Unit	1015
Title	Plan Block for Yarding
Document type	Learning resource

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BC Forest Safety

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Feedback is welcome and may be sent to training@bcforestsafe.org.

Table of Contents

Unit Introduction

What you will learn in this unit

By the end of this unit, you will be able to demonstrate your knowledge of:

- Planning the block
- Hazards in the block
- Environmental considerations
- Worker safety when planning the block

Why it's important for you to learn this unit

It is always the responsibility of any person using these materials to inform him/herself about the Occupational Health and Safety Regulations related to the work being conducted. A full list of OHSR related to this unit can be found in the relevant package.

Are you ready to take this unit?

To take this unit, you need to have completed the following units:

- 1002 – Describe Forest Industry
- 1003 – Use Safe Work Practices
- 1004 – Communication in the Workplace
- 1005 – Recognize, Evaluate, and Control Hazards Related to General Forestry
- 1006 – Describe Workplace Documentation
- 1007 – Describe Emergency Preparedness
- 1008 – Describe and Apply Workplace Attributes
- 1009 – Recognize, Evaluate, and Control Hazards Related to Yarding
- 1010 – Describe Basic Regulations and Standards
- 1011 – Describe and Access Intermediate Regulations and Standards
- 1012 – Describe, Access, and Apply Advanced Regulations and Standards
- 1013 – Describe Rigging Components and Apply Basic Rigging Practices

Does this unit apply to you?

This unit applies to you if you are in the following occupation:

- Hook tender

Section 1015-01: Planning the Block

What you will learn in this section

By the end of this section, you will be able to demonstrate your knowledge or ability of the following key points:

1.1 Read and apply block map

1.2 Place equipment in accordance with job requirements

1.3 General consideration when planning block for logging

1.4 Coordinate block plan with supervisor

1.5 Sequence to avoid phase congestion when planning block for logging

1.6 Trespass in when block planning

Key Point 1.1: Read and Apply Block Map

This key point covers how to read and apply the information on a block map.

All crew members should have access to a map of the block. They also should understand the map clearly to be able to communicate locations and what is going on around the block and avoid or eliminate hazards in the work area.

Block maps usually indicate the following:

- Boundaries of the block
- All residual areas, corridors, and road locations
- Landings
- Backspars

They also show natural features by means of contour lines and elevations and ongoing placements of machines. Hazardous areas can be identified and avoided by reading block maps as well.

To be able to read and determine locations on maps it is necessary to understand map scale, symbols, and directions.

Map scale

Map scale refers to the relationship (or ratio) between distance on a map and the corresponding distance on the ground. For example, on a 1:5000 scale map, 1 cm on the map equals 50 m (5000cm) on the ground.

Cardinal directions (NSEW)

Maps will have an arrow or symbol used to display the orientation of the cardinal directions:

- North
- East
- South
- West

Sometimes it is a single arrow with an “N” indicating which way is North on the map. Usually the upper part of the map indicates north.

Geographic latitude and longitude (Emergency Coordinates)

Latitude and longitude of the map defines the location of operations. It helps to communicate and locate a situation in case of emergency. If describing your location verbally, you should say it this way: “Latitude is fifty degrees, fifty-nine minutes and fifty seconds. Longitude is one hundred twenty-seven degrees, two minutes and twenty-five seconds.”

Emergency Coordinates

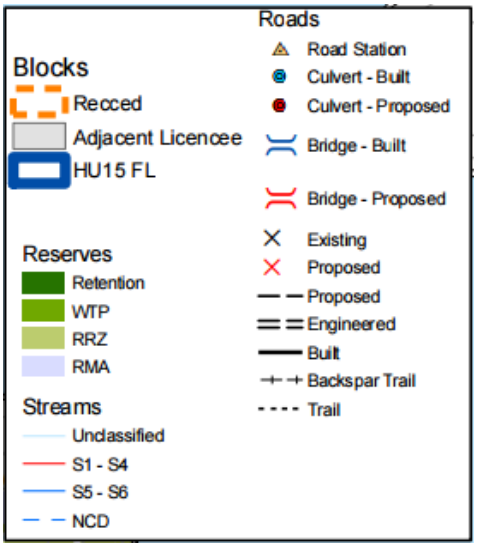
Latitude: 50° 59' 50" **Longitude: 127° 02' 25"**

Map’s legend

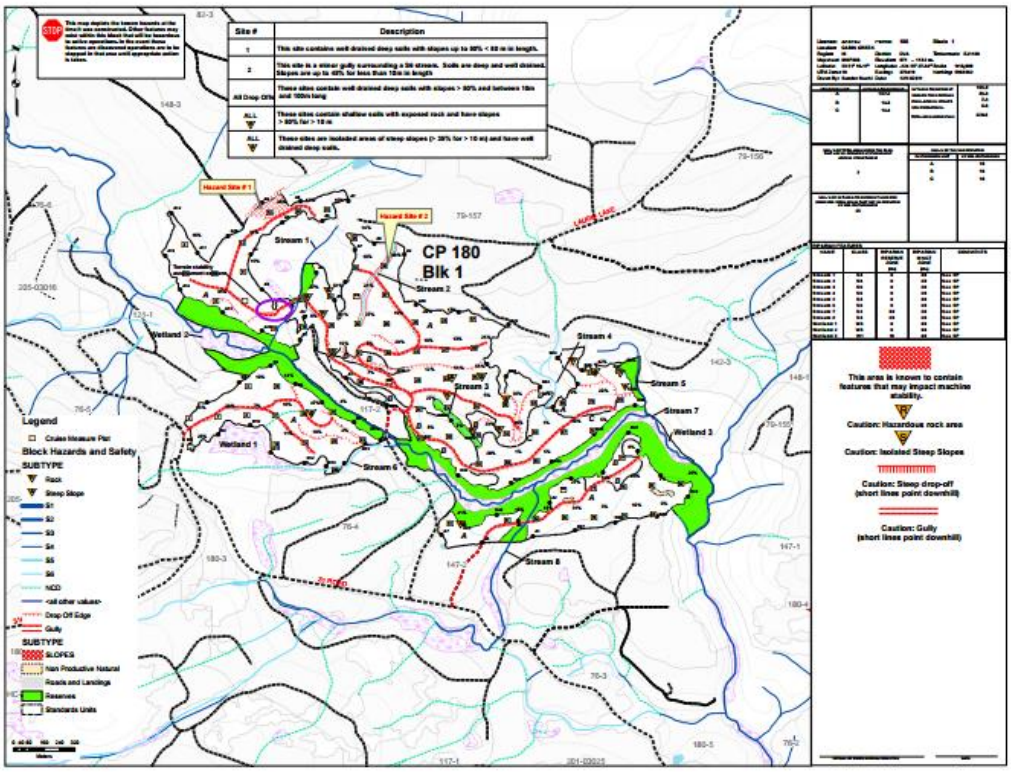
A map's legend indicates the meaning of symbols on the map. Symbols indicate places, roads, blocks, etc. Symbols include:

- Figures
- Shapes
- Lines
- Colors

Below is a sample of a map’s legend. Symbols may vary in different maps.



Sample block map



There may be other information provided on the map to clarify streams, slopes, soil quality, etc. Always check the back of the map for more information.

Now try the quiz on the next page.

Read and Apply Block Map—Self-Quiz

1. The map scale is 1:10000, 1 cm on the map is equals to:

   - ☐ 10 m on the ground
   - ☐ 100 m on the ground
   - ☐ 1000 m on the ground
   - ☐ 50 m on the ground

2. What is the verbal description of latitude on the coordinates below?
   “49° 14' 46" N and 123° 6' 5" W”

   - ☐ Forty-nine degrees, fourteen minutes and forty-six seconds.
   - ☐ One hundred twenty-three degrees, six minutes and five seconds.
   - ☐ Forty-nine degrees, fourteen feet and forty-six inches.
   - ☐ One hundred twenty-three degrees, six feet and five inches.

Now check your answers on the next page.

Read and Apply Block Map—Quiz Answers

1. The map scale is 1:10000, 1 cm on the map is equal to:

   Answer: **100 m on the ground**

2. What is the verbal description of latitude on the coordinates below?

   “49° 14' 46" N and 123° 6' 5" W”

   Answer: **Forty-nine degrees, fourteen minutes and forty-six seconds**

Key Point 1.2: Place Equipment in Accordance with Job Requirements

This key point covers how to place equipment in accordance with the job requirements.

Each landing will present unique features in terrain, layout, and productivity. In a highly productive operation, a lot of wood will go through the landing. An efficient layout that minimizes interference between machine operation and people on the ground increases both production and safety. Keeping the work flowing smoothly reduces the risk of an unexpected incident and possible injury. For best results, consider the following conditions before moving in to set up a landing:

- Yarding system
- Volume of timber
- Slope of surrounding terrain
- Deflection
- Payload analysis
- Guyline anchors
- Order of the skyline roads to yard

Yarding system

Determine the yarding system you should use. Consider the following:

- Available equipment
- Terrain
- Timber size
- Yarding distances

Think about the size of timber and number of sorts. Tree-length logging requires much more room than log-length. Is there room to safely deck larger sorts of logs? Be sure there is a sufficient landing-chute area to safely land the logs.

Volume of timber

In highly-productive sites, it may be necessary to include a surge area (a sufficient area for the processing of timber to log lengths) on the landing. This will allow the processor to deck unprocessed logs until incoming volume slows. Be sure there is adequate room to deck the volume of timber and expected log sorts.

Slope of surrounding terrain

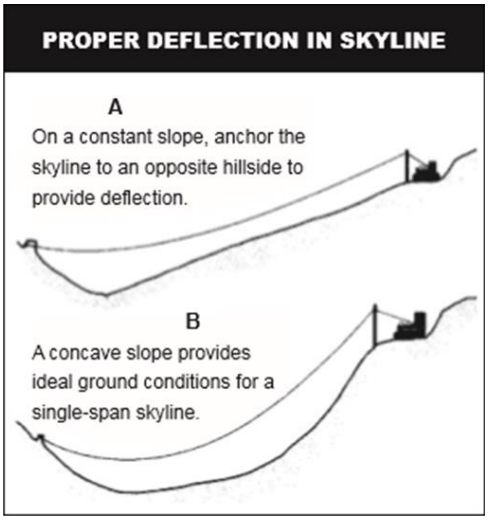
The slope of surrounding terrain dictates how logs will be landed, how many logs, and where they may be decked. On steep terrain, there may be a problem landing tree-length logs. Very steep terrain may make it impossible to increase the size of landing and decking areas, and requires machines and landing personnel to work in close proximity. In that case, the organization of the landing needs to be extremely efficient with space, and work processes need to be tightly organized to avoid interference between machines and people on the ground. Increased diligence is necessary. Communicate clearly in the planning stage, so everyone understands the work procedures and hazards.

CAUTION!

On small landings, plan in advance for situations where the loader operator may need to grab the logs to effectively land a turn, and hold them while the chaser undoes chokers and hands the logs off to the processor. Prepare for runaway logs on steep terrain and keep the rigging crew well in the clear.

Deflection

Deflection is critical in logging with cable systems. Poor deflection will affect payload capacity and reduce production, and in some cases (such as in going over a blind ridge to log behind that ridge) may make it impossible to tighten the lines enough to effectively get the logs off the ground. Many loggers can assess the terrain by eye. In uncertain situations, running a deflection line before rigging up allows a closer look at the terrain and a clear indication of how tight the lines may have to run. At this stage, the landings are already in place, and the logger will need to assess what deflection is available and choose an appropriate yarding system.



Payload analysis

There are several ways to analyze the payload for any given tower, landing, and terrain combination. Analyze the worst payload scenario for each landing to determine how much wood can be safely carried on the skyline. If suitable payload is not available with a tail hold down low on a unit, consider finding a tail hold up the back side, or use a tail tree to raise the line and give more deflection.

Guyline anchors

Locate and mark available guy line stumps suitable for the expected yarder locations. If appropriate stumps are not available, then other anchoring methods (such as dead man or equipment anchors) need to be established before rigging up the tower.

Communicate with the falling crew to be sure potential guy line stumps are not cut off too short at any potential landing sites. Some landing locations may not be identified beforehand, because the terrain can be seen much better once timber is on the ground. A different landing and set of anchors may prove more favorable. Also, plan ahead to preserve necessary tail and support trees.

IMPORTANT!

Communicate working towards or away from loader to loader operator well in advance of any changes.

Order of the skyline roads to yard

Normally, skyline roads work away from the side where the logging road enters the landing and the position of the log loader. Working away allows the log loader more room as the volume of logs accumulates. However, if the terrain creates a side hill for the rigging crew, it is more important to log the felled timber from top to bottom for the safety of the crew. Then, the skyline roads might start farther away and move toward the loader. Plan road changes in advance. Also, consider obstacles that may obstruct moving the skyline.

Now try the quiz on the next page.

Place Equipment in Accordance with Job Requirements—Self-Quiz

1. Tree-length logging requires much more room than log-length.
   - ☐ True
   - ☐ False
2. What information does the slope of surrounding terrain dictate?
   - ☐ How logs will be landed
   - ☐ Where logs are processed
   - ☐ Where the logs may be decked
   - ☐ All of the above
3. Poor deflection will affect payload capacity and reduce production
   - ☐ True
   - ☐ False

Now check your answers on the next page.

Place Equipment in Accordance with Job Requirements—Quiz Answers

1. Tree-length logging requires much more room than log-length.
   Answer: **True**
2. What information does the slope of surrounding terrain dictate?
   Answer: **All above**
3. Poor deflection will affect payload capacity and reduce production
   Answer: **True**

Key Point 1.3: General Consideration When Planning Block for Logging

This key point covers the general considerations to take when planning a block for logging.

