



NATIONAL RURAL  
**FIRE**  
AUTHORITY  
*Te mana ahi māwhā o te motu*

*Fire Management  
Guidelines  
for  
Small Forests*





## Notes

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*Paul N. Baker, Napier. January 2003.*

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**Cover page.** *Mature stand of Douglas Fir, Rotorua District.*

Once you have provided this information, you may wish to:

1. Advise your neighbours if they are likely to be affected.
2. Mark access routes for incoming fire vehicles, if this is necessary, through whichever gate is closest and safest. (Use bright coloured Spray Can paint writing the word 'Fire' with an arrow pointing in the direction of the access gate.)
3. Mark suitable water supplies and access to these in the same method as in 2.
4. If using helicopters, identify any aerial hazards, and mark or eliminate these. Fell trees on the 'entrance / exit flight path' – if on your property. Identify wires strung across gullies etc. Establish helicopter water points upwind of the fire, and certainly away from dense smoke or ember fall outs.
5. Move livestock that may be affected by fire or smoke.

A sample 'Fire Response Schedule' appears as Appendix I on the NRFA web page under 'Publications' for this guide. We strongly advise forest owners to use this Fire Response Schedule to make a similar template for their forest to be sent to their local Fire Authority, neighbours and first response fire crews.

## Contents

<i>Introduction</i> .....	1
<i>Preventing forest fires</i> .....	3
Avoid the factors that make fires more likely .....	3
Select less burnable species .....	4
Tending your forest in a way that reduces risk .....	4
Keep fire starters out of your forest .....	5
<i>Preparing for fire</i> .....	10
Easy access .....	10
Good signage .....	11
Adequate water .....	11
Equipment for fighting smaller fires .....	13
<i>Managing the risks</i> .....	15
Neighbours .....	15
Contractors .....	15
Insurance .....	16
<i>If a fire starts</i> .....	17

List of Annexes available at the National Rural Fire Authority WebPages ([www.nrfa.fire.org.nz](http://www.nrfa.fire.org.nz) See references under "Publications".)

	Annex
<i>Fire Response Schedule</i> .....	1
<i>Chainsaws</i> .....	2
<i>Contractors Requirements</i> .....	3
<i>Legal Aspects</i> .....	4
<i>Electricity</i> .....	5
<i>Registered Forest Areas</i> .....	6
<i>Vegetation Fire Orders – Dangerous Situations</i> .....	7



## *If a fire starts ...*

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Phone '111' promptly. Large fires were once small fires.

To comply with the law:

*Any person not engaged in essential services who becomes aware of an unattended fire burning in the open air, in a forest area, or during a restricted or prohibited fire season, shall cease work and do everything within his / her power to extinguish the fire. If the person finds that they are unable to extinguish the fire, they shall notify the nearest available fire officer of the outbreak.*

For practical purposes, this means that if you can't put the fire out, phone 111 and notify your Fire Authority.

State:

- Your name, RAPID number, telephone contact number and where the fire is located. You may have to spell some place names. A prearranged New Zealand Map series 260 grid reference for your forest could help. (E.g. Sheet W19 561 231.)
- What is burning and which Fire Authority (if known) has to deal with it.
- Extent of the fire in hectares and the type of terrain in which the fire is burning.
- The closest brigade or volunteer rural fire force that is available to deal with the fire.
- The quickest route and the quickest roads for fire fighters to take to get to the fire.

## Insurance

Insurance gives forest owners some security so that a fire doesn't mean needing to sell other assets (such as your home) to pay for fire suppression costs or other losses caused by a fire starting on your property.

The property found to be the 'point of origin' for the fire is a likely target for lawsuits from people suffering losses.

For example, a fire originating in your exotic commercial forest and spreading to a larger commercial forest will have the other owner attempting to put out the fire.

See Appendix 4 for things to think about when selecting insurance.

