British Columbia Forest Safety Council

Falling Supervisor Survey December 2011

Prepared for British Columbia Forest Safety Council

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HUMAN FACTORS AT WORK

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Executive Summary

- 102 falling supervisors responded to an online survey sponsored by BCFSC.
- Participants are experienced and largely non union. Injury rates were higher for individuals with less than 10 years experience in their current position.
- Participants work on steep slopes. Over 40% of participants work on slopes of 60% to 100% 'Often' or 'Every day'
- Participants are falling or supervising falling of large trees. Over 30% fall or supervise falling of 5 – 7 foot trees 'Often' or 'Every day'.
- Crew sizes are small. Around half of participants supervise chargehands and just over half of participants who responded to the question (46) reported that they are certified falling supervisors (bullbuckers). As this number is higher than the number of individuals who have currently been certified by BCFSC, this suggests a lack of clarity about certification.
- Half of participants fall infrequently and half spend at least one day falling per week. A typical working day is 10 to 12 hours (including travel time). With the majority having an official working day of 8 hours or less, it is clear that participants are working more than is 'officially' required. The incidence of serious injuries was strongly related to time spent falling, suggesting that it is falling trees that causes injuries, rather than simply walking the block.
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- Participants are waking early (4am to 6am), and the average amount of sleep is 7 hours (meaning many are getting less). There is a large gap (average 2 hours) between waking and arriving in the field. Average time in the field is 9 hours (well over the 6.5 hour 'faller day').
- Breaks are short, with the majority (69%) taking 30 minutes or less throughout the day.
- Many are working a typical working week (5 on, 2 off). However, the average shift length tells a different story (10 on, 4 off). Very little of the 'time on' is lost due to shut downs, meaning many will be working 10 days in a row.
- Many are experiencing difficulty finding qualified fallers, and the majority would definitely or maybe use a centralized database if it was accessible. Most rely on personal contacts or fallers getting in touch when recruiting.
- Inspection times range from 15 minutes to half a day depending on the type of inspection. There is wide variation in the length of inspections. There is no commonly agreed terminology for different types of inspection.
- Individuals who spent less time on inspections were more likely to have experienced a serious injury. This is a very interesting result and may benefit from further analysis. This result could not be fully explained by time spent falling (which was not significantly related to inspection times).
- Filling in paperwork at the camp/ office takes longer than any other inspection related task
- The majority of participants report walking every block for every faller, and disagree with the statement 'I don't usually have time to walk the block'.
- Participants tailor the frequency of their visits to the type of faller, with trainee and problem fallers being visited the most frequently. A small minority make very infrequent visits: 9% report visiting experienced fallers once a month or less and over 5% visit trainee and problem fallers once a month or less.
- The majority (84%) report that most stumps fully conform to all regulations
- Inspections are almost always documented. Participants are spending considerable time on paperwork each day – more than 1 hour for 37%.
- Blasting was found to be OK, easy or very easy for just over half (52.5%). However this still means it is impossible or difficult for nearly half arrange blasting to overcome falling difficulties (47.5%). Area deletions, substituting pre-defined leave trees and machine assist are available to the majority of participants. Asking another faller for help was the easiest option, regarded as easy or very easy by the majority.

- The results validate the 2011 project 'Hazard Identification and Communication Tool', as all hazard factors identified as part of that project were judged to contribute to risk. The factor with the highest rating was 'Working on top of each other (stacking fallers). The factor with the lowest rating was 'Heavy leaners (leaning out) at boundaries'.
- Many participants are working whilst tired or injured. The majority are getting behind with documentation, some on a daily basis. Many find themselves getting behind with inspections a few times a year.
- Injury rates are extremely high. 48% have suffered a serious work related injury in the past 12 months. Carpal tunnel syndrome (31%) and white finger (22%) are particularly common.
- The number of participants who have experienced minor injuries **in the past month** is extremely high (66%).