Several basic elements must be considered in a logging plan:

- Safety of the workers
- Type of terrain
- Size and volume of the timber
- Yarding distances and available deflection
- Potential landing and haul road locations
- Type of machine and cable yarding system
- Environmental considerations

Type of terrain

Topographic features will affect the planner's choices. Proper planning can minimize the impact on worker safety and productivity.

Size and volume of timber

Each forest region in the province has its own unique tree species, with a common or average tree size and volume per hectare. Planners should ensure that the logging plan includes correctly sized equipment and appropriate log-handling requirements. Failure to do so could result in safety hazards from anchor or rigging failures.

Yarding distances and available deflection

Yarding distance is determined by deflection, the line capacity of the equipment, and the type of cable logging system. At less than the required minimum deflection, the cable system may fail. Logging firms can develop a logging plan using topographic maps, aerial photographs, and field data. They may run deflection lines along the proposed yarding slopes to ensure that proper deflection can be maintained. If required, intermediate support trees or backspars should be identified at this time to prevent them from being felled.

Potential landing and haul road locations

Haul road systems and log landing areas should be located to ensure:

- Safe yarding and landing of the logs
- Optimum yarding distances and deflection
- The use of correct types of yarding and loading equipment

- The use of a correct landing size for the equipment and functions
- That logging trucks have the ability to travel the grades both empty and loaded

Small wood yarder with intermediate support tree

Jump-up landing for a small wood yarder

Common planning mistakes

Some common planning mistakes include:

- Inadequate guyline anchoring methods
- Deflection lines not run
- Too small or too large a yarder for the size of wood
- Small, poorly located landings that quickly become congested and are extremely hazardous for the workers

Note: In these landings, there are no safe work areas for the landing workers, nor is there sufficient room to land, deck, buck, and load logs

- Safety hazards such as runaway logs and rolling debris
- Falling timber within two-tree lengths of the active yarding lines
- Timber being dumped rather than laid out for yarding direction
- Trees and logs not felled and bucked in an effective pattern for selective corridor logging
- Danger trees left standing within reach of the yarding crew's work areas
- Too small a falling crew to keep ahead of the yarding crew (common in deep -snow areas)
- Insufficient timber felled before yarding
- Failure of various phase personnel to consult with one another
- Yarding distances are too long causing crew to overload yarding system

Now try the quiz on the next page.

General Consideration when Planning Block for Logging—Self-Quiz

1. Haul road systems and log landing areas should be located to ensure:

   - ☐ The use of correct types of yarding and loading equipment
   - ☐ Optimum yarding distances and deflection
   - ☐ Safe yarding and landing of the logs
   - ☐ All of the above

2. Too small a falling crew to keep ahead of the yarding crew is common in deep-snow areas.

   - ☐ True
   - ☐ False

3. Timber being dumped rather than laid out for yarding direction is not a mistake in planning.

   - ☐ True
   - ☐ False
   - ☐

Now check your answers on the next page.

General Consideration when Planning Block for Logging—Quiz Answers

1. Haul road systems and log landing areas should be located to ensure:

   Answer: **All above**

2. Too small a falling crew to keep ahead of the yarding crew is common in deep-snow areas.

   Answer: **True**

3. Timber being dumped rather than laid out for yarding direction is not a mistake in planning.

   Answer: **False**

Key Point 1.4: Coordinate Block Plan with Supervisor

This key point covers how to coordinate a block plan with your supervisor.

Supervisors require good communication skills to explain what the requirements are and the hooktender or operator need these skills to explain why or why not they can meet the requirements.

There are usually many changes in the plan as the operation progresses and the communication needs to be frequent so the plan or expectations can be updated accordingly.

It is important for the crew and especially the hook tender to anticipate any probable hazards, delays, problems, or opportunities and communicate what is coming to the supervisor as soon as possible.

The ability to think several steps ahead is very important to inform the supervisor on time about any upcoming issues as it may take several hours or days to take necessary actions.

Coordinate Block Plan with Supervisor—Self-Quiz

1. It is important for the crew and especially the hook tender to anticipate any probable hazards and delays.

   ☐ True

   ☐ False

2. Changes in the plan as the operation progresses need to be communicated so the plan or expectations can be updated accordingly.

   ☐ True

   ☐ False

Now check your answers on the next page.

Coordinate Block Plan with Supervisor—Quiz Answers

1. It is important for the crew and especially the hook tender to anticipate any probable hazards and delays.

   Answer: **True**

2. Changes in the plan as the operation progresses need to be communicated so the plan or expectations can be updated accordingly.

   Answer: **True**

Key Point 1.5: Sequence to Avoid Phase Congestion When Planning Block for Logging

This key point covers sequencing to avoid phase congestion when planning a block for logging.

Phase congestion occurs when one production phase adversely affects another, and worker safety is compromised. Phase congestion may occur within a single phase, between or amongst phases.

The Coastal Harvesting Advisory Group (CHAG) has identified phase congestion as a contributing factor in increasing the risk levels associated with coastal logging and has recommended use of the Phase Congestion Hazard Assessment as one tool for mitigating phase congestion.

The Phase Congestion Hazard Assessment is intended to supplement existing Site Safety Plans. Due to the variety of situations and possible factors that could contribute to phase congestion, the form has been developed to provide the person creating the Site Safety Plan with a structured template that will enable them to clearly identify possible factors and implement site specific solutions to address them.

Phase Congestion Hazard Assessment form

How to use this form

The Phase Congestion Hazard Assessment form has been developed as an Appendix to the Site Safety Plan for the worksite and should be included as an integral part of the Site Safety Plan. It should be created as part of the Site Safety Plan and reviewed and revised as required.

Each of the components listed on the Phase Congestion Hazard Assessment form should be answered with a “Yes” or “No.”

Part A

Control measures should be identified and documented for any components receiving a “No” response in this part. Control measures are required to mitigate the risk to an acceptable level. It is optional to add comments into this column for any components that have received a “Yes.”

Part B

Control measures should be identified and documented for any components receiving a “Yes” in this part. Control measures are required to mitigate the risk to an acceptable level. It is optional to add comments into this column for any components that have received a “No.”

Review Site Safety Plan and this Appendix as required and adjust as necessary. Phase congestion and associated risks can change in a short period of time, so periodic review and follow up may be necessary.

Here’s a completed Phase Congestion Hazard Assessment form.

Phase congestion hazard assessment form

PART A: Prime Contractor, Approvals, Scheduling, Engineering, Worker Spacing		
Component	**Yes/No or N/A**	**Comments (Control Measures)*** *One or more control measures should be identified for any items marked with a 'No' in the middle column.
Prime Contractor		
Is the Prime Contractor aware of all activities occurring in or adjacent to the workplace? (For example, other contractors or operations that could have a negative effect on worker safety)	Yes	XYZ Road Construction LTD is working in adjacent block-no conflict including no blasting (flyrock) hazard. Crews advised to pay attention for blasting signs and whistles.
Approvals		
Are necessary approvals in place? (For example, RP and/or CP Approval, Licensee Approval, etc.)	Yes	
Production Schedule		
Are production schedules sufficient to avoid phase congestion?	No	If harvesting is not completed by fire season, this could cause congestion issues. Will revisit July 1, 2014.
Does the contractor or Company operation have adequate resources? (For example, workers, supervision, and equipment.)	Yes	
Engineering		
Is engineering complete/ready for the site? (For example, logging	Yes	

pre-works, layout complete, road layout designs complete, etc.)		
Does the block and/or road design eliminate potential safety concerns that could contribute to congestion? (For example, small openings, edges, rock bluffs, landings, etc.).	No	First spur in block has tight landing with limited room for yard, process and load. Speak to licensee representative about widening this area before landing is required.
Component	Yes/No or N/A	Comments (Control Measures)* *One or more control measures should be identified for any items marked with a 'No' in the middle column.
Spacing		
Is spacing adequate within/amongst/between phases and workers? (For example, fallers working too close together, fallers on top of road crew, machinery operating above other crews, etc.)		Yarding: All good except for Spur 1 noted above. Processing: all good except for Spur 1 noted above. Loading: All good except for Spur 1 noted above. Hauling: Watching for traffic when entering mainline.
Right of Ways?	Yes	
Roads?	Yes	
Falling?	Yes	
Yarding?	No	
Helicopter harvesting?	N/A	
Processing?	No	
Loading?	No	
Hauling?	Yes	
Push off Log Dump?	N/A	
Silviculture operations?	N/A	
Deactivation?	N/A	
Other?	N/A	
Part B: Other Constraints		
Component	Yes/No or N/A	**Comments (Control Measures)*** *One or more control measures

		should be identified for any items marked with a ‘Yes’ in the middle column.
Other Constraints		
Are there other constraints that could contribute to phase congestion? (For example, non-workers in the area, wildlife issues, etc.)		Hiking Trail close to NE corner of block. Signs posted at two ends of trail warning of active operations. Signage to be monitored by foreman. Crew to be aware of possible public interaction.
Public Access?	No	
Fisheries?	N/A	
Wildlife?	N/A	
Weather?	N/A	
Upset conditions?	N/A	
Other? (For example, mechanical, road maintenance work, etc.)	N/A	

Now try the quiz on the next page.

Sequence to Avoid Phase Congestion when Planning Block for Logging—Self-Quiz

1. Phase congestion occurs when one production phase adversely affects another, and worker safety is compromised.

   ☐ True

   ☐ False

2. Which of these factors need to be considered to avoid phase congestion?

   ☐ Production Schedule, Receiving necessary approvals

   ☐ Engineering, Prime contractor awareness of the procedure

   ☐ Spacing

   ☐ All of the above

Now check your answers on the next page.

Sequence to Avoid Phase Congestion when Planning Block for Logging—Quiz Answers

1. Phase congestion occurs when one production phase adversely affects another, and worker safety is compromised.

   Answer: **True**

2. Which of these factors need to be considered to avoid phase congestion?

   Answer: **All of the above**

Key Point 1.6: Trespass when Block Planning

A trespass happens when trees are harvested or operations occurred outside of an approved boundary, like the boundary to a cutblock.

It is important that each logging plan provides for the removal of over-the-line danger trees within reach of the work areas. Each operation must have a formal internal reporting system between the fallers, supervisors, and forestry engineers. Forest engineering staff must in turn establish formal approval procedures for removal of over-the-line danger trees not covered in the original logging plan.

This notification process is extremely important in controlling hazards in areas such as Riparian Zones or Biodiversity Patches. Windthrow creates these hazard areas during the harvesting phase. The logging plan must also note trees felled for guyline stumps and guyline corridors.

Always know your position on the map

Boundaries and trespass responsibilities

Make sure that the harvesting activity always occurs within the boundaries of the approved cutblock, and that road-related activities occur within the authorized clearing width.

A trespass can also occur inside a cutblock such as:

- Along an internal wildlife tree patch
- By removing too many trees from a partial cut
- By removing tree species that were not supposed to be cut

IMPORTANT!

If details on the map do not match what you find in the field, stop work and contact your supervisor. Work together to resolve the uncertainties. Remember that you may be held responsible for trespasses.

Plans and maps should have:

- North arrow
- Scale (for example, 1:10,000 means 1 cm on map = 100 m in the field)
- Cutblock name and field marking (for example, paint, ribbon color or blazes)
- Cutting permit and hammer mark
- Road name, number and stations, paint or ribbon colors used for centerline, slope stakes, etc.
- Date of map or map version
- “Drafted” or “Approved by”
- Explanation of map symbols used
- Explanation of color coding
- Numbered corner markers

Note: They exist around the outside edge of the cut-block and around leave strips inside the cutblock.

The checklist below can help ensure you do not create a trespass.

Due diligence checklist

- ☐ Operational plans and maps should always be complete
- ☐ Understand the details on the plan that affect your work
- ☐ Discuss critical areas and walk them in the field with a supervisor and other operators
- ☐ Always know your exact location in the field compared to the map. Check your progress from time to time
- ☐ Falling boundaries, riparian reserve zones, wildlife tree retention patches, etc., must be adequately marked considering all the circumstances
- ☐ Marked boundaries and the site plan must be consistent. Approved changes must be noted on the map and boundaries amended in the field
- ☐ Old boundary marking must be painted out and old flagging removed
- ☐ If you are unsure about any aspect of your work including maps and plans, stop work

Now try the quiz on the next page.

Trespass when Block Planning—Self-Quiz

1. A trespass can only occur outside the boundaries of the approved cutblock.

   ☐ True

   ☐ False

2. Plans and maps should have an explanation of map symbols used and explanation of color coding.

   ☐ True

   ☐ False

3. Old boundary marking and old flagging must be retained on maps.

   ☐ True

   ☐ False

4. If you are unsure about any aspect of your work, including maps and plans, continue your work with caution.

   ☐ True

   ☐ False

Now check your answers on the next page.

Trespass when Block Planning—Quiz Answers

1. A trespass can only occur outside the boundaries of the approved cutblock.

   Answer: **False**

2. Plans and maps should have an explanation of map symbols used and explanation of color coding.

   Answer: **True**

3. Old boundary marking and old flagging must be retained on maps.

   Answer: **False**

4. If you are unsure about any aspect of your work including maps and plans, continue your work with caution.

   Answer: **False**

Section 1015-02: Poor Planning Hazards

What you will learn in this section

By the end of this section, you will be able to demonstrate knowledge of the following key point:

2.1 Hazards related to block planning

Key Point 2.1: Hazards related to block planning

Workers need to be shown the hazards they will face on the job and the controls to avoid being harmed by those hazards.

Before starting any new block, all workers must be involved in identifying any significant hazards on the site and the way those hazards will be controlled. There must be documented evidence on site listing the hazards and controls, and showing that all operators are aware of the hazards and controls.

Operational hazards and safety considerations

There are common safety considerations that planners and cable loggers must address. The management of these concerns must be recognizable in the plan and on the ground. Failure to address these concerns may result in worker injury and orders from WorkSafeBC officers.

