BC Forest Safety

Fall and Burn Resource Package

This resource package is designed for Fallers and Falling Supervisors engaged in fall and burn projects. It contains information and tools to safely implement projects to help mitigate devastating mountain pine beetle infestations.

Released 2021

Purpose

The information and tools in this guide are provided to assist companies with project efficiency and effectiveness as well as provide information to meet current legal requirements for a fall and burn project. The use of these resources is not required by law or intended to add unnecessary workload. However, using them will help ensure that your operation is in compliance with WorkSafeBC (WSBC) requirements including the Workers Compensation Act and Occupational Health and Safety Regulation. It is the responsibility of owners, employers, supervisors and workers to ensure they are in compliance with this act and regulations.

This resource package will help identify:

- What is fall and burn?
- What is the purpose?
- What is required to fall trees for a fall and burn project?
- What qualifications are needed?
- What needs to be in place before work starts?

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1. Definitions

AERIAL SURVEY

The first step in identifying and mapping beetle infestation locations and movements.

ALTERNATE FALLING METHODS

Methods of falling trees to overcome falling difficulties that include machine assist, qualified assistance, line pull, and danger tree blasting.

BC FALLER TRAINING STANDARD

These are the safe work procedures for falling trees.

BUCKER

A chainsaw operator who limbs and bucks the felled timber into manageable segments, which are then stacked by hand into burn piles.

CERTIFIED FALLER

A person who has demonstrated the required skills and knowledge of a hand faller and is certified by one of the three WSBC approved administrators of the BC Faller Training Standard:

1) BC Forest Safety Council (BCFSC)
2) BC Wildfire Management Branch
3) Canadian Association of Geophysical Contractors (CAGC)

CHARGE HAND

A qualified person designated as an alternate Falling Supervisor who is knowledgeable of the supervisor roles and responsibilities when the lead Falling Supervisor is not readily available at the falling site.

CHUCKER

A crew member who piles and burns the cut pieces of the target trees. This worker may also be qualified to assist with bucking the trees for burning.

DANGER TREE

A live or dead tree whose trunk, root system or branches have deteriorated or been damaged to such an extent that it is a potential danger or hazard to worker safety.

OHS Reg 26.1 defines a dangerous tree as a tree that is a hazard to a worker due to:

a. its location or lean,
b. its physical damage,
c. overhead conditions,
d. deterioration of its limbs, stem or root system, or
e. any combination of the conditions in (a) to (d) above.

DESIGNATED FIRST AID ATTENDANT

Person with a current first aid certificate that meets the site's first aid requirements. This person is responsible for administering first aid as needed, maintaining first aid records and maintaining first aid equipment.

EMERGENCY RESPONSE PLAN

A documented, pre-planned response plan to aid in quickly and effectively handling incidents to ensure the protection of workers, public health, safety, property and the environment. Refer to WSBC OHS Regulation Section 3.16 and the Guideline Part 4.13 - 4.16.

FALL & BURN

A low-to-moderate "seek and destroy" management strategy that targets Mountain Pine Beetle infestations. Individually infested trees are tagged, felled and bucked into manageable pieces that are then piled and burned to kill the beetles.

FALLER INSPECTIONS

A qualified person must perform and document an inspection of a faller's worksite, tools, equipment and work practices, using the BC Faller Training Standard, at time intervals appropriate to the risk.

OHS Regulation 3.5 General requirement

> Every employer must ensure that regular inspections are made of all workplaces, including buildings, structures, grounds, excavations, tools, equipment, machinery and work methods and practices, at intervals that will prevent the development of unsafe working conditions.

FALLING SUPERVISOR

OHS Regulation 26.22.1 - Falling Supervisors for forestry operations

1) A qualified supervisor must be designated for all falling and associated bucking activities in a forestry operation.
2) The supervisor designated under subsection (1) must:
   a. ensure that the falling and bucking activities are planned and conducted in accordance with this regulation,
   b. inspect the workplace of each faller at time intervals appropriate to the risks, and
   c. keep a record of every inspection conducted under paragraph (b).
3) The supervisor designated under subsection (1) must not undertake or be assigned activities which interfere with performance of the supervisor's duties under subsection (2).

HAZARD

WSBC defines a hazard as “a thing or condition that may expose a person to a risk of injury or occupational disease”.

NO WORK ZONE

An area around a hazard that is well marked with flagging tape, documented and communicated to other workers. Work may not be carried out within the zone due to exposure to the hazard. Often used in situations where the hazard cannot be immediately felled or removed.

