



Southern Rural Fire Authority

Best Practice Guidelines For Fire Mitigation in Forest Operations

September 2016

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1.1 Introduction

The Southern Rural Fire Authority (SRFA) was formed in late 2003 bringing together the rural fire management responsibilities of Southland District Council (SDC), Gore District Council (GDC), Invercargill City Council (ICC), Department of Conservation (DoC) and Southern Plantations Rural Fire District (SPRFD) which was a previous amalgamation of forest company fire management responsibilities. At the time of amalgamation policies and procedures that had previously been utilised to great effect by SPRFD was carried over into SRFA.

In 2013 these procedures were reviewed to create the first version of the SRFA Best Practice Guidelines for Fire Mitigation in Forest Operations. The 2013 guidelines have been reviewed in 2014 and 2016, replaced by Version 3.0 following feedback from the forest industry.

SRFA in partnership with other RFA's and advice from New Zealand rural fire researchers developed a website in 2013 to easily disseminate fire danger levels which are updated hourly to the public using weather data from its weather stations located throughout the district. These fire danger levels are based on the predominant fuel type for each geographic zone and are a change from previously utilising the fire weather index. This approach will result in a more consistent level of fire restrictions in line with what could be expected with an ignition. The noon reading (1300 hours during daylight savings) should be used as the daily fire danger level unless the fire danger significantly increases. The zone colour equates to the fire danger level and standing instructions outlined in pages 5-9.

Forest owners and/or managers need to familiarise themselves with the website; www.ruralfiredanger.co.nz, to ensure the correct fire danger levels are being implemented for their worksites.

The specifications set out within this document are deemed to be minimum requirements for commercial forests within SRFA.

Should a forest owner or contractor adopt more stringent requirements for their work site, this is fully supported by SRFA.

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Section 2 - Work Site Fire Response Capabilities

2.1 Silvicultural Operations

The following fire fighting equipment is recommended for silvicultural operations within commercial forests:

Light vehicles:

- 1 x 1 kg ABE fire extinguisher.
- Cell-phone and/or radio communications with forest company channels.
- 1 x shovel.
- Vehicle fitted with spark arrestor on exhaust for non turbo vehicles.

Heavy vehicles:

- 1 x 2 kg ABE fire extinguisher.
- 1 x shovel assigned to vehicle.
- Cell-phone and/or radio communications with forest company channels.
- Vehicle fitted with spark arrestor on exhaust for non turbo vehicles.

Crew bus:

- 1 x 2 kg ABE fire extinguisher.
- 2 x shovels assigned to vehicle.
- Cell-phone and/or radio communications with forest company channels.
- Vehicle fitted with spark arrestor on exhaust for non turbo vehicles.

Thinning crew (additional to vehicle requirements):

- Shovels - minimum one per two persons.
- 2 x Rega knapsack sprayers designed for fire fighting (kept full).
- 1 x 300 g dry powder fire extinguisher per chainsaw operator.

Planting, Pruning and other non mechanised silviculture operations (additional to vehicle requirements):

- Shovels - minimum one per two persons (mandatory during fire season).
- 2 x Rega knapsack sprayers (kept full) designed for fire fighting (mandatory during fire season).

Note: Please view Appendices for further information relating to fire extinguisher types.

2.2 Logging Operations

The following fire fighting equipment is recommended for logging operations within commercial forests:

Light vehicles:

- 1 x 1 kg ABE fire extinguisher.
- Cell-phone and/or radio communications with forest company channels.
- 1 x shovel.
- Vehicle fitted with spark arrestor on exhaust for non turbo vehicles.

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Heavy vehicles:

- 1 x 2 kg ABE fire extinguisher.
- 1 x shovel assigned to vehicle.
- Cell-phone and/or radio communications with forest company channels.
- Vehicle fitted with spark arrestor on exhaust for non turbo vehicles.

Crew bus:

- 1 x 2 kg ABE fire extinguisher.
- 2 x shovels assigned to vehicle.
- Cell-phone and/or radio communications with forest company channels.
- Vehicle fitted with spark arrestor on exhaust for non turbo vehicles.

Heavy machinery:

- 1 x 9 kg ABE fire extinguisher located on each machine.