## *Introduction*

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This guide is for the owners of small forests. One third of New Zealand's plantation forest estate is in smaller forest ownerships totalling 616,000 ha. Protecting small forests from fire is critical to realising the full value from your trees. The National Rural Fire Authority encourages you to follow these guidelines to help you achieve your forest owning objectives. Please use this guide and the accompanying data to be found at the National Rural Fire Authority web page under "Publications".



## *Managing the risks*

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A forest owner can minimise the risks and consequences of fire by effective use of neighbours, contractors and insurance.

### **Neighbours**

A local community working in your favour is a great asset. *Supportive neighbours are especially important when the forest owner is an absentee owner.* Notifications of fire problems are more likely from good neighbours than official agencies. Forest owners should encourage:

- A strong, watchful and helpful local community. The forest owner needs to be a part of the community and support it if she / he expects support in return. The local community is likely to be a first responder to any wildfire on the property.
- Responsible site visitors.

### **Contractors**

Contractors work in many smaller forests doing a wide range of work. Their contracts should specify conditions for the safety of others, themselves and the forest. This is especially so with operators of heavy machinery and chainsaws. A sample schedule is available on the NRFA website as Appendix 3 to this guide under 'Publications'.

**Suggestion:** *Before the contractor is allowed onto the property to begin work, ask to see evidence of sufficient and appropriate insurance cover as well as a current paid-up premium.*

Knapsack water sprayers are cost effective on smaller fires. Larger or more extensive forest fires require specialised equipment and numerous people. Your Fire Authority has these resources. Call them on 111.

**Improve your chances of putting the fire out by:**

- Ensuring easy access, good signage and plenty of water.
- Having suitable clothing available before a fire.
- Having suitable fire-fighting equipment to effectively deal with a small fire.
- Calling your Fire Authority (111) for help before any fire gets too large.

## *Fire management guidelines for small forests*

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If you have a small forest – and by small we mean anything from a few trees to over 100 hectares – this guide is for you. It's for private owners of exotic or indigenous forests, and it tells you how to reduce the chances of a fire, and how to prepare so that, if a fire does happen, it can quickly be controlled.

## *Preventing forest fires*

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### **Avoid the factors that make fires more likely**

Be extra careful if your trees are on a site with one of the following risk factors:

- **North facing sites.** The sun warms such sites and dries both ground and vegetation much faster than southern faces.
- **Sites with higher temperatures.** These sites dry out faster than cooler, wetter sites, making more fuel 'available' to feed the fire.
- **Sites experiencing lower relative humidity.** Fire burns more vigorously in low relative humidity, so sites are at risk in dry weather, even cold sites, such as high altitude hill country.
- **Windy sites.** If fire starts on such sites, it will spread faster, cause more damage and be harder to put out than at calmer sites. Don't burn on windy days.
- **Sites well hidden from public view with good road access.** These sites are favoured for burning out stolen motor vehicles or working on illegal activities such as growing cannabis.



## Select less burnable species

Nearly all woody tree species will burn. Even trees that are reluctant burners may catch if the understory is full of plants that burn well. Consider weed control.

As the chart below indicates, many of New Zealand's exotic species burn more readily than many native tree species.

Does not burn well			Average burn				Burns well			
0	1	2	3	4	5	6	7	8	9	10
			Douglas fir			Pinus radiata			Eucalyptus sp	
			Tasmanian blackwood						Cypress sp	
Kotukutuku (Fuchsia)	Kamahi			Tawa			Totara		Kanuka	
Broadleaf (Griselinea)	Ngaio			Rimu			Tree ferns		Manuka	
									Hakea	Gorse
Lower fire risk						High fire risk				

### Reduce your risk by:

- Planting a buffer around your trees of less easily burned native species. Make the buffer 10 to 20 metres wide against road edges or vulnerable boundaries.
- Clear any gorse near or under your trees, and keep it cleared.
- When planting your forest, choose species that have a lower burning risk.