PROBING

The on the ground information gathering process of locating, identifying and assessing individual infested trees by a trained worker, often a Forest Technician.

QUALIFIED

WSBC defines qualified as being knowledgeable of the work, the hazards involved and the means to control the hazards, by reason of education, training, experience or a combination thereof.

QUALIFIED ASSISTANCE

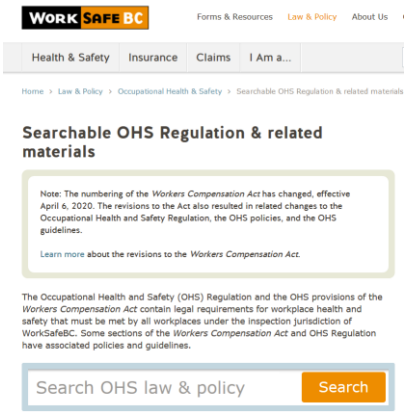
A person qualified to render assistance to a faller for first aid, an emergency or a falling difficulty. OHS Guideline G26.28 Summoning qualified assistance

WILDLIFE TREE

A tree, dead or living with dead wood features (holes, cracks, loose bark, etc.) providing habitats for cavity dwelling species or nesting species. May also be lichen producing.

WORKSAFEBC (WSBC)

The organization was established by provincial legislation as an agency with the mandate to oversee a no-fault insurance system for the workplace. The Occupational Health and Safety (OHS) Regulation and Part 3 of the Workers Compensation Act contain legal requirements for workplace health and safety that must be met by all workplaces under the inspection jurisdiction of WorkSafeBC. Some sections of the Workers Compensation Act and OHS Regulation have associated policies and guidelines. Workers Compensation Act and OHS Regulation



Active site with marked trees and trees bucked, ready to be piled and burned.

2. Overview

Fall and burn is primarily used to manage low-to-moderate Mountain Pine Beetle infestation. Unlike Fir and Spruce Bark Beetles that prefer the shady side of downed wood, Mountain Pine Beetles prefer healthy standing trees. Because of this, conventional trap tree programs are ineffective, and a more direct approach is needed. Aerial surveys can identify attack areas and the direction of infestation movement. In heavily infested areas that are accessible by road, logging the stand is effective. But in areas that are low-to-moderately infested and less accessible, an alternative strategy is recommended that targets individually infested trees. The infested trees are tagged, felled and bucked into manageable pieces then piled and burned to kill the beetles. This direct “seek and destroy” management strategy is referred to as fall and burn.

The fall and burn method is very labour-intensive and crews are spread out to work in remote, often isolated sites. Management programs and processes will vary as needed to suit each project and jurisdiction, but the fundamentals remain the same. The following is a general description of the fall and burn process:

- Companies bid on the contract and are awarded areas up to 100km x 100km in size. The areas are broken down into smaller sections for operational planning. Some of the larger contracts span multiple burning seasons (winters) due to the size of the area and/or the level of infestation.
- The size and scope of fall and burn projects can vary greatly. A larger contractor might employ up to 50-60 workers with a crew consisting of supervisors, probers, fallers and chuckers. Smaller contracts may only require two workers, typically a faller and a chucker, to complete the project. Contractors and workers are paid per tree.
- Fall and burn is conducted during the winter season. Crews typically use trucks to reach areas accessible by road and may also use snowmobiles to reach sites not accessible by trucks.
- A probing crew will assess an identified section and gather important data. They will measure, identify and mark infested trees.
- The probing data is used by the contractor to develop a map showing all the affected trees. This map is submitted to the company/agency who issues a cutting permit for that section to the contractor.
- Falling crews are engaged and provided with infestation maps and GPS coordinates of individual trees identified by the probing crew. The falling crew(s) will locate the clusters of the identified trees and develop a plan to fall the trees to reduce the amount of work required to move the infested wood to burn piles.
- Infested trees are felled and bucked into manageable sections or pieces. The chucker starts a fire or multiple fires and piles the infested pieces onto the fire to burn the beetles hiding underneath the bark.
- Supervisors must ensure all marked trees are burnt adequately to kill the beetles and workers are following safe work procedures.
- Stumps need to be kept low and often the fire is built to include the stump. During heavier snow accumulation, tree bases must be shoveled out for accessibility and to facilitate a low stump. If the stump cannot be burned, the bark must be peeled off to expose the cambium layer to the weather, allowing the cold temperatures to kill the beetles or larvae hiding in the stump.

