FOREST SAFETY CODE (Tasmania)

b2ØŜYōŜℕ нлнм

CONTENTS

1 INTRODUCTION

1.1 Background

¢KŠ C2NŠăú {I·ŦŠúè /2ŘŠ ó¢I·ăY I·yλI·ú óúKŠ /2ŘŠú ǿI·ă ŦλNăú λyúN2ŘdzÔŠŘ λy´нллн I·yŘ dzLJŘI·ŭŠŘ λy´нллт¢ Lú LJN2ØλŘŠă LJNI·ÔúλÔI·f I·ŘØλÔŠ 2y´K2ǿ ű2 YI·yI·ƎŠ NλăʼnλyűKŠ ¢I·ăYI·yλI·y´Ŧ2NŠăú λyŘdzăúN̈¢

² KŠy´¢I·ăYI·yλI· I·Ř2LJúŠŘ űKŠ yI·ûλ2yI·ffè KI·NY2yIăŠŘ *Workplace Health and Safety Act 2012* ó¢I·ăú ó ² I{ !Ôűú I·yŘ űKŠ *Workplace Health and Safety Regulations 2012* ó¢I·ăú ó ² I{ wŠƎdzfI·ûλ2yăú λű ŠyI·ÔúŠŘ űKŠ *Work Health and Safety (Transitional and Consequential Provisions) Act 2012* ó¢I·ăúΣ ǿKλÔK ŠăűI·ōfăKŠŘ űKŠ C2NŠăú {I·ŦŠúè /2ŘŠ ó¢I·ăYI·yλI·ú I·ă I· LJNŠăÔNλōŠŘ Ô2ŘŠ¢ ¢Kλă NŠÔ2ƎyIăŠă űKŠ ăλƎyIŦIλÔI·yÔŠ 2Ŧ űKŠ Ŧ2NŠăú λyŘdzăúN̈è ű2 ¢I·ăYI·yλI· I·yŘ űKŠ dzyλIjdzŠ I·yŘ KI·Î I·NŘ2dză ǿ2N̈ʼnLJfI·ÔŠă λy´ǿKλÔK Ŧ2NŠăú ǿ2N̈ʼnŠNă 2LJŠNI·ûŠ¢

¢KŠ Ŧ2NŠăú λyŘdzăúN̈è NŠYI·λyã 2yŠ 2Ŧ űKŠ KλƎKŠăú NλăʼnλyŘdzăúNλŠă λy´!dzăúNI·fIλ· ōdzű űKŠ ŦI·úI·ŧûúè NI·ûŠ λy´¢I·ăYI·yλI· KI·ă λYLJN2ØŠŘ ăλƎyIŦIλÔI·yűfè ăλyÔŠ űKŠ /2ŘŠ ǿI·ă λyűN2ŘdzÔŠŘ¢ DλØŠy´ûKλă ōI·Ôʼnλ3N2dzyŘΣ I· LJNλYI·NŠè 2ō2ŠÔűλØŠ 2Ŧ ûKŠ {ûŠŠNλyƎ /2YY´λúûŠŠ NŠăLJ2yăλōfŠ Ŧ2N ûKŠ 2ØŠNλăλƎKű 2Ŧ ûKŠ NŠØλăλ2y´2Ŧ ûKŠ /2ŘŠ ǿI·ă ű2 Šyãdz NŠ ûKŠ ăűI·údză 2Ŧ ûKŠ I·YŠyŘŠŘ C2NŠăú {I·ŦŠúè /2ŘŠ NŠYI·λyŠŘ I·ă I· LJNŠăÔNλōŠŘ Ô2ŘŠ¢

¢KŠ λyűN2ŘdzÔűλ2y´2Ŧ ûKŠ ²I{ !Ôű I·yŘ ûKŠ ²I{ wŠƎdzfI·ûλ2yã YI·ŘŠ YI·yê 2Ŧ ûKŠ ûŠNYă dzăŠŘ λy´ûKŠ нллт /2ŘŠ NŠŘdzyŘI·yű¢ !fă2Σ ûKλă yŠǿ fŠƎλăfI·ûλ2y´ŠÈLJfÔλűfè I·dzűK2NλăŠă yI·ûλ2yI·ffè I·LJLJN2ØŠŘ /2ŘŠă 2Ŧ tNI·ÔűλÔŠΣ ǿKλÔK Ô2ØŠN ăλYλfI·N ădzō2ŠÔű YI·ûúŠN ű2 ûKŠ нллт C2NŠăú {I·ŦŠúè /2ŘŠ¢ ¢I·ăYI·yλI· KI·ă I·Ř2LJúŠŘ Y´I·yê 2Ŧ ûKŠăŠ Ô2ŘŠă λy´NŠÔŠyű ëŠI·Nă¢

¢KŠ ăÔ2LJŠ I·yŘ I·LJLJfλÔI·ûλ2y´2Ŧ ûKŠ I·YŠyŘŠŘ C2NŠăú {I·ŦŠúè /2ŘŠ ó¢I·ăYI·yλI·ú нлн1 NŠYI·λyã the same as ûKŠ нллт /2ŘŠ ōdzű ûKŠ Ô2yűŠyű KI·ă ōŠŠy´Y2ŘλŦλŠŘ ű2 NŠÔ2ƎyIăŠ ûKŠ ŘλŦŦŠNŠyű ŠyI·ōfλyƎ fŠƎλăfI·ûλ2y´ōëY

- Šyãdz NλyƎ ûKI·ú Řdzűλŝă I·yŘ Řdzûè K2fŘŠNă I·NŠ Ô2yãIăúŠyű ǿλúK ûKŠ yŠǿ yI·ûλ2yI·ffè KI·NY2yIăŠŘ fŠƎλăfI·ûλ2y´
- LJN2ØλŘλyƎ Ŧ2N Ô2yãIăúŠyÔè ōŠűǿŠŠy´ûKλă Ř2ÔdzY´Šyű I·yŘ I·Ř2I·ÔŠyű fI·ǿă I·yŘ /2ŘŠă 2Ŧ tNI·ÔűλÔŠ NŠfŠØI·yű ű2 ûKŠ ¢I·ăYI·yλI·y´Ŧ2NŠăú λyŘdzăúN̈è
- dzLJŘI·ûλyƎ ûKŠ Ř2ÔdzY´Šyű ű2 NŠŦfŠÔű ûKŠ Ŧ2NYI·ú 2Ŧ Y´2ŘŠNy´ /2ŘŠă 2Ŧ tNI·ÔűλÔŠ
- λyűŠƎNI·ûλyƎ λyŦ2NYI·ûλ2y´I·ăăžÔλI·ûŠŘ ǿλúK yŠǿ ûŠÔKy2f2Ǝè
- NŠŦfŠÔűλyƎ I·yŘ I·ŘŘNŠăăλyƎ Ô2YY´Šyűă NŠÔŠλØŠŘ FN2Y´ λyŘdzăúN̈è ăúI·ʼnŠK2fŘŠNă¢

¢Kλă Ř2ÔdzY´Šyű NŠŦŠNŠyÔŠă ăŠØŠNI·f NŠfŠØI·yű **Australian Standards (AS)**Σ 2ûKŠN ăúI·ûŠ I·yŘ /2YY´2yØŠI·fûK fŠƎλăfI·ûλ2yΣ I·yŘ /2ŘŠă 2Ŧ tNI·ÔűλÔŠ¢ ¢KŠ NŠŦŠNŠyÔŠyƎ 2Ŧ ûKŠăŠ Ř2ÔdzY´Šyűă ăŠŠʼnă ű2 Šyãdz NŠ ûKI·ű ûKŠ /2ŘŠ NŠY´I·λyã ÔdzNNŠyű ǿKŠy´ I·YŠyŘY´Šyűă ű2 NŠŦŠNŠyÔŠŘ fŠƎλăfI·ûλ2y´I·yŘ ăúI·yŘI·NŘă 2ÔÔdzN¢

1.2 Review process

¢KŠ нлнл NŠØλŠǿ 2Ŧ C2NŠăú {I·ŦŠúè /2ŘŠ ǿI·ă ŦdzyŘŠŘ ØλI· I· ăλƎyIŦλÔI·yű Ô2πλyØŠăúY´Šyű FN2Y´ ûKŠ ¢I·ăYI·yλI·y´Ŧ2NŠăú λyŘdzăúN̈è I·yŘ tNλØI·ûŠ C2NŠăûă ¢I·ăYI·yλI·¢ ¢KŠ LJN2ÔŠăă ǿI·ă 2ØŠNăŠŠy´ōè I· ăúŠŠNλyƎ Ô2YY´λúûŠŠ ÔKI·λNŠŘ ōè tNλØI·ûŠ C2NŠăûă ¢I·ăYI·yλI· ǿλúK Y´ŠY´ōŠNăKλLJ FN2Y´ ¢I·ăYI·yλI·y´C2NŠăûă I·yŘ C2NŠăú tN2ŘdzÔûă bŠűǿ2N̈ʼnΣ {dzăúI·λyI·ōfŠ ¢λY´ōŠN ¢I·ăYI·yλI·Σ ûKŠ !dzăúNI·fIλ·y´ C2NŠăú /2yűNI·Ôû2Năă !ăăžÔλI·ûλ2yΣ I· fI·NƎŠ λyŘdzăúNλI·f Ŧ2NŠăú YI·yI·ƎŠN ó[ŠyI·K 9ăűI·ûŠúΣ I·yŘ I· NŠLJNŠăŠyűI·ûλØŠ 2Ŧ ûKŠ ¢I·ăYI·yλI·y´ C2NŠăú LyŘdzăúN̈è ²2N̈ʼn I ŠI·fûK I·yŘ {I·ŦŠúè /2YY´λúûŠŠ¢ ²2N̈ʼn{{I·ŦŠ ¢I·ăYI·yλI· LJŠNă2yyŠf ădzLJLJ2NûŠŘ ûKŠ Ô2YY´λúûŠŠ I·ă 2ōăŠNØŠNă¢

¢KŠ 2ō2ŠÔűλØŠă 2Ŧ ûKŠ NŠØλŠǿ λyÔfdzŘŠŘY

- LJN2ØλŘλyƎ dzLJπû2πŘI·ûŠ ƎdzλŘI·yÔŠ 2y´KλƎKπNλăʼn I·ÔűλØλúλŠă I·yŘ Ô2YY´2y´KI·Î I·NŘă λy´ÔdzNNŠyű Ŧ2NŠăúN̈è 2LJŠNI·ûλ2yã
- dzLJŘI·ûλyƎ /2ŘŠ NŠŦŠNŠyÔŠă ű2 ûKŠ ÔdzNNŠyű !Ôű I·yŘ NŠƎdzfI·ûλ2yã
- ŠfλY´λyI·ûλyƎ λyÔ2yãIăúŠyÔλŠă ǿλúK 2ûKŠN fŠƎλăfI·ûλ2y´I·yŘ /2ŘŠă 2Ŧ tNI·ÔűλÔŠ
- Y´I·ʼnλyƎ ûKŠ /2ŘŠ Ô2yãIăúŠyű ǿλúK yI·ûλ2yI·f ƎdzλŘI·yÔŠ
- I·ŘŘNŠăăλyƎ ûKŠ ŦŠI·ûdzNŠă 2Ŧ ÔdzNNŠyű ¢I·ăYI·yλI·y´Ŧ2NŠăúN̈è 2LJŠNI·ûλ2yã
- I·ŘŘNŠăăλyƎ ŠY´ŠNƎλyƎ ǿ2N̈ʼnλyƎ LJI·ûúŠNyã I·yŘ ûŠÔKy2f2ƎλŠă
- LJN2ØλŘλyƎ ŦfŠÈIōfλúè Ŧ2N ŘλŦŦŠNŠyű ăÔI·fŠă 2Ŧ Ŧ2NŠăúN̈è 2LJŠNI·ûλ2yã
- Ŧ2ÔdzăλyƎ 2y´LJNI·ÔűλÔI·f ŠÈI·Y´LJfŠă I·yŘ I·ŘØλÔŠ ű2 I·ÔKλŠØŠ ăI·ŦŠ I·yŘ KŠI·fûKè 2dzúÔ2Y´Šă¢

¢KŠ I·YŠyŘŠŘ /2ŘŠ λă ûKŠ NŠăʼndzfű 2Ŧ ŠÈúŠyãλØŠ Ô2yãdzfúI·ûλ2y´ǿλúK ʼnŠè ăúI·ʼnŠK2fŘŠN ƎN2dzLJă 2ØŠN I· ǿ2πëŠI·N LJŠNλ2Ř¢

1.3 Scope and application

1.3.1 Application of the Forest Safety Code (Tasmania)

¦yŘŠN ûKŠ ²I{ !ÔűΣ ûKŠ C2NŠăú {I·ŦŠúè /2ŘŠ ó¢I·ăYI·yI·úΣ fIʼnŠ λûă LJNŠŘŠÔŠăă2NΣ I·LJLJfIŠă ű2 LJŠNă2yã ǿK2 KI·ØŠ NŠăLJ2yãλōfIûλŠă Ŧ2N ǿ2N̈ʼnLJfI·ÔŠ KŠI·fûK I·yŘ ăI·ŦŠúè λy´Ŧ2NŠăúN̈è 2LJŠNI·ûλ2yã λy´¢I·ăYI·yλI·¢

! LJŠNă2y´Ô2yŘdzÔûλyƎ I· ōdzăλyŠăă 2N dzyŘŠNûI·ʼnλyƎ ó t / . ¦ú KI·ă ûKŠ LJNλYI·Nè Řdzúè dzyŘŠN ûKŠ ²I{ !Ôű ű2 Šyãdz NŠΣ Ψă2 ŦI·N I·ă λă NŠI·ă2yI·ōfè LJNI·ÔűλÔI·ōfŠΣ ûKI·ű ǿ2N̈ʼnŠNă I·yŘ 2ûKŠN LJŠ2LJfŠ I·NŠ y2ű ŠÈLJ2ăŠŘ ű2 ǿ2N̈ʼnLJfI·ÔŠ KŠI·fûK I·yŘ ăI·ŦŠúè NλăʼnλăλyƎ FN2Y´ ûKŠ ōdzăλyŠăă 2N dzyŘŠNûI·ʼnλyƎ¢

t / . ¦ă ǿλúK NŠăLJ2yãλōfIûè λyÔfdzŘŠ fI·yŘ2ǿyŠNăΣ Ŧ2NŠăú YI·yI·ƎŠNăΣ Ô2yűNI·Ôû2NăΣ I·yŘ ûλY´ōŠN ōdzăλyŠăă 2ǿyŠNă ûKI·ű ƎN2ǿΣ YI·λyűI·λyΣ KI·NØŠăúΣ I·yŘ LJNN2ÔŠăă ǿ22Ř LJN2ŘdzÔûă ǿλúKλy´I· Ŧ2NŠăú¢

[illegible]

Section 2.2 Person conducting a business or undertaking [illegible]

1.3.2 *Scope of the Code*

[illegible]

[illegible]

[illegible]

[illegible]

- [illegible] *Forest Practices Act 1985* [illegible]
- [illegible]
- [illegible]

1.4 *Forest Practices Act 1985* and the Forest Practices Code

[illegible] *Forest Practices Act 1985* [illegible]

[illegible]

- [illegible]
- [illegible]
- [illegible]

[illegible] *Work Health and Safety Act 2012* [illegible]

1.5 Heavy Vehicle National Law and the Log Haulage Code

(Written subject to formal registration)

[illegible] *Heavy Vehicle National Law Act 2012* [illegible] *Heavy Vehicle National Law (Tasmania) Act 2013* [illegible] *Heavy Vehicle National Law (Tasmania) Regulations 2014* [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] **logs** [illegible]

1.6 Other legislation

C2NŜăúNè 2LJŜNI·úλ2yã I·ŘŘNŜăăŜŘ λϒfI·úŜN ăŜÕúλ2yã 2Ŧ úKλă Ř2ÕdzϒŜyú ϒI·è I·fă2 õŜ ădzõ?ŜÕú û2 2úKŜN fI·øă úKI·ú û2dzÕK 2ϒϒI·úúŜNă NŜfI·úŜŘ û2 KŜI·fúK I·yŘ ăI·ŦŜúè¢ ¢KŜăŜ λyÕfdzŘŜ ϒI·úúŜNă fλ]Ŝ úKŜ NŜƎdzfI·úλ2ϒ2ŦY

- I·ƎNλÕdzfúdzNI·f I·yŘ ØŜúŜNλyI·Nè ÕKŜϒλÕI·fă
- Ijdz I·NNèλyƎ I·ÕúλØλúλŜă
- 2ØŜNKŜI·Ř LJ2øŜN fλySă
- KŜfλÕ2LJúŜNă I·yŘ ŘN2ySă¢

1.7 Structure and approach of the Tasmanian Forest Safety Code

¢KŜ /2ŘŜ λă ăúNdzÕúdzNŜŘ I·N2dzyŘ I· õN2I·Ř 2LJŜNI·úλ2yã ÒèÕfŜ Ŧ2N Ŧ2NŜăú 2LJŜNI·úλ2yã λϒúKŜ Ŧ2ff2øλyƎ 2NŘŜNY