Operational hazards and safety considerations include the following:

- Site plan and logging plan
- Log landing areas
- Corridors
- Cross-slope movement of the skyline
- Runaway log hazard
- Overhead hazards
- Windthrow
- Riparian management and reserve zones
- Feathered edges
- Trespass

Site plan and logging plan

The site plan and logging plan must allow for:

- Trees to be felled without the unnecessary brushing of standing timber
- Faller substitution of one leave tree for another
- Limitation of upslope falling of trees to within acceptable industry standards
- Removal of trees that interfere with the rig-up or that could be pushed or pulled into the work area
- Removal of over-the-line danger trees and trees that present a hazard to workers

Specific areas to be monitored include:

- Riparian Management and Reserve Zones
- Gully Management Zones

- Wildlife Tree Patches
- Areas adjacent to side and back lines

An informed falling crew will eliminate controllable hazards for rigging crews and landing workers. Hazards controlled by fallers also reduce the number of additional hazards that rigging crews face.

Log landing areas

Increased pressure to minimize site degradation is reflected in the reduction in size of log landing areas. Landings must be constructed to safely accommodate all the required equipment and functions, as well as to provide safe work areas for ground workers. Landings must be large enough to land two-thirds of the length of the average log being yarded.

Landings can be classified as temporary structures and reclaimed once harvesting is finished. Guylines must be secured to suitable anchors. This will require that guyline corridors be felled in some areas.

Yarding corridors should be flared at the landing to prevent trees being yarded onto the equipment and workers. Trees that will interfere with the rig-up, landing of the logs, or the loading process must be removed.

Corridors

Corridors must be wide enough to facilitate safe yarding of logs. This will be a function of the following:

- Deflection
- Equipment size
- Timber size and height
- Log length

Corridors should be clearcut and flared at the landing. Where possible, corridors should be angled slightly cross-slope for uphill yarding.

Cross-slope movement of the skyline

Planners and logging crews must minimize hazards created by the skyline striking standing trees on the edges of corridors. Under no circumstances should the skyline create widow makers in the crowns of trees. This can be controlled by use of a lead block for directional control of the skyline and/or by lowering the skyline. The use of designated “rub trees” is acceptable provided the trees’ stability is assured. If a rub tree becomes unstable, it must be removed immediately.

Runaway log hazard

Straight downhill yarding on steep slopes is prohibited.

Straight uphill yarding should be limited to slopes upon which there is no significant hazard to the rigging crews.

On blocks where it is feasible, given the prescription, angle the corridors cross-slope so that the rigging crew is up-slope of the turn. Where no practical alternative exists to straight uphill yarding corridors on steep ground, the crew must walk a sufficient distance, cross-slope, to be clear of the runaway log hazard.

Activities in the landing that may dislodge materials must be stopped when the down-slope crew is in the hazard area.

Overhead hazards

There can be a significant increase in overhead hazards in partial cuts or intermediate cuts. Brushing of trees increases with the density of the residual stems. It is desirable to have the block felled well ahead of yarding activity. This increases the likelihood that residual trees will have the small broken limbs blown out of them by the wind. Rigging crews must be aware of any forest health issues such as root rot. This will alert them to potential unstable trees missed by the fallers.There is a significant hazard of trees being yarded over or snapped off by the tong line if the positioning of the carriage and placing of chokers is poor. Logs that are being laterally yarded to the carriage should be bucked to facilitate clear yarding. Logs should not be “powered” out of the hang-up position.

Rub trees that have been overused by the yarding crew or poorly selected by the planners or fallers may become hazardous very quickly. Hazardous rub trees must be removed immediately.

Windthrow

There is a significant increase in windthrow hazards in the following areas:

- Partial cuts in which a sufficient number of stems per hectare have been removed, reducing inter-crown damping
- Riparian and Gully Management areas in which the edges have not been feathered or the crowns reduced
- Side and back lines laid out without sufficient consideration of predominant wind in relation to elevation and topographic features

Windthrow hazard is also increased by falling trees right to the top of a ridge then stopping. The back line should be stopped before the ridge line or extended up and over the ridge as long as the felled timber can be angled into the block and yarded safely.

Cable yarding crews must have a written wind speed shutdown criteria in order to ensure control of the wind throw hazard. The operation should also have administrative procedures to control post-wind throw hazards, such as leaning trees or unbuffered danger trees in Riparian Zones.

Windthrow amendments

In many of the wind-thrown edges, retaining standing trees to function as a wind break may be desirable to prevent further blowdown. The logging plan for the wind throw amendment must reflect:

- The location of the yarding corridors

- The lay of the wind-thrown trees in relation to the direction of yarding
- The specific type of yarding equipment to be used (for example, skyline with dropline carriage); this is important because a grapple yarder system cannot fulfill the performance requirements of a dropline system
- Faller substitution of residual trees to allow for hazardous tree removal and establishment of corridors
- Widening of the corridor at the roadside
- Availability of backspars and/or tailhold stumps
- Appropriate deflection for the yarding system

Riparian management and reserve zones

The logging plan must include notations to allow for tailholds in reserve areas and skyline corridors through the reserve areas of the block where safe deflection is necessary.

It may be necessary to map and field mark backspars or tailhold trees and provide a written description of how tree damage will be controlled.

Danger trees within reach of a skyline that passes through the Riparian Reserve Zone must be removed. It is important that planners include appropriate comments on the silviculture and logging plans.

Feathered edges

Many prescriptions require that the edges of Riparian Zones be selectively cut to reduce wind throw potential. The larger “trigger trees” and other merchantable timber are removed. To minimize hazards to the rigging crew from residual saplings and trees being yarded over, it is advisable to yard these trees in tree lengths. If the trees are bucked to log length, residual trees made hazardous by yarding activities must be removed before workers set chokers in the hazardous areas.

Trespass

It is important that each logging plan provide for the removal of over-the-line danger trees within reach of the work areas. Each operation must have a formal internal reporting system between the fallers, supervisors, and forestry engineers.

Forest engineering staff must in turn establish formal approval procedures for removal of over-the-line danger trees not covered in the original logging plan. This notification process is extremely important in controlling hazards in areas such as Riparian Zones or Biodiversity Patches. Wind throw creates these hazard areas during the harvesting phase. The logging plan must also note trees felled for guyline stumps and guyline corridors.

Now try the quiz on the next page.

Hazards Related to Block Planning—Self-Quiz

1. Which specific areas must be monitored for tree related hazards?

   ☐ Riparian management and reserve zones

   ☐ Gully management zones and wildlife tree patches

   ☐ Areas adjacent to side and back lines

   ☐ All of the above

2. Landings must be large enough to land one-third of the length of the average log being yarded.

   ☐ True

   ☐ False

3. Corridors must be wide enough to facilitate safe yarding of logs.

   ☐ True

   ☐ False

4. Danger trees within reach of a skyline that passes through riparian reserve zone must be protected.

   ☐ True

   ☐ False

5. To minimize hazards to rigging crew from residual saplings and trees being yarded over, it is advisable to yard these trees in tree lengths.

   ☐ True

   ☐ False

Now check your answers on the next page.

Hazards Related to Block Planning—Quiz Answers

1. Which specific areas must be monitored for tree related hazards?

   Answer: **All of the above**

2. Landings must be large enough to land one-third of the length of the average log being yarded.

   Answer: **False**

3. Corridors must be wide enough to facilitate safe yarding of logs,

   Answer: **True**

4. Danger trees within reach of a skyline that passes through the Riparian Reserve Zone must be protected.

   Answer: **False**

5. To minimize hazards to the rigging crew from residual saplings and trees being yarded over, it is advisable to yard these trees in tree lengths.

   Answer: **True**

Section 1015-03: Environmental Considerations

What you will learn in this section

By the end of this section, you will be able to demonstrate your knowledge of the following key point:

3.1 Environmental considerations when planning block activities

Key Point 3.1: Environmental Considerations when Planning Block Activities

Environment considerations when planning block activities include considerations for workers and riparian areas, fish, and non-fish streams.

Environmental considerations for workers

Improper logging practices can seriously reduce the forest's ability to carry out vital environmental and ecological functions. It is very important to understand main environmental considerations and necessary actions when planning logging activities with the block.

Riparian areas, fish, and non-fish streams

A riparian area is the interface between land and a river or stream. Wetlands and lakes may also have riparian areas. Riparian zones are important in ecology, environmental management, and civil engineering because of their role in soil conservation.

A stream is a watercourse, having an alluvial sediment bed, formed when water flows on a perennial or intermittent basis between continuous definable banks. A stream may be classified as fish bearing or non-fish bearing.

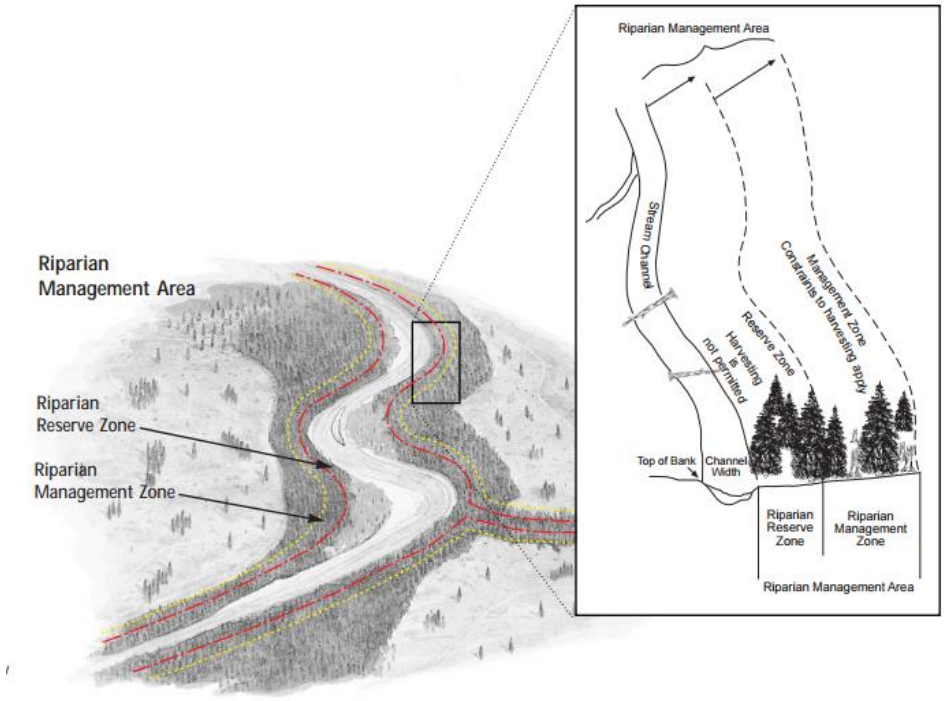
It is important to ensure that planning and practices around streams and riparian areas provide protection to fish and fish habitat as well as the riparian area itself.

Riparian reserve zone

The riparian reserve zone, if any, is the portion of the riparian management area located adjacent to a stream, wetland, or lake. Harvesting of trees is not permitted normally in the reserve zone unless approved by government in specific circumstances.

Riparian reserve zone

The riparian reserve zone is that portion of the riparian management area that is outside of any riparian reserve zone or if there is no riparian reserve zone, that area located adjacent to a stream. Harvesting of trees is permitted in the management zone.



Specified minimum RMA slope distances for stream riparian classes

The riparian management areas consist of a management zone and, for fish streams of 1.5 meters in width or greater, a riparian reserve zone.

Each of the zones has width requirements based on the stream classification. Constraints to forest practices are applied within these zones, with the most stringent requirements applied to the reserve zones.

Riparian class	Average channel width (m)	Reserve zone width (m)	Management zone width (m)	Total width (m)
S1 large rivers	≥ 100	0	100	100
S1 (except large rivers)	> 20	50	20	70
S2	> 5 ≤ 20	30	20	50
S3	1.5 ≤ 5	20	20	40
S4	< 1.5	0	30	30
S5	> 3	0	30	30
S6	≤ 3	0	20	20

Fish stream or community watershed

Not fish stream and not in community watershed

Weather safety shutdowns

Planners must calculate the impact of weather and the season on the operation.

Cold, snowy, and excessively wet weather have the most impact on development plans, but the impact of these factors decreases as the planning efforts increase.

Logging sensitive areas during heavy rain seasons

- Scarring of the duff on the hillsides causes extreme site degradation through erosion
- Workers may be exposed to the hazards of mud and rock slides
- Establish rainfall shutdown criteria
- Ensure ditches and culverts are running free of obstructions

Logging moist areas before freeze-up

- Yarding activity and equipment movement cause excessive site degradation
- Haul roads get punched out, making log hauling difficult
- Crew buses and emergency transportation vehicles cannot negotiate the roads

Logging during periods of excessive snow

- Logs buried beneath the snow are sometimes missed, resulting in the need for re-logging when the snow is gone
- Gut-hooked logs and logs frozen in the snow often break
- Hazards of walking in the felled and bucked timber, impaired visibility, and the hazards of moving equipment increase

Logging in excessive fog

- Crew cannot see the lay of the logs, increasing the hazard of upending and swinging logs
- The haulback dislodges logs, roots, and stumps that the crew cannot see
- It forces spotting of logs without proper sightlines to see hazards

Logging during electrical storms

- If lightning strikes the lines or equipment, the crew is exposed to the hazard of electrocution

Frost boils

- Frost boils on the road can cause machines that are being moved to become stuck or roll over. The road condition will deteriorate in a very short time

Environmental signs that require immediate work shutdown and evacuation of the work site

Shut down operations when these conditions exist:

- Sudden muddy water in creek (especially in gullies)
- Sudden lack of flow in streams during wet weather
- Cracks appearing in the soil
- Small (anything ≥1m x 1m) sloughs of soil occurring
- Anchor stumps pulling out in wet soil
- Landslides occurring in the general area, or sounds of landslides occurring
- Sloughs in road cuts, especially during road construction or deactivation.
- Cracks appearing in the roads
- Water squirting out of road cuts between soil layers

Example of operational limits (these limits will vary among operations)

Zone	Shift end	24 hour	48 hour	72 hour
Very Wet Zone	50mm	100mm	150mm	200mm
Wet Zone	45mm	80mm	130mm	170mm
Drier Zone	30mm	50mm	80mm	110mm
Unstable upslope road conditions	10mm	20mm	30mm	40mm

Snow melt soil moisture input

Snow melt is an important factor in determining the total soil moisture input. The following tables show examples as to the amount of snow melt that must be added to the precipitation recorded in a rain gauge at the worksite in applicable situations. These numbers will vary between operations. Snow melt must be considered at or above the worksite; i.e., where the melt event is occurring.