- On large projects, sites are set up like a wheel with the road access point being the hub of the wheel. An Emergency Transportation Vehicle (ETV) will be located at this point. If needed, one or more helicopter pads or helicopter landing sites with be identified and marked.
- Each two person crew will be assigned a piece of the wheel to work through. Crew placement must consider qualified assistance requirements along with access to first aid. The two-tree length rule must be observed and can be challenging to coordinate individuals and crews.

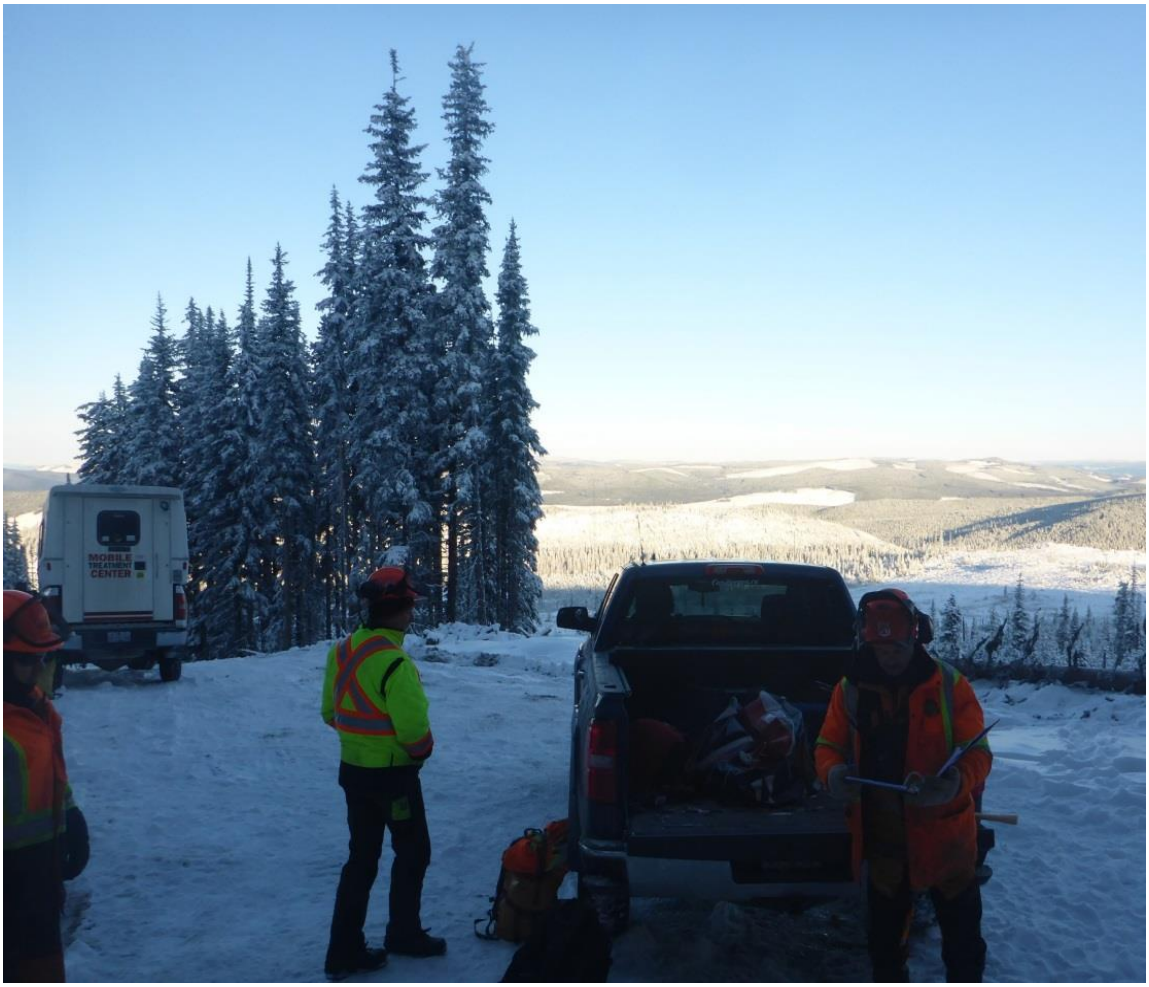
Multiple burn piles blazing

3. Project Preparation

Fall and burn projects should have the following in place before falling activities start:

1) **A pre-work meeting** with the client needs to occur. This is an onsite meeting where all the details of the project are discussed and signed off by the tenure holder and contractor. Issues pertaining to cut allowances, environmental constraints, project targets and goals, safety related issues and operational plans are discussed.
2) Filing a **Notice of Project (NOP)** with WorkSafeBC: In accordance with OHS Reg 26.4, this important step is a WSBC requirement for any project. The Notice of Project Form is available on the WSBC website and must be submitted at least 24-hours in advance of the startup of work.
3) A comprehensive, site-specific **Emergency Response Plan (ERP)** is a crucial requirement for any worksite and needs to be tested for effectiveness.
4) A pre-work walk-through of the project should be completed by a qualified person to identify work area hazards and to confirm the layout and work plan is achievable. Members of the probing crew can complete this task if they are qualified to recognize and document worksite hazards.
5) A **site hazard assessment** needs to be completed to document the general hazards identified during the walk-through. The control measures for these hazards need to be described and included in the document.
6) A **first aid site assessment** needs to be developed. Fall and burn operations are often in very remote locations with individual crews even more isolated depending on work site access, which is a considerable barrier to access time-sensitive first aid treatment and medivac services. Prior to starting work, all appropriate first aid requirements must be readily available on-site including first aid equipment, trained first aid attendant(s) and an established medivac plan (as outlined in the ERP).
7) An **initial safety meeting** needs to be held and documented reviewing the ERP, the site hazards and controls, identifying the designated first aid attendant(s), the location of first aid and fire management equipment, etc. Crews should also review the communication system, designated radio channel, person-check system, work-site signage and general documented work plan as outlined in OHS Reg 26.5.
8) A system should be in place to document and alert workers to the existence of a specific hazard. Use a **hazard report form** with a Corrective Action Log (CAL) to document any specific hazards identified at any time during the project. The hazard alert must be shared with workers, contractors and other phases that may be affected by the hazard.
9) As the project progresses, any relevant changes to the original work plan needs to be documented and shared with any workers affected by the changes.
10) Consider using this all-in-one fillable ERP and Block Plan PDF form which streamlines the documentation requirements.
11) An accurate, **detailed project map** is required and is a key component of a successful work plan. The map should show access routes, target tree locations, trails, helicopter pads and any important landmark references. Used in conjunction with the daily work plan, the map can show location of work activities, known hazards and other vital information. Every member of the crew should be provided with a copy and have access to the work plan documents on-site.

12) A **Qualified Falling Supervisor** must be designated and on-site to control and direct the falling activity, whether there are two fallers or twenty. The supervisor is responsible for planning and documenting the daily activities and faller inspections. With a small crew, the supervisor may also be one of the fallers.



Mobile treatment centre (MTC) at the muster location of a project

4. Roles, Responsibilities & Qualifications

QUALIFIED CONTRACTOR

A qualified contractor will have references, a sound work plan for the project and all the necessary people and equipment for the task. This can be confirmed by asking for and checking references, requesting documentation from previous projects and discussing the crew experience/qualifications.

QUALIFIED FALLING SUPERVISOR

The Falling Supervisor is required to control and direct the hand falling for the project and is responsible to ensure all steps have been taken to prepare for the falling activity. These steps include making a falling plan to ensure qualified assistance is available to each faller, ensuring the ERP is accurate and has been tested for effectiveness, and making sure the work area is controlled.

Each certified hand faller on the crew needs to be qualified to fall trees in the timber and terrain they will be working in. The Falling Supervisor verifies this by observing the faller's work and completing a documented faller inspection to confirm the faller has the skills and knowledge to use the Safe Work Procedures (SWP) of the BC Faller Training Standard as outlined in OHS Reg 26.21.

The falling supervisor's responsibilities are to ensure:

- Each faller knows the work plan, Emergency Transportation Vehicle (ETV) location and can develop and manage their work area.
- Access and egress trails are cleared and marked.
- Qualified assistance is available for each faller.
- An effective person-check and communication system is established and followed.
- The work plan is followed including danger tree management and safe working distances are maintained.
- Regular safety meetings with the crew are conducted and documented.
- Ensure other workers, contractors and phases are identified and made aware of falling activity.
- Alternate falling methods are available.
- Program objectives are met.
- Ensure visitors are managed in accordance with the company's visitor orientation policy which should include a visitor orientation checklist. Visitors must be accompanied on the falling site.

The qualifications of a qualified Falling Supervisor are explained in the definitions section of this document as outlined by WSBC Regulation 26.22.1. A qualified Falling Supervisor should have knowledge of their role, previous experience and may have attended a Falling Supervisor training course.