Note: Machines should be regularly cleaned and checked to prevent debris build up within machine likely to cause ignition. Where space is an issue on machinery a 9 kg extinguisher could be substituted with two 4.5 kg ABE extinguishers. Note: Where machinery is fitted with internal fire suppression systems or carries a capacity of water greater than 100 litres plus water additive, with the ability to pump through a hose (such as systems fitted to the blade on some skidder models) will only require one 4.5 kg ABE extinguisher.

Vehicle towing flammable liquids:

- 1 x 9 kg foam or Class B fire extinguisher available on the towing vehicle as detailed in "Approved Code of Practice for Safety and Health in Forest Operations", Section 9.5.1.

Fire equipment to be kept at skid site:

- Shovels - minimum one per two persons.
- 2 x Rega knapsack sprayers designed for fire fighting (kept full).
- 180 litres of water kept on-site for fire fighting.

Tree fallers/chainsaw operators (additional to vehicle and skid site requirements):

- 1 x 300 g dry powder fire extinguisher per chainsaw operator to be kept on person at all times

Note: Please view Appendices for further information relating to fire extinguisher types.

2.3 Forest Managers

The following fire fighting equipment is required for Forest Managers working within commercial forests:

Light vehicles:

- 1 x 1 kg ABE fire extinguisher.
- Cell-phone and/or radio communications with forest company channels.
- Where Forest Manager is involved as a SRFA representative they shall carry their SRFA issued PPE at all times during fire season.
- 1 x shovel.
- Vehicle fitted with spark arrestor on exhaust for non turbo vehicles.

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Where the Forest Manager is involved with other forestry operations the minimum fire equipment requirements specified in 2.1 and/or 2.2 shall also apply.

2.4 Fire Training Requirements

Employers and principals of forest workers have a legal requirement under Health and Safety legislation to ensure all employees are adequately trained for the tasks expected of them as well as equipment they will be required to operate as part of their employment. This means workers will require a minimum level of fire training applicable to their normal type of work site.

SRFA requires the following unit standard based training for forestry workers: (Note forestry work includes land preparation, establishment, silviculture, transportation and harvesting)

Mandatory unit standards:

Unit Standard	Title
17769	Demonstrate knowledge of general health, safety and environment requirements in forestry (Forestry General Requirements)

Recommended minimum requirement unit standards for forest workers beyond mandatory (for those involved with fire control activities with Southern Rural Fire Authority):

Unit Standard	Title
3285	Demonstrate knowledge of protection of personal safety at vegetation fires
3286	Control vegetation fire using dry fire fighting techniques
3287	Suppress vegetation fire with water and water additives
21417	Operate light portable pumps in a vegetation environment
3271	Suppress fire with hand extinguishers and fixed hose reels

Note: Or equivalent training for fire extinguisher use.

Forest workers/managers who are involved with SRFA for fire control activities will receive training from SRFA relating to these activities which may include higher level training above the requirements listed above. Those contractors/forest workers who are not engaged by SRFA as an on-call fire fighting resource will need to work with a training provider to undertake the fire training listed above.

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Section 3 - Fire Danger Levels and Standing Instructions

3.1 Level One - Strictly enforced during period of restricted fire season

Level 1: Code Green

Low Fire Danger
for geographic climate zone as shown at
www.ruralfiredanger.co.nz

Undertake Maintenance Checks and Notification Procedures

Instructions for all personnel to follow:

1. Physical Checks and Sign Off
 - Daily physical inspection of all hauler blocks, ropes and surrounding areas for clearance from slash, binding and fire hazards.
 - Weekly physical inspection of all fire equipment (including fire extinguishers).
2. Maintenance and Cleaning
 - Chainsaws - keep high standard of maintenance, as detailed in “*Approved Code of Practice for Safety and Health in Forest Operations*”, Section 4.2.
 - Machinery - Keep high standard of cleanliness, as detailed in “*Approved Code of Practice for Safety and Health in Forest Operations*”, Section 6.5.
3. Notification
 - Report any fire no matter of size through 111 system.
 - SRFA duty officer to notify forest owner of any fire no matter the size.
 - Notify Forest Manager of any welding, grinding (hot work). A fire permit will only be required during a restricted fire season across SRFA district.
 - The fire danger level recorded at noon (1300 hours during daylight savings) each day will be the level used for restrictions for duration of the day unless specified otherwise by the Forest Company or Southern Rural Fire Authority staff where the fire danger level has significantly changed from the noon reading.
 - Daily fire danger levels can be easily located at:
www.ruralfiredanger.co.nz.
 - Forest owners and managers are encouraged to use EcoConnect (NIWA) for fire weather and fire danger predictions. Contact SRFA to enable log in access.