Table #2: 24 Hour Snowmelt additions during rain-on-snow events						
Average Temperature[1]	Open Area			Forested Area		
	WIND[2]			WIND[2]		
	Low	*Moderate*	*High*	*Low*	*Moderate*	*High*
0.5-2.0˚C	3mm	10mm	25mm	1mm	5mm	11mm
2.1 – 5.0˚C	15mm	35mm	75mm	5mm	10mm	25mm
5.1-10.0˚C	25mm	70mm	120mm	10mm	28mm	40mm
10.1-15˚C	35mm	95mm	160mm	15mm	40mm	60mm

Table #3: Hourly snow melt during rain-on-snow events[3]						
Average Temperature[1]	Open Area			Forested Area		
	WIND[2]			WIND[2]		
	Low	*Moderate*	*High*	*Low*	*Moderate*	*High*
0.5-2.0˚C	0.15mm	0.45mm	1.05mm	0.04mm	0.2mm	0.5mm
2.1 – 5.0˚C	0.65mm	1.5mm	3.15mm	0.2mm	0.4mm	1.2mm
5.1-10.0˚C	1.05mm	3.0mm	5.0mm	0.4mm	1.2mm	1.7mm
10.1-15˚C	1.5mm	4.0mm	6.7mm	0.65mm	1.7mm	2.50mm

Table #4: Snow melt during sunny conditions				
Average Temperature[1]	24 hr Melt		Hourly Melt[3]	
	Open	Forested	Open	Forested
0.5-2.0˚C	8mm	2mm	0.3mm	0.1mm
2.1 – 5.0˚C	24mm	4mm	1.0mm	0.17mm
5.1-10.0˚C	43mm	17mm	1.8mm	0.7mm
10.1-15˚C	53mm	21mm	2.2mm	0.9mm
>15˚C	65mm	25mm	2.7mm	1.1mm

[1] **Average Temperature** is calculated by adding the maximum and minimum temperature for the time period and dividing by 2. OPTIONAL: Temperature decreases at ***0.5°C*** for every *100m* increase in elevation for **rain-on-snow** and ***1.0°C*** for **sunny conditions**.

[2] ***Low*** (<10 km/hr): Leaves and small twigs in constant motion speed; wind extends light flag
Moderate (10-20km/hr, gusts >30km/hr): Small trees sway, maps/paper difficult to hold still.
High (>20km/hr, gusts >40km/hr): Whole trees in motion, clouds moving rapidly, rain blowing sideways.

[3] Using hourly melt rates to calculate 24 hr melt rates will not equal values in Table 2 and Table 4 because numbers were rounded for ease of calculation.

Feathered edges

Many prescriptions require that the edges of Riparian Zones be selectively cut to reduce wind throw potential. The larger “trigger trees” and other merchantable timber are removed. To minimize hazards to the rigging crew from residual saplings and trees being yarded over, it is advisable to yard these trees in tree lengths. If the trees are bucked to log length, residual trees made hazardous by yarding activities must be removed before workers set chokers in the hazardous areas.

Site degradation

This is also called soil disturbance or site disturbance. Soil disturbance is the damage to the soil on the logging worksite. And regulations set out how much is allowed.

Soil disturbance is a general term referring to the following types of disturbance:

- Unrehabilitated temporary access structures, including excavated or bladed trails of a temporary nature
- Corduroyed trails
- Compacted areas
- Dispersed disturbance
- Permanent access structures such as roads and landings

Soil disturbance requiring rehabilitation

Temporary access structures (including excavated or bladed trails of a temporary nature), compacted areas, and corduroyed trails require

rehabilitation if the area of disturbance exceeds the limits set out in regulation.

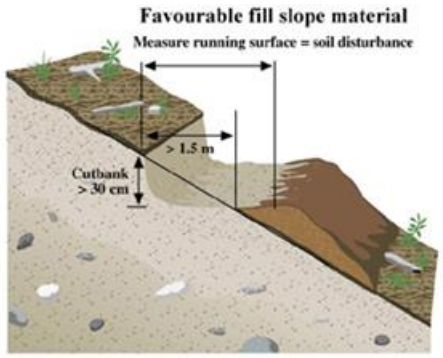
Examples of soil disturbance

Examples of soil disturbance include:

- Excavated or bladed trails
- Corduroyed trails
- Compacted areas

Excavated or bladed trails

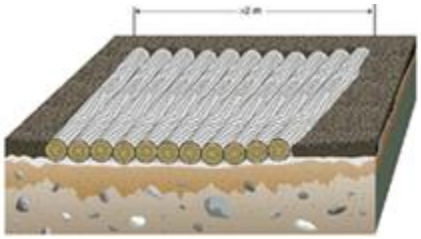
Bladed trails are constructed to provide flat locations and travel routes for mobile backspars. These trails are also used to increase stability for skidding equipment when working in steep terrain.



Corduroyed trails

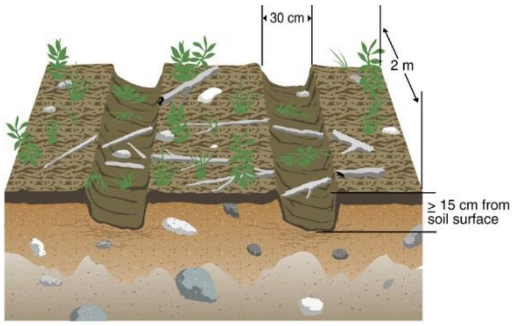
Corduroyed trails are constructed using logs and woody debris placed side by side to form a surface capable of supporting equipment traffic.

Tree tops and limbs placed in front of harvesting equipment to distribute machine load and reduce soil compaction should not be considered as corduroyed trails, unless the debris prevents the establishment of regeneration at close to the approved target stocking standards. If satisfactorily rehabilitated, a corduroyed trail does not count as soil disturbance.



Compacted areas

Machine traffic over soils can cause compaction which increases soil density and reduces the air spaces between soil particles. This can cause problems when reforesting a site.



Now try the quiz on the next page.

Environmental Considerations when Planning Block Activities—Self-Quiz

1. The interface between land and a river or stream is called:

   ☐ Riparian area

   ☐ Riparian reserve zone

   ☐ Riparian management zone

   ☐ Non-fish stream

2. Frost boils on the road can cause machines that are being moved to become stuck or roll over.

   ☐ True

   ☐ False

3. Small (anything ≥1m x 1m) sloughs of soil occurring does not need immediate shutdown but must be discussed with your supervisor.

   ☐ True

   ☐ False

4. To minimize hazards to the rigging crew from residual saplings and trees being yarded over, it is advisable to yard these trees in tree lengths.

   ☐ True

   ☐ False

Now check your answers on the next page.

Environmental Considerations when Planning Block Activities—Quiz Answers

1. The interface between land and a river or stream is called:

   Answer: **Riparian area**

2. Frost boils on the road can cause machines that are being moved to become stuck or roll over.

   Answer: **True**

3. Small (anything ≥1m x 1m) sloughs of soil occurring does not need immediate shutdown but must be discussed with your supervisor.

   Answer: **False**

4. To minimize hazards to the rigging crew from residual saplings and trees being yarded over, it is advisable to yard these trees in tree lengths.

   Answer: **True**

Section 1015-04: Worker Safety

What you will learn in this section

By the end of this section, you will be able to demonstrate knowledge of the following key point:

4.1 Safety for crew members when planning a block

Key Point 4.1: Safety for Crew Members when Planning a Block

This key point covers safety for your crew members when planning a block.

Major hazards for the crew discussed in this key point represent conditions where specific safety recommendations apply. In addition, workers in the bush need one good tip that applies everywhere – stay alert and always know your escape route.

Train new workers to keep an eye out for hazards while they work and think through in advance which way to move if danger erupts. A work position with no good escape route is the wrong place to be.

Hazard 1: Inaccurate signal operations

Unexpected line movement can result if a radio signal malfunctions or is used wrongly. Check equipment and operator knowledge of signals in advance.

Always have two radio transmitters where chokers are being set. A second radio is for backup, but there could be occasions when the second radio is used to stop the rigging when the rigging slinger is occupied or when the crew splits up to set chokers on either side of the mainline. Alert the yarder engineer when both radios are in use.

Precautions

- Set up the radio whistle on an assigned frequency for the operating location to prevent interference
- Handle radio units carefully to ensure reliable operation. Replace malfunctioning units at once
- Keep battery charged as required
- Guard against accidental activation of spare transmitters. Avoid sounding a stop from both radios at the same time which could be understood as a “hup-ho” to go ahead fast on the rigging. A worker carrying a second set of transmitters need to sound the whistle for a stop with a long stop or emergency stop
- The rigging crew must be able to distinctly hear the whistle signals. If necessary, set the yarder whistle away from the yarder and closer to the edge of the landing where the rigging crew can hear it over the motor noise of the carriage
- The yarder engineer must receive clear distinct whistles before any line movement. If the yarder engineer is not sure, he must repeat the whistle and wait for a reply or call on the voice channel to verify

- All motorized carriages must be equipped with a working horn

Keep transmitter ready to signal stop in case of an emergency, especially:

- When spotting the rigging
- After a go-ahead signal has been given, until the turn is cleared
- When lines are being run around

The “talkie tooter” style needs to be nearly vertical then the metal band is squeezed to engage the radio signal, with the black metal loop (antennae) shown around the hand pointed towards the yarder.

Hazard 2: Swinging and springing chokers

Avoid chokers when the line is moving. Foremost, stay clear of swinging chokers when the rigging is suspended. Chokers dragging on the ground with line movement can also be dangerous if they catch on an obstacle and spring free.

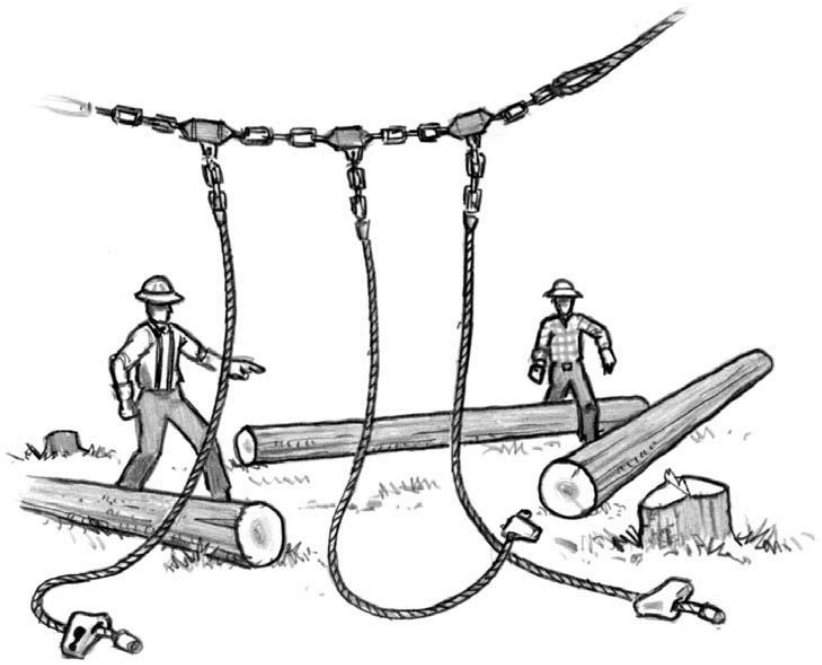
When grabbing the chokers directly under the carriage, either run the carriage ahead or get in and get out, particularly when the carriage is low to the ground.

Precautions

- As chokers come back to toward the rigging crew, watch for the chokers pulling debris, which can be thrown toward the crew. The chaser on some carriages lets out the drop line as the carriage comes back. Make sure the chokers are not low enough to run into obstructions or pick up debris
- Stay in the clear, at least two choker lengths away, until the rigging is spotted. For carriages with a dropline, this distance may need to be increased. Stay clear of the potential swing of the choker

- When chokers are swinging, bells and knobs must be slacked onto the ground to stop the choker movement before the crew approached

Be careful of hang-ups when pulling on a choker. If a choker is badly fouled over a log or in brush, don't jerk it free. Walk over and unfoul it.



Only approach the rigging once the chokers come to rest

Hazard 3: Suspended and hung-up rigging

Use caution when working directly under the rigging. There is always a chance a line will be unintentionally released and rigging will drop faster than expected when being slacked down.

Suspended rigging can be dangerous. When the rigging is slacked down, any part of the lines can hang up on saplings or windfall roots and dangle dangerously. Always clear hang-ups before choking logs.