- dzyŘŜNăúI·yŘλyƎ NŜăLJ2yãλõλfλúλŜăΣ ϒI·yI·ƎλyƎ NλăŢT Õ2yãdzfúλyƎΣ Õ22LJŜNI·úλyƎΣ I·yŘ Õ22NŘλyI·úλyƎ øλúK 2úKŜNă
- LJfI·yϒλyƎ I·yŘ LJNŜLJI·NŜŘyŜää λyÕfdzŘλyƎ úNI·λyλyƎΣ λyŘdzÕúλ2yΣ ŜϒŜNƎŜyÕè LJNN2ÕŜŘdzNŜăΣ LJŜNă2yI·f LJN2úŜÕúλØŜ ŜIjdzλLJϒŜyú ót t9úΣ I·yŘ ŦNăú I·λŘ
- I·ŘŘλúλ2yI·f Õ2ϒϒ2yϒKI·ÎI·NŘă LJNŜăŜyú λϒϒ2ăú Ŧ2NŜăú 2LJŜNI·úλ2yã
- KI·ÎI·NŘă I·yŘ Nλă] Õ2yúN2fă λϒ2LJŜNI·úλ2yã Õ2ØŜNλyƎ Õ2dzLJŜ I·ÕÕŜăăΣ úλϒōŜN KI·NØŜăúλyƎΣ ŜÈúNI·Õúλ2yΣ fI·yŘλyƎă I·yŘ f2I·ŘλyƎΣ λyŦŦλŜfŘ LJN2ÕŜăăλyƎΣ I·yŘ ăλfØλÕdzfúdzNŜ LJNI·ÕúλÕŜă¢

² λúKλϒúKλă 2LJŜNI·úλ2yã ÒèÕfŜ úKŜ I·LJLJN2I·ÕK ûI·]Ŝyϒλă û2 KλƎKfλƎKú KI·ÎI·NŘă I·yŘ LJN2ØλŘŜ NŜÕ2ϒϒŜyŘŜŘ Nλă] Õ2yúN2fă¢ ² KŜNŜ I·LJLJN2LJNλI·ûŜΣ úKŜ ŦI·Õû2Nă úKI·ú I· Nλă] I·ăăŜăăϒŜyú ăK2dzfŘ Õ2yãλŘŜN I·NŜ 2dzúfλySŘ¢ ¢Kλă Nλă] ϒI·yI·ƎŜϒŜyú I·LJLJN2I·ÕK dzyŘŜNLJλyã úKŜ I·ŘØλÕŜ ƎλØŜyϒλyúKŜ /2ŘŜ¢

9I·ÕK 2LJŜNI·úλ2yI·f ăŜÕúλ2yóŜ¢Ǝ¢ *Section 8 Timber harvesting*Σ *Section 9 Log extraction*ú õdzλfŘă 2yúKŜ õI·ăŜfλySKI·ÎI·NŘăΣ Nλă] ŦI·Õû2NăΣ I·yŘ Nλă] Õ2yúN2fã ăŜú 2dzû λϒ *Section 3.10 Baseline risk management for forest operations* I·yŘ ÒI·yϒõŜ Õ2yãλŘŜNŜŘ ăúI·yŘI·f2yŜ λϒúKI·ú úKŜè NŜŦfŜÕú úKŜ LJNλyÕλLJfŜă 2dzúfλySŘ λϒúKŜ ƎŜyŜNI·f ăŜÕúλ2yã 2Ŧ úKŜ /2ŘŜ¢

¢KŜ /2ŘŜ λŘŜyúλŦλŜă KI·ÎI·NŘă I·yŘ NŜÕ2ϒϒŜyŘŜŘ Nλă] Õ2yúN2fã úKI·ú NŜŦfŜÕú úKŜ λyŘdzăúNè¢ă ÕdzNNŜyú LJNI·ÕúλÕŜă I·yŘ Nλă] I·ăăŜăăϒŜyúă¢

¢KŜ /2ŘŜ λă dzyŘŜNLJλyySŘ õè Ŝăúl·õfλăKŜŘ I·yŘ úŜăúŜŘ Nλă] ϒI·yI·ƎŜϒŜyú LJN2ÕŜăăŜă Ŧ2N ϒI·yê Ŧ2NŜăúNè úI·ă]ă I·yŘ I·ÕúλØλúλŜă I·yŘ úKŜăŜ ăK2dztŘ õŜ dzăŜŘ 2NΣ øKŜNŜ ySÕŜăăI·NèΣ I·Řdzăú ŜŘ õè I· Nλă] I·ăăŜăăϒŜyú úKI·ú ŘŜI·fă øλúK λϒϒŜŘλI·úŜ 2N ÕKI·yƎŜŘ Õ2yŘλúλ2yã óŜ¢Ǝ¢ øŜI·úKŜNΣ ŜIjdzλLJϒŜyúú¢

¢KŜ Nλă] I·ăăŜăăϒŜyú NŜϒI·λyã I· õI·ăλÕ û22f û2 õŜ dzăŜŘ øKŜNŜ úKŜ ÕλNÕdzϒăúI·yÕŜă ØI·Nè ŦN2ϒ úKI·ú ŘŜăÕNλõŜŘ λyúKŜ /2ŘŜ 2N øKŜNŜ ϒI·úúŜNă y2ú Ò2ØŜNŜŘ λyúKŜ /2ŘŜ KI·ØŜ û2 õŜ ϒI·yI·ƎŜŘ¢

1.8 How to use the Code

¢KŜ /2ŘŜ NŜLJNŜăŜyúă LJNI·ÕúλÕI·f ƎdzλŘI·yÕŜ 2yøN]LJfI·ÕŜ KŜI·fúK I·yŘ ăI·ŦŜúè λϒŦ2NŜăú 2LJŜNI·úλ2yã¢ Lú ÕI·yõŜ dzăŜŘ λyúKŜ Ŧ2ff2øλyƎ øI·èăϒ

- I·ă I· õŜyÕKϒI·N] I·ƎI·λyãú øKλÕK úK2ăŜ øλúK NŜăLJ2yãλõλfλúλŜă ÕI·yÕKŜÕ] úKŜNN ÕdzNNŜyú ăèăúŜϒă 2Ŧ ø2N]
- I·ă I· ă2dzNÕŜ 2Ŧ λyŦ2NϒI·úλ2yúû2 dzăŜ λyI·yè NλăŢ I·ăăŜăăϒŜyú 2N λyúKŜ âŜfŜÕúλ2y2Ŧ NλăŢ Õ2yúN2fă
- I·ă I· õI·ăλă Ŧ2N ŘŜØŜf2LJλyƎ I· C2NŜăú hLJŜNI·úλ2yã {I·ŦŜúè óCh{ú tfI·y
- I·ă úKŜ Ŧ2dzyŘI·úλ2y2yøKλÕK ăI·ŦŜ 2LJŜNI·úλyƎ LJN2ÕŜŘdzNŜă I·NŜ õdzλfú
- I·ă úKŜ úŜϒLJfI·úŜ I·ƎI·λyãú øKλÕK I·yè Õ2ϒLJfλI·yÕŜ 2N ø2N]LJfI·ÕŜ KŜI·fúK I·yŘ ăI·ŦŜúè I·dzŘλú ăK2dztŘ õŜ õI·ăŜŘ
- I·ă úKŜ ăúI·yŘI·NŘ I·ƎI·λyãú øKλÕK I·yè I·fúŜNyI·úλØŜă û2 úKŜ I·LJLJN2I·ÕK NŜÕ2ϒϒŜyŘŜŘ λyúKŜ /2ŘŜ ÕI·yõŜ úŜăúŜŘ 2N ϒŜI·ădzNŜŘ¢

hLJŜNI·úλ2yã 2Ŧ ŘλŦŦŜNŜyú ăλÎŜΣ yI·údzNŜΣ I·yŘ ăÕI·fŜ øλff ŦλyŘ ă2ϒŜ LJI·Núă 2Ŧ úKŜ /2ŘŜ ϒ2NŜ LJŜNúλyŜyú úKI·yϒ2úKŜNă¢ ¢KŜ NλăŢ ϒI·yI·ƎŜϒŜyú I·LJLJN2I·ÕK ăŜú 2dzû λyϒfŜƎλătI·úλ2yϒŜyI·õfŜă ŘλŦŦŜNŜyú 2LJŜNI·úλ2yã û2 ŦλyŘ ă2fdzúλ2yã NŜfŜØI·yú û2 úKŜ ăÕI·fŜ 2Ŧ 2LJŜNI·úλ2yã I·yŘ úKŜ fŜØŜf 2Ŧ ăI·ŦŜúè 2N KλƎKŜNØ¢

I2øŜØŜNΣ λú ăK2dzfŘ õŜ ŜϒLJKI·ăλăŜŘ úKI·ú úKŜ ϒI·?2N KI·ÎI·NŘă 2Ŧ Ŧ2NŜăúNè ø2N] Ř2 y2ú ŘλăÕNλϒλyI·úŜ õè ăλÎŜ 2N ăÕI·fŜ I·yŘ yŜλúKŜNI Ř2Ŝă úKŜ I·LJLJfλÕI·úλ2ϒ2Ŧ]y2øyϒI·yŘ úŜăúŜŘ Nλă] Õ2yúN2fã¢

1.9 Code language and style

{2ϒŜ Nλă] Õ2yúN2fã I·yŘ LJN2ÕŜăăŜă I·NŜ ϒI·yŘI·úŜŘ λϒúKŜ ! ÕÚ 2N NŜƎdzfI·úλ2yã ó¥**must**ûú¢ húKŜNøλăŜ Õ2yúN2fã I·NŜ ŘŜăÕNλõŜŘ I·ă **'should'** ăúI·úŜϒŜyúă λyŘλÕI·úλyƎ úKŜ ƎdzλŘI·yÕŜ ăK2dztŘ õŜ Ŧ2ff2øŜŘ dzyfŜăă λú ÕI·yõŜ ŘŜϒ2yăúNI·úŜŘ I·yϒ I·fúŜNyI·úλØŜ I·ÕKλŜØŜă úKŜ ăI·ϒŜ fŜØŜf 2Ŧ ăI·ŦŜúè 2N KλƎKŜNú¢

¢KŜ ŜÈÕŜLJúλ2yϒû2 úKλă Ŧ2NϒdzfI·úλ2yλă øKŜNŜ ŜØλŘŜyÕŜ I·yŘ λyŘdzăúNè LJNI·ÕúλÕŜ ŘŜϒ2yăúNI·úŜă úKŜNŜ λă 2yfè 2yŜ ăI·ŦŜ øI·è û2 ϒI·yI·ƎŜ úKŜ NλăŢ¢ LyϒúKλă ÕI·ăŜ ŜÈLJNŜăăλ2yã ădzÕK I·ă ΨϒdzăúΣ ΨR2 y2úΩ I·yŘ ΨySØŜNΩ I·NŜ dzăŜŘ¢ ¢KŜ ϒ2ăú Õ2ϒϒ2yÕI·ăŜă I·NŜ ăŜLJI·NI·úλ2yŘλăúI·yÕŜă óŜ¢Ǝ¢ ûø2 úNŜŜ fŜyƎúKăú I·yŘ 2LJŜNI·û2N Õ2ϒLJŜúŜyÕè NŜIjdzλNŜϒŜyúă úKI·ú I·NŜ y2ú ϒI·yŘI·ûŜŘ λyϒNŜƎdzfI·úλ2yϒ õdzú I·NŜ ϒI·yŘI·úŜŘ λyϒyŘdzăúNè LJNI·ÕúλÕŜ¢ ΨadzăúΩ λă dzăŜŘ λyϒNŜfI·úλ2yϒû2 úKŜ dzăŜ 2Ŧ tt9 øKŜNŜ λú λă dzyfλ]Ŝfè úKI·ú úKŜNŜ λă I·ŦŜI·ăλõfŜ I·fúŜNyI·úλØŜ û2 NŜŘdzÕŜ úKŜ KI·ÎI·NŘ õè 2úKŜN ϒŜúK2Řă¢

¢KŜăŜ I·NŜ ŜÈI·YˊLJfŜă 2Ŧ ØKI·ú ÕI·yˊōŜ ŘŜăÕNăōŜŘ I·ă ŭKŜ ΨăŭI·úŜ 2Ŧ ˥yƵØŧŜŘƎŜ© I·ō2dzú ŭKŜ KI·Î I·NŘ I·yŘ ŭKŜ Ø I·ëă 2Ŧ ŜfλYλyI·ŭλyƎ Nλă˥© ¢Kλă ăă ŜÈLJNŜăăŜŘ λyˊŭKŜ ! Õŭ I·ă LJI·NŭÚ 2Ŧ ØKI·ú ăă ΨNŜI·ă2yI·ōfè LJNJI·ÕŭλÕI·ōfŜ©

{ŜØŜNJI·f ăèYō2fă I·NŜ dzăŜŘ ŭƵ KλƎKfλƎKŭ Õ2YˊY2yˊLJN2ÕŜăăŜă© KI·Î I·NŘăƵ I·yŘ Nλă˥ Õ2yŭN2fă©

¢KŜ Ŧ2ff2ØλyƎ ăèYō2fă NŜLJNŜăŜyŭ ŭKŜ ˥Ŝè LJN2ÕŜăăŜă λyˊY I·yI·ƎλyƎ Ø2N˥LJfI·ÕŜ KŜI·fúK I·yŘ ăI·ŦŜúè© ¢KŜè I·NŜ dzăŜŘ I·ă ŭKŜ ōI·ăλÕ ăúNdzÕŭdzNŜ 2Ŧ ŜI·ÕK 2LJŜNJI·úλ2yI·f ăŜÕúλ2y©

Planning Ŧ2N Ŧ2NŜăú 2LJŜNJI·úλ2yă λyˊf2yƎŜN úŜNYˊ KI·NØŜăú LJfI·yăƵ I·yÝdzI·f LJfI·yăƵ I·yŘ Ŧ2N 2LJŜNJI·úλ2yI·f LJfI·yă©

Consultation, cooperation, and coordination ōŜŭØŜŜyˊNŜfŜØI·yŭ LJI·NúλŜă λyÕfdzŘλyƎ Õ2yŭNJI·ÕŭN2Nă I·yŘ Ø2N˥ŜNă ŭKI·ú ō2úK ŜăúI·ōfλăK ăI·ŦŜ ăèăúŜYă I·yŘ ŜyÕ2dzNJI·ƎŜ ŭKŜ I·ÕúλØŜ λyØ2fØŜYˊŜyŭ 2Ŧ I·ff©

Risk assessment λyˊŭKŜ LJfI·yÝλyƎ ăúI·ƎŜ I·ă ØŜff I·ă Ŧ2N 2LJŜNJI·úλ2yI·f Nλă˥ă I·yŘ ØKŜyˊ2LJŜNJI·úλyƎ Õ2yŘλúλ2yă ÕKI·yƎŜ©

Hazards λŘŜyŭλŦλŜŘ ădzÕK I·ă KI·Î I·NŘ2dză úNŜŜăƵ N2ffλyƎ 2N ăfλŘλyƎ f2ƎăƵ I·yŘ I·Ř?I·ÕŜyŭ YˊI·ÕKλySNè© . 2úK Õ2YˊY2yˊKI·Î I·NŘă I·yŘ KI·Î I·NŘă ăLJŜÕλŦλÕ ú2 ÔŜNúJI·λyˊúI·ă˥ăκI·ÕúλØλúλŜă©

Risk controls ŭ2 ŜfλYλyI·ûŜ 2N NŜŘdzÕŜ I·ăăŜăăŜŘ Nλă˥ă ă2 ŦI·N I·ă λă NŜI·ă2yI·ōfè LJNJI·ÕúλÕI·ōfŜ© . 2úK Õ2YˊY2yˊNλă˥ Õ2yŭN2fă I·yŘ ăLJŜÕλŦλÕ Õ2yŭN2fă Ŧ2N ÔŜNúJI·λyˊúI·ă˥ăκI·ÕúλØλúλŜă©

¢KŜ Ŧ2ff2ØλyƎ ăèYō2fă I·NŜ dzăŜŘ ŭ2 KλƎKfλƎKŭ I·yŘ NŜλyf2NÔŜ YˊŜI·ădzNŜă ŭ2 YˊI·yI·ƎŜ Nλă˥ă©

Equipment designed for the task and operated within specifications ƎλØŜyˊŭKŜ 2LJŜNJI·úλyƎ Õ2yŘλúλ2yă ădzÕK I·ă ăf2LJŜ I·yŘ ØŜI·ŭKŜN.