## Tend your forest in a way that reduces risk

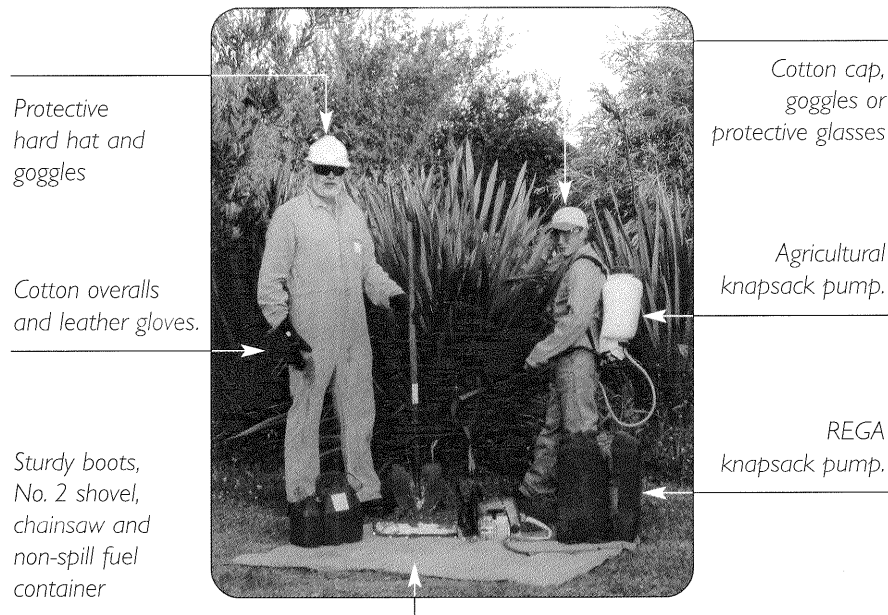
The time of year and the way that you tend to your forest can increase or reduce the risk of a fire. For example, if you thin in autumn, you reduce the risk; thin in summer and you increase it. Broadcasting fertiliser in a very young forest will cause weeds and grass to grow vigorously, increasing the amount of fuel available; applying fertiliser to each tree will promote tree growth rather than weed growth.

## Equipment for fighting smaller fires

If you intend to deal with a smaller fire yourself, you'll need suitable clothing and hardware. *Safety is extremely important in fire fighting.* Synthetic clothing (overalls, trousers, shirts, jackets and underwear) melts if exposed to radiant or direct heat. This can happen even under a layer of cotton or wool. Natural fibres are better for fire fighting. Leather gloves and sturdy footwear are a 'must'. People with bare feet or jandals should not be allowed onto the fireground. Send them out of danger. 'Hard hats' or woollen 'Balaclava' eye protection, first-aid kit and clean drinking water are also 'musts' in fire fighting. If a forest owner has any doubts about fighting the fire, leave it to the Rural Fire Authority.

### Basic Fire Equipment

Forest owners will have some basic equipment at hand for every-day work.



Larger capacity water points can ideally be located outside the forest area. Rubber lined dams are useful for providing water at high points. Fence these off, as stock will drink from them and cloven hooves destroy the liners.

If a dam is made, the Regional Council may need to be consulted prior to construction, depending on water volume held or catchment area.

#### **Fire preparation.**

*This forest access has a RAPID number clearly visible, a name on the letter box (other side), good road width and grade, no overhanging vegetation and easy access to the plantation for fire vehicles.*



Easy access  
to forest

RAPID No.

Firm road  
with no  
obstructions

Good road  
width - 4m

#### **Reduce your risk by:**

- *Considering the amount of available fuel resulting from any tending operation, and planning the timing or method to reduce or remove it.*
- *Pruning trees close to road edges so that fires can't use weeds on verges to travel through a forest.*
- *Stopping mechanical operations when fire danger is extreme or very high. To check fire danger status, see 'Publications' on [www.nrfa.fire.org.nz](http://www.nrfa.fire.org.nz).*

#### **Keep 'fire starters' out of your forest**

Humans start most fires. Try to stop illegal activities, escapes from controlled burns, and carefully manage machinery operation, recreational use and other potentially harmful activities in your forest.