Recommendations

1. A faller risk matrix developed previously for BCFSC states that individuals falling trees on slopes that are steeper than 60%, or falling trees that are larger than 5' (60") require specialized skills. Based on the results of this survey, up to 40% of participants may require specialized skills (note, however, that not all participants fall trees). BCFSC to review whether this requirement for specialized skills matches actual skill levels in the population of falling supervisors.
2. There appears to be a lack of clarity about what certification means. BCFSC to communicate with falling supervisor population to ensure the terms 'qualified' and 'certified' falling supervisor are clearly defined and fully understood.
3. A typical working day was 10 to 12 hours, supporting the results of the falling supervisor workload research in 2010. This is considerably longer than the official working day of 8 hours or less. Average time in the field is 9 hours. Combined with an average sleep time of 7 hours, this suggests that falling supervisors are likely to be suffering from fatigue, which will tend to accumulate over the course of their shift (average 10 days). Participants are waking early (4am – 6am) which will also contribute to fatigue as circadian rhythms mean this is a time of low alertness. Fatigue can cause some of the same performance impacts as drinking alcohol. BCFSC to communicate performance impact of fatigue to supervisors, and investigate means of encouraging supervisors to self-monitor for fatigue.
4. Supervisors who spent more time falling trees are more likely to have experienced serious injuries. This suggests that falling trees rather than simply walking the block is the main cause of serious injuries. It would be interesting to compare injury rates of supervisors to fallers, as anecdotal evidence in the workload research performed in 2010 suggested that supervisors may be more at risk of injury when falling due to the distraction of their supervisory responsibilities.
5. Inspection terminology lacks clarity. In conducting the preparation for the survey it was apparent that participants had varying interpretations of what, for example, an 'informal' inspection might be. BCFSC to provide examples of inspections in accordance with OH&SR 3.5 and 26.22.1 to illustrate possible scenarios where an informal inspection might be conducted.
6. A small number of individuals (5%) are making very infrequent inspections, once a month or less. BCFSC to provide examples of inspections and triggers for inspections, with reference to OH&SR 3.5. Key focus should be on work practices and methods pertaining to fallers OH&SR 26.22.1 and WC Act 115(2)(e).
7. BCFSC to promote the faller evaluation video (which focuses on inspections) and continue to reinforce inspections in the falling supervisor training.
8. Individuals who spent less time on inspections were more likely to have experienced a serious injury. This is a very interesting result and may benefit from further analysis. BCFSC to consider further analysis of the survey data to understand how this result came about.
9. Filling in paperwork at the camp/ office takes longer than any other inspection related task. This supports anecdotal evidence collected in 2010 suggesting that supervisors are finding themselves doing more paperwork than inspecting. BCFSC has revised the Falling Supervisor course to address these issues. BCFSC to promote online resources to reduce paperwork.
10. Blasting is easy, very easy, or OK to arrange for nearly half of participants (52.5%). However, this suggests that almost half of fallers may be using alternative, less safe methods to deal with danger trees due to lack of access to blasting. BCFSC to investigate means of making blasting more widely available (e.g., promote Dangerous Tree Blasting for Fallers course).
11. The Hazard factors identified as part of the 2011 Hazard Identification and Communication Tool project were all judged to contribute to risk. This provides strong evidence that the hazard factors are seen as contributing to risk by falling supervisors. BCFSC to discuss each hazard factor individually and identify whether there is potential for reducing exposure (e.g., is there a way to reduce or eliminate 'working on top of each other (stacking fallers)).
12. Injury rates are extremely high, particularly Carpal tunnel syndrome and white finger. BCFSC to discuss possible preventative measures for each injury type with WorkSafeBC, and communicate results to supervisors.
13. The frequency of minor injuries is extremely high. The 2004 Forest Safety Task Force report (A Report and Action Plan to Eliminate Deaths and Serious Injuries in British Columbia's Forests, p.22) states that: "The profile for serious injuries and less serious injuries is almost identical. This is significant in that the environment that can cause a minor strain can also

cause a major amputation or even a death. The margin of difference between strains and sprains and serious injuries and death is very small and can be due to chance. As such, the conditions that cause less serious injuries need to be targeted in the reduction of serious injuries and deaths." A frequency of 66% experiencing minor injuries in the previous month is very high, and suggests that supervisors may be avoiding injury through luck and not as a result of maintaining a safe working environment. Minor injuries were reported by supervisors who fall trees, and also by those who do not.
In order to reduce fatalities, it is essential to detect and address unsafe situations. The only way to do this before a serious injury has occurred is to track and respond to less serious incidents. It is recommended that BCFSC take steps to develop a near miss reporting system to track near misses and minor injuries, in order to take a pro-active approach to safety, as opposed to a reactive approach driven by serious injuries and fatalities. This will help to achieve the goal of addressing situations that can lead to a fatality, before the fatality actually happens.

