



BASIC FIRE SUPPRESSION SAFETY

PROGRAM INTRODUCTION

Oregon Forest Laws require loggers and landowners to be prepared to control any wildfire threat to our natural resources, and make a reasonable effort to control any fire started through their activity. Wildland firefighting efforts in Oregon are a cooperative effort between landowners, agencies, associations and the logging industry.

Because logging crews make many initial fire suppression attacks, are asked to burn slash and work on project fires, it is important to receive basic fire suppression training. Existing employees need to receive this training (or refresher) between January 1 and the official declaration of each fire season. Employees hired after the start of fire season who have not received this training can fight fire under the direct supervision of a competent person for a maximum of 17 days.

This training program is about safely fighting wildfire. You will become familiar with fire behavior; fire safety; fire suppression activities; fire tools and equipment, and personal protective equipment.

BASIC FIRE BEHAVIOR

How Fire Burns - When the right combination of heat, oxygen and fuel are present, fire can burn on a self-sustaining basis. You can control and suppress fire by removing either the heat, oxygen, or fuel. Basic factors affecting wildland fire are fuel, weather conditions, and land topography. Friction from cables rubbing, tail blocks, sparks from chainsaw exhaust, feller-buncher saws, warming fires, smoking, and vehicle exhaust pipes can ignite a fire just as quickly as a match.

How Fire Spreads - Topography (the lay of the land) influences fire behavior. Fire spreads faster on steeper slopes. The direction slopes face (the aspect) affects how much fuels may dry. For example, south facing slopes receive more daylight sun so fuels are drier and ignite more quickly. Un-ignited fuels above the fire ignite more quickly. A fire burning in a narrow draw or canyon can easily cross. Draws and canyons can cause winds to increase and change direction. As fire season progresses, wind, temperature and lower relative humidity dry fuels causing them to ignite quickly and fires to spread faster. By the nature of the job and where it is located, forest workers have little influence over fuels, weather and topography. They can use good practices and still find themselves in a dangerous fire environment.

SMOLDERING FIRES - Usually occur in ground fuels such as rotten logs, duff, loose needles, and leaves. They will have little or no open flame and the heat given off is usually of low intensity, which does not radiate very far from the fire. A fog spray nozzle setting usually works best. A straight stream may throw burning material outside the fire line.

CREEPING FIRES - may have active flame but are slow moving. These fires have low intensity and do not radiate heat more than a few feet ahead of the flame. They can usually be attacked directly with hand tools, back pumps or water hoses.

RUNNING FIRES - are found in all types of fuels, such as grass, brush and slash when driven by slope or moderate to strong winds. Flames at the head or leading-edge lean in the direction it's moving and may be a couple to 20 feet or more in length. Temperatures on the head and sides near the head are usually too intense for hand crews to make a safe direct attack.

SPOT FIRES - are small fires outside the main fire perimeter. They can occur anywhere along the perimeter. Spot fires occur when burning material called embers are lifted in smoke columns and rolled or blown across the fire lines and ignite unburned fuels. Wind speed and size of the embers determine how far across the fire line a spot fire will occur. Fire whirls (dust devils) can carry burning embers across the line and may occur on any part of the fire. Increasing frequency and number of spot fires are indicators of worsening fire conditions.

CROWN FIRES - are characterized by flames burning and being carried through the crown or tops of brush or trees. This kind of fire should only be initially attacked by competent fire fighters.

TORCHING - occurs when a ground fire ignites a single or clump of trees. Torching trees can occur on any fire and may cause spot fires. Torching should not be confused with crown fires.

BASIC FIRE SAFETY

All fires, including prescribed fires, under the right conditions and circumstances, have the potential for causing you serious injury or take your life. Learn the Watch-out Situations, Fire Orders, Lookouts, Communication, Escape Routes and Safety Zones.

