



OP 1.3.1 Operational Protocol For Hazardous Trees and Appropriate Use of Chainsaws



OP 1.3.1
OPERATIONAL PROTOCOL
for
Hazardous Trees and
Appropriate Use of Chainsaws

Prepared by:

Operational Services
NSW Rural Fire Service
15 Carter St, Lidcombe 2127
Locked Bag 17, Granville 2142
Telephone: (02) 8741 5555
Fax: (02) 8741 5300

Contents

Terms and Abbreviations	2
1. Links	3
2. Superseded Procedure	3
3. Purpose	3
4. Hazards	3
5. Personal Protective Equipment.....	3
6. Operational Procedures	4
7. Operational Guidance	5
8. Use of Chainsaws	7
9. Responsibility	8
Appendix A.....	9
Appendix B.....	10

Terms and Abbreviations

Chainsaw Operator (CSO)	The person in control of a chainsaw.
Chainsaw Trousers / Pants	The design of these pants usually incorporates ballistic nylon pads which are sewn into the legs in order to protect the operator's leg.
Chaps	Worn over existing pants and secured with buckles and straps, these pants incorporate ballistic nylon pads which are sewn into the front part which covers and protects the legs.
Cross Cut	The task of cutting timber already on the ground.
Div Com	Divisional Commander
Dry Stag or Stag	A dead or dry standing tree or part of. The affected tree may be decayed.
Fall Zone	The ground area affected by debris if a tree, or its upper branches, was to fall, including the down slope area affected by debris movement.
Faller / Feller	Person falling / felling standing trees or part of.
Felling Zone	The area in all directions around the tree being felled equivalent to a radial distance of two and a half times the height of the tallest tree within the felling zone.
Hazard	Anything that has the potential to cause injury or illness to employees.
Hazardous Trees	Trees that have structurally weakened trunks or branches. Trees which are double-leaders (two trunks), trees which are dead, which are leaning or lopsided, or trees and branches that are "hung-up" are associated with a heightened tree fall risk.
IAP	Incident Action Plan
OIC	Officer in Charge
PO	Planning Officer
PPC/PPE (Personal protective clothing and equipment)	Any clothing and equipment to be worn or used by a person to protect that person from risks of injury. For chainsaw operation this includes safety helmet, hearing protection, eye protection, leg protection, foot protection, high visibility clothing.
SA	Safety Advisor (works in the field and reports to SO)
SO	Safety Officer (works within IMT and reports to IC)
TIC	Thermal Imaging Camera
Tree Falling / Felling	Task of cutting standing timber.
"Widow Maker"	A tree or a limb of a tree, which can fall without warning.
TFT	Trim and Cross Cut Felled Trees. The unit of competency aligned with TFT is "FPICOT2221A Trim and cross cut felled trees".
TFI	Tree Falling Intermediate. The unit of competency aligned with TFI is "FPIFGM3204A Fall trees manually (intermediate)".
TFF	Tree Falling Fireline. The unit of competency aligned with TFF is "FPIFGM3205A Fall trees manually (advanced)".

1. Links

- [Service Standard 3.1.6 Operational Protocols and Procedures.](#)
- [Service Standard 3.2.1 Coordinated Firefighting and Air Operations.](#)
- [Service Standard 5.1.5 Protective Clothing and Accessories](#)
- WorkCover NSW 2010 OHS Management Tool Forestry Industry Safety Tool

2. Superseded Procedure

- Rural Fire Service Fireground SOP 18

3. Purpose

- 3.1** This Hazardous Trees and Appropriate Use of Chainsaws Operational Protocol addresses two significant risks posed to firefighters at incidents. Hazardous trees and chainsaw usage are a part of dealing with numerous incidents and Incident Controllers, along with all firefighters, must be pro-active in managing these risks.
- 3.2** All firefighters must be aware that trees affected by fire, storm or other environmental factors are often subject to premature and unexpected collapse. Procedures to identify, mark and deal with these hazards are outlined in this protocol.

4. Hazards

- 4.1** Hazardous trees and using chainsaws presents several hazards, including:
- (a) injury to firefighters and bystanders by falling debris or trees;
 - (b) injury to firefighters from chainsaws;
 - (c) damage to equipment; and
 - (d) damage to property.

5. Personal Protective Equipment

- 5.1** In accordance with Service Standard 5.1.5 Protective Clothing and Accessories the minimum PPE required to operate a chainsaw at any level is:
- (a) hearing protection;
 - (b) eye protection;
 - (c) helmet; and

(d) leg protection (chaps)

This is in addition to the standard bush fire PPC.