Precautions

- Never stand directly under the rigging! Stay to the side. If it is necessary to cross beneath lines, do it swiftly, and only when there is no load on the lines
- The yarder engineer must keep the braking system well-maintained, including safety brake or dogs
- The yarder operator must stay at the controls when the crew is setting a turn, with brakes applied
- With a dropline carriage, clear a hang-up by repositioning the carriage to drop the chokers in a clear area.Hand-clear a hang-up only when the rigging is slacked down
- Clear a hangup with a shotgun carriage or buttrigging

Clear a hangup with a shotgun carriage or buttrigging

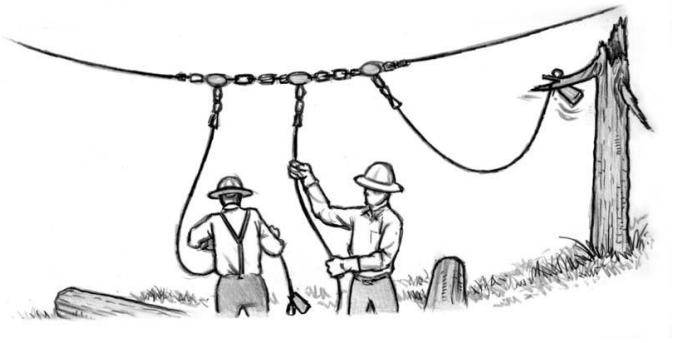
To clear a hangup with a shotgun carriage or buttrigging, complete the following steps:

- Tightline the turn
- Remove the sapling or other obstruction
- Slack the mainline to add weight to break the hang-up
- Slack the mainline and skin the rigging to clear the lines, or skin the rigging back and pick up light turn to clear the lines

Suspended rigging hazards

- Drum brakes can fail
- Brake bands, anchors, adjusting rods can fail; dogs may slip off pawls, particularly on early-model yarders
- Sudden loss of air pressure can cause the rigging to drop some distance before the spring brake or dogs engage
- Controls may be accidentally released
- Brake may be wet or sticky
- Rigging may hang up on limbs or roots and crash down unexpectedly

The skyline can incur bounce when the rigging is stopped fast. The sky line moves it is not static, so the chokers will continue to bounce and the carriage as well long after everything is stopped.



Clear hung-up rigging before working with chokers

Hazard 4: Rolling logs, rocks, and other objects

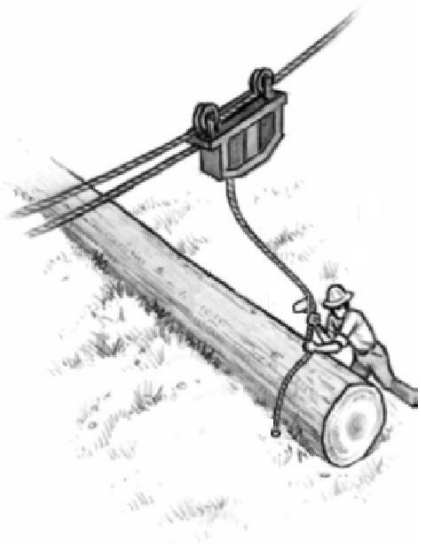
Gravity is the primary source of hazardous energy when working on a slope. Logs, rocks, or other objects can be disturbed by rigging activities and roll or slide downhill toward the crew. The risk is greater working around newly felled timber, where logs can shift and dislodge other logs or material that appeared stable.

Precautions

- Yard a slope from the highest point down
- Never work below unstable logs, rocks, or other material. If it is unclear what is holding a log, then assume it can move at any time

- When getting in the clear above and behind the turn before the go-ahead signal, identify the logs that will move and check that no unbucked logs or tree lengths could intrude on the safe area chosen. When there is no logged-off area available, retreat farther, and use extra caution. Never remain below anything that could be dislodged when the turn is yarded free
- In an area with bucked timber, never stand on the second cut of a tree that is hooked up
- If there is any doubt about the action of logs in a turn, give the “go ahead slow” signal
- Stay alert to the moving turn and be ready to signal stop if a hazard develops. Chokers can break on the way to the landing or logs break in two, sending material back down on the rigging crew

Beware of unstable logs or other objects beyond the work area that could roll or slide and impact nearby logs



- Stay above the log on sloped ground

- Don’t put any part of your body inside of a choker that is done up around a log, if the log shifts or the rigging bounces it will tighten up on you
- Rigging slinger should recognize hazards ahead of time and clear them by going back a little farther and running a turn over the possible loose object to dislodge it or check for stability

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CAUTION!

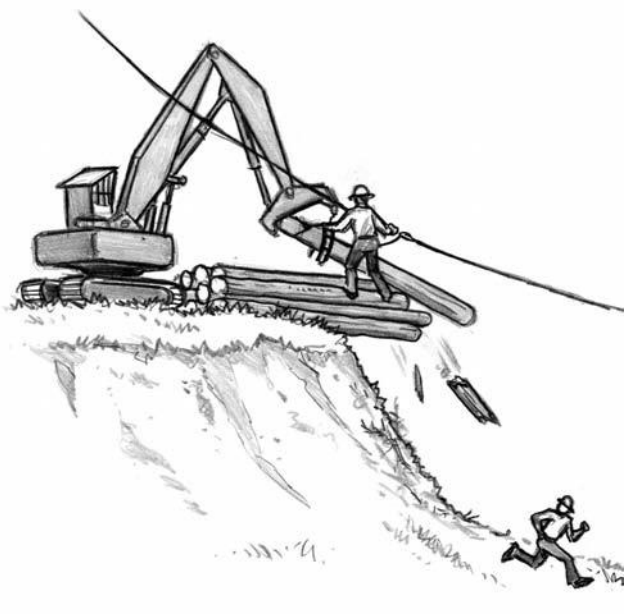
Be prepared! Always know your escape route!

Hazard 5: Working below a landing on steep ground

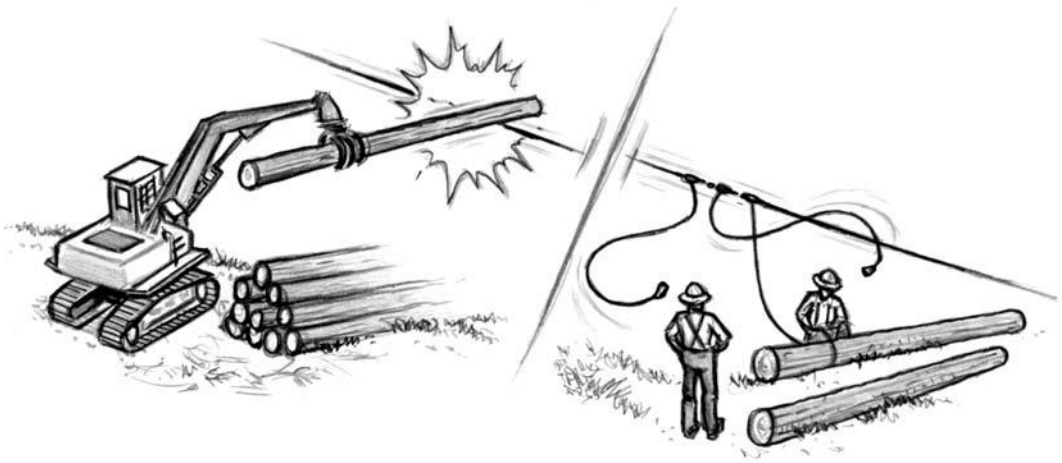
The landing must be planned to minimize the risk of logs or other debris kicked loose at the landing from running downhill toward the rigging crew. On a small landing, the cramped operating area for the loader becomes hazardous. For example, a log in the grapple can strike the mainline and cause the rigging to jump as the rigging crew sets a turn below, or logs may be decked too close to an edge and get disrupted as logs are added.

Precautions

- Discuss the organization of the landing and work zones with the entire crew beforehand. Communication and planning with multiple perspectives improves effectiveness and attention to safety
- The landing must be adequate for the turn to be landed and for the choker to be undone without using the loader to prevent the turn from running back down the hill
- Plan the areas of operation of the yarder, processor, and loader. Maintain safe distances. Identify areas where equipment operations overlap
- Make sure the loader boom or log in the grapple does not strike the mainline, skyline, running lines, or guylines when the rigging crew is setting chokers. Avoid throwing debris over the bank
- Set up an emergency whistle at the landing with a signal worked out in advance to warn the rigging crew if materials slide off the landing or other hazards appear they may be unable to see

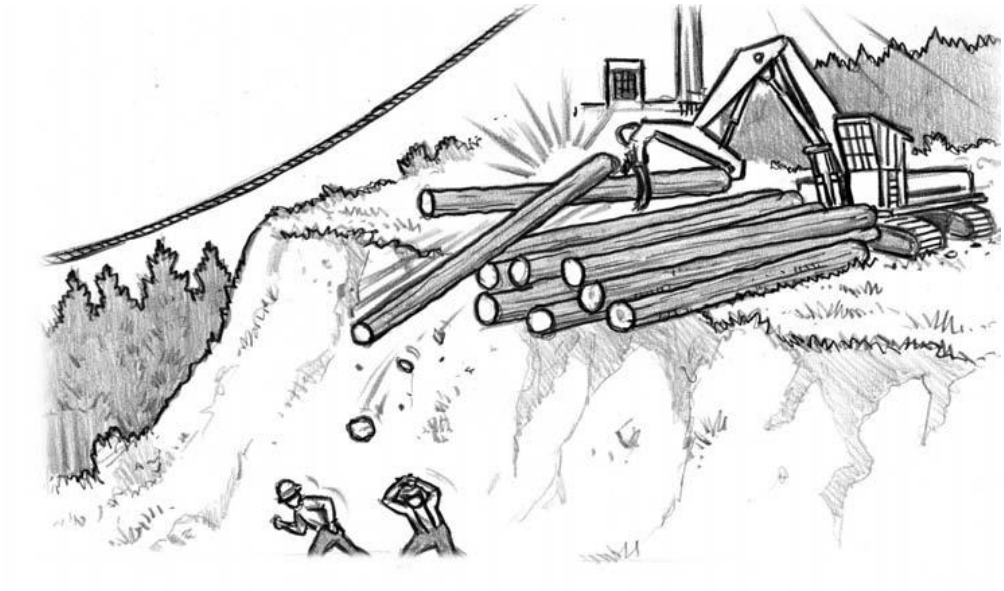


A short landing is sometimes inevitable, and it may be necessary for the loader or processor to grab and hold the turn while the chaser unchokes the logs. Make sure the rigging crew below is in the clear, in case a log slips out of the grapples.



If a machine on the landing hits the mainline, the rigging crew can be endangered by swinging chokers.

Rigging crew needs to take responsibility for their own safety and not slack the rigging down too far when setting turns outside the landing, or if they do need to do it, they need to communicate that with the loader operator and time it when it is convenient for both.



Beware of log decks close to the edge of the landing. A log can slip off the pile and fall downhill.

CAUTION!

Emergency whistle is a long continuous whistle until the danger has subsided.

Hazard 6: Windfall trees

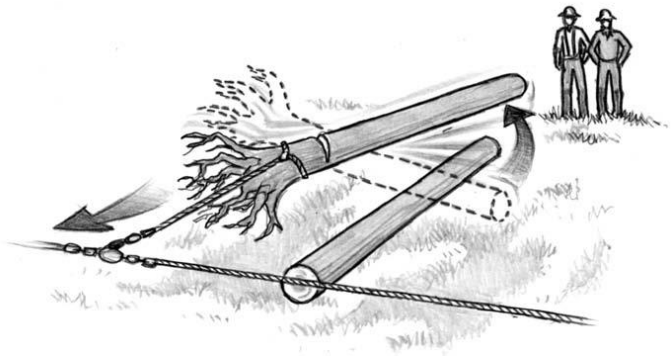
Windfall roots will often sit back when a tree is bucked off or yarded free, particularly if it is bucked short. Heavy rains can disturb the ground and this may cause the root to tip more easily.

Unstable rootwads, when kicked loose, can move unpredictably and cover a wide swath. Any unstable rootwad identified as a hazard in a work area needs to be moved or made secure.

Note: The illustration above shows the WRONG technique. Remember to always set chokers from the upper side.

Precautions

- Always consider root wads dangerous. Avoid getting below or behind root wads. Always approach from the upper side
- Pull a root wad clear with rigging when it appears unstable



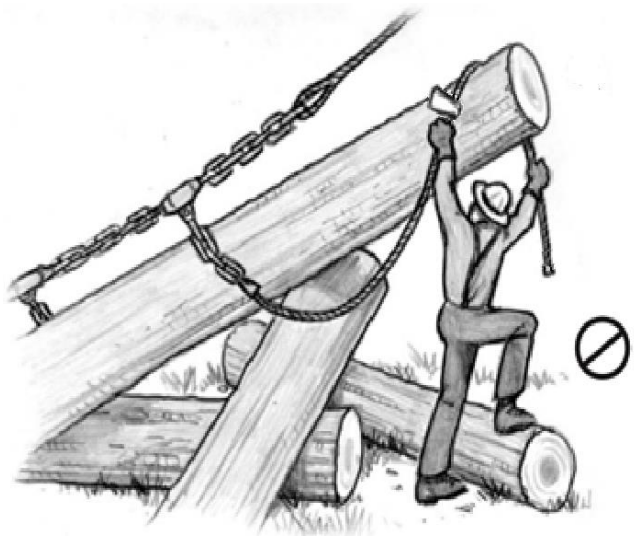
Pull unstable roots clear with the rigging. Get in the clear before lines move

Hazard 7: Hooking up the turn

Hooking up the turn and starting it to the landing can be hazardous work. Adequate training and safe work procedures are vital. In addition to the safe practices outlined earlier in this chapter, remember the following general precautions

Precautions

- Stay in the clear until the rigging is slacked and chokers stop swinging
- When logs are layered, hook up those on top first to reduce applied tensions and damage
- Avoid crawling under logs that could slip or drop, and watch for logs that could be dislodged by movement from other logs
- When tension is applied to the mainline or dropline, beware if it does not rise into position. The line may be fouled and could break free and throw heavy debris



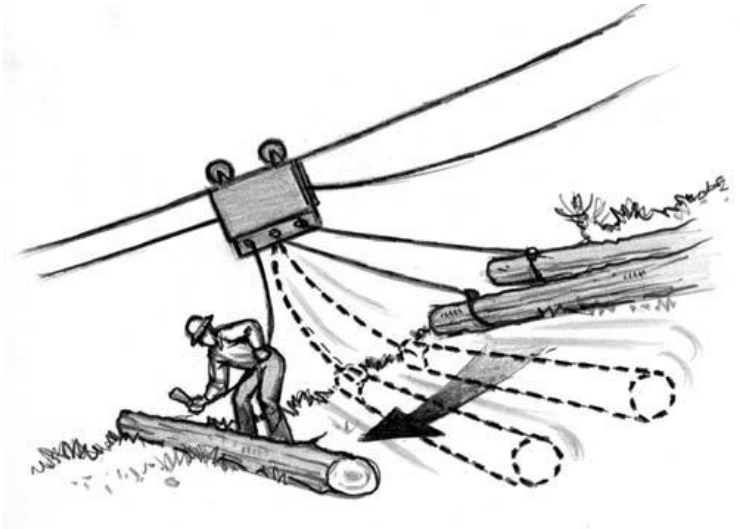
Avoid crawling underneath logs that could slip or drop

Hazard 8: Choked logs moving when haulback is slacked

On a steep hillside, if the haulback is slacked too much or runs unexpectedly when setting the turn, logs already hooked up can be pulled downhill by the weight of the mainline.