Safe work practices I·ÕKλŜØŜŘ ŭKN2dzƎK NŜfŜØI·yŭ úNJI·λyλyƎ ljdzI·fλŦλÕI·úλ2yăƵ fλÕŜyÕŜăƵ t t 9Σ I·yŘ NŜI·ŘλySää Ŧ2N Ø2N˥ LJ2fλÕλŜă ădzÕK I·ă ŦI·úλƎdzŜƵ ŘNdzƎăƵ I·yŘ I·fÕ2K2f©

Exclusion zones and safe work areas ŭ2 ăŜLJI·NJI·úŜ Ø2N˥ŜNă ŦN2Yˊ 2LJŜNJI·úλ2yI·f I·yŘ Ŧ2NŜăú KI·Î I·NŘă© tKèăλÕI·f ō I·NλNλŜNăƵ ŘλăúI·yÕŜƵ 2N úλYˊŜπōI·ăŜŘ YˊŜI·yă 2Ŧ ăŜLJI·NJI·úλ2y©

Communication systems Ŧ2N I·ÕÕŜăă ădzÕK I·ă ăλƎyI·ƎŜƵ Ŧ2N Õ2YˊYˊdzyλÕI·úλyƎ ōŜŭØŜŜyˊ2LJŜNJI·ú2Nă λyˊYˊI·ÕKλySă I·yŘ 2yˊ ŭKŜ ƎN2dzyŘƵ I·yŘ Ŧ2N ŜYˊŜNƎSyÕè I·yŘ ŜØI·Ödz I·úλ2yˊăλúdz I·úλ2yă©

2 RESPONSIBILITIES

2.1 Introduction

9yădzNλyƎ **health** I·yŘ ăI·ŦŜúè λyˊ**forestry operations** NŜljdzλNŜă ŜØŜNè2yŜ ú2 LJfI·è úKŜλN LJI·Nú λyˊŜfλYλyI·úλyƎ 2N NŜŘdzÕλyƎ Nλă˥ă ă2 Ŧ I·N I·ă λă NŜI·ă2yI·ōfè LJNJI·ÕúλÕI·ōfŜ© ¢KŜăŜ NŜăLJ2yăλōλfλúλŜă 2N ΨŘdzúλŜă© ôúKŜ ûŜNYˊ dzăŜŘ λyˊŭKŜ ² I { ! Õúú I·NŜ NŜfI·úŜŘ ú2 ŭKŜ N2fŜ ŭKŜ LJŜNăă2yˊKI·ă λyˊŭKŜ Ŧ2NŜăúNè LJN2ŘdzÕúλ2yˊÕèÕfŜ©

¢KŜ ² I { ! Õŭ ăŜûă 2dzú I· NJI·yƎŜ 2Ŧ ŘλŦŦŜNŜyŭ Ředzúè K2fŘŜNă I·yŘ LJNŜăÕNλōŜă úKŜ NŜăLJ2yăλōλfλúλŜă úKŜè KI·ØŜ© ² I { wŜƎdzfI·úλ2yă LJN2ØλŘŜ YˊN2NŜ ŘŜúJI·λf 2yˊØKI·ú Yˊdzăú ōŜ Ř2yŜ ú2 ŜfλYλyI·ûŜ 2N NŜŘdzÕŜ KI·Î I·NŘă I·yŘ Nλă˥ă©

LÚ λă λYˊLJ2NúJI·yŭ ú2 dzyŘŜNăúJI·yŘ ŭKI·ú LJŜNă2yă YˊI·è K2fŘ ăλYˊλfI·N ŘedzúλŜă λyˊă2YˊŜ ÕNÕdzYˊăúJI·yÕŜă I·yŘ ŭKI·ú ŘedzúλŜă I·NŜ 2ŦúŜyˊ NŜÕλLJN2ÕI·f© C2N ŜÈI·YˊLJfŜz I· ōdzăλyŜää KI·ă I· Ředzûè ú2 LJN2ûŜÕú ŭKŜ KŜI·fúK I·yŘ ăI·ŦŜúè 2Ŧ **workers**Σ ōdzú Ø2N˥ŜNă I·fă2 2ØŜ I· Ředzûè ú2 ŭKŜ ōdzăλyŜää ú2 Ŧ2ff2Ø LJN2ÕŜŘdzNŜă I·yŘ y2ú ú2 LJdzú ŭKŜYˊăŜfØŜă 2N 2ŭKŜNă I·ú Nλă˥©

5dzúλŜă ÕI·yŸ2ú ōŜ Ψ Õ2yŭNJI·ÕúŜŘ 2dzûΩ ōdzú ŜI·ÕK LJI·Núè Yˊdzăú ŘλăÕKI·NƎŜ ŭKŜNλ NŜăLJŜÕúλØŜ NŜăLJ2yăλōλfλúλŜă ú2 ŭKŜ ŜÈúŜyŭ ŭKI·ú ŭKŜè KI·ØŜ ŭKŜ ÕI·LJI·Õλúè ú2 λyŦfdzŜyÕŜ I·yŘ Õ2yŭN2f ŭKŜ YˊI·úúŜN©

! fI·yŘ2øyŜNΣ Ŧ2N ŜÈI·YˊLJfŜz KI·ă I· Ředzûè ú2 LJN2ØλŘŜ I· úλYˊōŜN KI·NØŜăúλyƎ Õ2yŭNJI·ÕúN2N øλúK NŜfŜØI·yŭ λyŦ2NYˊI·úλ2yˊI·ō2dzú ŭKŜ ăλúŜ I·yŘ ŭKŜ KI·Î I·NŘă úKŜè ˥yƵø 2N YˊƎKú NŜI·ă2yI·ōfè ˥yƵø I·ō2dzú© Lú I·fă2 KI·ă I· Ředzûè ú2 ăI·úλăŦè λúăŜfŦ ŭKI·ú ŭKŜ Õ2yŭNJI·ÕúN2N λă ÕI·LJI·ōfŜ 2Ŧ ăI·ŦŜfè dzyŘŜNúJI·˥λyƎ ŭKŜ úI·ă˥©

¢KŜ Õ2yŭNJI·ÕúN2N YˊdzăŭúKŜyˊdzyŘŜNúJI·˥Ŝ ŭKŜ úI·ă˥ ōè úI·˥λyƎ ŭKλă λyŦ2NYˊI·úλ2yˊλyŭ2 I·ÕÕ2dzyŭ I·yŘ I·LJLJfèλyƎ ŭKŜN 2øyˊăLJŜÕλŦλÕ ăI·ŦŜ 2LJŜNJI·úλyƎ LJN2ÕŜŘdzNŜă©

2.2 Person conducting a business or undertaking

¢KŜ ² I { ! Õŭ LJNŜăÕNλōŜă ŭKI·ú I· **person conducting a business or undertaking (PCBU)** KI·ă ŭKŜ LJNλYˊI·Nè Ředzûè dzyŘŜN ŭKŜ ² I { ! Õŭ ú2 Ŝyădzŋ̂Σ Ψă2 ŦI·N I·ă λă NŜI·ă2yI·ōfè LJNJI·ÕúλÕI·ōfŜΣ ŭKI·ú ø2N˥ŜNă I·yŘ 2ŭKŜN LJŜ2LJfŜ I·NŜ y2ú ŜÈLJ2ăŜŘ ú2 **workplace** KŜI·fúK I·yŘ ăI·ŦŜúè Nλă˥ă I·NλăλyƎ FN2Yˊ ŭKŜ ōdzăλyŜää 2N dzyŘŜNúJI·˥λyƎ©

t / . ¦ λă I· ōN2I·Ř Õ2yÕŜLJŭ ŭKI·ú ŜÈúŜyŘă ōŜè2yŘ ŭKŜ úNJI·Řλúλ2yI·f ŜYˊLJf2èŜNKŜYˊLJf2èŜŜ NŜfI·úλ2yăKλLJ ú2 λyÕfdzŘŜ I·ff úèLJŜă 2Ŧ Yˊ2ŘŜNyˊ ø2N˥λyƎ I·NNJI·yƎŜYˊŜyŭă© ! yŘ dzyŘŜNúJI·˥λyƎ YˊI·è KI·ØŜ ŜfŜYˊŜyŭă λyˊÕ2YˊY2yˊ øλúK I· ōdzăλyŜääΣ ădzÕK I·ă 2NƎI·yλăI·úλ2yΣ ăèăúŜYă I·yŘ LJ2ăăλōfè Õ2yŭλydzλúèΣ ōdzú dzyŘŜNúJI·˥λyƎă I·NŜ dzădzI·ffè y2ú Õ2YˊYˊŜNÕλI·f 2N LJN2Ŧλúπ YˊI·˥λyƎ λyˊyI·údzNŜ©

! t / . ¦ λyˊŭKŜ Ŧ2NŜăú λyŘdzăúNè λyÕfdzŘŜăY

- fI·yŘ2øyŜNă øK2 ƎN2ø 2N KI·NØŜăú úλYˊōŜN 2yˊúKŜλN 2øyˊLJN2LJŜNúèΣ dzyfŜää λú ăă Ŧ2N úKŜλN 2øyˊLJŜNă2yI·f dzăŜ
- fI·yŘ2øyŜNă I·yŘ Ŧ2NŜăú YˊI·yI·ƎŜNă øK2 ŜyƎI·ƎŜ Õ2yŭNJI·ÕúNă ú2 KI·NØŜăú 2N úNJI·yăLJ2NúJ Ŧ2NŜăú LJN2ŘdzÕúă

- [illegible]

[illegible]

- [illegible]
- [illegible]
- [illegible]

[illegible]

- [illegible]
- [illegible] **plant**
- [illegible]
- [illegible]
- **health monitoring**.

[illegible]

[illegible]

- [illegible]
- [illegible]
- [illegible]

[illegible]

2.3 Other duty holders

[illegible]

- **Designers, manufacturers, suppliers, and importers of plant, substances, or structures** [illegible]

  [illegible]
- **Officers** [illegible]

  [illegible]
- **Workers and other people at the workplace** [illegible]
  - [illegible]
  - [illegible]
  - [illegible]

[illegible]

[illegible] **visitors** [illegible]

2.4 Reasonably practicable

[illegible]

a. *the likelihood of the hazard or the risk concerned occurring*

   [illegible]

b. *the degree of harm that might result from the hazard or the risk*

   [illegible]

c. *what the person concerned knows, or ought reasonably to know, about the hazard or risk, and about the ways of eliminating or minimising the risk*

[illegible]

1. *the availability and suitability of ways to eliminate or minimise the risk*
   [illegible]
2. *after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk*
   [illegible]

2.5 WHS Regulations

[illegible]

[illegible]

[illegible] **notifiable incident** [illegible]

[illegible]

2.6 Understanding responsibilities across the planning and operational cycle

[illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]

[illegible]

2.6.1 *Landowners*

[illegible] **Forest Practices Plans** [illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

2.6.2 *Forest managers or landowners who engage contractors*

[illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

2.6.3 Contractors

! ŦƵNŜáű **contractor** ŀ·ă ŀ· t / . ¦ ƛă NŜăLJƶ2yẕƛōfŜ Ŧ2N ăŀ·ŦŜfê Ô2ϒLJfŜűƛyƎ úKŜ úŀ·ăʅă ădzÔK ŀ·ă ăƛúŜ LJNŜLJŀ·NJŀ·úƛ2y[ăŜŜŘ Ô2ffŜÔűƛ2y[úNŜŜ LJfŀ·yűƛyƎ[**felling**[ŜÈűNJŀ·Ôűƛy Ǝ[LJN2ÔŜăăƛyƎ[ŀ·yŘ úNJŀ·yãLJ2NűƛyƎ LJN2ŘdzÔű ŦN2ϒ ûKŜ **coupe**Φ / ƶyűNJŀ·Ôű2Nă ŀ·NŜ NŜăLJƶ2yẕƛōfŜ Ŧ2N Ŝyãdz NƛyƎϒ

- Kŀ·Îŀ·NJŘă ƛŘŜyűƛŦƛŜŘ ƛyϒűKŜ Ch{ tfŀ·yϒŀ·NŜ ϒŀ·yŀ·ƎŜŘ
- ǿ2N]ŜNă ŀ·NŜ ădzƛúŀ·ōfè úNJŀ·ƛyŜŘ ŀ·yŘ ŜIjdzƛLJLJŜŘ ű2 Ř2 ûKŜ ƨ2ō ăŀ·ŦŜfè
- ƛyϒ2Nϒŀ·ûƛ2yϒ2yϒKŀ·Îŀ·NJŘă ădzÔK ŀ·ă ÔKŜϒƛÔŀ·fã ƛă ŀ·ÔÔŜăăƛōfŜ ű2 dzăŜNă
- ăŀ·ŦŜ ǿ2N] LJN2ÔŜŘdzNŜă ű2 ûKŜ ăLJŜÔƛŦƛÔ NJăʅă 2Ŧ ûKŜNJ 2LJŜNJŀ·ûƛ2yã ŀ·NŜ ŀ·LJLJfƛŜŘ
- ǿ2N]ŜNă ŀ·NŜ Ô2yãdztűŜŘ 2ϒNJăʅăƶ ăŀ·ŦŜ ǿ2N] LJNJŀ·ÔűƛÔŜăƶ ŀ·yŘ ŀ·yê ÔKŀ·yƎŜă ű2 ădzÔK LJNJŀ·ÔűƛÔŜă
- LJfŀ·yű ƛă ădzƛúŀ·ōfŜ Ŧ2N ûKŜ úŀ·ăʅ ŀ·yŘ ŀ·ōfŜ ű2 ōŜ 2LJŜNJŀ·ûŜŘ ǿƛúKƛyϒƛúă ăŀ·ŦŜ ǿ2N]ƛyƎ fƛYϒƛúă
- ǿ2N] ƛă ŀ·ÔűƛØŜfê ădzLJŜNJØƛăŜŘ ŀ·yŘ ϒ2yϒƛű2NJŜŘ
- LJfŀ·yű ƛă NJŜƎdzfŀ·NJfè ƛyãLJŜÔűŜŘ ŀ·yŘ Yŀ·ƛyűŀ·ƛyŜŘ
- ăLJŜÔƛŦƛÔ Ô2ϒYdzyƛÔŀ·ûƛ2yϒŀ·yŘ ŜYŜNJƎŜyÔè LJN2ÔŜŘdzNŜă ŀ·NŜ Ŝăúŀ·ōfƛăKŜŘ ŀ·yŘ ûŜăúŜŘ
- ădzƛúŀ·ōfŜ ŦƛNJăúŀ·ƛŘ ŀ·yŘ ŀ·ϒŜyűúƛŜă ŀ·NŜ LJN2ØƛŘŜŘΦ

2.6.4 Designers, manufacturers, suppliers, etc.

¢KŜăŜ Řdzúè K2fŘŜNă ŀ·NŜ NŜăLJ2yẕƛōfŜ Ŧ2N Ŝyãdz NƛyƎ LJfŀ·yű úKŀ·ú ƛă ŘŜẕƛƎyŜŘ ű2 NŜŘdzÔŜ Nƛăʅ ƛă ădzLJLJfƛŜŘ ű2 ŜyŘ dzăŜNă ădzÔK ŀ·ă Ô2yűNJŀ·ÔűƛNă wŜăLJ2yẕƛōfƛúƛŜă ű2 ûKŜ ŜyŘ dzăŜN ƛyÖfdzŘŜϒ

- LJN2ØƛŘƛyƎ dzăŜNă ǿƛúK ƛyŦ2Nϒŀ·ûƛ2yϒŀ·ō2dzú ăŀ·ŦŜ dzăŜ 2Ŧ LJfŀ·yű 2N ădzōăúŀ·yÖŜă
- LJN2ØƛŘƛyƎ dzăŜNă ǿƛúK ŀ·yê dzLJŘŀ·ûŜŘ ƛyŦ2Nϒŀ·ûƛ2yϒŀ·ō2dzú ǿ2N]LJfŀ·ÖŜ KŜŀ·fûK ŀ·yŘ ăŀ·ŦŜúè ƛăădzŜă úKŀ·ú KŀØŜ ŀ·NJăŜyϒƛyϒúKŜ dzăŜ 2Ŧ ŜIjdzƛLJϒŜyű 2N ădzōăúŀ·yÖŜă

2.7 Control and influence

hŦűŜyϒƛyϒŦ2NŜáűNè 2LJŜNJŀ·ûƛ2yã ăŜØŜNJŀ·f t / . ¦ ă ŀ·NŜ ǿ2N]ƛyƎ ƛyϒŀ· Ô2ϒϒ2yϒǿ2N]LJfŀ·ÖŜ ŀ·yŘ úKdză ϒŀ·è K2fŘ ăƛϒƛfŀ·N ŘdzűƛŜă ŀ·ű ûKŜ ăŀ·ϒŜ ûƛϒŜΦ ² KŜNJŜ ϒdztűƛLJfŜ t / . ¦ ă óŜΦƎΦ Kŀ·NØŜăúƛyƎ Ô2yűNJŀ·ÔűƛNJ[Kŀ·dzfŀ·ƎŜ Ô2yűNJŀ·ÔűƛNJ[ŀ·yŘ Ŧ2NŜăú ϒŀ·yŀ·ƎŜNJó K2fŘ ŘdzűƛŜă ŀ·ű ûKŜ ăŀ·ϒŜ ûƛϒŜ[Ŝŀ·ÖK t / . ¦ ǿƛff NŜűŀ·ƛyϒNŜăLJ2yẕƛōfƛúè ű2 ϒƛyƛϒƛăŜ Nƛăʅăʅă ű2 ûKŜ ŜÈűŜyű ű2 ØKƛÖK ƛű Kŀ·ă ŀ· Öŀ·LJŀ·Ôƛúè ű2 ƛyϒfdzŜyÖŜ ŀ·yŘ Ô2yűNJ2f ûKŜ ϒŀ·úűŜNØ CdzNűKŜNJ[ƛŦ ϒ2NJŜ ûKŀ·yϒyŜ LJŜNJă2yϒKŀ·ă ŀ· Řdzúè ƛyϒNJŜfŀ·ûƛ2yϒű2 ûKŜ ăŀ·ϒŜ ϒŀ·úűŜNØ dzyŘŜNJ ûKŜ ² ŀ{ !ÖűŽ Ŝŀ·ÔK LJŜNJă2yϒǿƛúK ûKŜ Řdzúè ϒdzăű[ă2 Ŧŀ·NJ ŀ·ă ăƛNJŜŀ·ă2yŀ·ōfè LJNJŀ·ÔűƛÔŀ·fŜ[Ô2yãdztű[Ô22LJŜNJŀ·ûŜ ŀ·yŘ Ô22NJŘƛyŀ·ûŜ ŀ·ÔűƛØƛúƛŜă ǿƛúK ŀ·ff 2ûKŜNJ LJŜNJă2yã ǿK2 KŀØŜ ŀ· Řdzúè ƛyϒNŜfŀ·ûƛ2yϒű2 ûKŜ ăŀ·ϒŜ ϒŀ·úűŜNØ