You need to be able to recognize the following **WATCH-OUT SITUATIONS**:

- Fire not scouted and sized up.
- In country not seen in daylight.
- Safety zones and escape routes not identified.
- Unfamiliar with weather and local factors influencing fire behavior.
- Uninformed on strategy, tactics and hazards.
- Instructions and assignments not clear.
- No communication link with crew members/supervisor.
- Constructing fire line without safe anchor point.
- Building fireline downhill with fire below.
- Attempting frontal assault on fire.
- Unburned fuel between you and the fire.
- Cannot see the main fire, not in contact with anyone who can.

- On a hillside where rolling material can ignite fuel below.
- Weather becoming hotter and drier.
- Wind increases and/or changes directions.
- Getting frequent spot fires across line.
- Terrain and fuels make escape to safety zones difficult.
- Taking a nap near the fireline.

When **WATCHOUT SITUATIONS** are identified, the following **FIRE ORDERS** identify the appropriate actions to be taken:

- Keep informed on fire weather conditions and forecast.
- Know what your fire is doing at all times.
- Base all actions on current and expected behavior of the fire.
- Identify escape routes and safety zones, and make them known.
- Post lookouts when there is possible danger.
- Be alert. Keep calm. Think clearly. Act decisively.
- Maintain prompt communications with your forces, your supervisor and adjoining forces.
- Give clear instructions and insure they are understood.
- Maintain control of your forces at all times.
- Fight fire aggressively, having provided for safety first.

One way to remember how to safely fight a wild fire is to follow the simple letters: **LCES**

- **Lookouts** – Are lookouts needed?
- **Communications** – Have positive communication links been established?
- **Escape Routes** – Have escape routes been identified and communicated to everyone?
- **Safety Zones** – Are safety zones needed? If so, have safety zones been established?

NOTE: A safety zone is a designated area of sufficient size and suitable location that is expected to protect fire personnel from known hazards without using fire shelters. They can be an already burned area, previously constructed safety area, a meadow that won't burn, manmade or natural rocky area that is large enough and sufficiently devoid of fuels to take refuge without being burned, etc.

FIRE SUPPRESSION ACTIVITIES

During the Site Plan Pre-Work Safety Meeting crews should discuss site-specific fire suppression activities along with other safety topics. Identify and assign fire suppression activities appropriate for each workers' ability.

- When a crew is on site, they should always understand how to report a fire and identify action that can be taken to safely control the fire. Make sure workers know their job assignments and who should do what.
- When a single person is on site, such as a watchman, they should report the fire, and describe the fire suppression activities they will take. Agree on a check-in system to be used, and identify escape routes to safety zones to ensure the fire will not trap them.

REPORTING FIRES

Report all fires to the local wildland fire agency or 911. Size-up the fire and provide the following information:

- **Location** – Give the specific location such as township, range, section and/or latitude and longitude including driving directions.
- **Size of the fire** – How many acres is the fire? Or is it the size of a frying pan, pickup, or football field?
- **Topography** – Is the fire mid-slope, in the draw, or the top of ridge?
- **Fuels** – What is burning? Grass, slash, trees, or equipment?
- **Fire Behavior** – Is the fire moving fast? Is it spotting ahead? What is the fire doing?
- **Weather** – What is the speed and direction of the wind?
- **Landowner and/or operator name** – Give the landowner or operator name.

ENGINE PLACEMENT

When sizing up where to place engines (fire trucks), keep the following in mind:

- Don't completely block a road.
- Park the engine where it is protected from the spread of fire.
- Park the engine facing out. The engine may be the fastest means of escaping a fire.

USING WATER

The proper use of water to control wildfires is essential. When using water:

- Get in close to what you are spraying, using a fog pattern.
- Get on the perimeter and work your way in from the bottom to the top.
- Spray parallel and/or into the base of the fire flames.
- Don't push embers into unburned fuel.
- Don't bring the hose lay directly down the hill toward the fire. Bring it in from the sides.
- Don't charge the hose until it is pulled into place and the nozzles are open.
- Keep the hose lay as straight as possible.
- Try to work two people to a nozzle, one to spray and one to turn material over.
- Water is a limited resource that needs to be used conservatively.
- Have a plan for when you run out of water.