#### **Discourage illegal activities**

Make it difficult to park up a stolen vehicle and burn it out, to use your forest for drug cultivation, or to deliberately set a fire.

- *Improve property security. Limit trespassers and perhaps encourage approved access. Locked gates or barriers such as drains, concrete blocks or large trees across entry points will limit vehicles and reduce fire opportunities for vandals, as will encouraging sensible folk to visit your land. (Use the 'Trespass Act 1980' if necessary. This Act is available from Government Bookshops. Tel 04 499 3433.)*
- *Have sound gates, fences or barriers; minimise gorse; and have friendly, responsible and co-operative neighbours. Consider being part of a 'Neighbourhood Watch'.*

### **Avoid escaped controlled burns**

About 20% of wildfires are 'managed fires' that have escaped. If you or your neighbours are burning off, ensure that the burn is under complete control at all times.

Before starting a controlled burn:

- Establish fire breaks.
- Seek advice from your local Fire Authority.
- Check the long-range weather forecasts and fire season status.
- If the fire season status is 'restricted', get a fire permit from your Fire Authority. Ensure you comply with any 'special conditions' on the fire permit.
- Tell all the neighbours what you are planning, and when.
- Select a suitable time of day when conditions are less severe.

### **Ensure machinery is operated safely**

When machinery is being used in your forest, ensure that:

- Bulldozers, excavators or trucks are well maintained and have suitable fire extinguishers on board.
- Machines are clean and have no oil or fuel leaks; turbo-charged or fitted with a spark arrester; radiator clear of grass and fine twigs etc. (Turbo-charged engines do not emit as many large cinders as other engines.)
- Bulldozer belly pans are clean. (No sump oil, fine twigs and branches.)
- Exhausts on all plant engines are not ported towards fine dry fuels nearby. *(Make sure that contracts specify that exhausts port in accordance with Forest and Rural Fires Regulation 1979, regulation 31, as a minimum.)*

### **Good signage**

You've got to let fire fighters know where to go. Have signs at entrance points and property boundaries. These are helpful and distinguish one property from another. RAPID numbers also need to be prominent to identify the property when a fire is reported. Mark:

- Bridge weight limits.
- Water point access.
- Places where there are hazards that may not be known to strangers entering the property.

**Suggestion:** Many of the signs you require can be purchased from industrial safety shops.

### **Adequate water**

Water points should be easily accessible and clearly marked. They could include: streams, rivers, ponds, dams or tanks. Mark major supplies of 'all year round' water. Ensure that:

- Vehicles can access the water.
- Safe aircraft landing points are no more than 50 metres away from the supply point.
- Water points are well situated around a forest. Ideally, helicopter water sources should be within two minutes flying time of any part of the forest.
- The available water volume is sufficient to supply pumpable water at 30 litres per second to fill numerous tankers, many large monsoon buckets and hoses. A young forest may have adequate water now, but not in ten years if the trees have drawn it all up for growth.
- The available water volume is greater in areas that are drier more often or have severe droughts. (Eastern vs. Western New Zealand.)

## Preparing for fire

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If a fire starts, you need it to be put out as soon as possible, before it spreads. You can help this to happen by preparing well in advance. The keys are easy access, good signage and adequate water.

### Easy access

Make sure that firefighting equipment can get onto your site. Road surfaces must not be undermined and not have deep ruts cut by water. Long dry grass over steeper roads reduces traction and makes access dangerous. Compacted gravel road surfaces provide better grip than recently dozed moist surfaces or grass.

You'll need at least light truck access (4x4). This requires 4-metre road width with vegetation cut back to this width; road grades no greater than 1 in 4; bridges capable of taking 2.5 tonnes laden weight. Turning areas of up to 5 m must be available for a multi-point turn.