! t / . ¦ Ôŀ·yy2ú Ô2yűNJŀ·Ôű 2dzú 2Ŧ ƛűă ǿ2N]LJfŀ·ÖŜ KŜŀ·fûK ŀ·yŘ ăŀ·ŦŜúè 2ōfƛŀ·ûƛ2yã hyÖŜ Ô2yűN2f 2N ƛyϒfdzŜyÖŜ ŜÈƛáúă ŀ· t / . ¦ 2ǿŜă ŀ·yϒ2ōfƛŀ·ûƛ2yϒű2 ƛűă Ô2yűNJŀ·ÔűƛNă Φ

/2yűN2f ƛyÖfdzŘŜă ō2ûK fŜƎŀ·f ŀ·yŘ LJNJŀ·ÔűƛÖŀ·f Ô2yűN2fΦ tNJŀ·ÔűƛÖŀ·f Ô2yűN2f ŜÈƛáúă ƛŦ ŀ· t / . ¦ ŘŜÖƛŘŜă ű2 ƎƛØŜ ŀ· ŘƛNJŜÖűƛ2yϒű2 ŀ· LJŜNJă2yϒŀ·yŘ ûKƛă ŘƛNJŜÖűƛ2yϒƛă ŀ·ÔűŜŘ dzLJ2yΦ ¢KŜ yl·ûdzNJŜ 2Ŧ ûKŜ fŜƎŀ·f NJŜfŀ·ûƛ2yãKƛLJ ŀ·yŘ ûKŜ Ô2yűN2f ŀ·ōfŜ ű2 ōŜ ŜÈŜNJÖƛăŜŘ ōè ŀ· t / . ¦ ǿƛff ŀ·ŦŦŜÖű KƛØ ϒdzÖK ƛű ăă NJŜIjdzNJŜŘ ű2 Ř2Φ 9yƎŀ·ƎƛyŜ ŜÈLJŜNJű Ô2yűNJŀ·ÔűƛNă ŀ·yŘ ØŜNJŦèƛyƎ ûKŀ·ú ŀ· Ô2yűNJŀ·ÔűƛNJ ϒŀ·yŀ·ƎŜă NJăʅă ϒŀ·è ōŜ ØƛŜØŜŘ ŀ·ă úŀ·ʅƛyƎ NJŜŀ·ăƛyŀ·ōfŜ ăűŜLJă ű2 ŘƛăÔKŀ·NJƎŜ ŀ· Řdzúè 2NJ LJŀ·NJű 2Ŧ ŀ· Řdzúè Φ

!yŜÈŀ·ϒLJfŜ 2Ŧ ŀ· ŘƛNJŜÖűƛ2yϒƛă ǿKŜNJŜ ŀ· Ŧ2NJŜáű ƨǿyŜN NJŜIjdzNJŜă Ô2ϒLJfƛŀ·yÖŜ ǿƛúK ûKŜƛNJ t t9 NJdztŜă ŀ·ă ŀ· Ô2yŘƛúƛ2yϒ2Ŧ ŜyűŜNƛyƎ ŀ· Ŧ2NJŜáű ōdzű Ř2Ŝă yƨű KŀØŜ ŀ· ŘƛNJŜÖű Ô2yűNJŀ·ÔűΦ ¢2 ŘƛăÔKŀ·NJƎŜ ûúă ŘdzúèŒ ƛű ǿ2dztŘ yŜŜŘ ű2 ÔKŜÔ]ûKŀ·ú ûKŜ Ŧ2NJŜáű Ô2yűNJŀ·ÔűƨNJ Kŀ·ă ŀ· ǿŀ·è 2Ŧ Ô2yØŜèƛyƎ ûKƛă LJ2fƛÔè ű2 ØƛăƛúƨNJăΣ fƛ]Ŝ ƛyŘdzÖúƨ2yϒNJŜÖ2NJŘăΦ húKŜNJ ŜÈŀ·ϒLJfŜă 2Ŧ K2ǿ ŘdzűƛŜă ϒŀ·è ōŜ ăKŀ·NJŜŘ ŀ·NJŜ LJNJ2ØƛŘŜŘ ƛyϒ *Table 3*Φ

2.8 Farm forestry

Lϒ ûKŜ Ôŀ·ăŜ 2Ŧ Ŧŀ·NJϒ Ŧ2NJŜáűNè ǿKŜNJŜ 2ǿyŜNă KŀØŜ LJfŀ·yűŜŘ ăϒŀ·ff LJf2ûă ƛű ϒŀ·è y2ú ōŜ ŜÔ2y2ϒƛÔ ű2 dzăŜ ûKŜ ϒŀ·ÔKƛyŜNè ŀ·yŘ ϒŜűK2Řă dzăŜŘ ƛyϒfŀ·NJƎŜπăÔŀ·fŜ Kŀ·NJØŜăűƛyƎΦ ¢KŜ ÔKŀ·ƛyϒ2Ŧ NJŜăLJ2yẕƛōfƛúƛŜă Ŧ2NJ KŜŀ·fűK ŀ·yŘ ăŀ·ŦŜúè ƛyăϒŀ·ffπăÔŀ·fŜ 2LJŜNJŀ·ûƛ2yã ϒŀ·è ōŜ fŜăă Ô2ϒLJfŜĒ ōdzű ûKŜ LJNJƛϒŀ·NJè ŘdzúƛŜă Ř2 y2ú ÔKŀ·yƎŜ ŀ·yŘ ûKŜ ăŀ·ϒŜ NJŜăLJ2yẕƛōfƛúƛŜă NJŜϒŀ·ƛyΦ

C2NJ ŜÈŀ·ϒLJfŜ[ŀ· t / . ¦ ǿK2 ƛă ŀ· ăϒŀ·ff 2LJŜNJŀ·ûƛ2NJ ϒŀ·è dzyŘŜNJűŀ·ʅŜ ă2ϒŜ 2Ŧ ûKŜ ǿ2N] ûKŜϒăŜfØŜă ōdzű ϒŀ·è ŀ·fă2 ŜyƎŀ·ƎŜ Ô2yűNJŀ·ÔűƛNJă ű2 Ŧŀ·ff úNJŜŜă 2NJ Ô2yűNJŀ·Ôű ăŀ·ǿϒƛffă ű2 Kŀ·NJØŜăű ŀ·yŘ LJNJ2ÔŜăă úƛϒÔŜNJΦ

!ă ŀ· t / . ¦ ǿK2 ϒŀ·è 2yfè 2ÖÔŀ·ăƛ2yŀ·ffè ŜyƎŀ·ƎŜ Ô2yűNJŀ·ÔűƛNJă úKŜNJŜ ƛă ăűƛff úKŜ NJŜăLJ2yẕƛōfƛúè ű2ϒ

- ăŜfŜÖű ădzƛúŀ·ōfŜ Ô2yűNJŀ·ÔűƛNJă Ijdzŀ·fƛŦƛŜŘ Ŧ2NJ ûKŜ úŀ·ăʅ
- LJN2ØƛŘŜ Ô2yűNJŀ·ÔűƛNJă ǿƛúK Kŀ·Îŀ·NJŘ ƛyŦ2NJϒŀ·ûƛ2yϒŀ·ō2dzú ûKŜ ăƛúŜ
- Ô2yãdztű ŀ·yŘ Ô22NJŘƛyŀ·ûŜ ǿƛúK ûKŜ Ô2yűNJŀ·ÔűƛNJ 2yϒŀ·yê ăŀ·ŦŜúè ƛăădzŜă ûKŀ·ú ŀ·NJăŜ
- Ŝyãdz NJŜ ăŀ·ŦŜ ŀ·ÖÔŜăă ŀ·yŘ ŜƎNJŜăă Ŧ2NJϒ ûKŜ Kŀ·NJØŜăűƛyƎ Ô2dzLJŜă
- Ŝyãdz NJŜ ûKŜ ăŀ·ŦŜúè 2Ŧ 2ûKŜNJă 2yϒŀ·Ř2ŀ·ÔŜyű fŀ·yŘ ŀ·yŘ 2LJŜNJŀ·ûƛ2yã ƛă yƨű ƛϒLJŀ·ÔűŜŘ
- ϒ2yűƛ2N ûKŜ ăŀ·ŦŜúè LJŜNJŦ2NJϒŀ·yÖŜ 2Ŧ ûKŜ Ô2yűNJŀ·ÔűƛNJΦ

3 MANAGE RISKS

3.1 Risk management in overview

wλă] Y l·yl·∃ŜYŜyű λă l· LJN2ŐŜăă ű2 KŜfLJ Y l·yl·∃Ŝ ø2N]LJfl·ŐŜ KŜl·fűK l·yŘ ăl·ŦŜűè l·yŘ Ő2YLJfè øλúK űKŜ fl·øφ

.2űK űKŜ ² l{ !Őű l·yŘ ² l{ wŜ∃dztl·úλ2yã NŜIjdzλNŜ úKŜ λŘŜyűλŦλŐl·úλ2y2Ŧ Kl·Îl·NŘăΣ l·ăăŜăăYŜyű 2Ŧ NXă]ăΣ l·yŘ úKŜ ŘŜØŜf2LJYŜyű 2Ŧ Ő2yűN2fã ű2 ŜfλYλyl·úŜ 2N NŜŘdzŐŜ NXă] ă2 Ŧl·N l·ă λă NŜl·ă2yl·ōfè LJNl·ŐúλŐl·ōfŜφ

¢KŜ 2ō?ŜŐúλØŜ 2Ŧ úKŜ ø2N]LJfl·ŐŜ KŜl·fűK l·yŘ ăl·ŦŜűè NXă] Y l·yl·∃ŜYŜyű LJN2ŐŜăă λă ű2 LJN2ØλŘŜ úKŜ ΨKλ∃KŜăű tŜØŜf 2Ŧ LJN2úŜŐúλ2y l·ű ø2N] ă2 Ŧl·N l·ă λă NŜl·ă2yl·ōfè LJNl·ŐúλŐl·ōfŜφ

! Y2NŜ ŘŜúl·λfŜŘ 2dzúfλySŜ 2Ŧ úKŜ NXă] Y l·yl·∃ŜYŜyű LJN2ŐŜăă Ől·y¯ōŜ Ŧ2dzyŘ λy¯úKŜ l·LJLJN2ØŜŘ /2ŘŜ 2Ŧ tNl·ŐúλŐŜ
How to manage work health and safety risks.

Figure 1 ōŜf2ø ăK2øă úKŜ LJN2ŐŜăă l·ă 2dzúfλySŘ λy¯úKŜ /2ŘŜφ

Figure 1: Overview of the risk management process

¢KŜ Ŧ2dzNXtăúŜLJ LJN2ŐŜăă 2Ŧ λŘŜyűλŦèλyE Kl·Îl·NŘăΣ l·ăăŜăăλyE NXă]ăΣ Ő2yűN2ffλyE NXă]ăΣ l·yŘ NŜØλŜøλyE Ő2yűN2fã λă dzyŘŜNLJλyySŘ ōè LJN2ŐŜăăŜă 2Ŧ Ő2yãdztűl·úλ2y£ Ő22LJŜNl·úλ2y£ l·yŘ Ő22NŘλyl·úλ2y¯ósee Section 4úφ

¢KŜ ŜfŜYŜyűă 2Ŧ úKŜ LJN2ŐŜăă l·NŜ 2dzúfλySŘ λy¯Y2NŜ ŘŜúl·λf λy¯úKŜ Ŧ2ff2øλyE ăŜŐúλ2yãφ

3.2 Common terms

! **hazard** λă ă2YŜűKλyE λy¯úKŜ ø2N] ŜyØλN2yYŜyű úKl·ú Kl·ă úKŜ LJ2úŜyűλl·f ű2 Ől·dzăŜ Kl·NY ű2 úKŜ KŜl·fűK l·yŘ ăl·ŦŜűè 2Ŧ LJŜ2LJfŜφ LY¯Ŧ2NŜăúNè 2LJŜNl·úλ2yã ă2YŜ 2Ŧ úKŜ]Ŝè Kl·Îl·NŘă λyŐfdzŘŜ Ŧl·ffλyE ōNl·yŐKŜăΣ E N2dzyŘ Ő2yŘλúλ2yãΣ l·yŘ ăűŜŜLJ ăf2LJŜ ø2N]φ

! **risk** λă úKŜ ŐKl·yŐŜ ó2N fλ]ŜfλK22Řú úKl·ú l· Kl·Îl·NŘ øλff Ől·dzăŜ Kl·NY ű2 úKŜ KŜl·fűK l·yŘ ăl·ŦŜűè 2Ŧ LJŜ2LJfŜφ I l·NY YŜl·yã ŘŜl·úKΣ λy?dzNèΣ λffySăăΣ 2N Řλă Ŝl·ăŜ úKl·ú Ő2dztŘ ōŜ ădzŦŦŜNŜŘ ōè l· LJŜNă2y¯ŜELJ2ăŜŘ ű2 l· Kl·Îl·NŘφ LY¯Ŧ2NŜăúNè 2LJŜNl·úλ2yã úKλă Ő2dztŘ λyŐfdzŘŜ ŘŜl·úK 2N λy?dzNè ŦN2Y ŜljdzλLJYŜyű N2ff2ØŜN 2N ŦN2Y ōŜλyE ăúNdzŐ] ōè Ŧl·ffλyE ōNl·yŐKŜăφ

! **risk assessment** λă l· ø l·è 2Ŧ ŜăúλYl·úλyE úKŜ yl·údzNŜ l·yŘ fŜØŜf 2Ŧ NXă]φ ² 2N]λyE 2dzú øKl·ú Ő2dztŘ Ől·dzăŜ Kl·NY l·yŘ K2ø ăŜN2dză úKl·ú Kl·NY Ő2dztŘ ōŜ øλff LJN2ØλŘŜ úKŜ ōl·ăλă Ŧ2N ŘŜŐλŘλyE øKl·ú NXă] Ő2yűN2fã l·NŜ NŜljdzNŜŘφ

! **risk control** λă l· LJNŴŜØŜyύλ2y´Y´Ŝl·ădzNŴŜ úKl·ú ŜfλY´λyl·úŜă l· ǿ2Nٿ LJfl·ÔŜ KŜl·fúK l·yŘ ăl·ŦŜűè Kl·Îl·NŴŘ 2NJ Nλăٿ 2NΣ λŦ úKλă λă y2ű NŴŜl·ă2yl·ōfè LJNJl·ÔúλÔl·ōfŜΣ NŴŜŘdzÔŜă úKŜ Nλăٿ ă2 ŦI·NJ l·ă NŴŜl·ă2yl·ōfè LJNJl·ÔúλÔl·ōfŜΦ Ly´Ŧ2NŴŜăúNŴè 2LJŜNJl·úλ2yã Nλăٿ Ô2yύN2fă λyŎfdzŘŜ ăl·ŦŜ ǿ2Nٿ l·NŴŜl·ăΣ 2LJŜNJl·úλJ LJNJ2úŜÔúλǾŜ ăúNdzÔŰdzNŴŜăΣ l·yŘ ű·l·Ǝ 2dzű l·yŘ λă2fl·úλ2y´LJNJ2ÔŜŘdzNŴŜă ǾKŜy´Yl·λyűl·λyλyƎ LJfl·yűΦ

3.3 Identify hazards

¢KŜ ² l { wŜƎdzfl·úλ2yã ăúl·úŜ úKl·ú l· LJŜNŴă2y´Ô2yŘdzÔúλyƎ l· ōdzăλySăă 2NJ dzyŘŜNJúl·ٿλyƎ ót / . ¦ Kl·ă l· Řdzúè ű2 λŘŜyύλŦè Kl·Îl·NJŘăΣ Ô2yύN2f NλăٿăΣ ŜyãdzNŴŜ Ô2yύN2fă NŴŜY·λy´ŜŦŦŜÔúλǾŜΣ l·yŘ ű2 NŴŜǾλŜǿ Ô2yύN2fă ǾKŜNŴŜ ySÔŜăăl·Nŵ⊕

l l·Îl·NJŘă Ôl·y´ōŜ λŘŜyύλŦλŜŘ ōè Y´ŜúK2Řă ădzÔK l·ă ǿl·fٿ úKN2dzƎK λyãLJŜÔúλ2yãΣ Kl·Îl·NJŘ ÔKŜÔٿfλăúăΣ Ô2yãdzfűl·úλ2yΣ l·yŘ NŴǾλŜǿλyƎ ŜljdzλLJY´Ŝyύ 2LJŜNJl·úλyƎ λyãűNdzÔúλ2yã⊕ ² KŜNŴŜ ǿŜfπٿy2ǿy´Kl·Îl·NJŘă l·NŴŜ λŘŜyύλŦλŜŘ úKŜy´ٿy2ǿy´Σ ŜŦŦŜÔúλǾŜ Ô2yύN2fă ăK2dzfŘ ōŜ dzăŜŘ⊕

wŜƎdzfl·úλ2yã Y´l·è Y´l·yŘl·úŜ ǿKl·ú Y´dzăú ōŜ Ř2yŜ óŜ⊕Ǝ⊕ ŘŜπŜyŜNΞλăŜ ŜljdzλLJY´Ŝyύ ōŜŦ2NŴŜ ŜfŜÔúNλÔl·f ǿ2Nٿ λă Ôl·NJNλŜŘ 2dzúú 2NJ /2ŘŜă 2Ŧ tNJl·ÔúλÔŜ Y´l·è NŴŜÔ2Y´Y´ŜyŘ Ŝăúl·ōfüăKŜŘ l·yŘ ŜŦŦŜÔúλǾŜ Ô2yύN2fă óŜ⊕Ǝ⊕ ăŜLJl·NJl·úλ2y´Řλăúl·yÔŜăú ű Kl·ú ăK2dzfŘ ōŜ dzăŜŘ⊕