FIRE TRAILING

- All fires must be trailed.
- Fire trails or fire lines should be one and a half times wider than the flame length or the fuel that will burn.

BEST PRACTICES

- The initial attack trail should be enough to hold the fire until the trail can be improved.
- The head of the fire and any dogleg will need a wider trail than cooler parts of the fire.
- Trails built on slopes under the fire need to be cup trenched, and able to catch rolling or burning material.
- Keep the trail as tight to the burned off or black area and as straight as possible, preferably working with one foot in the black.
- Be aware of unburned fuel or jackpots between the fire and the trail.
- Be aware of stumps and snags, they can ball or blow embers across the trail.
- Put the berm to the outside of the trail.
- Dirt can be used to knock down flames but anything that is buried must be uncovered to be extinguished.
- Build the trail down to mineral soil and cut out roots.
- Once the trail is built it must be patrolled because often it is your escape route out. You don't want to rebuild the trail, and you don't want fire to hook around behind leaving you no way out.

AIRCRAFT AND RETARDANT DROPS

Aircraft effectively assist ground personnel to control wildfires. Water, foam, and retardant are delivered to fires by helicopters, and single or multi-engine aircraft. When aircraft work a fire, be aware of their drop zones.

When an aerial drop is to occur in your work area:

- Do not stand under or in the path of the drop.
- Move to a safe location away from the drop zone.
- Stay clear of snags, dead tops and limbs in the drop area.
- Do not remain in the area if there are rocks or other materials that may be dislodged by the drop.
- Be cautious of low aircraft drop heights because rocks, dirt, brush, logs, fire tools, portable pumps can be moved during a drop. Wind generated from the aircraft itself can cause the fire to burn with increase intensity along the drop zone.

If you cannot move in the clear during a drop:

- Never run unless escape is ensured.
- Lie face down, with you head toward the oncoming aircraft with hard hat in place.
- Discard hand tools to the side. Put them behind you and downhill, but not in the path of someone else.

- Grasp something firm to prevent being carried or rolled about by the potential impact of the dropped liquid.

After a retardant drop is complete:

- Wipe retardant off tool handles before resuming work.
- Watch your footing. Wet retardant is slick.
- If retardant is dropped across a highway, slow down traffic or wash retardant off the road surface.
- Be alert for snags, tree tops or the possibility of other falling debris knocked loose by the drop.
- Return to your work area and take advantage of the water or retardant.

TOOLS, EQUIPMENT, VEHICLES AND MACHINES

Do not use tools, equipment, vehicles or machines designated for fire, for any other purpose.

Vehicles:

- Only allow trained and qualified workers can operate equipment and vehicles.
- The agency having jurisdiction will determine the number and type of tools and equipment to be used on the fire.
 - Do not transport loose tools in vehicle passenger compartments.

Machines:

- Only allow trained and qualified workers can operate machines.
- Keep machines designated for fire suppression in good conditions.
- Immediately remove any defective machine from service.

Before assigning an operator to construct a fire trail or fight a fire on steep slopes, discuss with the operator the:

- Limitations of the machine.
- Soil conditions.
- Direction of travel (traveling straight up and down the slope).
- The hazards of turning the machine on the slope.

When constructing fire trail, or fighting fire on steep slopes, take precautions to provide machine stability by:

- Using the blade.
- Tying to stumps, anchors, or other machines.
- Using materials to limit the slope under the machine.
- Limiting the machine range of movement and/or the machine loading.