At any time if the fire danger increases to moderate, implement 'Level 2 - Code Blue'

Level 1: Code Green

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3.2 Level Two - Strictly enforced during period of restricted fire season

Level 2: Code Blue

Moderate Fire Danger
for geographic climate zone as shown at
www.ruralfiredanger.co.nz

Introduce Emergency Plans and Increase Maintenance Checking

Instructions for all personnel to follow:

1. Physical Checks and Sign Off
 - As detailed in Level 1 - Code Green' above
 - Crew vehicles and service agency vehicles: All vehicles in forest to be checked by contractor for required fire equipment.
2. Maintenance and Cleaning
 - As detailed in Level 1 - Code Green' above
3. Notification
 - Report any fire no matter the size through 111 system.
 - SRFA duty officer to notify forest owner (or manager) of any fire no matter the size.
 - All staff and contractors shall be advised of increasing level of fire danger.
 - All SRFA forestry duty officers to be contactable on pager within five minutes (where applicable).
4. Review
 - Review forest mowing operations where applicable with consideration to degree of grass curing and seasonal drying conditions.

At any time, if the fire danger increases to high, implement 'Level 3 - Code Yellow'

Level 2: Code Blue

3.3 Level Three - Strictly enforced during period of restricted fire season

Level 3: Code Yellow

High Fire Danger
for geographic climate zone as shown at
www.ruralfiredanger.co.nz

Introduce Work Restrictions on Forest Operations

Instructions for all personnel to follow:

1. Physical Checks and Sign Off As per 'Level 2 - Code Blue' above.
2. Maintenance and Cleaning As per 'Level 2 - Code Blue' above.
3. Emergency Planning As per 'Level 2 - Code Blue' above, **PLUS:**
 - Water points Identify and inspect two nearest reliable water points.
 - Escape routes Establish two escape routes from the forest. All crew members to participate.
 - Emergency communications All vehicles to have a reliable form of emergency communication.
 - Refuelling sites Shovel and knapsack sprayers on each site. Crew to continually scan work site for visible signs of likely fire starts.
4. Work Restrictions
 - Smoking Smoking restricted to roads and cleared fire breaks within forests and vehicles.
 - Fire Patrol One person for each operational site to remain for 30 minutes after operations cease and completes site inspection before leaving.
 - Review activities Review work activities that may create an ignition hazard as detailed in "Approved Code of Practice for Safety and Health in Forest Operations", Section 2.8.
5. Notification As per 'Level 2 - Code Blue' above, **PLUS:**

Forest Manager to notify those working in their forests current daily fire danger level.

All staff and contractors shall be advised of increasing level of fire danger

At any time, if the fire danger increases to very high, implement 'Level 4 - Code Orange'

Level 3: Code Yellow

3.4 Level Four - Strictly enforced during period of restricted fire season

Level 4: Code Orange

**Very High Fire Danger
for geographic climate zone as shown at
www.ruralfiredanger.co.nz**

Introduce Work Restrictions on Forest Operations

Instructions for all personnel to follow:

1. Physical Checks and Sign Off As per 'Level 3 - Code Yellow' above.
2. Maintenance and Cleaning As per 'Level 3 - Code Yellow' above.
3. Emergency Planning As per 'Level 3 - Code Yellow' above, **PLUS:**
 - Silvicultural crews Have hand held communications with them at all times.
 - Harvesting crews **DAILY** checks of all requirements recorded in diaries. Site risk rating. Preparedness, attack and evacuation plan to be established.
 - Refuelling sites Shovel and fire extinguishers on each site. Crew to continually scan work site for visible signs of likely fire starts.
 - Back blocks Inspect and cleaned around after each shift.
4. Work Restrictions
 - Smoking Smoking restricted to inside of crew vehicle only.
 - Roadside mowing Forest Manager to evaluate potential risk from ignition as detailed in "*Approved Code of Practice for Safety and Health in Forest Operations*", Section 2.8.
 - Thinning to waste Forest Manager to evaluate potential risk from ignition as detailed in "*Approved Code of Practice for Safety and Health in Forest Operations*", Section 2.8.
 - F-breaking and s-raking Forest Manager to evaluate potential risk from ignition as detailed in "*Approved Code of Practice for Safety and Health in Forest Operations*", Section 2.8.
 - Fire Patrol One person for each operational site to remain for 30 minutes after operations cease and completes site inspection before leaving.
5. Extended Hours Only by agreement with Forest Manager.
6. Notification As per 'Level 3 - Code Yellow' above.