¢Kλă λă ăK2ǿy´λy´*Figure 1* l·ă ΨٿyǾǿy´Nλăٿλă l·yŘ Ôǿύ N2făΩ l·yŘ KλƎKfλƎKűă úKl·ú λy´Y´l·yê Ôl·ăŜă 2yÔŜ l· Kl·Îl·NŘ λă λŘŜyύλŦλŜŘ ǿŜ Ôl·y´λY´Y´ŜŘλl·úŜfê l·LJLJfê ǿŜfπٿy2ǿy´l·yŘ ŜŦŦŜÔúλǾŜ Ô2yύN2fă⊕

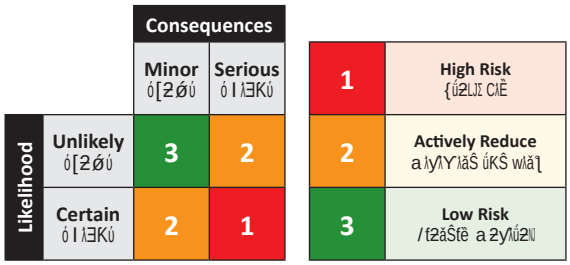
3.4 Risk assessment

wλăٿ l·ăăŜăăY´Syύ λă dzăŜŘ ű2 ǿ2Nٿ 2dzű úKŜ ōŜăú ǿl·è ű2 ŜfλY´λyl·úŜ 2NJ NŴŜŘdzÔŜ NλăٿăǾ a l·yê ² l { wŜƎdzfl·úλ2yã ăŜú 2dzű úKŜ ŦI·Ôú2Nă úKl·ú Y´dzăú ōŜ Ô2yãλŘŜNŴŜŘ λy´ŜfλY´λyl·úλyƎ 2NJ NŴŜŘdzÔλyƎ úKŜ NλăٿǾ ¢KŜăŜ l·NŴŜ ŜŦŦŜÔúλǾŜtê úKŜ ōl·ăλă 2Ŧ úKŜ NλăٿǾ l·ăăŜăăY´Syύ⊕

Lΰ λă Ô2Y´Y´2y´λy´úKŜ l·ăăŜăăY´Syύ 2Ŧ NλăٿǾ úKl·ú Y´Sl·ădzNŴŜa 2Ŧ úKŜ fλٿŜfλK22Ř óLJN2ōl·ōλfλúèú l·yŘ úKŜ fŜǾŜf 2Ŧ Kl·NJY´ óÔ2yãŜljdzŜyÔŜú l·NŴŜ ădzY´Y´l·NλăŜŘ λy´l· NλăٿǾ Y´l·úNλÊ⊕

! y´ŜÈl·Y´LJfŜ λă ăK2ǿy´λy´úKŜ *Figure 2* ōŜf2ǿ⊕

Figure 2: Example of a risk matrix



¢Kλă ŜÈl·Y´LJfŜ λă ŘŜăλƎyŜŘ ű2 l·ăăλăú LJNJ2Y´LJú ŘŜÔλăλ2y´Y´l·ٿλyƎ⊕ LŦ l· NλăٿǾ Kl·ă l· KλƎK fλٿŜfλK22Ř 2Ŧ 2ÖÖdzNJNλyƎ l·yŘ ăŜNλ2dză λy´dzNŴè l·ă l·y´2dzúÔ2Y´ŜΣ úKŜy´λú ǿ2dzfŘ ōŜ NJl·úŜŘ l· 1 NŴŜljdzλNλyƎ λY´Y´ŜŘλl·úŜ l·Ôúλ2y´ú2 ăú2LJ 2NJ ŦÈ úKŜ LJNJ2ōfŜY´ óŜ⊕Ǝ⊕ LJNJŜăŜyÔŜ 2Ŧ Kl·Îl·NŘ2dză úNŴŜŜă λy´úKŜ ǿ2Nٿ λyƎ Î2yŜú⊕

LŦΣ Ŧ2NJ ŜÈl·Y´LJfŜΣ ǿŜl·úKŜNJ l·yŘ ƎN2dzyŘ Ô2yŘλúλ2yã ǿŜNŴŜ ÔKl·y´EλyƎ l·yŘ 2LJŜNJl·úλ2y´2Ŧ ÔŜNúl·λy´Ŝljdzλ LJY´Ŝyύ Y´l·è ōŜ Ô2Y´LJN2Y´λăŜŘΣ úKŜy´λú Ô2dzfŘ ōŜ NJl·úŜŘ l· 2 l·yŘ Ô2yãλŘŜNJl·úλ2y´2Ŧ 2úKŜN 2LJúλ2yã ű2 Y´λyλY´λăŜ NλăٿǾ ăK2dzfŘ ōŜ ƎλǾŜy⊕

¢KŜăŜ ú22fă l·NŴŜ ?dzăú 2yŜ ǿl·è 2Ŧ KŜfLλyƎ ŘŜÔλŘŜ ǾKl·ú λă úKŜ KλƎKŜăú fŜǾŜf 2Ŧ LJNJ2úŜÔúλ2y´Ŧ2NJ úKŜ ăλúdzl·úλ2y⊕

3.5 Risk controls

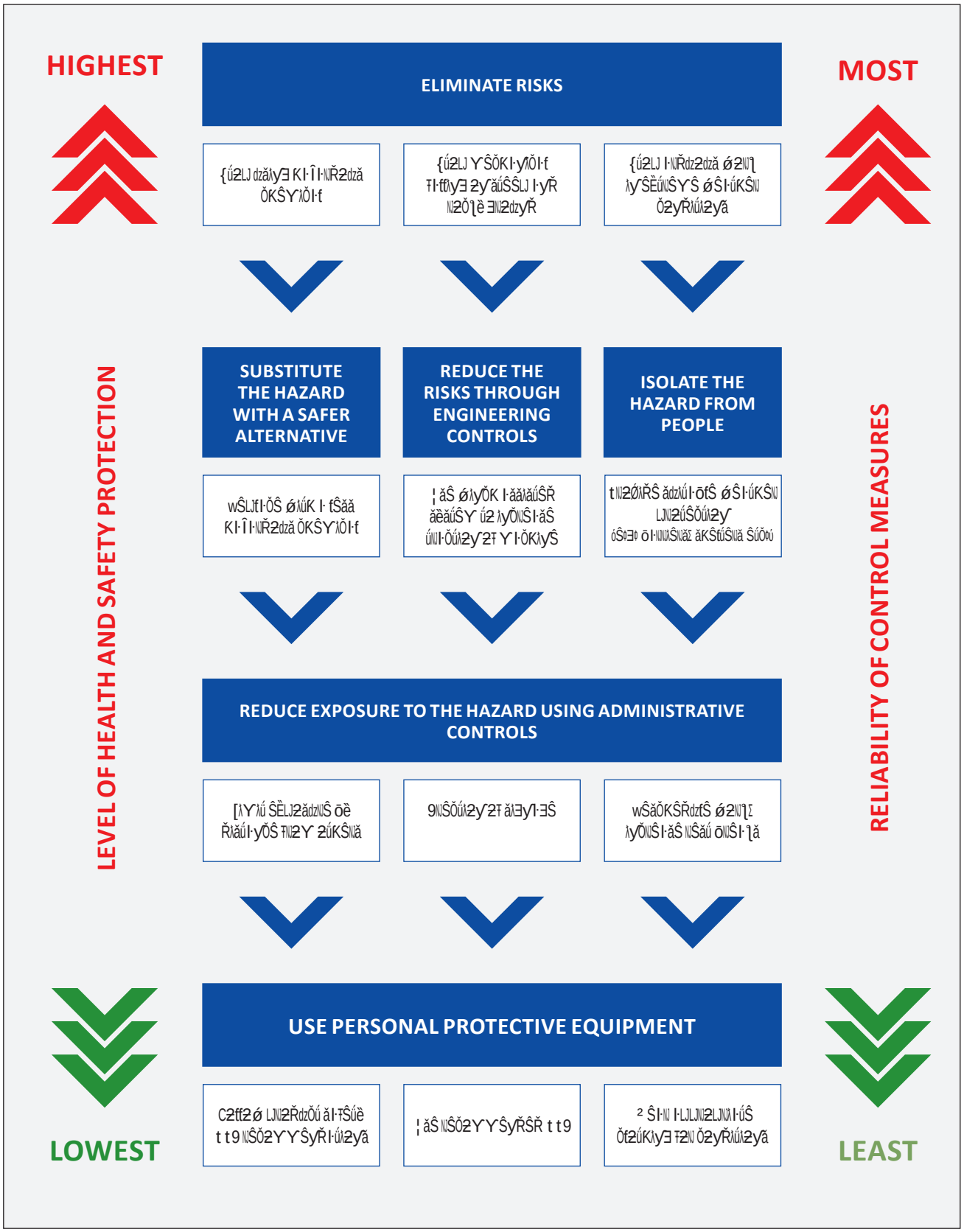
wλăٿ l·ăăŜăăY´Syűă l·NŴŜ l·λY´ŜŘ l·ú λŘŜyύλŦèλyƎ NλăٿǾ Ô2yύN2fă úKl·ú ǿλff l·ÔKλŜǾŜ úKŜ KλƎKŜăú fŜǾŜf 2Ŧ LJNJ2úŜÔúλ2y´ă2 ŦI·NJ l·ă λă NŴŜl·ă2yl·ōfè LJNJl·ÔúλÔl·ōfŜ⊕ ² Kl·ú λă Y´Sl·yú ōè úKŜ KλƎKŜăú fŜǾŜf 2Ŧ LJNJ2úŜÔúλ2y´λă ōŜăú ŘŜăÔNλōŜŘ ōè úKŜ Ô2yÔŜLJú 2Ŧ úKŜ ΨKλŜNJl·NŴÔKè 2Ŧ Ô2yύN2f Y´Sl·ădzNŴŜă⊕

! KλŜNJl·NŴÔKè 2Ŧ Ô2yύN2f ōŜƎλyă ǿλúK úKŜ ŜfλY´λyl·úλ2y´2Ŧ úKŜ NλăٿΣ l·yŘ λŦ úKλă λă y2ű LJNJl·ÔúλÔl·ōfŜΣ 2úKŜN 2LJúλ2yã ŦN2Y´ úKŜ ădzōăúλúdzúλ2y´2Ŧ ăl·ŦŜNJ l·fűŜNJyl·úλǾŜăΣ ŘŜăλƎyλyƎ 2dzű NλăٿΣ Ř2ǿy´ű2 l·ŘY´λyλăúNJl·úλǾŜ LJNJ2ÔŜŘdzNŴŜă l·yŘ LJŜNăă2yl·f LJNJ2úŜÔúλǾŜ ŜljdzλLJY´Ŝyύ ót t9 Y´dzăú ōŜ Ô2yãλŘŜNŴŜŘ⊕ Ly´LJNJl·ÔúλÔŜΣ l· Ô2Y´ōλyl·úλ2y´2Ŧ NλăٿǾ Ô2yύN2fă Y´l·è ōŜ NŴŜljdzλNŴŜŘ ű2 NŴŜŘdzÔŜ NλăٿΣ λy´úKŜ ǿ2NٿLJfl·ÔŜ⊕

¢KŜ LJNλyÔλLJfŜ ōŜKλyŘ úKŜ KλŜNJl·NŴÔKè 2Ŧ Ô2yύN2f λă úKl·ú NλăٿǾ Ô2yύN2fă úKl·ú l·NŴŜ ŘŜLJŜyŘŜyύ 2y´λyŘλØλŘdzl·f ōŜKl·Øλ2dzNJ l·NŴŜ fŜăă NŴŜfλl·ōfŜ úKl·y´NλăٿǾ Ô2yύN2fă úKl·ú ŜyƎλyŜŜNJ 2NJ ŘŜăλƎy´2dzú NλăٿΣǾ Ly´ă2Y´Ŝ Ôl·ăŜăΣ l· NŴŜƎdzfl·úλ2y´ǿλff LJNJŜăÔNλōŜ úKŜ KλŜNJl·NŴÔKè úKl·ú Y´dzăú ōŜ Ŧ2ff2ǿŜŘ⊕

¢KŜ KλŜNJl·NŴÔKè λffdzăúNJl·úŜŘ λy´*Figure 3* ōŜf2ǿ ǿl·ă ŜÈúNJl·ÔúŜŘ ŦN2Y´ úKŜ l·LJLJN2ǾŜŘ /2ŘŜ 2Ŧ tNJl·ÔúλÔŜ
How to manage work health and safety risks l·f2yƎ ǿλúK ă2Y´Ŝ Y´l·úÔKŜŘ ŜÈl·Y´LJfŜă ŦN2Y´ Ŧ2NŴŜăúNŴè 2LJŜNJl·úλ2yã⊕

Figure 3: The hierarchy of control with forestry operations examples



3.6 Review risk controls

9ŦŦŜŎűλØŜ ℕλă⌉ Y l·yl·∃ŜYŜyű ℕŜljdzλℕŜă yƵű 2yťè űKl·ű ø2ℕ⌉LJfl·ŎŜ ℕλă⌉ă ōŜ Ŏ2yűℕ2ffŜŘ ōdzű űKl·ű űKŜè ōŜ ŎKŜŎ⌉ŜŘ ű2 ăŜŜ λŦ űKŜè l·ℕŜ 2LJŜℕl·úλyƎ ŜŦŦŜŎűλØŜťè l·yŘ űKl·ű ŎλℕŎdzYăűl·yŎŜă Kl·ØŜ yƵű ŎKl·yƎŜŘ {λYλťl·ℕ YŜűK2Řă ű2 űK2ăŜ Ŧ2ℕ Kl·Îl·ℕŘ λŘŜyűλŦλŎl·úλ2y Ŏl·y ōŜ dzăŜŘ ű2 ŎKŜŎ⌉ ŜŦŦŜŎűλØŜySyŜăă

hűKŜℕ ŎKl·yƎŜă Yl·è LJℕ2YLJű l· ℕŜØλŜø 2Ŧ ℕλă⌉ Ŏ2yűℕ2ťă λyŎťdzŘλyƎY

- l·y dzyLJfl·yŷŜŘ ŎλℕŎdzYăűl·yŎŜ fλ⌉Ŝ l· ōℕŜl·⌉Ř2øy 2ℕ Yl·ŎKλyŜ ƎŜűűλyƎ ō2ƎƎŜŘ
- l·y λyŎλŘŜyű ℕŜƎl·ℕŘťŜăă 2Ŧ λy?dzℕè Ŏ2yăŜljdzŜyŎŜ ăK2dzťŘ YŜl·y Ŏ2yűℕ2ťă l·ℕŜ ŎKŜŎ⌉ŜŘ
- l·dzŘűű ŦλyŘλyƎă ăK2øλyƎ Ŧl·λťdzℕŜă 2ℕ y2yπŎ2YLJfλl·yŎŜă
- λăădzŜ 2Ŧ y2úλŎŜă ōè űKŜ ℕŜƎdzfl·ű2ℕ
- ø2ℕ⌉ŜℕăĂ 2ℕ 2űKŜℕă ℕl·λăλyƎ Ŏ2yŎŜℕyă l·ō2dzű űKŜ ŜŦŦŜŎűλØŜySyŜăă 2Ŧ Ŏ2yűℕ2ťă
- ŎKl·yƎŜă ű2 Ŏ2YLJŜűŜyŎè ăűl·yŘl·ℕŘă l·yŘ l·ōλfλúè 2Ŧ ŎdzℕℕŜyű ø2ℕ⌉ŜℕăĂ ű2 YŜŜű úKŜY
- yŜø λyŦ2ℕYl·úλ2y ŦℕY l·ydzŦl·ŎűdzℕŜℕă l·yŘ ădzLJLJfλŜℕă l·ō2dzű ădzōăűl·yŎŜă 2ℕ ŜljdzλLJYŜyű Yl·è λYLJl·Ŏű 2y úKŜ ŜŦŦŜŎűλØŜySyŜăă 2Ŧ ŎdzℕℕŜyű Ŏ2yűℕ2ťă

3.7 Use of risk management process

/λℕŎdzYăűl·yŎŜă λy øKλŎK ℕλă⌉ Yl·yl·∃ŜYŜyű l·yŘ ălJŜŎλŦλŎ ŜťŜYŜyűă ădzŎK l·ă ℕλă⌉ l·ăăŜăăYŜyűă l·ℕŜ ySŜŘŜŘ λyŎťdzŘŜY