Personal Protective Equipment (PPE)

After the initial attack employees involved in fire suppression activities, are required to wear the following protective clothing when fighting a fire:

- Pants and a long-sleeved shirt.
- Leather lace-up boots or other suitable footwear with a minimum 8-inch top height. The sole and heel of the boot must be of slip resistant material.
- Hand protection or at least cotton gloves.
- An approved hard hat, which must be of a bright contrasting color.
- Leg, eye, and hearing protection if operating a power chain saw.

Don't wear synthetic clothing when you may be called upon or are fighting fire.

If additional specialized protective clothing or equipment is required such as fire-resistant clothing or fire shelters, it will be provided at no cost, and personnel will be instructed in its proper use.

Emergency Burn Treatment

First degree burns are characterized by redness of the skin, second degree burns by blistering, and third degree by destruction of underlying tissue.

- Burns should not be treated with butter, Vaseline or ointments.
- Minor burns that do not cover a large area of the body should be immersed in water to relieve the pain.
- Major burns or burns that cover large areas of the body are serious. Treat the victim for shock, and bandage the burn with many layers of dry sterile gauze or any other clean, dry material. Do not treat the burn itself with any salves or ointments. Get professional medical help as soon as possible.

SUMMARY

Remember:

- Make sure a communication system is established and everybody understands the check-in system.
- Evaluate your surroundings and situations at all times on all fires.
- Start your attack at the lowest coolest part of the fire and build line along the flanks or sides working toward the head or top of the fire.
- Never attack a fire without establishing escape routes, evaluating the need and establishing safety zones, and start from a safe anchor point.
- Usually a direct attack should only be attempted on the coolest part of the fire.
- Control action should move from the coolest part around both flanks toward the head.
- Burning material can roll down steep slopes and cross the fire line. The fire trail on the downhill side of a fire should be trenched or cupped to catch this rolling material.

- Lookouts and/or patrols with communications to personnel on the main fire should be posted any time spotting is occurring.
- After a fire, things that were stable will move with ease (watch falling/rolling material).
- Escape routes usually need to go side hill or down and out away from the fire
- Don't try to out run the fire up the hill (smoke and heat will get to you first)
- Fires move fastest where people move slowest (in brush and uphill).
- In lighter fuels the best safety zone is usually in the black or burnt area. If you need to escape from harm's way, leave your equipment, you can start over. Without you, it is tough to start up again.
- If a fire starts from any cause on the active logging operation while the logging is actually being done and includes the watchman service time, the logger is required to make every reasonable effort to extinguish the fire. This is a requirement of law and failure to comply may make the logging contractor responsible for all fire cost.

IF A FIRE DOES OCCUR, THE FIRE FIGHTING AGENCY MUST BE CALLED IMMEDIATELY. (If you get the fire out, you are still required to report it).

FIRE SEASON

After the FIRE SEASON is declared, a series of requirements go into effect:

- No fires are permitted without a burning permit.
- The flammable debris around blocks must be cleared for a 20-foot circle around the block.
- Logging operations must operate under the Industrial Fire Precaution Levels program. These levels range from Level 1 which allows logging without restriction on time of day of shut down or type of logging being done. The most restrictive level is Level 4 which stops all logging unless specifically allowed for on a case-by-case basis. The Fire Precaution Level for the day is generally displayed at forestry offices such as Ranger Stations.
- Certain types of logging equipment must be equipped with an approved spark arrestor and all logging equipment should be maintained in such a way as to minimize it starting a fire.
- Power saws must be equipped with an approved spark arrestor and must be used with the attachments that came with them such as chain brakes and dogs. Power saws must be

moved at least 20 feet from the point of fueling before starting and the operator of the saw must have a shovel and an approved fire extinguisher with them.

- Cable logging operation layouts must avoid cable rub which could result in spark or combustion.
- A watchman is required to be on the logging site for three hours after the equipment is shut down. That amount of time is to be designated in writing by the firefighting agency. The watchman must be able to radio for help and must observe the area where logging took place that day.

REMEMBER...

THE BEST FIRE IS ONE THAT NEVER STARTS!