. Development Avenue
Boise, Idaho 83705-5354

Dear Line Manager:

You have been selected to complete an important self-assessment survey related to your line management role in the Bureau of Land Management (BLM). As a BLM manager with oversight responsibilities for wildfire suppression and/or prescribed fire, you have the opportunity to impact change in the fire-related training required for line managers.

The Office of Fire and Aviation is sponsoring this survey, which was developed by a group of managers participating in the BLM Leadership Academy. To ensure the data collected is statistically sound, the survey was also developed in cooperation with the University of Idaho. The survey questions are based on competencies for agency administrators identified in "Standards for Fire and Aviation Operations 2001," the BLM "Redbook."

Remember, this survey is confidential and its results will be used to help us determine the adequacy of the fire-related training you are required to complete. As the season of 2002 is demonstrating, fire management is a responsibility that is critical to BLM. In order for us to provide better training, experience, and mentoring we must have a realistic idea how BLM Managers and their Fire Management Officers (FMOs) assess related performance and needs.

I am asking you to take a few minutes out of your busy schedule to complete this survey. We will post the results on our National Interagency Fire Center (NIFC) website sometime in September 2002. Thank you for assisting us.

Very truly yours,

Larry Hamilton, Director
Office of Fire and Aviation