6. Operational Procedures

- 6.1** All identified hazardous trees must be cordoned off or marked, and advice provided to crews operating in the vicinity.
- 6.2** The IC must ensure that any IAPs and briefings provide advice in regard to hazardous trees, specifically in regard to areas of concern.
- 6.3** ICs must ensure a systematic process is in place to identify, mark and provide advice in regard to hazardous trees on the fireground.
- 6.4** The 'LACES' checklist – Lookouts, Awareness, Communications, Escape Routes and Safety Refuges, should be utilised in regard to all operations:
- Lookouts
 - Awareness
 - Communications
 - Escape route
 - Safety refuge
- 6.5** The SA (if appointed, IC if not) must be advised of hazardous trees and tree felling operations. These officers must consider the risk level of any activities compared to the identified need and provide advice and direction as appropriate.
- 6.6** IC, SA and OICs shall take a proactive approach to dealing with timber hazards and shall, and where possible in consultation with a CSO, examine safer alternatives before considering the use of a chainsaw to remove a hazard. Safer alternatives include the use of heavy plant, avoidance of the area or “wait and see”, where the situation requires crews to standby and wait for the tree to fall naturally.
- 6.7** The use of chainsaws for the removal of fallen timber, standing timber and trees that have been damaged or are posing a risk due to fire or wind, must be carried out by an operator qualified to the level commensurate with the task.
- 6.8** The use of a chainsaw is at the discretion of the chainsaw operator and no other person shall direct them to undertake any operation if the operator feels it is unsafe to do so.
- 6.9** Chainsaw use after dark should only be considered in exceptional circumstances. In such instances sufficient lighting to illuminate the entire work area and tree canopy must be provided.
- 6.10** At fires or incidents that may require tree felling operations, the IC should request a fireline tree felling team to be made available.

- 6.11 One operator is to act as a felling safety lookout during tree felling operations.
- 6.12 The felling of hung up trees shall not be conducted without the use of machinery or mechanical assistance.

7. Operational Guidance

Hazardous Trees

- 7.1 The risks posed to firefighters working in the fall zone of hazardous trees must be assessed prior to commencing work. A standard risk assessment approach shall be used as the basis for managing the risk i.e. identify the risk, assess the risk and mitigate the risk.
- 7.2 Nothing in this Operational Protocol overrides the importance of all firefighters to adhere to the 'Look Up and Live' principle whereby all personnel should constantly assess the environment they are working in, including above their heads.

Identifying the risk

- 7.3 Prior to operations the IC, SO or OIC of the unit must ensure that, either through inspection or local knowledge, every effort is made to determine whether the fireground may potentially contain hazardous trees in the locations where firefighters will be working. Appendix A Hazardous Tree Identification Checklist is used to assist in this task.
- 7.4 Access to areas which may contain hazardous trees shall be restricted until the risk posed by these trees is assessed and controlled.

Assessing the risk

- 7.5 Personnel experienced in identifying hazardous trees should be used to assess the trees in the identified area. If an experienced person is not available the IC shall determine the most suitable person. A checklist to assist assessors in identifying hazardous trees is attached at Appendix A.
- 7.6 In identified area(s), all trees within two and a half tree lengths of areas where personnel will be working should be assessed for soundness and structural integrity.
- 7.7 Where they are available, TICs should be used to assist in identifying those trees which contain significant heat and may be potentially weakened.
- 7.8 Confirmed hazardous trees must be physically marked by the prescribed marking method shown at 7.13 below, and if appropriate, their location marked on any operational maps being used for the incident.

- 7.9** The location and risk posed by identified hazardous trees, along with any other areas where hazardous trees are likely to exist, shall be noted in any IAP developed for the incident.

Managing the risk

- 7.10** Many options exist for managing hazardous trees and the most suitable method will depend on all relevant factors being considered. Suitably trained and experienced personnel will determine the method of control and priorities for this work.
- 7.11** Control methods may include a combination of:
- (a) Move operations to avoid the tree** – such as constructing a fire containment line;
 - (b) Keep personnel away from the tree** – personnel must not work within the ‘fall zone’ of identified and marked hazardous tree/s;
 - (c) Education** - ensure all personnel have an awareness of the risks posed by hazardous trees and that all relevant documentation (e.g. IAP) contains reference to hazardous trees; and
 - (d) Remove the tree** – by either manual and/or mechanical means.
- 7.12** The location of identified hazardous trees and the details of the proposed control strategy shall be conveyed to all affected personnel.

Marking Hazardous Trees

- 7.13** The convention for marking hazardous trees is:
- (a)** red and white flagging tape shall be used to exclude personnel from the fall zone of hazardous trees or from sections of the fireground containing any hazardous trees where no action has been taken to manage the risk. The perimeter should be at least two and a half tree lengths (or two crown widths when broken limbs are hung up in trees) from the identified hazard, allowing extra distance if working downslope of the hazard;
 - (b)** the symbol for marking (where safe to do so) an individual tree is the approved WorkCover NSW symbol:



- (c)** affected trees should be marked (wherever possible and safe to do so) with this symbol using high visibility markers or paint with an arrow pointing from this symbol to the feature that most defines the tree as dangerous. If it is unsafe to mark the tree in question, the symbol can be placed on a nearby tree with an arrow pointing to the hazardous tree and distance away;

- (d) where known, mark the location of identified high risk tree and limb hazards on an operational map of the area (as part of an IAP) using the following symbol:



8. Use of Chainsaws

- 8.1 The following guidelines are to be utilised for each of the three levels of chainsaw used in NSW RFS activities.