- øKŜℕŜ ℕŜljdzλℕŜŘ ōè ² l { wŜƎdzfl·ûλ2yã
- LJℕŜLJl·ℕλyƎ l· C2ℕŜăű hLJŜℕl·ûλ2yã {l·ŦŜűě óCh{ú tfl·y
- øKŜy Yl·yl·∃λyƎ l· KλƎKπℕλă⌉ ăλűdzl·ûλ2y ădzŎK l·ă ℕŜY2Øl·f 2Ŧ Kl·Îl·ℕŘ2dză ûℕŜŜă
- øKŜy l· ySø Kl·Îl·ℕŘ λă λŘŜyűλŦλŜŘ
- LJdzℕŎKl·ăλyƎ ySø ŜljdzλLJYŜyű
- ø2ℕ⌉λyƎ øλűK Ŏ2yűℕl·ŎűŽℕă 2ℕ ădzōŎ2yűℕl·ŎűŽℕă
- dzyŘŜℕűl·⌉λyƎ l·y l·ŎűλØλúè λyŎKl·yƎŜŘ ŜyØλℕ2yYŜyű ű2 y2ℕYl·f
- ℕŜăLJ2yŘλyƎ ű2 λyŎλŘŜyűă
- ?dzăűλŦèλyƎ l·y l·fűŜℕy1·ûλØŜ ű2 űKŜ /2ŘŜ ℕŜŎ2YYŜyŘl·ûλ2y ădzŎK l·ă l· LJdzℕLJ2ăŜ ălJŜŎλŦλŎ ŜÈŎťdzăλ2y Î2yŜ
- LJfl·yŷλyƎ Ŧ2ℕ dzăŜ 2Ŧ ySø YŜűK2Řă l·yŘ űŜŎKy2f2ƎλŜă

3.8 Documenting risk management

52ŎdzYŜyűλyƎ úKŜ ℕŜădzfűă 2Ŧ ℕλă⌉ Yl·yl·∃ŜYŜyű l·ŎűλØλúè λă ℕŜŎ2YYŜyŘŜŘ LyăŽ2YŜ Ŏl·ăŜăΣ ² l { wŜƎdzfl·ûλ2yã øλff ℕŜljdzλℕŜ ŎŜℕűl·λyℕŜŎ2ℕŘă ōŜ ⌉ŜLJű ădzŎK l·ă l· ℕŜƎλăűŜℕ 2Ŧ Kl·Îl·ℕŘ2dză ŎKŜYλŎl·făΣ fλăűă 2Ŧ l·LJLJfλŎl·ōfŜ ăl·ŦŜűè Řl·úl· ăKŜŜűăΣ 2ℕ ŜYŜℕ∃SyŎè LJfl·yã

LyYl·ŘŘλűλ2yΣ úKŜℕŜ l·ℕŜ 2űKŜℕ ℕŜl·ă2yã øKè ōl·ăλŎ ℕŜŎ2ℕŘă ăK2dzfŘ ōŜ ⌉ŜLJú ¢KŜè λyŎťdzŘŜY

- Ŝyl·ōfŜă l· Řdzűè K2fŘŜℕ ű2 ŘŜY2yăűℕl·ûŜ K2ø ŘŜŎλăλ2yã l·ō2dzű øKl·ű λă ℕŜl·ă2yl·ōfè LJℕl·ŎűλŎl·ōfŜ øŜℕŜ Yl·ŘŜ
- l·ff2øă λyŘdzŎűλ2y l·yŘ ălJŜŎλŦλŎ úℕl·λyλyƎ ű2 ōŜ úl·ℕƎŜűŜŘ l·ű ⌉Sè Kl·Îl·ℕŘă
- LJℕ2ØλŘŜă l· ōl·ăλă Ŧ2ℕ LJℕŜLJl·ℕλyƎ ăl·ŦŜ ø2ℕ⌉ LJℕ2ŎŜŘdzℕŜă
- l·ff2øă yŜø ăűl·ŦŦ ű2 dzyŘŜℕăűl·yŘ øKè ℕλă⌉ Ŏ2yűℕ2f ŘŜŎλăλ2yã Kl·ØŜ ōŜŜy Yl·ŘŜ
- ŘŜY2yăűℕl·ûŜă ű2 2űKŜℕă è2dzℕ l·LJLJℕ2l·ŎK ű2 Yl·yl·∃λyƎ ℕλă⌉ óŜ¢∃¢ ℕŜƎdzfl·ű2ℕΣ l·dzŘλű2ℕΣ úK2ăŜ è2dz ûŜyŘŜℕ ű2 Ŧ2ℕ Ŏ2yűℕl·ŎűăÚ¢

¢KŜ Ch{ tfl·y ăK2dzfŘ Ř2ŎdzYŜyű úKŜ ℕλă⌉ Yl·yl·∃ŜYŜyű l·LJLJℕ2l·ŎK űl·⌉Sy¢

¢KŜ fŜØŜf 2Ŧ ℕŜŎ2ℕŘ ⌉ŜŜLJλyƎ øλff Øl·Nè l·ŎŎ2ℕŘλyƎ úKŜ ăλÎŜ l·yŘ Ŏ2YLJfŜÈλűè 2Ŧ úKŜ 2LJŜℕl·ûλ2yã l·yŘ űKŜ ōℕŜl·ŘűK l·yŘ yl·ûdzℕŜ 2Ŧ úKŜ ℕλă⌉ă Yl·yl·∃ŜŘ¢

3.9 Understanding the level of risk to be managed

Lffdzăűℕl·ûλ2y 2Ŧ úKŜ fŜØŜf 2Ŧ ℕλă⌉ λy ŘλŦŦŜℕŜyű ŎλℕŎdzYăűl·yŎŜă λă ăK2øy λy *Table 1* ōŜf2ø¢

Table 1: Understanding levels of risk and implications for risk management

RISK PROFILE IN FORESTRY OPERATIONS		
LOWER RISK ⟶ HIGHER RISK		RISK MANAGEMENT IMPLICATIONS
{ʎyƎtŜ Ö2yúNI·ÖúƗ2N 2LJŜNI·úʎ2y	a dztúʎJtŜ Ö2yúNI·ÖúƗ2Nă 2yˇäúÛŜ	I ʎƎKŜN NʎăⱢ YˆŜI·yã ƎNŜI·ÛŜN ăKI·NʎyƎ 2Ŧ NʎăⱢ ʎyf2NYˆI·úʎ2yˇI·yŘ Ö22NŘʎyI·úʎ2yˇ 2Ŧ I·ÖÛʎØúẽ
a 2ăú 2LJŜNI·úʎ2yã dzyŘŜN LJN2ÛŜÖÛʎØŜ ÖI·y2LJẽ	CŜø 2LJŜNI·úʎ2yã dzyŘŜN LJN2ÛŜÖÛʎØŜ ÖI·y2LJẽ	I ʎƎKŜN NʎăⱢ YˆŜI·yã ăI·ŦŜ ø2NⱢ I·NŜI·ă Yˆdzăú öŜ Ö2yúʎyftzI·ffẽ Yˆ2yʎú2NŜŘ
[2ø fŜØŜf 2Ŧ YˆI·yftzI·f ŦI·ffʎyƎ	I ʎƎK fŜØŜf 2Ŧ YˆI·yftzI·f ŦI·ffʎyƎ	I ʎƎKŜN NʎăⱢ YˆŜI·yã ăⱢʎff I·yŘ úNI·ʎyʎyƎ 2Ŧ ŦI·ffŜN ÖNʎúÖI·f
a 2ăú ŦŜffʎyƎ lă ăYˆI·ffŜN ă2ŦúøƨƨŘ ăLJŜÖlŜă	a 2ăú ŦŜffʎyƎ lă fI·NƎŜ KI·NŘøƨƨŘ ăLJŜÖlŜă	I ʎƎKŜN NʎăⱢ YˆŜI·yã ŦI·ffʎyƎ YˆŜúK2Řă yŜŜŘ NŜƎdzfI·NⱢ I·ăäŜääYˆŜyú
[ÚúútŜ ø2NⱢ Ř2yŜ I·f2yŜ	a 2ăú ø2NⱢ Ř2yŜ I·f2yŜ	I ʎƎKŜN NʎăⱢ YˆŜI·yã ƎNŜI·úŜN ŘŜLJŜyŘŜyÖŜ 2yˇNŜfʎI·ōfŜ Ö2YˆYˇdzyʎÖI·úʎ2yã
a 2ăú ø2NⱢ 2yˇŦfI·úƶ ŜØŜyˇƎN2dzyŘ	a 2ăú ø2NⱢ 2yˇäúŜŜLƶ dzyŜØŜyˇƎN2dzyŘ	I ʎƎKŜN NʎăⱢ YˆŜI·yã NŜƎdzfI·NⱢ I·ăäŜääYˆŜyú 2Ŧ øŜI·úKŜN I·yŘ ƎN2dzyŘ Ö2yŘNúʎ2yã
[I·NƎŜ f2Ǝ fI·yŘʎyƎä	{YˆI·ff f2Ǝ fI·yŘʎyƎä Ö2yãúNI·ʎyŜŘ öẽ ŜyØN2yYˆŜyúI·f NŜIjdzNŜYˆŜyúă	I ʎƎKŜN NʎăⱢ YˆŜI·yã ƎNŜI·úŜN Ö22NŘʎyI·úʎ2yˇI·yŘ YˆI·ʎyúŜy1·yÖŜ 2Ŧ ăI·ŦŜ ø2NⱢ I·NŜI·ă
{ŜLJI·NJI·úʎ2yˇŘʎăúI·yÖŜă ŜI·ăẽ úʎ2 ŘŜúŜNYˆʎyŜ I·yŘ YˆI·ʎyúI·ʎyˇ	{ŜLJI·NJI·úʎ2yˇŘʎăúI·yÖŜă ŘʎŦŦʎÖdzfú úʎ2 ŘŜúŜNYˆʎyŜ I·yŘ YˆI·ʎyúI·ʎyˇ	I ʎƎKŜN NʎăⱢ YˆŜI·yã ƎNŜI·úŜN ŘŜLJŜyŘŜyÖŜ 2yˇÖ2YˆYˇdzyʎÖI·úʎ2yã

5ŜLJŜyŘʎyƎ 2yˇúKŜ fŜØŜf 2Ŧ NʎăⱢΣ úKŜ NʎăⱢ YˆI·yI·ƎŜYˆŜyú ŜŦŦ2Nú øʎff ØI·NẽΦ a I·yI·ƎʎyƎ KʎƎK fŜØŜfă 2Ŧ NʎăⱢ LJfI·ÖŜă ƎNŜI·úŜN ŘŜLJŜyŘŜyÖŜ 2yˇNʎăⱢ YˆI·yI·ƎŜYˆŜyú I·yŘ Kƨø NʎăⱢ ÖI·yˇōŜ NŜŘdzÖŜŘΦ

¢KŜ fŜØŜf 2Ŧ NʎăⱢ øʎff I·fă2 ʎyŦfdzŜyÖŜ úKŜ ⱢʎyŘ I·yŘ ŘŜúI·ʎf 2Ŧ Ř2ÖdzYˆŜyúI·úʎ2yˇNŜIjdzNŜŘ ú2 YˆŜŜú Ö2YˆLJfʎI·yÖŜ NŜIjdzNŜYˆŜyúăΦ

3.10 Baseline risk management for forest operations

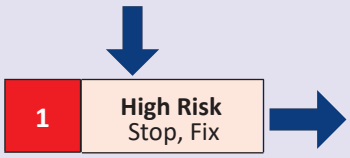
[I·yŘ2øyŜNăΣ Ŧ2NŜăú YˆI·yI·ƎŜNăΣ I·yŘ Ö2yúNI·ÖúƗ2Nă KI·ØŜ NŜăLJ2yãʎōfʎúʎŜă ú2 YˆI·yI·ƎŜ NʎăⱢ I·ú ØI·NʎƗ2dză ăúI·ƎŜă ʎyˇúKŜ LJfI·yYʎyƎ I·yŘ LJN2ŘdzÖúʎ2yˇÖèÖfŜΦ *Table 2* ōŜf2ø 2dzúfʎySă I· ōI·ăŜfʎyŜ 2Ŧ KI·ÎI·NŘăΣ NʎăⱢ ŦI·ÖúƗ2NăΣ I·yŘ NʎăⱢ Ö2yúNⱢfă úKI·ú I·LJLJfẽ ú2 I·ff I·ăLJŜÖúă 2Ŧ Ŧ2NŜăú 2LJŜNI·úʎ2yãΦ

- ¢KŜ fʎăúŜŘ KI·ÎI·NŘă I·NŜ ōI·ăŜŘ 2yˇʎy?dzNè I·yŘ ʎyÖʎŘŜyú ŘI·úI· I·ă øŜff úKŜ ⱢyƗøfŜŘƎŜ I·yŘ ŜÈLJŜNʎŜyÖŜ 2Ŧ Ŧ2NŜăú 2LJŜNI·úƗ2Nă I·yŘ I·NŜ úKŜ YˆƗăú Ö2YˆYˆ2yˇă2dzNÖŜ 2Ŧ ŘŜI·úK 2N ʎy?dzNèΦ
- ¢KŜ fʎăúŜŘ NʎăⱢ I·ăäŜääYˆŜyú ŦI·Öú2Nă I·NŜ 2ySă fʎⱢŜfè ú2 ŜÈLJfI·ʎyˇúKŜ yI·údzNŜ 2Ŧ úKŜ NʎăⱢ I·yŘ ʎyŦfdzŜyÖŜ úKŜ fʎⱢŜfʎK22Ř I·yŘ LJ2úŜyúʎI·f KI·NYˇ 2Ŧ úKŜ fʎăúŜŘ KI·ÎI·NŘăΦ
- ¢KŜ fʎăúŜŘ NʎăⱢ Ö2yúN2fă I·NŜ úKŜ ƎŜySNI·f ÖI·úŜƎ2NʎŜă 2Ŧ YˆŜI·ădzNŜă úKI·ú øʎff ʎyŘʎØʎŘdzI·ffẽΣ 2NⱢ ʎyˇÖ2YˆōʎyI·úʎ2yΣ ŜfʎYˆʎyI·úŜ 2N YˆʎyʎYˆʎăŜ NʎăⱢă ă2 ŦI·NⱢ I·ă ʎă NŜI·ă2yI·ōfẽ LJNJI·ÖúʎÖI·ōfŜΦ

¢Kʎă ōI·ăŜfʎySˆ ʎă úI·ⱢŜyˇI·ă úKŜ ăúI·NúʎyƎ LJ2ʎyú ʎyˇI·ff úKŜ ƎdzʎŘI·yÖŜ 2yˇăLJŜÖʎŦʎÖ ŦŦ2NŜăú 2LJŜNI·úʎ2yã ʎyˇ *Sections 8 to 13*Φ

LyˇŜI·ŎK 2Ŧ úKŜăŜ ăŜÖúʎ2yã I·ŘŘʎúʎ2yI·f I·yŘ ăLJŜÖʎŦʎÖ KI·ÎI·NŘă I·yŘ NʎăⱢ ŦI·Öú2Nă I·NŜ 2dzúfʎySŘ I·yŘ NʎăⱢ Ö2yúN2fă I·NŜ Ödzăú2YˆʎăŜŘ ú2 úKŜ 2LJŜNI·úʎ2yã I·yŘ ÖʎNÖdzYˆăúI·yÖŜă óŜΦƎΦ úẽLJŜ 2Ŧ Ö2YˆLJSúSyÖẽΣ ăŜLJI·NJI·úʎ2yˇŘʎăúI·yÖŜăΣ úẽLJŜ 2Ŧ ŜIjdzʎLJYˆSyúΣ I·yŘ øƨNⱢ YˆŜúK2ŘúΦ

Table 2: Baseline risk management for all forest operations

Hazards	Risk assessment	Risk controls
△ Hazardous trees and falling objects e.g. limbs, dry stags, dead and brittle tops, hollow trees, and widow makers △ Sloping, rough, uneven, and unstable terrain △ Rolling logs, sliding logs, or materials under tension △ Breach of exclusion zones and separation distances by ground workers, mobile plant, or falling trees or objects △ Objects ejected or released from machinery such as chain shot	● The proposed pattern of work such as felling and extraction method or site preparation plan ● Steepness of slope, length of slope, soil condition, debris, stumps, and holes ● Location of workers and other operations ● Current and forecast weather conditions affecting ground conditions, visibility, and worker fatigue ● Effectiveness and reliability of communication systems 	● Safe work practices achieved through relevant training and competencies, licences, PPE, and readiness for work policies ● Equipment designed for the task and operated within specifications ● Exclusion zones and safe work areas to separate workers from operational and forest hazards. Physical barriers, distance, or time-based means of separation ● Communication systems for access, such as signage, for communicating between operators in machines and on the ground, and for emergency and evacuation situations

Using the risk matrix in *Table 2*, the hazards and risk assessment lead to a high risk rating. Stop and fix using the appropriate risk controls.

4 CONSULT, COOPERATE, AND COORDINATE

4.1 Overview

The WHS Act Part 5 outlines the duty to consult with workers and with others (e.g. in forestry it may include landowners, forest managers, and contractors).

As indicated in *Section 2* on responsibilities, duty holders may share duties to provide a safe workplace.

This section examines situations where this need to consult, cooperate, and coordinate is essential in achieving safe outcomes.

4.2 Consultation with workers

Businesses must consult with workers on workplace health and safety matters under their control that may have an impact on their health and safety. The WHS Act states that persons conducting a business or undertaking (PCBUs) must consult (so far as is reasonably practicable) with workers on matters including:

- identification of hazards and assessment of risks
- decisions on risk controls
- decisions on health monitoring
- decisions on proposed changes that may affect workplace health and safety.

Consultation should take place whenever there is a decision that may impact on health and safety in forestry operations. Consultation at the planning stage can minimise problems on the job.