To ensure the Falling Supervisor is qualified, check references and discuss their experience and their plan for executing the project. They should be able to provide documentation from previous projects they have supervised that will include the documents discussed above along with regular documented faller inspections. Their experience should include projects similar to fall and burn, in similar timber and terrain with similar objectives.

CERTIFIED FALLER

A Certified Faller is responsible for carrying out the work plan. They must be knowledgeable of the plan, project goal and methods required to achieve the desired outcome by ensuring they:

- Review the work plan documents and have access to them.
- Participate in the initial safety meeting, document review and sign off.
- Follow the work plan, stop work if the plan cannot be achieved or an unsafe condition is encountered.
- Use SWP's outlined in the BC Faller Training Standard.
- Follow person-check and qualified assistance guidelines.
- Have a map, tree location coordinates and a copy of the ERP.
- Not undertake work that is beyond their limits of skills, knowledge or experience and seeks qualified assistance when these situations are encountered.

By understanding the goals of the project, the Faller can use their knowledge and experience to make the project a success.

A Certified Faller should have current certification from one of the three approved Administrators of the BC Faller Training Standard and should provide a current wallet certification card and log book.

The logbook should have past work experience and contact information for references. A qualified person needs to ensure the Faller has the experience to perform the work required of them in the timber and terrain they are placed. This can be done by checking work references, through discussion and observing the Faller's work.

OHS Reg 26.21 and OHS Guideline G26.21/26.22

BUCKER

Responsible for cutting the felled trees with chainsaws once trees have been felled. A bucker may help the Faller cut the trees in to manageable bolts that can be manually piled for burning. As buckers follow the Fallers, they must ensure safe working distances are maintained from the Fallers and other workers. In some situations, a bucker may provide emergency or medical qualified assistance to a Faller if they are qualified to do so. It is the buckers responsibility to follow the safe work procedures provided to them by the employers and to avoid the designated high-risk violations of manual falling and bucking. Buckers may have taken a chainsaw training course, or they may have been trained on the job.

CHUCKER

As the title describes, this worker chucks the bolts into a pile for efficient burning. This may be a designated position on a multi-person crew, or it may be a role that both the Faller and their assistant do together as a vital step in the process. Chuckers must follow safe work procedures for their role which include safe working distance from active falling and bucking.

5. Training

Fall and burn projects involve jobs that are excellent for new workers to gain valuable experience working towards a rewarding career. Many new faller trainees that have completed the 30-day New Faller Training course gain experience on fall and burn projects as they offer beneficial in-field experience working towards their Faller Certification. Some workers new to this type of project are trained as chainsaw operators with basic chainsaw operator training and are employed as buckers and chuckers.

Employers training workers are required to maintain training documentation as outlined in OHS Regulation 3.25. Consider these key items when hiring new and young workers and training workers:

1) Young / New Workers - WSBC OH&S Regulation 3.22 to 3.25 and related Guideline G3.23
2) Faller Training – WSBC OH&S Regulation 26.22
3) Faller Trainee Weekly Training and Progress Reports
4) Coaching and mentoring: Can assist in training workers to learn a new job or adding new skillsets to a familiar role.

In falling, a Certified Faller may not be qualified to perform the work in the timber and terrain they are placed in which leaves a Falling Supervisor with some choices.

1) Determine that the Faller is not qualified to do the job and decide not to employ that person.
2) Employ the Faller in a role that they are qualified to do such as bucker.
3) Provide the Faller with training to fill gaps of knowledge and skills relating directly to the timber type and terrain that they will be working in. Training is done under the close supervision of a person who is qualified in the timber type and terrain. A record of the training must be completed and maintained by the employer as per regulation.

For faller trainees, the tasks assigned on a fall and burn project may or may not count towards the required weekly reports for certification. As per WSBC guideline G26.22(7), each week will be assessed on a case-by-case basis to determine if the activity meets the required criteria for forestry training experience. Trainee's planning to count their experience from fall and burn projects towards challenging for certification should have their weekly reports accurately completed containing as much detail as reasonably possible with copies submitted to BCFSC for review.

6. Daily Plan

Completing a daily work plan involves many factors including adjusting to operational changes, ensuring First Aid coverage, ERP effectiveness and crew management.

FIRST AID COVERAGE

- Designated qualified assistance in place for all fallers
- First aid attendant and equipment requirements are met for daily and project operations.
- Medivac arrangements confirmed daily including day-to-day confirmation with helicopter to confirm availability and check-in/out with contact designate.