At any time, if the fire danger increases to extreme, implement 'Level 5 - Code Red'

Level 4: Code Orange

3.5 Level Five - Strictly enforced during period of restricted fire season

Level 5: Code Red

Extreme Fire Danger
for geographic climate zone as shown at
www.ruralfiredanger.co.nz

Introduce Work Restrictions and Fire Response Contingency Plans

Instructions for all personnel to follow:

1. Physical Checks and Sign Off As per 'Level 4 - Code Orange' above.
2. Maintenance and Cleaning As per 'Level 4 - Code Orange' above.
3. Work Restrictions As per 'Level 4 - Code Orange' above, **PLUS:**
 - Smoking All smoking within forest banned.

STOP ALL WORK AT 1400 HOURS

- Harvesting operations Recommend all chainsaw and extraction to **STOP 1400 hours**. Recommend all processing **STOP 1400 hours**.
 - All forest operations **STOP 1400 hours**.
4. Extended Hours To be determined by Forest Manager following evaluation of the risk in consultation with the Principal Rural Fire Officer, Deputy Principal Rural Fire Officer or SRFA duty officer. The decision to continue operating must be made with consideration to "*Approved Code of Practice for Safety and Health in Forest Operations*", Section 2.8.2
 5. Emergency Planning As per 'Level 4 - Code Orange' above

ALL OPERATIONS ARE TO STOP IF:

**OPERATIONS REQUESTED TO CEASE IMMEDIATELY BY SOUTHERN RURAL FIRE
AUTHORITY UNDER SECTION 21.(1)(a) FOREST AND RURAL FIRES ACT 1977
(Prohibition of certain operations during periods of extreme fire hazard)**

Level 5: Code Red

Section 5



Section 4 - Fire Permits

4.1 Welding/Grinding Operations in Forests

Welding and grinding operations in forest areas require a fire permit issued by a SRFA Rural Fire Officer during a restricted fire season across the SRFA district. This is due to welding and grinding being deemed to be a fire in the open air as defined by the Forest and Rural Fires Act 1977.

During an open fire season across the SRFA district, welding operations may take place without a fire permit, however approval from the forest owner/manager should be sought and applicable safety precautions put in place. These include:

- Maintain an area free of any combustible material at a 5 metre radius around the site.
- Dampen down area prior to welding.
- Weld on a skid site only.
- Have 1 x 9 kg ABE fire extinguisher immediately available at the welding site.
- Check site on completion of welding.
- Permission of forest owner or manager to undertake the welding.

Note: Where a 9 kg ABE fire is not available, 2 x 4.5 kg fire extinguishers must be immediately available at the welding site

Fire permits can be obtained from SRFA by contacting 0800 773 363. Alternatively a small number of Rural Fire Officers from forest companies have been appropriately trained and warranted for issuing fire permits for welding and grinding **within their own forests**. These are:

- Ernslaw One.
- Rayonier.
- Southwood Export.

All SRFA fire permits will be issued pursuant to SRFA Policy and Procedures for Issue of Fire Permits.



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Section 5 - Appendices

5.1 Fire Extinguisher Types

5.1(a) Foam



Foam fire extinguishers are marked with a blue band.

Foam fire extinguishers work by covering a burning flammable liquid with a blanket of foam, cutting off the fire's air supply and preventing the release of flammable vapours.

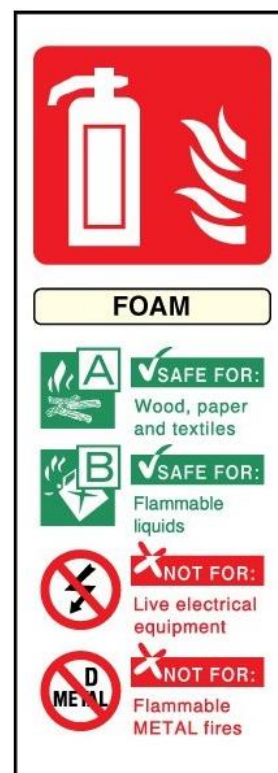
Foam options are available in a 9.1 litre and a 4.5 litre spray foam size.