Consultation may be achieved through formal processes such as elected workplace health and safety representatives and workplace health and safety committees or through crew meetings at which safety issues can be discussed (*see Section 4.7*).

Section 48 of the WHS Act specifies the nature of consultation to ensure:

- relevant workplace health and safety information is shared with workers
- workers are given a reasonable opportunity to express their views and to raise work health or safety issues
- workers are given a reasonable opportunity to contribute to the decision-making process relating to the work health and safety
- the views of workers are taken into account

- workers are advised of the outcome of any consultation in a timely manner, and if the workers are represented by a health and safety representative, consultation must include that representative.

Workers have the right to refuse to do a task if they have a genuine belief there is a serious risk to their health or safety.

The approved Code of Practice *Work health and safety consultation, cooperation and coordination* provides more detailed information about consultation, particularly where workers are represented by health and safety representatives.

4.3 Working with other duty holders

In forestry operations there may be several persons (each with PCBU duties) working together requiring a shared understanding of hazards and risks and how to manage them. *Figure 4* below illustrates how different parties may interact and how safety depends on each party undertaking their responsibility.

Figure 4: Sharing responsibilities example

In the example above, at the entry into a coupe, the landowner has already assumed responsibilities for safe access through road construction. Forest managers and the forest contractor establish entry protocols through signage and truck drivers are made aware of what procedures must be followed on the road and within the coupe.

A **Forest Operations Safety (FOS) Plan** incorporates the hazards identified by the landowner or forest manager and follows consultation about agreed methods. The contractor ensures the safety of the access road by relevant separation distances and consults with subcontractors on any changes to initial plans. The forest manager in consultation with contractors agrees on site communication systems.

These matters are documented in the FOS Plan. It is important that these plans are consistent where different duty holders develop plans. Part of the coordination task is to ensure the chain of information about hazards, risks, and safe work procedures flows down through the various contractors and subcontractors.

4.4 Adjoining operations

The importance of coordinating forestry operations applies not only within a work area such as a **log landing** but also where there are adjoining operations. The following example illustrates coordination issues.

A landowner engages a company to conduct aerial spraying to control weeds. An adjoining site has silviculture workers undertaking planting work.

The landowner needs to:

- ensure the aerial spraying contractor understands the work and area including any hazards such as power lines
- ensure the aerial contractor meets all required standards
- outline the conditions for safely doing the work (e.g. wind, weather, visibility)
- advise and consult with the planting contractor about the nature, timing, and location of spraying.

The planting contractor needs to:

- provide workers with information about the spraying work
- take action to ensure there is no exposure to workers by moving work to another location, or suspending work while spraying occurs and moving out of the exposure zone
- recommence work on advice from landowner that activity is completed.

This example highlights the need to coordinate activities in order to prevent creating new hazards for those working in adjoining areas.

4.5 Risk management

Risk management will be required in the production cycle to reflect the different responsibilities held by landowners, forest managers, and contractors.

Throughout this chain is the need to consult, coordinate, and cooperate.

- Landowners identify hazards and pass on information to the forest manager.
- Forest managers assess risks such as slope, terrain, and safe harvesting method and include this as part of contractor consultation and selection.
- Selected contractors confirm risks and apply risk controls. They conduct further risk assessments as conditions change and new hazards are identified.
- Workers participate in risk assessments and provide feedback on effectiveness of controls.

Effective risk management in forestry operations needs a coordinated effort.

Table 3 below illustrates the risk management roles of different duty holders.

Table 3: Coordination and cooperation in the risk management process

Duty holder				
Landowner	Identify site hazards	Assess risks to determine harvesting method	Establish risk controls for safe access and exit	Incorporate any changes to hazard and risk profile in next rotation
Forest manager	Confirm site hazards with contractor	Assess risks and determine methods, equipment, and practices in consultation with contractor	Develop FOS Plan based on risk assessment of identified hazards for use by contractors	Respond to contractor-identified issues and any impact on methods or timing of operations
Contractor	Check hazards before commencement	Confirm risk assessment for overall operations before commencement	Address hazards set out in FOS Plan and manage risks of specific operations	Monitor hazards across operations on a daily basis and make changes where risk controls prove ineffective
Subcontractor	Check hazards before commencement	Confirm risk assessment for task before commencement	Address hazards set out in FOS Plan and manage risks of specific operations	Monitor hazards of task on a daily basis and make changes where risk controls prove ineffective
Workers	Be aware of identified hazards	Participate in risk assessment	Follow safe work procedures defined for task/activity	Speak up if controls ineffective or compromised

4.6 Sharing the same duty

In *Table 3*, different duty holders are carrying out similar duties to make the workplace as safe as is reasonably practicable.

The most important part of the WHS Act to help understand these situations is where more than one person holds the same duty.

Section 16 (3)(b) of the WHS Act states duty holders:

> "…must discharge the person's duty to the extent to which the person has the capacity to influence and control the matter or would have had that capacity but for an agreement or arrangement purporting to limit or remove that capacity."

In any example about holding the same duty the legal position will always come down to the specific facts of the case.

To elaborate on *Table 3*, a subcontractor who comes onto the site to repair or maintain machinery has direct control of the safety of any specific repair or maintenance task. Actions to meet this duty include:

- undertake the work in a safe manner (e.g. de-energise, etc.)
- follow site safety procedures
- remain in safe work area and only enter other zones when called in by the person operating in that zone.

The principal harvesting contractor has control and influence of where the maintenance takes place and is responsible for safe work areas to protect the contractor while working. Actions to meet this duty include:

- ensuring subcontractor is familiar with access and communication protocols
- ensuring subcontractor is aware of and follows separation distances
- providing a safe work area where repairs can take place (e.g. open area).

The FOS Plan should cover site responsibilities and procedures, and induction into and sign off on the plan by all parties is a means of establishing clarity.

The forest manager or landowner does not directly control or influence the safety of the maintenance subcontractor's work but still has duties. The landowner or forestry manager holds the duty of PCBUs who manage or control a workplace. Section 20(2) states:

> "The person with management or control of a workplace must ensure, so far as is reasonably practicable, that the workplace, the means of entering and exiting the workplace and anything arising from the workplace are without risks to the health and safety of any person."

A specific duty in this case would be the safety of access roads and associated signage that affects the safety of the subcontractors as they enter and exit the site. Thus, a duty holder's level of control will vary even though they hold the same duty concurrently.

Finally, a worker, while not with the duties of a PCBU, still has a responsibility to follow safe work procedures and not put others at risk. In this case, not operating equipment within the maintenance safe zone would be an example.

4.7 Crew meetings

Crew meetings (e.g. toolbox talks) provide an opportunity to keep everyone informed about the work, hazards, and risk controls.

At the commencement of a new work site an initial meeting to induct workers into the site should cover issues such as:

- work plans and methods
- safe work instructions
- safe work areas and separation distances
- communication protocols
- emergency plans.

After work has commenced on the site, crew meetings at the beginning of each day should cover:

- any new hazards identified such as changes in weather, ground conditions, and visibility
- any concerns about safety or issues that have arisen
- problem solving any issues of concern
- information about any new workers, contractors, or visitors
- confirmation of safe work areas
- advice on any change to operations.

These meetings should be brief but aim at resolving any uncertainties, provide any new information relevant to the day's work, and provide positive reinforcement of safe work practices. It is recommended that crew meetings are documented to demonstrate compliance in addressing any matters raised.

5 PLAN AND PREPARE

5.1 Overview

The planning context for forest operations covers both long-term forest management, specific forest operation plans through to day-to-day operational activities. *Figure 5* below shows a typical planning process.

Figure 5: Planning in forest operations

This Code focuses on the Forest Operations Safety (FOS) Plan stage onwards and the people, equipment, and processes required to undertake the work in a safe and healthy way. The level of preparation and planning will depend on the scale, complexity, and safety challenges of the work.

5.2 Contractor engagement

The best safety outcome is likely to be the result of a contractor engagement process where the brief is clear and practicable, and the selected contractor can demonstrate the capability and track record to complete the job safely.

A forest manager or landowner should consider the following in selecting contractors:

- the contractor understands the forest manager's/landowner's health and safety policy
- the contractor has a safe way of undertaking work given the nature of the work and the hazards identified in the work plan (e.g. terrain, type of timber, slope)
- evidence of the suitability of contractor staff and equipment for the work
- evidence of safe work practices to address issues in the work
- verification of the contractor's safety system and track record
- the ability to monitor or audit the contractor's safety system
- an agreed process for resolving issues.

A contractor should consider the following in assessing how they can meet job requirements:

- information on hazards identified and any risk assessment undertaken by the landowner/forest manager to assess safety requirements
- information on the timelines and any contingency arrangement where timelines are impacted by changed conditions
- the opportunity to inspect the site and consult the forest manager on hazards and risks
- a clear understanding of respective workplace health and safety responsibilities
- an outline of the methods, equipment, staff, and practices they will use to meet the safety needs of the work and the health and safety policy of the principal
- any independent verification of their safety performance through previous audits or participation in any industry certification scheme
- a process to consult and resolve issues that impact on the ability of the contractor to meet standards.

Across the contracting chain, health and safety performance is dependent on shared expectations, information, and practices. This can be achieved through consultation and coordination up and down the contracting chain.

The ability to consult, resolve issues, and then communicate outcomes to all involved is a critical part of a safe contracting process.

5.3 Forest Operations Safety Plan

The FOS Plan is the key mechanism for consultation and communication when a site is handed over to a contractor at the commencement of forest operations. The plan should be prepared by the landowner or forest manager in conjunction with the planning and operational requirements of the approved coupe Forest Practices Plan.

Site and forest hazards should be identified for the site before work commences and the plan should be prepared by the landowner or forest manager. In farm forestry, the landowner may need assistance from the contractor. The baseline risk management template outlined in *Section 3.10* should form the basis of the agreed measures that are identified jointly with contractors to eliminate or reduce the risk related to the identified hazards.

The contents of the FOS Plan should be reviewed to ensure it is appropriate and agreed to by all persons conducting a business or undertaking (PCBUs) on site. As the operation progresses and new site or forest hazards are identified these should be recorded on the FOS Plan and acknowledged.

The FOS Plan provides the context in which a contractor's **safety management system**, with more detailed plans and procedures, are applied and modified to address specific issues within their direct control.

The following essential elements should be applied in the plan to mitigate identified hazards.

Equipment designed for the task and operated within specifications given the operating conditions.

Safe work practices as identified in this Code to address the identified hazards.

Exclusion zones and safe work areas to separate workers from operational and forest hazards. Physical barriers, distance, or time-based means of separation.

Communication systems such as signage or for communicating in emergency and evacuation situations.

These essential elements underpin the common risk controls used to manage risk in forestry operations. The guidance on specific hazards and operations covered in the Code follow this approach.

Other subjects covered in this section such as first aid and emergency planning should also be covered in FOS Plans.

Further detail and a sample plan can be found in *Appendix A: Forest Operations Safety Plan*.

At the conclusion of an operation, when the site is handed back by the contractor, issues of significance to future operations should be brought to the attention of the forest manager or landowner.

5.4 Exclusion zones and safe work areas

The use of exclusion zones and safe work areas requires further definition given the widespread use of this measure.

In forestry operations, a failure to separate activities that create risks to others can result in death or serious injury. Risks arise in situations such as:

- ⚠ manual fallers being impacted by adjacent mechanical falling or **forwarding**
- ⚠ log markers and measurers impacted by machinery on a log landing
- ⚠ truck driver being impacted by log loading

The **exclusion zone** is a designated area in which others, apart from the operator, are excluded. Uncontrolled or unplanned entry into the exclusion zone by others puts each party at risk.

An exclusion zone can be established by:

- Defining a **separation distance** – the common separation distance is two tree lengths of any tree being fallen or extracted.
- Creating a **physical barrier** – for example, a parked (not operating) machine placed between ground-based workers and other working machines.
- Scheduling activities at **different times** – risks are reduced by scheduling different parts of the process at different times. For example, log landing construction is completed ahead of the interaction with other activities.

Entry into an exclusion zone can only be undertaken when called in by the zone 'owner'. This involves visual recognition, radio communication or other signalling and the cessation of the activity before the person enters the zone. Recommencement of activity is again initiated by radio communication or other signalling.

In addition, an exclusion zone is used to separate anyone from hazardous trees or from power lines.

A **safe work area** is a designated area outside another operator's exclusion zone. An area on a log landing for maintenance, an area in which a log truck driver is located during loading, an area where a choker setter stands before signalling the turn to be hauled, or an area where log measuring takes place are all examples. The same methods of distance, physical barrier, and time are used to define safe work areas.

In the case of separation distances, the common measure is **two tree lengths**. This may not always be practicable, particularly on landing sites with limited space or where equipment features such as boom size and arc are more relevant. In these situations, a risk assessment should be undertaken to establish an agreed and documented plan that achieves the highest level of protection that is reasonably practicable.

Such plans should be able to demonstrate safety is maximised by:

- work occurring under protective structures where possible and using radio protocols when leaving that protection
- reliable radio communications that enable persons outside a canopy to advise of location and any change therein
- a relevant safety factor is used for equipment such as twice boom length or boom arc
- suitable signage and traffic control
- consultation and sign off on the plan by those subject to it.

5.5 Training

The provision of training is a core duty of all PCBUs as set out in *Section 2 Responsibilities*. Best practice in the forest industry includes:

- selection of employees with relevant competencies for forestry work (*see Section 5.7 Operator competency* below)
- provision of training to nationally endorsed standards with training and assessment to be conducted by a registered training organisation
- provision of induction training to new employees on and off the job
- provision of training in company specific policies and procedures
- keeping records of training, competencies, and licences.

5.6 Induction

Induction is necessary not only for new employees but also prior to commencement of forestry operations. Induction should cover:

- identified hazards on the site
- contractor and forest manager workplace health and safety policies (e.g. drug and alcohol policy)
- safe work procedures
- personal protective equipment (PPE) requirements
- emergency procedures

- incident reporting
- first aid and amenities
- communication protocols
- disciplinary procedures
- consultation and issue resolution.

Inductions should be refreshed when things change.

5.7 Operator competency

PCBUs must ensure workers who are required to perform hazardous work in forestry operations have the relevant competencies to carry out their job safely.

Competencies must be demonstrated or verified through statements of attainment before work commences.

All workers must hold a **statement of attainment** for **units of competency** providing for:

- workplace health and safety and environmental care
- specific hazardous activities such as:
  - use of handheld motorised plant (e.g. chainsaws)
  - operation of heavy machinery (e.g. feller buncher)
  - driving log trucks
  - ground workers such as choker setters.

Appendix B: Operator competency requirements sets out the units of competency that are required by the industry under Safe and Skilled Essential Training Standards. These are minimum standards and recognise pre-existing qualifications that are supplemented by relevant experience.

New entrants must be supervised by competent operators while they are under training. Their employer should ensure competencies are attained within six months of commencing work.

When new plant is introduced to a business, the PCBU should provide workers with training on this specific plant. It is good practice to arrange refresher training as necessary, and independent assessments of competency for existing operators who undertake high-risk tasks.

Records of training, statements of attainment, and any related licences should be kept.

5.8 Selection of equipment

Selection of equipment should be made with the assistance of designers, manufacturers, and suppliers who have duties to provide plant that is fit for purpose and designed to operate safely.

The purchaser should set out the intended use, operating conditions, and likely site hazards to the supplier who in turn should determine suitable equipment for consideration.

Common design and operational issues that should be considered include:

- operator protective devices and structures (*see Appendix C: Protective structures for forestry machines*)
- compliance with Australian or overseas design standards including any attachments
- compatibility and design standard compliance of attachments for plant
- suitability of the machinery for the intended terrain and use
- ergonomic features (e.g. cabin access, working posture, cabin visibility, noise, and vibration)
- operator cabin protection (e.g. reinforced cabin glazing to protect the operator from chain shot)
- guarding of hazardous machinery components.

5.9 First aid

First aid requirements are set out in the WHS Regulations and specific guidance is provided in the approved Code of Practice *First aid in the workplace.*

The WHS Regulations outline the matters that must be considered to establish first aid arrangements. These matters are:

- the nature of the work being carried out at the workplace
- the nature of the hazards at the workplace
- the size, location, and nature of the workplace
- the number and composition of the workers at the workplace.

It is recommended that there be a minimum of one trained first aider on site to provide ongoing coverage.

The preferred training for all workers is:

- HLTAID001: Provide Cardiopulmonary Resuscitation
- HLTAID002: Provide Basic Emergency Life Support
- HLTAID003: Provide First Aid.

Appendix D: Example of contents for first aid kits reproduced from the approved Code outlines typical contents for first aid kits including additional items for remote workplaces.

Specific requirements for workplaces should be guided by a risk assessment as set out in the approved Code.

5.10 Amenities

Amenity requirements are set out in the WHS Regulations and specific guidance is provided in the approved Code of Practice *Managing the work environment and facilities.*

The same matters as for first aid must be considered in assessing amenities. Consequently, amenity provision may vary but as a minimum should include:

- clean drinking water
- hand washing facility
- suitable sanitation arrangements, such as portable toilets on longer duration operations
- shelter from conditions.

Amenities should be in a safe work area away from identified hazards.

5.11 Personal protective equipment

Where a risk remains after applying the hierarchy of controls (see Figure 3) the WHS Regulations require a PCBU to minimise the remaining risk so far as is reasonably practicable by ensuring the provision and use of suitable PPE.