OPERATIONAL CHANGES

- Adjusting work location due to weather or other outside influences.
- On-site visitors.
- Wildlife or other new hazards identified with controls implemented.
- Work progression identifying new ground covered each day.

CREW MANAGEMENT

- Crew member placement involves keeping each worker safe and productive by putting individuals in roles where their skills and experience can be maximized.
- Maintaining safe working distances while meeting qualified assistance needs.
- Documenting individual worker placement and person-check in assignments.
- Daily crew safety discussion.

Daily plan and safety discussion

7. Common Challenges & Best Practices

COMMON CHALLENGES

Fall and burn projects typically involve scattered pockets of infested trees over a large area which can result in crews being spread out and often isolated. Coordinating multiple worksites offers unique challenges such as supervising, meeting first aid requirements and ensuring effective emergency response.

With small crews working in isolation and covering large areas, having a strong communication system is vital. Handheld radios with back-up satellite communication devices is often the norm for these types of projects. Depending on the identified risks such as extreme weather or working distances, hourly (or every two hours) status check-ins are required with a designated person such as the first aid attendant or the Supervisor who tracks the crew's status and their locations as they work through their assigned areas. Each crew performing hand falling must have qualified assistance readily available which includes a minimum Level 1 First Aid.

Using a central worksite focal point or an ETV site may be a solution to managing regulated First Aid worksite requirements. Crews can spread out from the centralized point like spokes on a wheel to work their areas within a 20-minute travel time to the ETV site. If an ETV cannot meet the 20-minute travel time for the crew(s), then a designated medivac heli-landing site must be used. There must also be a designated route to get the worker to the heli-site or the ETV.

With constantly changing work areas and daily challenges, maintaining an effective ERP requires thorough planning and will require constant adjusting and updating which may involve the addition of specialized equipment as the project progresses. There are specific steps to be taken if a helicopter is to be used as the primary method for medivac.

If crews are travelling to their work sites on snowmobiles, a system must be in place with appropriate evacuation equipment to transport the worker to an evacuation site (ETV or Heli). A spine board, collar, basket stretcher and a towable toboggan will be required along with a person with the appropriate first aid to transport the injured worker(s) to the evacuation site. Crews will need to be placed close enough to one another to provide medivac support.

Supervising a larger work force of multiple two to four person crews is a significant challenge. Keeping track of crew movements and locations, providing direction for activities including faller inspections, ensuring work is being done in accordance with the work plan and verifying project objectives are being met safely and effectively are just some of the challenges supervisors will face. For larger projects, having multiple qualified falling supervisors, each assigned to a group of crews and working under the coordinated direction of a project supervisor, is recommended to meet regulation requirements.

BEST PRACTICES

A successful fall and burn project will factor many considerations into the workplan including:

- Designation of alternate supervisors.
- Use of charge hands.
- Use of technology like *Garmin Rhino* that combines a two-way radio with GPS location, tracking and messaging. This technology has live tracking features that link units to display the live locations of each unit.
- Keeping the work area size manageable. Use the appropriate number of falling supervisors or support with an alternate or assistant supervisor. Use charge hands if needed to share some of the falling supervisor responsibilities.
- Assigning each crew to perform and document their own hazard assessment of their falling areas.

A blazing burn pile

8. Resources

WorkSafeBC

WorkSafeBC – Occupational Health and Safety Regulation:

https://www.worksafebc.com/en/law-policy/occupational-health-safety/occupational-health-safety-regulation

WorkSafeBC – Occupational Health and Safety Regulation 26.22.1:

https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-regulation/part-26-forestry-operations?origin=s&returnurl=https%3A%2F%2Fwww.worksafebc.com%2Fen%2Fsearch%23q%3D26.22.1%26sort%3D%2540fcomputedohsorderfield343%2520ascending%26f%3Acontent-type-facet%3D%5BOHS%2520regulation%2520%2526%2520related%2520materials%5D%26f%3Alanguage-facet%3D%5BEnglish%5D#61EA11DFEAB946CD9A163C3CBF6772C4

Workers Compensation Act:

https://www.worksafebc.com/en/law-policy/workers-compensation-law/workers-compensation-act

BCFSC

Emergency Response Plan and Block Plan:

www.bcforestsafe.org/files/frm_xERPAndBlockPlan.pdf

BCFSC Faller Supervisor Training:

www.bcforestsafe.org/node/2216