Cross Cut Operations (TFT)

- 8.2 For clearing or moving of fallen timber and trees the:
- (a) operator must be qualified and current to TFT;
 - (b) operator shall undertake a basic risk assessment before commencing any chainsaw operation;
 - (c) operator must have a person assisting them at all times. This assistant should have hearing and eye protection in addition to standard bush fire PPC/PPE;
 - (d) chainsaw needs to be of a standard suitable for the job/task; and
 - (e) operator must have all support tools and equipment on hand before commencing the job/task.

Intermediate Tree Felling (TFI)

- 8.3 For tree felling operations, where the tree is not defective the:
- (a) operator must be qualified and current to TFI;
 - (b) operator shall undertake a risk assessment before commencing any chainsaw operation;
 - (c) operator must have a person assisting them at all times when felling trees. This offsider, where possible, should be qualified to TFT or higher;
 - (d) chainsaw needs to be of a standard that is suitable for the job/task; and
 - (e) operators must have all support tools and equipment on hand before commencing the job/task.

Fire Line Tree Felling (TFF)

- 8.4 This shall be undertaken when there is no alternative method readily available to remove a hazardous tree, such as heavy machinery. The:
- (a) operator must be qualified and current in TFF;
 - (b) operator must undertake a risk assessment before commencing any chainsaw operation;

- (c) operator must have an assistant who is qualified in chainsaw operation to TFI;
- (d) chainsaw needs to be of a standard that is suitable for the job/task; and
- (e) operator must have all support tools and equipment on hand before commencing the job/task.

9. Responsibility

- 9.1** The IC and OIC is responsible for providing strong leadership for the awareness and pro-active management of tree and limb hazards in fire operations.
- 9.2** The OIC and SO is responsible for:
 - (a) tasking of inspection, assessment and marking of tree and limb hazards in fire-affected work areas prior to deployments; and
 - (b) delivering the pre-operational briefing including the management of tree and limb hazards.
- 9.3** POs and SOs are responsible for ensuring warnings and advice on the management of tree and limb hazards noted in the IAP are issued and understood.
- 9.4** All personnel are responsible for maintaining vigilance and situational awareness whilst chainsaw operations are taking place.

Appendix A

HAZARDOUS TREE IDENTIFICATION CHECKLIST

This checklist can be used to assist in the identification of potentially hazardous trees. If work is undertaken and any of these hazards are identified, and persons or machinery are within the fall zone of the tree, then controls must be documented.

Common features of a potentially hazardous or distinctly hazardous tree. (Note: this is not exhaustive)	Yes	No	Control / Comment
"Hung up tree" or "Widow makers" (e.g. hung up limbs)			
Excessive rot content in the tree			
Scars			
Hollows			
Burnt out tree butt, trunk or limbs			
Thermal Imaging Camera (if available) shows substantial heat or hot spot in tree compared to surrounding timber			
Tree trunk with substantial damage			
Dangerous tree located less than two times its length from the work area			
Storm, wind or snow damaged tree			
Tree root system likely to uproot due to its location (slope, wet area)			
Tree with exposed root system			
Tree with excessive lean			
Tree larger than the capacity of the machine (if being pushed)			
Interlocking limbs with other trees			
Location restricting feller's safe movement e.g. boulders, steep, road fill			
Dead tree(s)			
Burning tree(s)			
Another tree lodged in the tree			

Assessor _____ Date _____
(Print name)

Supervisor _____ Date _____
Div Comm / SL etc. (Print name)

Appendix B

PROCEDURAL CHECKLIST

1. Never work alone

2. Never work when you are fatigued

3. Prepare to do the job safely and efficiently

- Personal protective equipment (hard hat, ear and eye protection, safety pants / chaps, first aid kit etc)
- Tools and supplies (axe, wedges, fuel, spare chain and cutter bar, files etc.)
- Well maintained saw and chain
- The operator is competent and confident for the tasks at hand

4. Evaluate cutting conditions

- Weather
- Terrain
- Escape routes
- Cutting position
- Tree Species

5. Evaluate the tree and its direction of fall

- Decide whether the tree is a dangerous tree
- Use a plumb line and bob if you consider it will help
- Determine lean and / or limb loading
- Check the tree for defects (splits, hollows, rot etc)
- Ensure a clear escape path prior to cutting

6. Make the scarf (undercut)

- Check for people within the fall zone
- Are the cuts level?
- Do the cuts match up?
- Does the scarf/undercut face the direction of fall?
- Is the scarf/undercut a proper depth?

7. Make the back cut

- Check for people within the fall zone
- Shout a warning and listen for replies
- Is the back cut at the correct height above the scarf/undercut?
- Use wedges as needed
- Leave adequate hinge wood to control the fall

8. Fell the tree

- Move to safety along the escape path
- Watch for overhead hazards
- Have adjacent trees been damaged?
- Are hanging limbs a problem?

9. Limbing trees

- Check the worksite for possible hazards
- Assess limbs for tension and spring problems

10. Crosscutting trees

- Determine whether you can cut safely
- Look for compression and tension wood
- Ensure a clear work area and escape path
- Cut from the uphill side where possible and safe to do so