If you lack access to water or have a serious fire risk, you'll need large truck access (4x6 or 4x4). This requires 4-metre road width with vegetation cut back to this width and to a height of 3.4 metres; road grades no greater than 1 in 5; bridges capable of taking 44 tonnes laden weight. This is what a 'transporter' carrying a larger bulldozer could weigh. Turning areas must be available – 12 m for a multi-point turn – you wouldn't want a stuck tanker up your drive!

- Machines have self-activating fire extinguishers, if possible.
- Chainsaws are fitted with spark arresters that trap or pulverise exhaust carbon particles. Work the saw at cooler times of the day in early morning and late afternoon. Halt operations if exhaust gasses cause fine fuels to smoulder.
- Persons using disc grinders or welding have suitable water supplies readily available at short notice, and a written authority from the forest owner. Work should be done in open areas and not too close to dry fuels such as browned off grass, Eucalypts or *Dracophyllum*. *N.B. A fire permit may be required.*

### Ensure that recreational users behave safely

Discourage recreational use during extreme fire danger.

Instruct all children living in or visiting the forest area about fire safety.

Gas-powered cooking stoves should be used rather than thermettes.

Discourage irresponsible behaviour, such as:

- Four-wheel drive and motorcycle rallies in the forest without proper exhaust systems on vehicles.
- Souveniring of signs describing the RAPID address or water points etc.
- Using an open flame anywhere near trees. This includes matches, fireworks, bonfires, blowtorches and so on. It is particularly important where there is long dry grass and steep slopes on northerly aspects.
- Firearms using tracer ammunition or with coarse-grained gunpowder. (Black powder.)



### **Do your 'housekeeping'**

Manage the site by planting or clearing fire breaks, avoiding fuel continuity, and keeping the understory clear of flammable materials:

- Create firebreaks by planting forest edges with species that don't burn well, discing soil or creating an access road. Firebreaks are best constructed on ridgelines or property boundaries.
- Clear pruning/thinning slash from roadsides and prune lower branches to ensure that fire has no fuel to climb into the trees. Keep weeds down on the forest margins – grazing can help (you may need to ensure that your trees are not browse vulnerable).
- Less combustible plants, such as *Lotus major* or clover about a roadway, also make effective fuel breaks.
- Avoid spilt oil and fuel. Don't dump fuel or grease containers. Remove or bury site or roadside rubbish, including derelict cars, and old plastic, paper or wooden containers.

A forest property that looks untidy is a more likely target for arsonists than a well-kept and well-managed one.

### **Avoid possible ignition points**

- Keep vegetation clear of power wires. Fires can start if branches contact wires or wires contact one another to shed molten aluminium into dry vegetation.
- If you are having any tracks formed on your forest, ensure that the operator knows of any gas pipelines and contacts the pipeline owner.
- Avoid planting on sites where there may be pockets of natural gas. These can seep to the earth's surface and ignite. Several such sites are known in the Eastern North Island.

- Avoid spontaneous combustion at sites where plenty of flashy fuels or finer fuels are present or buried (such as hay barns, wood processor sites at skids or landings). For example, reduce the amount of foliage and light branches about skid sites by putting it back into the forest. Make sure that steel ropes are not buried near fine fuels.
- Don't use explosives in elevated fire danger periods. Check conditions with your Fire Authority.
- Don't use tin lids or other reflective surfaces that might act as magnifying glasses and start fires. Phosphorus bait can be laid on an overturned earth sod instead of a tin lid (and later buried under the replaced sod), or alternative poisons can be used. Keep the site clean of bottles and other reflective items.

### **Lightning strikes**

Lightning strikes can happen in warm dry weather with the passage of cold fronts. While there is nothing a forest owner can do to stop lightening from starting a fire, some of the ideas above will help to reduce the amount of fuel, and therefore limit the seriousness of the fire.