Precautions

- Do not slack the haulback if some of the chokers are already hooked up to light or unstable logs
- Tread lightly to avoid moving logs or debris that could strike other workers



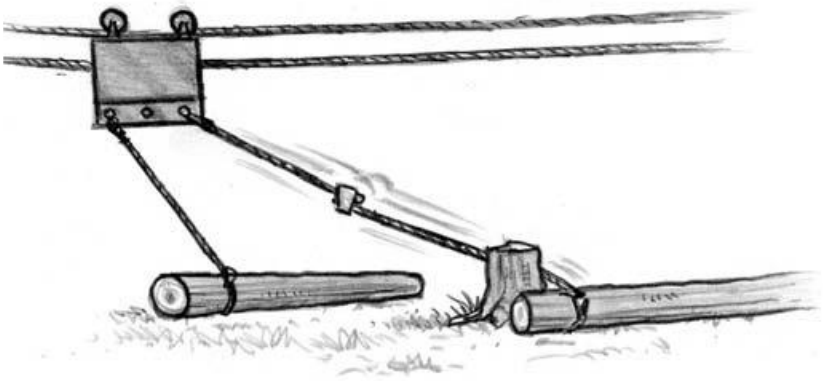
- The yarder engineer must keep control of the haulback while chokers are being set to avoid log movement

Hazard 9: Tagging chokers

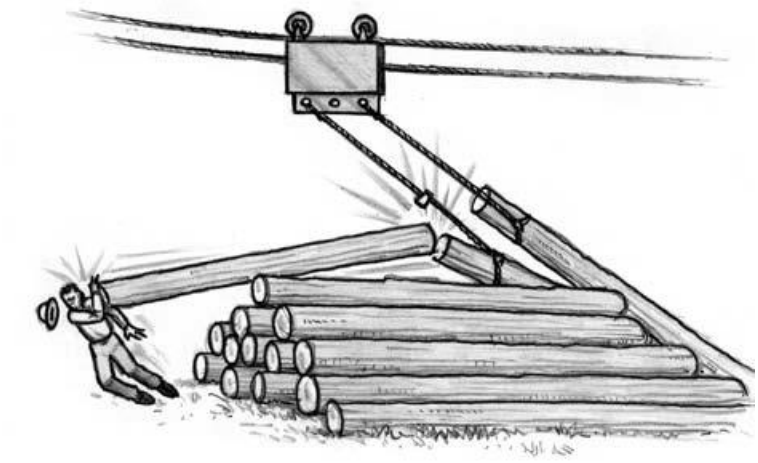
Adding a string out to a choker or leaving a long dropline can be useful to reach a distant log or direct a log around an obstacle. Tags should be removed and droplines shortened before the turn is yarded to the landing. Tagged logs foul more readily and are more difficult to control and tightline clear. Strung-out logs are also more difficult to land and may run outside the turn and jill-poke other logs ahead on a pile.

Precautions

- On a shotgun carriage or buttrigging, use a front choker for tagging logs whenever possible
- Shorten up the tagged choker or shorten the dropline before sending the turn to the landing



- Make sure all workers are in the clear before moving any lines, slacking or going ahead



Tagged logs are difficult to manage and are more susceptible to hang-ups in the brush and impacts at the landing.

IMPORTANT!

Untag logs in a safe area where logs are stable and not likely to move.

Now try the quiz on the next page.

Constantly Look for Hazards within Work Area—Self-Quiz Part 1

1. When chokers are being set, how many radio transmitters are required?

   - ☐ One
   - ☐ Two

2. Do you need to clear hang-ups before choking logs?

   - ☐ Yes
   - ☐ No

3. When working on a slope, and there is doubt about the action of logs in a turn, what signal do you give?

   - ☐ “go ahead slow”
   - ☐ “stop”

4. When working below a landing on steep ground, make sure the loader boom or log in the grapple does not strike which of the following when the rigging crew is setting chokers:

   - ☐ Mainline
   - ☐ Skyline
   - ☐ Running lines
   - ☐ Guylines
   - ☐ Any of the above

5. For windfall trees, consider root wads dangerous. You should approach from which side?

   - ☐ Below root wads
   - ☐ Behind root wads
   - ☐ The upper side

6. When hooking up the turn and logs are layered, which do you hook up first?

- ☐ Those on bottom
- ☐ Those on top

7. On a steep hillside, should you slack the haulback if some of the chokers are already hooked up to light or unstable logs?
   - ☐ Yes
   - ☐ No
8. Strung-out logs are easier to manage and land.
   - ☐ True
   - ☐ False

Now check your answers on the next page.

Constantly Look for Hazards within Work Area—Quiz Answers Part 1

1. When chokers are being set, how many radio transmitters are required?

   Answer: **Two**

2. Do you need to clear hang-ups before choking logs?

   Answer: **Yes**

3. When working on a slope, and there is doubt about the action of logs in a turn, what signal do you give?

   Answer: **“go ahead slow”**

4. When working below a landing on steep ground, make sure the loader boom or log in the grapple does not strike which of the following when the rigging crew is setting chokers?

   Answer: **Any of the above**

5. For windfall trees, consider root wads dangerous. You should approach from which side?

   Answer: **The upper side**

6. When hooking up the turn and logs are layered, which do you hook up first?

   Answer: **Those on top**

7. On a steep hillside, should you slack the haulback if some of the chokers are already hooked up to light or unstable logs?

   Answer: **No**

8. Strung-out logs are easier to manage and land.

   Answer: **False**

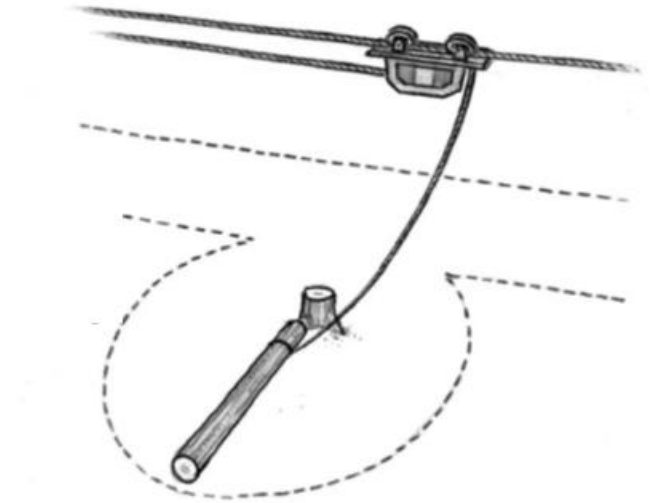
Hazard 10: Swinging and upending logs

Once a turn starts to move, a hang-up can cause a log in the turn to swing or upend, even when the logs are properly choked and there is good deflection in the line. The risk of a swinging log increases when logs are choked with long ends or guthooked, and with a ground lead.

Long ends give a log greater potential to upend or swing violently if it comes in contact with a stump or hang-up. This is most dangerous with long logs or tree-length logs, which have a greater swing radius.

Precautions

- The rigging slinger must ensure the rigging crew is well in the clear and out of the danger area of the longest log yarded before giving the go-ahead signal for the turn
- Always be above and behind the turn in a safe area
- The safest position in the clear is uphill and to the side of the turn and out of the bight of the haulback
- Choke logs with short ends whenever possible
- Get well clear when purposely upending or swinging a log. Do not depend on the log to swing in the expected direction
- Never guthook a log, unless a log end cannot be safely reached. Once pulled free, it is better to reposition the choker on the log before sending the turn to the landing



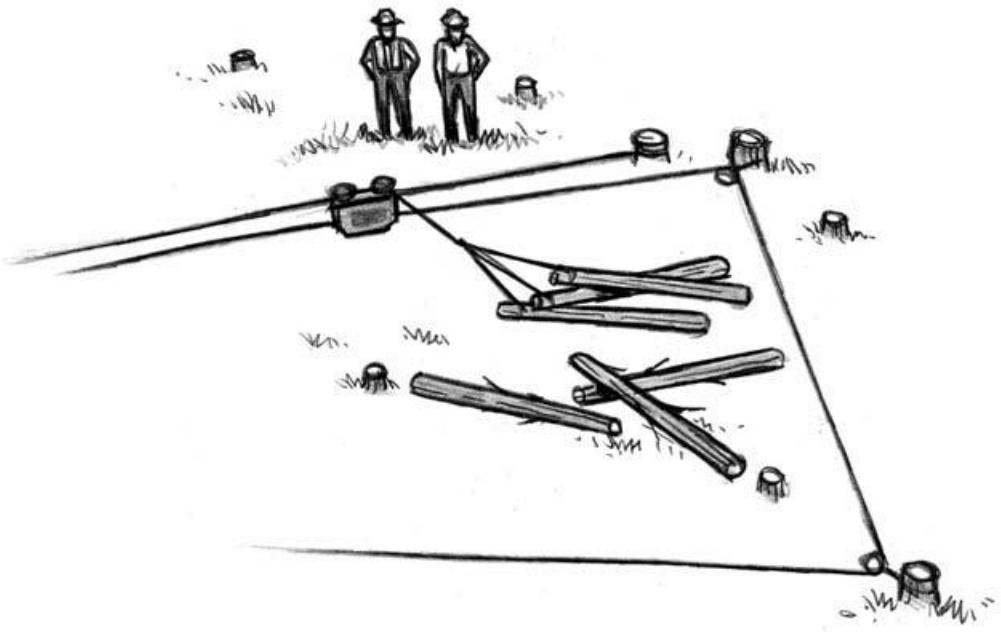
Logs in a turn can swing wildly. Stay well clear

Hazard 11: Positions in the bight of the line

The rigging crew must always get clear before a turn moves. Loggers standing in the bight of the line risk contact with a whipping cable, choked log, or thrown debris. Avoid a layout with a large bight area. A poor layout can make it difficult for the crew to get in the clear or judge where it is clear, especially near the front end.

Precautions

- Locate the backline ahead of the road line whenever possible. This allows the rigging crew to move to a safe area that is out of the felled timber and not in the bight of the line
- Beware of flying debris picked up by the haulback that could be tossed downhill



Corner blocks can create a large bight area. During setup, consider the ability of the rigging crew to get in the clear.

Hazard 12: Unhooking lines off anchors

Releasing a line off a stump anchor is very hazardous due to pressure in the line. Use caution and always stand on the inside of the point of attachment during release, particularly when there is pressure in the line.

Stumps are either, wrapped once and attached with a shackle through an eye, or they are wrapped three times and cable clipped or spiked. With single-wrapped stumps, it may be safe enough to unhook the end of the line and let it run. If the line needs to be held on the hillside, use a rigging chain and a short strap, or use a catch shackle and strap.

With multi-wrapped stumps, it may be necessary to use a rigging chain and use the strawline or come-a-long to pull the pressure out of the line to release the stump. If the pressure is great, use a back wrap to ensure the line is all out in the direction of pull, and use the strawline or come-a-long to lower the line.

Always stand on the inside of the point of attachment when releasing a line from an anchor

Set up the guy-line stump shackle with the pin pushed upwards through the hole. With the shackle and the molly done up on top, the pin can be driven out by a firm, hard hammer strike to the pin on the top side of the shackle. Skyline anchors will use a finger link or a catch shackle for release under tension.

Hazard 13: Choker breaking on turn through felled timber

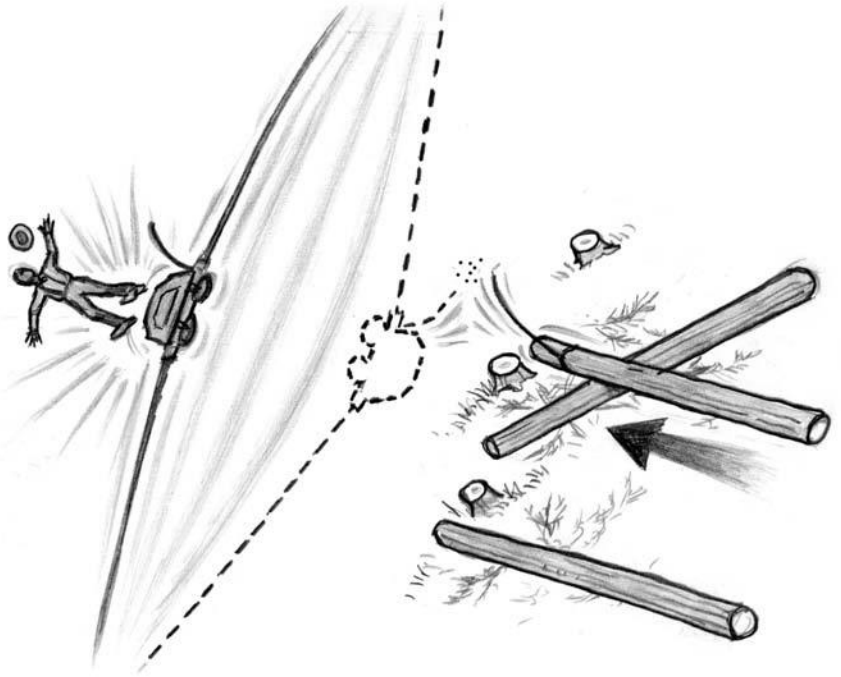
Beware of the increased risk of a choker breaking when yarding across a hill where the turn cannot be held from running through felled and bucked timber. Tight lining the rigging to clear the obstruction increases the danger of rigging flying uphill toward a crew “in the clear” if a choker or other rigging fails.