Method

An online survey was conducted in the Fall of 2011. The survey was developed based on interviews with falling supervisors and industry experts, and was piloted with five individuals before distribution. Participants were Falling Supervisors who were contacted using BCFSC list of Falling Supervisors and also via the Safe Companies e-mail list. When incomplete responses were remove, 102 remained. This met the survey target of 100 responses.

Results

Demographics

Age, tenure, and contract type

Participants are experienced and largely non union. Injury rates were higher for individuals with less than 10 years experience in their current position.

- All participants were male
- Participant age ranged from 25 – 64
- 16% had a union contract, and 84% were non union
- Years working in the forestry industry ranged from 8 to 46
- Years working in current position ranged from 6 months to 40 years
- There was a significant relationship between years in current position and occurrence of serious injuries (Spearman Correlation r = -.233, P = 0.033). Individuals with less than 10 years experience in their current position showed higher incidence of serious injuries. Length of time in the forestry industry was not significantly related to injuries. Note that only supervisors who spend at least some time falling trees had experienced a serious injury (the analysis included all supervisors, whether they fall trees or not). See section discussing injuries for more detail (page 16).

Workplace characteristics

Slope steepness

Participants work on steep slopes. Over 40% of participants work on slopes of 60% to 100% 'Often' or 'Every day'

- Information about slope steepness is shown below
- Over 40% of participants work on slopes of 60% to 100% 'Often' or 'Every day'
- Over 20% work on slopes steeper than 100% 'Often' or 'Every day'
- Note that participants are not necessarily falling trees

Timber size

Participants are falling or supervising falling of large trees. Over 30% fall or supervise falling of 5 – 7 foot trees 'Often' or 'Every day'.

- Over 50% of participants fall or supervise falling of 3 – 5 foot trees 'Every day'
- Over 30% fall or supervise falling of 5 – 7 foot trees 'Often' or 'Every day'
- Over 20% fall or supervise falling of trees over 7 foot 'Often' or 'Every day'

Note that supervisors are not necessarily falling – some may be working on these slopes whilst supervising, and supervising fallers falling timber of this size.

Crew size and composition

Crew sizes are small. Around half of participants supervise chargehands. Just over half of participants who responded to the question (46) reported that they are certified falling supervisors (bullbuckers). As this number is higher than the number of individuals who have currently been certified by BCFSC, this suggests a lack of clarity about certification.

- Most participants (over 50%) are working in small crews of 8 or fewer people (including supervisors, fallers and chargehands)
- 47% supervise chargehands and 53% do not
- The majority (65%) are the designated qualified supervisor
- 45% report that they are certified, and 55% report that they are not
- 70% supervise 6 or fewer fallers
- 75% supervise at least one non faller

How participants spend their time

Time spent falling

Half of participants fall infrequently and half spend at least one day falling per week. A typical working day is 10 to 12 hours (including travel time). With the majority having an official working day of 8 hours or less, it is clear that participants are working more than is 'officially' required. The incidence of serious injuries was strongly related to time spent falling, suggesting that it is falling trees that causes injuries, rather than simply walking the block.

- 20% do not fall trees
- 38% spend less than one hour falling trees in a typical week
- 51.5% spend at least one full day in the field falling trees (or equivalent hours) in a typical week
- 22% work 9 hours or less on a typical working day
- Around half of participants work 10 to 12 hours on a typical working day
- For 65% the official working day is 8 hours or less
- The average working day is 15 hours, compared to an average official day of 11 hours
- Time spent falling trees was very significantly related to occurrence rate of **serious** injuries (Spearman correlation = 0.405, $P < 0.001$). Individuals who do not fall trees didn't report any serious injuries in the previous 12 months. Individuals who spent 5 – 6 days per week falling trees had almost all experienced a serious injury in the previous 12 months. This suggests that it is falling trees that causes serious injuries, rather than simply walking the block.
- **Minor** injuries were not significantly related to time spent falling.

Time of day

Participants are waking early (4am to 6am), and the average amount of sleep is 7 hours (meaning many are getting less). There is a large gap (average 2 hours) between waking and arriving in the field. Average time in the field is 9 hours (well over the 6.5 hour 'faller day').

Most participants

- Wake up between 4am and 6am
- Arrive in the field from 6am to 8am
- Finishing in the field anywhere from 1pm to 6pm
- Are asleep by 10pm
- The average amount of sleep is 7 hours
- Time in the field varies widely – the average time is just under 9 hours
- The average time between waking and arriving in the field is 2 hours
- The average time between leaving the field and sleeping is 6 hours

Breaks

Breaks are short, with the majority (69%) taking 30 minutes or less throughout the day.