Foam Fire Extinguishers are suitable for the following types of fires:

Class A - Paper, textiles, wood, most plastics and rubber.

Class B - Flammable liquids.

This product should not be used on electrical fires (Class E).



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5.1(b) ABE extinguishers.



The Powder Fire Extinguisher ABE, distinguished by a white coloured band around the top of the cylinder, is the most widely used type of fire extinguisher suited for fires occurring in the house, boat, garage, car or caravan.

They discharge a fine powder that absorbs fuel molecules, depriving the fire of a fuel source.

Powder Fire Extinguishers are available in a range of sizes for domestic and industrial situations including 2.1 kg, 2.7 kg, 4.5 kg and 9.0 kg models. The ABE range also offers a 4.5 kg high performance fire extinguisher.

Powder Fire Extinguishers ABE are suitable for the following types of fire:

- Class A** - Paper, textiles, wood, most plastics and rubber
- Class B** - Flammable liquids
- Class C** - Combustible gases
- Class E** - Electrically energised equipment

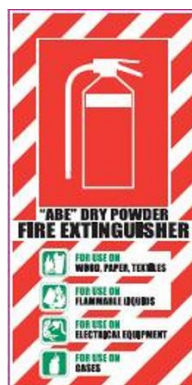


0.3 kg ABE fire extinguisher

Powder Fire Extinguishers ABE are suitable for the following types of fire:

- Class A** - Paper, textiles, wood, most plastics and rubber
- Class B** - Flammable liquids
- Class C** - Combustible gases
- Class E** - Electrically energised equipment

Worn on belt of chainsaw operators to extinguish small fires when they first occur



5.2 Knapsack Sprayers

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5.2(a) Rega knapsack sprayers.



16 and 20 litre versions available

This very high quality Rega fire fighting knapsack is an ideal alternative to an air/ water fire extinguisher. It is designed to extinguish small low intensity fires such as spot fires in a bush fire situation.

The knapsack has a large water capacity, variable jet/fan nozzle, bi directional pump action and excellent range. It can deliver 1.2lt per minute and is designed to be a comfortable fit utilising two adjustable shoulder straps.



Example of Rega vehicle mounting bracket

This Rega knapsack steel vehicle bracket is designed to hold your Rega knapsack securely when in transit. The Rega knapsack bracket features multiple supports, an adjustable retaining strap and quick release catch.

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5.2(b) Flexible knapsack sprayers.

There are a number of flexible/collapsible knapsack sprayers specifically designed for fire fighting on the market. The most prominent in New Zealand utilised by various rural fire authorities is the Scotty knapsack sprayer which has additional optional capabilities including foam mixing units, cover bags etc.



While well suited for rural fire authorities there is an increased level of maintenance required above that required of the Rega and other rigid knapsack sprayers. Care needs to be taken with these units that the cap is not cross threaded or the bladder tank does not become punctured when in storage.

5.2(c) Solo knapsack sprayers.

There are a number of Solo type knapsack sprayers which could be utilised in fire fighting. These units would need to be a minimum of 15 litres capacity and must have a straight tip on the end of the spray wand (i.e. is not a weed spray tip).



Section 3

5.3 Geographic Climate Zones

5.3 Geographic climate zone map for Southern RFA.



Note: The fire danger level for each geographic climate zone will be based on the predominant fuel type being either forest fire danger class or grassland fire danger class.

Section 3



5.4 Document Control

The table below lists the version history of this document.

Version	Date	Author	Reviewed by	Notes
Version 1	December 2013	Elton Smith	Rayonier, Southwood Export, Ernslaw One, Southern RFA Committee	First edition
Version 2	October 2014	Elton Smith	Southern RFA Policy Subcommittee	Revised
Version 3	September 2016	Elton Smith	Southern RFA Policy Subcommittee	Revised

5.5 Review

These guidelines will be reviewed every two years. Amendments may also be made in the interim, where there have been substantive developments in the NZFDRS or forest management practices that might impact trigger levels and preparedness levels.