Precautions

- Make sure the crew position “in the clear” is located above and behind the moving turn, and also beyond the bight of the line, in case rigging fails
- Try to hook up turns light enough to clear felled and bucked timber
- Immediately signal for slack if a choker breaks
- Hook up a bridle to support chokers on large logs

CAUTION!

A bridle can over load the mainline and it could break, caution should be used when bridling big logs, a longer choker is the safest way to choke over-sized wood.



- Always stay clear of the bight of the line, even when behind and above the turn. If a choker breaks as a turn moves, the rigging can snap sideways with great force
- On the first road-line of a setting the crew is in a hazardous position because of the felled and bucked timber is all around them. There is no clear ground yet, and they need to be more aware of the possibility of moving logs and get farther in the clear to be safe

CAUTION!

Avoid heavy turns. Turns that are too heavy or hooked up improperly increase the chance for hang ups. Reefing and heavy pulling strain the rigging and tower, and may result in catastrophic failure. Select turns light enough to yard without reefing.

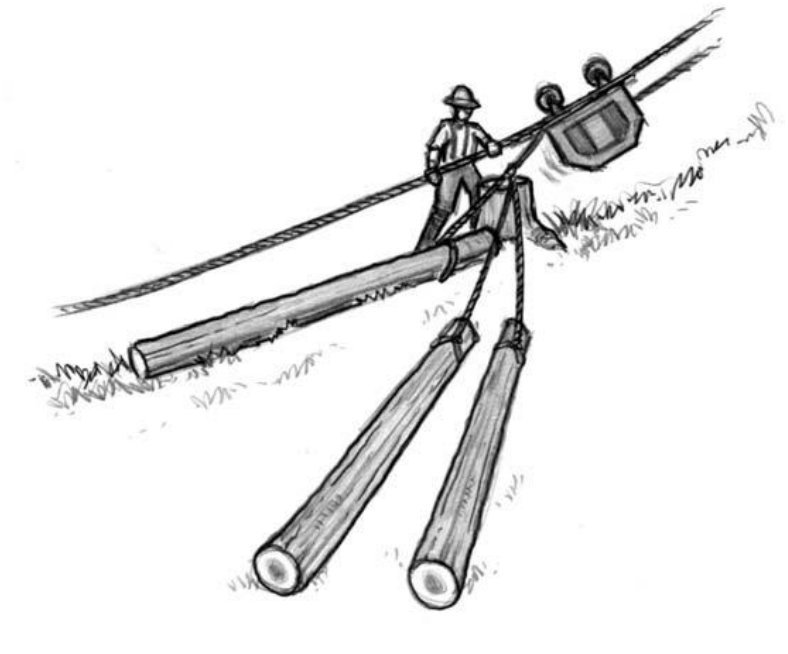
Hazard 14: Fighting hang-ups

Hang-ups are always hazardous. Good planning for the landing, yarding system, road lines, and payload should minimize problems with obstructions. Every hang-up is going to be different. On some it

may work to dislodge the hang-up by repositioning the carriage and pulling in the opposite direction. Others may require unhooking the logs and repositioning the chokers; and others to pull out one log at a time. Avoid letting hang-ups become routine, which may encourage the crew to gradually stand closer to the turn and forget the risk.

Precautions

- On steep hillsides, always approach hang-ups from the upper side
- Never approach from below the turn when yarding uphill if there is a risk of logs shifting or rolling
- Slack the rigging down before entering the area
- Watch for saplings snagged by the turn and bent under pressure
- Watch for loose rocks and other objects moving with the turn, especially on a hillside. Always assume the turn could roll or shift, and avoid getting caught in a pinch point
- Use caution when standing or working under elevated rigging, which could fall unexpectedly
- Ensure communication with the yarder engineer is working properly. A whistle is heard or a whistleman can hear and see the rigging slinger's signals
- Get clear before signaling to go ahead on the rigging. Make sure others are clear, too
- Designate a safe location for workers who must fight repeated hang-ups
- If repeated hang-ups occur, consider options to remove or minimize the problem



Use extra caution when approaching a hang-up

Hang-up hazards

- Rigging under tension may spring or pull loose
- Material disturbed by the hang-up could spring or move unexpectedly, even after the turn is cleared
- Rigging may drop unexpectedly. A log can possibly swing or upend even after the stop signal is given

---

CAUTION!

Always inspect a hang-up closely for hazards!

Hazard 15: Danger trees, loose limbs, and side binds

Remove snags and danger trees in the area before work begins, or arrange work to limit exposure. Stay vigilant as work progresses and report hazards to the hooktender.

Danger trees from farther away can also be hazardous if caught in the path of a tightening line. A side bind line caught on a tree, rock, stump, or debris pile can throw materials a considerable distance, and the bight in the line can spring one direction and rebound opposite if it breaks free. Side binds also rapidly damage a line and can be a fire hazard in dry weather.

Pay close attention to line movement to indicate obstructions. A haulback that saws into a stump, for example, will not move freely and may develop slack in the backline that allows rigging movement even after the yarder stops. If the rigging does not move at once when the haulback is slacked, stay clear, and slowly pick up the slack, then look for a side bind.

There is the possibility of creating danger trees when pulling logs from the timber edge. Rig the turn to minimize the possibility of this happening.

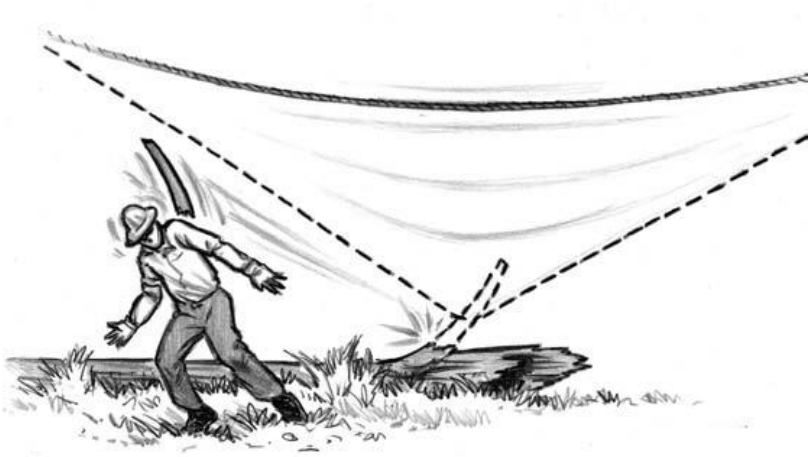
Precautions

- Stay alert for danger trees, snags, and loose limbs in the work area, especially on the back-end boundaries. Report and remove hazards, or attach safety ribbon and stay clear. Loose branches are common and often hard to see
- Always get in the clear of moving lines and keep well out of the bight of the line
- Stay alert for side binds and clear any hang-ups immediately
- String lines as straight as possible and stay above intervening obstacles
- Use extra caution when working with strawlines

Strawline side binds

Strawline hazards are commonly underestimated. The small line is actually more dangerous than other lines because it more easily runs through and catches on obstructions, and more easily breaks free under tension. Strawline can fail and throw pieces. Always stay clear of the strawline just like other moving lines, and watch carefully for side binds.

A line caught on a stump can suddenly break free



A hung-up line can throw a branch or a whole log when tensioned

When changing roads, run the straw-line ahead easy until the haulback eye is clear and through all blocks then go ahead at regular speed to reduce chance of the straw-line breaking if the haulback eye hangs up in a block.

Hazard 16: Walking in felled timber

Walking in felled timber presents several hazards, even on level ground. Logs may be unstable or slick, with bucked sections, or loose bark and falling even a short distance off a small log can result in

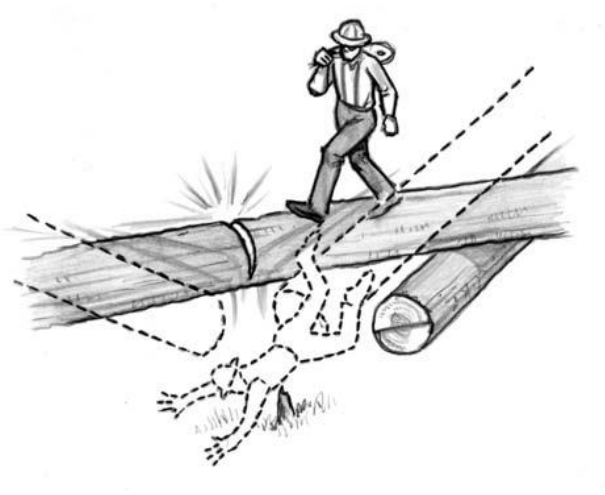
serious injury, due to sharp branches, broken hinge wood on stumps, uneven surfaces, stubs, or other hazards.

In an area of newly felled timber, snags or wildlife trees may have been left, and loose limbs (widow makers) may remain along the cutting line. Root wads bucked short have been known to suddenly sit back upright. Avoid walking under roots and stay alert for other hazards.

Workers need to stretch and limber up before heading out of the pick-up they have been sitting in for the hour-long ride to work. It will prevent injuries if the workers are flexible. Stay “loose” and be ready to drop or throw any objects you are packing if you slip or fall.

Precautions

- Stay alert and cautious while walking. It is not always possible to take action to avoid or eliminate hazards in felled timber, so caution is the best advice
- Look to ensure a log is supported by a stump or other solid object that will prevent rolling
- Wear appropriate caulk boots for walking on felled timber, logs, or boom sticks
- Look for hazard ribbon left by others, and report newly observed hazards to others in the crew. If a log is loose or unstable, consider kicking it free down the hill, particularly if leaving it would pose a hazard to the rigging crew as they work down the hill



Tree bucked up but still hanging

Loose bark can cause a serious fall, particularly when the sap is up

Windfall roots can sit back and crush a worker

Hazard 17: Working in standing timber

Working in a thinning operation in standing timber poses additional risks for the rigging crew not normally encountered in a clear-cut unit. Workers need to contend with risks such as:

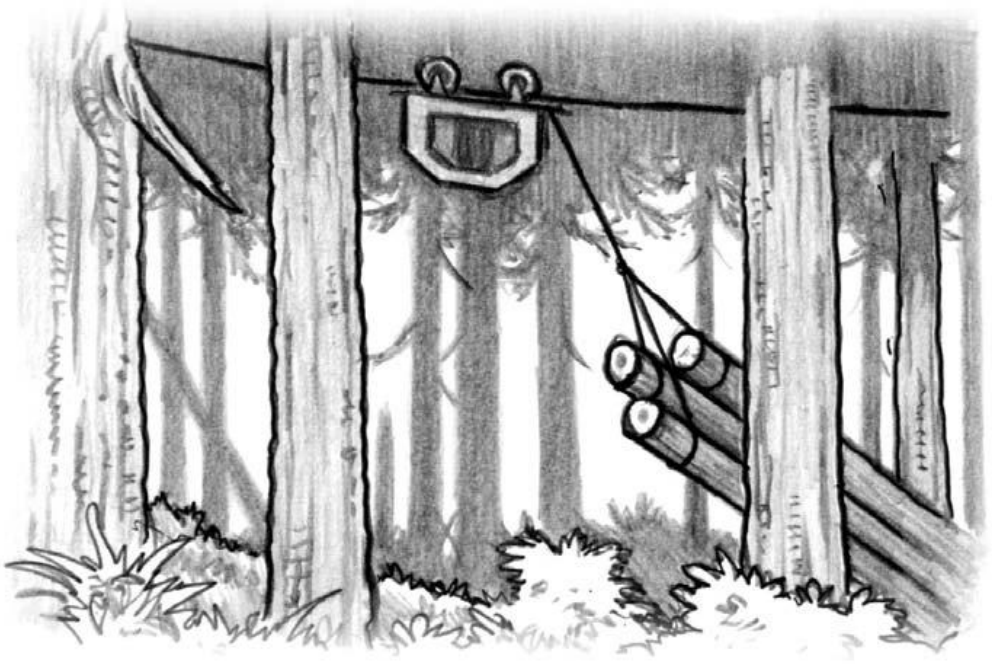
- Leaning and hung trees, limbs, and other overhead hazards
- Spring-loaded limbs and vines
- Logs that are out of lead
- Logs that will not easily turn up the corridor
- Similar obstructions due to surrounding trees left standing

Two of the biggest risks involve intermediate lift trees. Rigged trees can fail and fall in an unexpected direction, or the carriage can jump off of the jack as the carriage is returned to the rigging crew. Make sure the crew stays out of the potential failure zone of rigged support trees during outhaul as well as inhaul.

Trees or logs felled in a thinning operation may lay out of lead, making it necessary to position the carriage with some care to provide the straightest pull-out to the corridor without a hang-up. As the turn is pulled to the corridor, it may be necessary to reposition the carriage again to overcome a potential hang-up. The rigging slinger

needs to stay alert to stop the inhaul of the drop line before a turn becomes hung up.

The way logs are choked can help avoid hang-ups. Consider choking logs farther from the end than normal if it appears the pull will help a log clear a hang-up and enter the corridor before it swings into the direction of pull. Once the log is free, it may be necessary to stop and adjust the choker to the end before sending the turn on to the landing.