Shift length

Many are working a typical working week (5 on, 2 off). However, the average shift length tells a different story (10 on, 4 off). Very little of the 'time on' is lost due to shut downs, meaning many will be working 10 days in a row.

- The majority work 5 days on 2 days off
- The average shift length is 10 days
- Average time off after a shift is 4 days
- 75% spend half a day or less not working during a typical shift (due to weather shut downs, etc.)

Manpower and recruitment

Many are experiencing difficulty finding qualified fallers, and the majority would definitely or maybe use a centralized database if it was accessible. Most rely on personal contacts or fallers getting in touch when recruiting.

- 63% have found it difficult or very difficult to find qualified fallers this year
- 50% expect they will need more qualified fallers in 2012 (23% expect they will not)
- The majority would definitely (27%) or maybe (56%) use a database of qualified fallers. A minority of participants would definitely not use a database (17%)
- The most popular means of finding fallers was personal contacts/ people I have worked for before and being contacted by fallers

Inspections

Time taken for different types of inspection

Inspection times range from 15 minutes to half a day depending on the type of inspection. There is wide variation in the length of inspections. There is no commonly agreed terminology for different types of inspection. There is no commonly agreed terminology for different types of inspection.

Individuals who spent less time on inspections were more likely to have experienced a serious injury. This is a very interesting result and may benefit from further analysis. This result could not be fully explained by time spent falling (which was not significantly related to inspection times).

- When developing the survey it became clear that there is a lack of clarity in definitions of different types of inspection. Often terms like 'formal' and 'informal' were used to mean different things depending on the person. This lack of consistency suggests there may be confusion.
- Informal faller inspections take 30 minutes or less for the majority (79%)
- Monthly faller inspections take 1 – 2 hours for many (56%) but some report taking 10 minutes and others half a day, suggesting there is wide variation.
- Formal faller inspections take half a day or more for 57%
- There was a strong relationship between serious injuries and typical time to do an informal faller inspection (Spearman correlation = -0.31, $P < 0.01$). Every single individual who reported spending 5 minutes on informal faller inspections had experienced a serious injury, whereas very few individuals who spent 45 minutes or more on informal inspections had experienced a serious injury in the past year. This is a very interesting result and may benefit from further analysis
- A similar strong relationship was found for monthly faller inspections (Spearman correlation = -0.329, $P < 0.01$). Individuals who spent an hour or less were relatively more likely to experience a serious injury compared to those who spent 1.5 hours or more.
- There was no relationship between time spent on formal inspections such as the 23 pager and injuries

Inspection breakdown

Filling in paperwork at the camp/ office takes longer than any other inspection related task

The following bullets give the most common answer for each question, and the percentage of fallers giving that answer (e.g., for Walking the block/ fallers quarters the most common response was that it took 5 – 20 minutes, with 43% of participants giving this answer).

- Walking the block/ fallers quarter 5 – 20 minutes (most common answer, reported by 43% of supervisors)
- Measuring and examining stumps 10- 30 minutes (42%)
- Measuring bucked logs and reviewing quality 0 – 5 minutes (43.5%)
- Observing the faller falling and bucking 5 – 20 minutes (47%)
- Giving advice/ feedback, discussing inspection with faller 5 to 10 minutes (31%)
- Filling in paperwork 'in the field' (if not already included in previous answers) 5 – 20 mins (43)
- Filling in paperwork 'at the camp/ office' 5 minutes to 2 hours (no single answer predominated)

Walking the block

The majority of participants report walking every block for every faller, and disagree with the statement that 'I don't usually have time to walk the block'.

- The majority (60%) agree or strongly agree that they walk every block for every faller
- 74% agree or strongly agree that they walk the block for novice fallers
- 69% disagree or strongly disagree that they don't usually have time to walk the block
- 69% agree or strongly agree that they walk the block when the block is hazardous

Frequency of visiting different types of faller

Participants tailor the frequency of their visits to the type of faller, with trainee and problem fallers being visited the most frequently. A small minority make very infrequent visits: 9% report visiting experienced fallers once a month or less and over 5% visit trainee and problem fallers once a month or less.

The most frequent answers are

- Average faller – once a week
- Experienced faller – Once a week
- Newly qualified faller – Daily
- Trainee (working with another faller) - More than once a day/ Continuously
- Problem faller - More than once a day/ Continuously

Stump conformance

The majority (84%) report that most stumps fully conform to all regulations.