Hang-ups and failure of rigged trees are more likely logging in standing timber

Hazard 18: Ground and weather conditions

Poor weather creates hazards in the environment and also affects worker attitudes and energy. Cold and wet workers will be less vigilant and less likely to move far enough into the clear. Make sure workers dress appropriately for the weather to stay warm and dry.

The following points cover common conditions:

Rain

Loose and slick ground produces the most frequent source of injury in slips, trips, and falls. Take extra care walking on slopes, logs, and machinery.

Chokersetters should be alert for new hazards with sliding logs and other materials that appeared stable when dry.

Watch for slide hazards on slopes. Look for signs of loose trees or stumps, and smooth rock surfaces showing. Report suspicious signs at once.

Fog

Work can be carried out safely in fog by organizing additional communication and other precautions. However, on steep ground, work must stop if crews cannot see runaway objects. Wait for vision to improve.

Snow

Yarding in heavy snow is not always safe, practical, or productive. Snow will hide hazards and make it impossible to discern the length of logs or if they have been bucked or not.

Workers must be extremely cautious. Activity is slow and workers are prone to slips and falls. Logs can slide more easily, farther, faster, and quieter on snowy slopes.

Light snow produces hazards for the rigging crew as well. In moderate conditions though, it may remain possible to load trucks on the landing. Use extra caution when getting on and off machines and trucks. Use tire chains when necessary.

Thunderstorms

Lightning does indeed regularly strike poor souls working outside in the rain. Electrical storms are particularly dangerous for loggers. Nearby trees attract lightning; so do long lengths of steel cable, and especially moving cables. The risk is much more real than commonly imagined. Stop working until the storm passes. Stay clear of standing timber, towers, and blocks.

Hot and dry

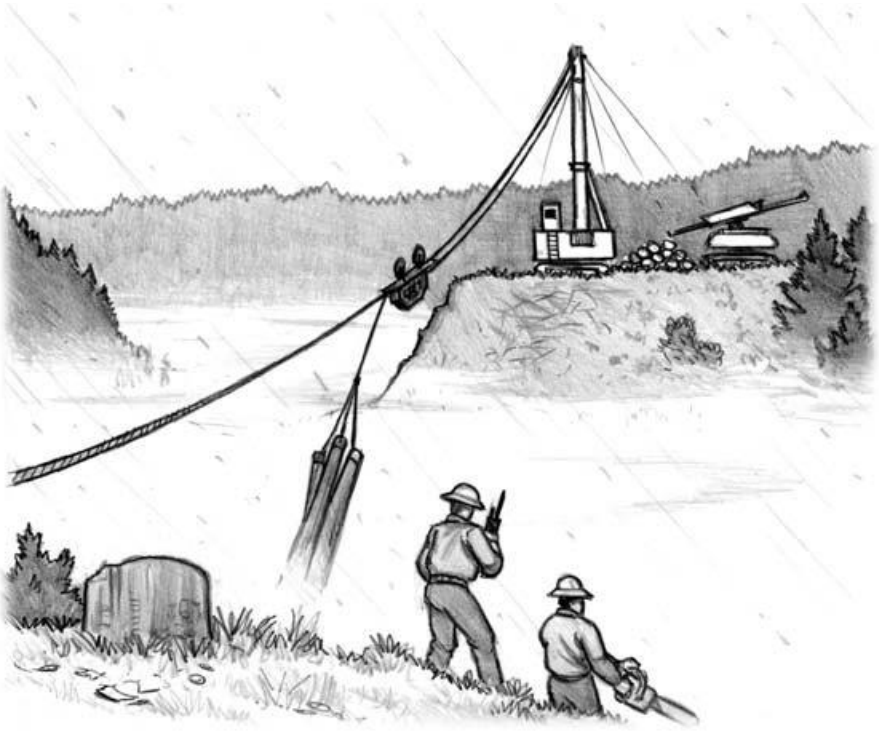
Take extreme care to avoid starting a fire. Apply all recognized fire-prevention procedures.

If a fire does start, follow the employer’s firefighting plan.

Wear adequate clothing to avoid sunburn or sunstroke. Drink plenty of fluids.

Know heat-stress and heat-stroke symptoms. If stress occurs, stop working and find shade. If stress continues, seek first-aid treatment immediately.

Heat also makes workers less vigilant as they get tired and more likely to not walk far enough to get “in the clear.” Workers need to hydrate before work starts or making decisions. Therefore safety is affected by dehydration.



Now try the quiz on the next page.

Constantly Look for Hazards within Work Area—Self-Quiz Part 2

1. Does the risk of a swinging log increase or decrease when logs are choked with long ends or guthooked?

   ☐ Increase

   ☐ Decrease

2. You should avoid a layout with a large bight area.

   ☐ True

   ☐ False

3. When releasing a line off a stump anchor, where should you stand?

   ☐ On the outside of the point of attachment during release

   ☐ On the inside of the point of attachment during release

4. If a choker breaks on a turn through felled timber, what should you do immediately?

   ☐ Signal the foreman

   ☐ Signal for slack

5. On steep hillsides, how should you always approach hang-ups?

   ☐ From the lower side

   ☐ From the upper side

6. What potential hazard does a side bound line caught on a tree, rock, stump, or debris pile present?

   ☐ Can cause trips and falls

   ☐ Can throw materials a considerable distance

7. When walking in felled timber, falling even a short distance off a small log can result in serious injury.

   ☐ True

   ☐ False

8. When working in standing timber, should you choke logs closer or farther from the end than normal to avoid hang-ups, if it appears the pull will help a log clear a hang-up and enter the corridor before it swings into the direction of pull?

   ☐ Closer

   ☐ Farther

9. Under foggy conditions, on steep ground, work can continue even if crews cannot see runaway objects.

   ☐ True

   ☐ False

Now check your answers on the next page.

Constantly Look for Hazards within Work Area—Quiz Answers Part 2

1. Does the risk of a swinging log increase or decrease when logs are choked with long ends or guthooked?

   Answer: **Increase**

2. You should avoid a layout with a large bight area.

   Answer: **True**

3. When releasing a line off a stump anchor, where should you stand?

   Answer: **On the inside of the point of attachment during release**

4. If a choker breaks on a turn through felled timber, what should you do immediately?

   Answer**: Signal for slack**

5. On steep hillsides, how should you always approach hang-ups?

   Answer**: From the upper side**

6. What potential hazard does a side bound line caught on a tree, rock, stump, or debris pile present?

   Answer**: Can throw materials a considerable distance**

7. When walking in felled timber, falling even a short distance off a small log can result in serious injury.

   Answer: **True**

8. When working in standing timber, should you choke logs closer or farther from the end than normal to avoid hang-ups, if it appears the pull will help a log clear a hang-up and enter the corridor before it swings into the direction of pull?

   Answer: **Farther**

9. Under foggy conditions, on steep ground, work can continue even if crews cannot see runaway objects.

   Answer: **False**

Level of first aid and supplies required

Employers are responsible for first aid in the workplace. A first aid assessment needs to be done to determine the first aid needs of your workplace then the findings will be reviewed and necessary steps will be taken to put proper first aid procedures in place.

Steps to first aid assessment

1. Identify the number of workplaces

    - First aid coverage should be based on the total workforce present at each workplace
    - If your assessment determines you have multiple workplaces, you must complete an assessment for each location

2. Identify your workplace hazard rating

    First aid coverage is also determined by your workplace hazard rating. This rating reflects the nature and extent of the risks and hazards in your workplace. WorkSafeBC uses three levels of hazard ratings:
    - Low
    - Moderate
    - High

Note: To assess your workplace's hazard rating, see the Assigned Hazard Rating List.

3. Consider the surface travel time to a hospital

    - The level of first aid service required changes if it would normally take more than 20 minutes to safely transport an injured worker to hospital by road or water

4. Determine the number of workers on a shift

    - Different shifts may have different requirements. Be sure to account for all workers who may require first aid during a shift

5. Determine the required first aid services for your workplace

    - By referring to the OHS Regulation and supporting Guidelines and consulting appropriate WorkSafeBC resources (see Forms and Resources below), you can best determine what first aid kits, facilities, emergency vehicles, and equipment you need

6. Review your assessment

    - Review Steps 1 through 5 within one year of completing your assessment, or when there is a significant change in operations

First aid in the workplace

First aid in the workplace is about providing workers with prompt, easily accessible, and appropriate first aid treatment. Depending on your workplace, some or all of the following might be needed:

- Occupational first aid attendants with the training appropriate for the type of workplace, number of workers, and time to a hospital
- Proper vehicles and facilities, such as Emergency Transport Vehicles (ETVs) or Mobile Treatment Centres (MTCs)
- First aid kits with appropriate types and quantities of supplies
- A record-keeping system so incidents can be logged
- Appropriate means of transporting injured workers to medical aid
- Effective means of communication between first aid attendants and workers served, and for the first aid attendant to call for assistance

An example of a first aid assessment sheet is found in the Resources section of this unit.

First aid assessment worksheet

First aid kits: Recommended minimum items

Personal first aid kit

These items must be kept clean and dry. A weatherproof container is recommended.

Quantity	Item
1	pressure dressing
6	sterile adhesive dressings, assorted sizes, individually packaged
1	wallet-sized instruction card advising the worker to report any injury to the employer for entry in the first aid records, and instructions on how the worker is to call for assistance
6	14 cm x 19 cm wound cleansing towelettes, individually packaged

Basic first aid kit

These items must be kept clean and dry and must be ready to take to the scene of an accident. A weatherproof container is recommended.

Quantity	Item
12	14 cm x 19 cm wound cleansing towelettes, individually packaged
30	hand cleansing towelettes, individually packaged
50	sterile adhesive dressings, assorted sizes, individually packaged
6	10 cm x 10 cm sterile gauze dressings, individually packaged
2	10 cm x 16.5 cm sterile pressure dressings with crepe ties
2	20 cm x 25 cm sterile abdominal dressings, individually packaged
4	cotton triangular bandages, minimum length of base 1.25 m
2	safety pins
1	14 cm stainless steel bandage scissors or universal scissors
1	11.5 cm stainless steel sliver forceps
6	cotton tip applicators
1	2.5 cm x 4.5 m adhesive tape
1	7.5 cm x 4.5 m crepe roller bandage
1	pocket mask with a one-way valve and oxygen inlet
6	pairs of medical gloves (preferably non-latex)

1	instruction card advising workers to report any injury to the employer for entry in the first aid records, and how a worker is to call for assistance

Level 1 First aid kit

These items must be kept clean and dry and must be ready to take to the scene of an accident. A weatherproof container is recommended for all items except the blankets. Blankets should be readily available to the first aid attendant.

Quantity	Item
3	blankets
24	14 cm x 19 cm wound cleaning towelettes, individually packaged
60	hand cleansing towelettes, individually packaged
100	sterile adhesive dressings, assorted sizes, individually packaged
12	10 cm x 10 cm sterile gauze dressings, individually packaged
4	10 cm x 16.5 cm sterile pressure dressings with crepe ties
2	7.5 cm x 4.5 m crepe roller bandages
1	2.5 cm x 4.5 m adhesive tape
4	20 cm x 25 cm sterile abdominal dressings, individually packaged
6	cotton triangular bandages, minimum length of base 1.25 m
4	safety pins
1	14 cm stainless steel bandage scissors or universal scissors
1	11.5 cm stainless steel sliver forceps
12	cotton tip applicators
1	pocket mask with a one-way valve and oxygen inlet
6	pairs of medical gloves (preferably non-latex)
	first aid records and pen

Level 2 First aid kit

These items must be kept clean and dry and must be ready to take to the scene of an accident. A weatherproof container is recommended for all items except the blankets. Blankets should be readily available to the first aid attendant.

Quantity	Item
3	blankets
24	14 cm x 19 cm wound cleaning towelettes, individually packaged
150	sterile adhesive dressings, assorted sizes, individually packaged
12	10 cm x 10 cm sterile gauze dressings, individually packaged
4	10 cm x 16.5 cm sterile pressure dressings with crepe ties
10	20 cm x 25 cm sterile abdominal dressings, individually packaged
12	cotton triangular bandages, minimum length of base 1.25 m
2	2.5 cm x 4.5 m rolls of adhesive tape
2	5 cm x 4.5 m rolls of adhesive tape
6	7.5 cm x 4.5 m crepe roller bandages
1	500 ml sterile 0.9% sodium chloride solution (saline) in unbreakable container
1	60 ml of liquid antibacterial soap in unbreakable container
1	universal scissors
1	11.5 cm stainless steel sliver forceps
1	penlight or flashlight with batteries
1	7.5 cm x 4.5 m esmarch gum rubber bandage
6	pairs of medical gloves (preferably non-latex)
1	Portable oxygen therapy unit consisting of a cylinder (or cylinders) containing compressed oxygen, a pressure regulator, a pressure gauge, a flow meter and a non-rebreathing mask (may be kept in a separate container from the other supplies)
1	oropharyngeal airway kit (may accompany the portable oxygen therapy unit)
1	manually operated self-inflating bag-valve mask unit with an oxygen reservoir (may accompany the portable oxygen therapy unit)
6	patient assessment charts

	first aid records and pen
1	pocket mask with a one-way valve and oxygen inlet

Level 3 First aid kit

The level 3 first aid kit is the same as the level 2 kit except that, in addition, one portable suction unit is recommended.

Now try the quiz on the next page.

Safety for Crew Members when Planning a Block—Self-Quiz

1. First aid coverage should be based on the total workforce present at each workplace.

   ☐ True

   ☐ False

2. The level of first aid service required changes if it would normally take more than 20 minutes to safely transport an injured worker to hospital by road or water.

   ☐ True

   ☐ False

Now check your answers on the next page.

Safety for Crew Members when Planning a Block—Quiz Answers

1. First aid coverage should be based on the total workforce present at each workplace.

   Answer: **True**

2. The level of first aid service required changes if it would normally take more than one hour to safely transport an injured worker to hospital by road or water.

   Answer: **False**