Documentation

Inspections are almost always documented. Participants are spending considerable time on paperwork each day – more than 1 hour for 37%.

- The majority of participants document inspections using one or several pages of information
- The 23 pager is not used for typical inspections
- 94% document at least something. 37% spend one hour or more daily on paperwork relating to safety or faller management.

Ease of overcoming falling difficulties

Blasting was found to be OK, easy or very easy for just over half (52.5%). However this still means it is impossible or difficult for nearly half arrange blasting to overcome falling difficulties (47.5%). Area deletions, substituting pre-defined leave trees and machine assist are available to the majority of participants. Asking another faller for help was the easiest option, regarded as easy or very easy by the majority.

- Blasting was found to be OK, easy, or very easy for just over half (52.5%) and difficult or impossible for 47.5%
- Making area deletions was OK, easy, or very easy for 75%
- Substituting pre-defined leave trees was OK, easy, or very easy for 80%
- Machine assist was OK, easy, or very easy for 71%
- Asking another faller was easy or very easy for 82%

Risk and Hazards

Hazard factor risk ratings

The results validate the 2011 project 'Hazard Identification and Communication Tool', as all hazard factors identified as part of that project were judged to contribute to risk. The factor with the highest rating was 'Working on top of each other (stacking fallers). The factor with the lowest rating was 'Heavy leaners (leaning out) at boundaries'.

- A project was conducted in 2011 to support decision making relating to falling hazards ('Hazard Identification and Communication Tool'. As part of the project a list of Hazard Factors was identified. The survey conducted as part of the current project enabled data to be collected on the extent to which participants regarded the different factors as contributing to risk.
- The hazard factors are shown in decreasing order of risk (highest risk first)

1. Working on top of each other (stacking fallers)
2. Trees that are unsafe to fall (e.g. danger trees)
3. Falling trees uphill
4. Difficulty avoiding conflict with other phases
5. Brushing standing timber/ disturbing canopy
6. Block layout that make it difficult to position fallers so they are within 10 minutes walk of each other
7. Not having room to fall timber sidehill
8. Difficulty getting to timber within the block (e.g. due to terrain)
9. Heavy leaners (leaning out) at boundaries

Risky situations

Many participants are working whilst tired or injured. The majority are getting behind with documentation, some on a daily basis. Many find themselves getting behind with inspections a few times a year.

In the past 12 months

- 60% have had to move pretty quickly to get out of the way of a tree/ other object
- 59% have felt too tired to work but for some reason had to work anyway
- 8% have had to work for hours at a stretch without a rest break on an almost daily basis
- 15% have worked longer than a 12 hour stretch a couple of times a week or more often
- 80.5% have got behind with documentation, 9% on an almost daily basis
- 63% have got behind with weekly faller inspections
- 62% have got behind with monthly stump audits
- 17% have worked while injured (first aid/ medically reported)

Injuries

Serious injuries

Injury rates are extremely high. 48% have suffered a serious work related injury in the past 12 months. Carpal tunnel syndrome (31%) and white finger (22%) are particularly common.

Serious injuries

In the past 12 month

- 7% have broken or fractured a bone
- 3.5% have had a hernia or rupture
- 7% have had temporary or permanent damage to eyes
- 31% have had carpal tunnel syndrome(numbness/ tingling/ burning sensation in hand)
- 13% have had serious back problems
- 13% have had hearing loss or tinnitus (ringing in the ears)
- 22% have had white hand/ white finger
- 11% have suffered 3 or more serious injuries
- 48% have suffered at least one serious injury in the past 12 months

Note that injuries showed a strong relationship to time spent falling and duration of inspections. See also 'Time spent falling' page 9 and 'Time taken for different types of inspection' page 12

Minor injuries

The number of participants who have experienced minor injuries in the past month is extremely high (66%).

In the past **month**, the percentage of participants who have experienced at least one minor injury is:

- 34% Strained or sprained muscle
- 34% Tripped and hurt themselves
- 55% Bruised
- 12% Cut
- 46% have experienced two or more different types of minor injury
- 66% have experienced at least one minor injury

Unlike major injuries, minor injuries were not significantly related to time spent falling.

Note that minor injuries are injuries that occurred in the past month (not 12 months as for serious injuries).

The appendix (with graphs and detailed statistics) is not included in this abbreviated version of the report. For the full report including appendices, please contact Allison Thompson at Thompson@bcforestsafe.org .