PPE provided to workers must be:

- selected to minimise risk to health and safety
- suitable for the work and the hazards associated with the work
- a suitable size and fit and reasonably comfortable for the worker that is going to use it.

Even though equipment provides protection, PPE should be worn by all working in forestry operations as all tasks involve some exposure to common hazards. PPE should be used in conjunction with other methods of reducing risk, rather than being the only level of protection.

The required PPE by activity is summarised in *Appendix E: PPE for forestry operations* and may include:

- high-visibility clothing
- safety helmet
- safety footwear
- hearing protection
- eye protection
- safety gloves
- leg protection
- respiratory protection.

Information must be provided to workers on the proper use, storage, and maintenance of PPE and must be replaced if damaged or ineffective.

The WHS Regulations also require that workers (and others such as visitors) must wear PPE in accordance with instructions and training. In addition, workers have a duty to not damage or misuse PPE and if the worker is aware of damage or ineffectiveness, they must report it to the PCBU.

Further information on PPE standards and the types of PPE which should be used in forestry operations is in *Appendix E.*

5.12 Emergency planning

The WHS Regulations set out the responsibility to prepare, implement, and maintain an emergency plan.

The nature of the plan depends on the assessment of the same factors used in the first aid and amenities sections above (i.e. nature of work, hazards, location, number of workers, etc.).

Using these factors, some typical emergency situations include:

- treatment and evacuation of injured worker(s)
- motor vehicle and machinery incidents
- chemical spill
- fire.

Emergency plans will vary but should include as a minimum:

- emergency meeting point established and communicated to all
- emergency contact numbers
- communications systems established and tested
- first aid adequate for possible scenarios
- working alone, no response, no return protocols
- adequate transport for evacuation if required.

The FOS Plan should include this emergency planning information. Information in the plan must be made available to all at the workplace and a run through of the procedures should be included in site induction. Emergency plans should be reviewed in crew meetings regularly to test the plan.

A worked example is shown in *Appendix F: Emergency plan examples.*

5.13 Provide information

All duty holders must provide information to other parties as part of their responsibilities as shown in *Section 2 Responsibilities*. A harvesting contractor, for example, must provide information on hazards and safe work procedures to both directly employed workers and to subcontractors. This information should include:

- information required by regulation such as safety data sheets (SDSs) for chemicals to be used
- risk controls for common hazards (e.g. extreme weather, drugs, and alcohol)
- information on site hazards
- safe work procedures for the work to be undertaken
- hazard and incident reporting
- emergency procedures
- information on first aid and amenities
- communication protocols.

This information mirrors induction topics and should be provided both to new workers and at the commencement of work at a site.

Information can be provided in a written or electronic form if it is accessible and in language that users can understand. Involving all crew members in developing information is the best way of guaranteeing business requirements will be understood and followed.

5.14 Documentation

Effective management of health and safety will always require some documentation to meet legislative requirements, to demonstrate to others that you are following safe working procedures and to allow effective induction and training to be undertaken.

In *Section 3.8 Documenting risk management*, the reasons for keeping basic records are outlined and these apply to all documentation.

The most applicable record keeping requirements of the WHS Act and Regulations to forestry operations include:

- Act s38. Duty to notify of notifiable incidents
- Regulation s43. Duty to prepare, maintain and implement emergency plan
- Regulation s50. Monitoring airborne contaminant levels (where applicable).

While these are explicit and mandatory requirements there are many other parts of the legislation that may require records to be kept to demonstrate compliance with legislation. Maintenance of equipment, training records, health monitoring records, safe work procedures, and risk assessments are just a few examples. The risk management system used by the business will generate this documentation.

Documented policies, plans, and procedures such as a FOS Plan should be up to date, reviewed when things change (e.g. contractual requirements, legislation, methods, and equipment) and amended accordingly.

5.15 Supervision

Supervision of work and maintenance of a safe and healthy work environment is the responsibility of the PCBU with direct control of the work. Forestry operations are often difficult to directly observe and supervise so supervision is highly dependent on consultation with and cooperation from crew members.

Some typical circumstances that monitoring and supervision may identify include:

- conflict between crew members that compromises safety
- inspection of stumps of manual faller indicates poor technique creating risks for faller and others
- machine operator using machine beyond limits.

In these cases, strategies such as counselling, refresher training, disciplinary procedures, or use of independent auditing may be used to resolve problems.

Compliance with safety policies and procedures will be highest where there is:

- clear understanding of the procedure and its role in achieving safety
- opportunities to discuss and problem solve issues that affect compliance
- understanding of the impact of poor practices on oneself and others
- acceptance of the legal duty to follow safety procedures and the role of agreed disciplinary procedures.

Regular crew meetings are a way of ensuring matters do not escalate and changes can be made to improve safety outcomes.

5.16 Incident reporting

Part 3 of the WHS Act requires PCBUs to notify WorkSafe Tasmania if at a workplace there is:

- a death
- someone suffers a serious injury or illness
- a dangerous incident.

In the case of any notifiable incident the site must be preserved until an inspector attends or directs otherwise.

Examples of serious injuries and illness include:

- amputation of any part of their body
- a serious head injury
- a serious eye injury
- serious lacerations
- medical treatment within 48 hours of exposure to a substance.

Examples of dangerous incidents include:

- an uncontrolled escape of a pressurised substance
- electric shock
- the fall or release from a height of any plant, substance, or things like a branch or tree.

Reporting of dangerous incidents is only necessary if someone was in imminent danger of serious injury.

For a full list of serious injury or illness, or dangerous incidents requiring notification to WorkSafe Tasmania, see their website at www.worksafe.tas.gov.au

The PCBU must keep a record of each notifiable incident for at least five years from the day that notice of the incident is given to the regulator.

Apart from statutory reporting requirements, businesses should have an internal process for reporting and investigating non-reportable incidents (e.g. lost time, medical treatment, near miss). It is good practice for a contractor to notify the parties who have engaged them about non-reportable incidents and may be a requirement in some contracts.

As with a notifiable incident, all reported incidents should be subject to risk assessment and review. An investigation of incidents will assist in determining future action.

From a risk management point of view the reasons for investigating incidents are to:

- prevent similar incidents recurring in the future
- identify any new hazards
- identify and choose suitable controls or strategies.

If the results of any investigation show that changes need to be made, corrective action must be taken.
The risk management process outlined in the Code should be the basis of identifying the best solutions. Sharing incident reports and the results of investigations throughout the industry may help ensure incidents are not repeated elsewhere.

6 COMMON HAZARDS AND RISK CONTROLS

6.1 Overview

In this section the focus is on common hazards found across forestry operations and known and effective ways of controlling risks. The baseline hazards outlined in *Section 3.10* are represented with specific references within some common hazard categories (e.g. hazardous trees), while other common hazards (e.g. fatigue, noise, psychosocial, hazardous chemicals) are created by different factors.

These hazards rarely impact health and safety on their own. It is usually a combination of factors that leads to injury and illness.

For example, fatigue is not just related to length of time working and time of day but also to accelerants such as noise, weather extremes, and manual handling.

6.2 Hazardous trees

In all aspects of forestry operations hazardous trees may pose a risk of death or serious injury.

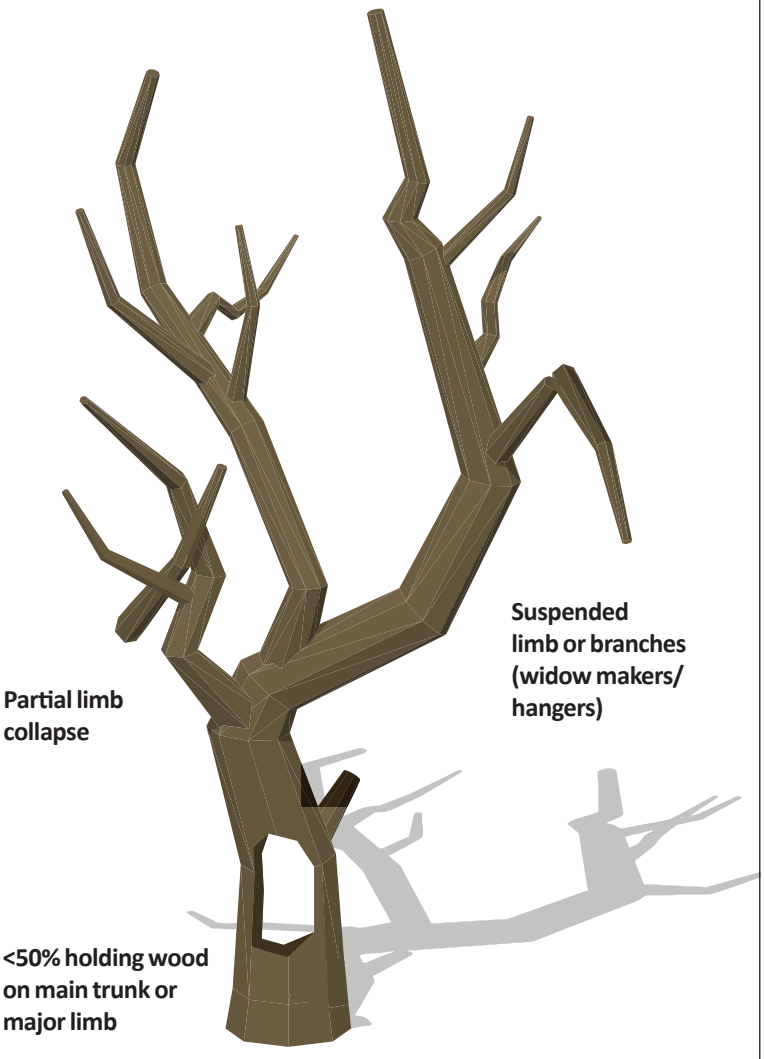
Trees may be hazardous for a range of reasons, for example because of overhead hazards like hung-up trees or **widow makers**, or defects that weaken their trunk.

Damage to trees caused by fire, wind, snow, or insects may mean all trees in an area are hazardous.

The risk from hazardous trees increases with high winds, periods of drought, recent isolation, or dead limbs drying out. Trees are hazardous if they have any of the features listed in *Figure 6* that are impacting the integrity or stability of the stem or limbs.

Figure 6: Features of hazardous trees

- widow makers / broken limbs
- rot
- fire damage to trunk or limbs
- snow or storm damage
- insect damage
- mechanical damage
- exposed root systems
- dead wood
- symptoms of internal damage include swelling, bark cracks, and wounds.



Common hazards	Common risk controls	Further information
△ Struck by falling limbs △ Struck by falling fire damaged tree △ Struck by another tree lodged in a hazardous tree	● Mark the tree with a yellow painted circle with an overlaid yellow 'X' and record its location on the Forest Operations Safety (FOS) Plan ● If assessed as too risky or ecologically important to remove, use high-visibility hazard tape to identify the hazardous area around the tree to a distance of two dominant tree lengths ● If assessed as safe to fell, use suitable manual or mechanical method ● Establish and maintain separation distance of other operations from hazardous tree (two tree lengths) ● Maintain communication with all in vicinity of hazardous trees	● *Tree hazard pictorial guide*, Forest Fire Management Victoria, The State of Victoria Department of Environment, Land, Water and Planning 2017 ● *Safe Work Procedure - management of tree hazards on the fireground*, Tasmanian Inter-agency Strategic Coordination Group, November 2020.

6.3 Noise

Exposure to noise in forestry operations above the prescribed level 85 dB (A) over an 8-hour weighted average or a peak level of 140 dB (C) may be experienced in forestry operations.

The level of exposure is dependent on the length of time and protection afforded by machine sound proofing or individual hearing protection.

Chainsaws and chippers are most likely to reach high levels over shorter periods. Audiometric testing is required where exposure above the limits requires frequent wearing of hearing protection to control the risk.

Common hazards	Common risk controls	Further information
△ Noise above exposure limit during chainsaw and chipper use △ Longer time exposure to machine noise in cabin △ Noise exposure of ground workers △ Conditions in which a normal conversation is difficult	● Manufacturer or supplier to provide noise assessment information ● Noise assessment when purchasing, sound proofing of cabin, minimum time with cabin open ● Regular machine maintenance to reduce noise emission ● Suitable breaks and task rotation to reduce exposure ● Damping and use of acoustic absorbent measures on machines, separation from noise source if practicable, coordination of noisy activities, and use of suitable hearing protection ● Use highest rated hearing protection	● WHS Regulations Part 4.1 –Noise ● Approved Code of Practice *Managing noise and preventing hearing loss at work.*

6.4 Hazardous manual handling

Hazardous manual handling is identified by assessing the following factors:

- postures
- movements
- forces
- duration and frequency of the task
- environmental conditions including heat, cold, and vibration.

Whole body and hand-arm vibration also contributes to hazardous manual handling.

Designers and manufacturers have duties to eliminate or minimise hazardous manual handling so far as is reasonably practicable so that risks to end users are minimised. Designers can reduce risks by eliminating or reducing the number of repetitive actions, postures, and movements required to operate equipment.

Manufacturers can provide product in smaller, lighter packaging and provide lifting points or aids to minimise the use of force.

Common hazards	Common risk controls	Further information
△ Poor cab set-up △ Getting in and out of machines △ Tree planting △ Vibration	● Ergonomic assessment when purchasing (access, posture, visibility, seat, controls) ● Ensure three points of body in contact with the machine and all points clean and non-slip ● Use planting **tools** that minimise or eliminate the need for bending and minimise force ● Support weight with harness when using equipment like brush cutters ● Purchase equipment with lowest hand-arm vibration emission level ● Machine cab suspended with special damping or other solution for minimising vibrations	● WHS Regulations Part 4.2 – Hazardous Manual Tasks ● Approved Code of Practice *Hazardous manual tasks*

6.5 Plant maintenance

The WHS Act section 19(3)(b) requires persons conducting a business or operation (PCBUs) to provide and maintain safe plant. This general duty is reinforced by WHS Regulations. The maintenance of mobile plant in a forest environment requires careful planning.

Regular and preventative maintenance is important for not only assuring the safe operation but to also limit exposure of other workers to hazards. Risks that regular maintenance should consider include:

- noise emissions
- exposure to high pressure fluids
- failure of safety features like braking systems
- integrity of guards and protective structures
- operator visibility through windscreens and protective structures
- suitability of emergency exits
- possibility of material being thrown at high speeds, like chain shot.

Forest machinery requires daily inspection and maintenance including checking fluid levels, refuelling, adding oils, cleaning the tracks and cabin, and replacing chipper blades on discs. Minor repairs may also be needed including repairing hydraulic hoses and replacing chains and bars.

Plant must be inspected and maintained in accordance with the manufacturer's specifications and instructions. If these are not known, inspections and maintenance must be done according to the recommendations of a **competent person**.

Items of plant tagged 'Do Not Operate' or which have exceeded a scheduled maintenance date should not be used. These issues should be identified when checking equipment before starting work.

In-field inspection, maintenance, and adjustment of forestry machinery like harvesters and excavators create a higher risk than regular preventative maintenance activities carried out off-site. This is because of exposure to in-field hazards like:

- △ poor weather conditions
- △ rough terrain
- △ muddy or slippery surfaces
- △ overhead hazards
- △ nearby plant
- △ other workers.

De-energise and check plant prior to the commencing of any repairs or maintenance in the field.

Common hazards	Common risk controls	Further information
△ Being hit, crushed, or lacerated when energy sources are not isolated △ Touching hot hydraulic oil or other hazardous chemicals △ Falls from height during repairs and maintenance △ Slips, strains, and falls getting in and out of machine △ Being hit by falling metal cowls, unsupported booms, and guards △ Touching moving machine parts when changing chain or bar	● Maintenance carried out in safe zone, separated from other workers and on flat ground ● Prevent interference with safety features like isolating switches and guards ● Maintenance to be carried out in accordance with manufacturer specifications, instructions, and information ● All equipment is isolated (i.e. turned off and locked out) as recommended by manufacturer specifications, instructions, and information ● Machine attachments (e.g. cutting head, blade, grapple) should be grounded and secured ● Regular clearing of debris such as leaves, sticks, and needles from machines to minimise fire risk ● Regular inspection of plant before use ● Compliance with 'Do Not Operate' tags or other warning notices ● Wear protective gloves when replacing chipper blades, chains, and bars or tightening bolts with spanners ● Wear protective eyewear when grinding or handling fuel and oils	● WHS Regulations Div. 7 - s213. Maintenance and Inspection of Plant - s214. Powered Mobile Plant - General Control of Risk ● Approved Code of Practice *Managing the risks of plant in the workplace*

6.6 Hazardous chemicals

Hazardous chemicals may be used in pest control, weed control, and fertilising operations and exposure needs to be controlled. Also, some substances used to operate and maintain mobile plant and powered handheld equipment are hazardous.

Flammable or combustible substances kept at the workplace must be kept at the lowest practicable quantity for the workplace.

Other legislation regulating the use of chemicals is listed below.

- For use of agricultural and veterinary chemicals see *Agricultural and Veterinary Chemicals (Control of Use) Act 1995* (Tas).
- For commercial operator licence see *Agricultural and Veterinary Chemicals (Control of Use) Act 1995* (Tas).
- For agricultural aircraft operator licence see *Agricultural and Veterinary Chemicals (Control of Use) Act 1995* (Tas).
- For transport of dangerous goods see *Dangerous Goods (Road and Rail Transport) Act 2010* (Tas).

These requirements should be checked when planning any operation involving chemicals.

Hazardous chemicals are regulated in Chapter 7 of the WHS Regulations and include specific duties for a PCBU to manage the risks to health and safety associated with using, handling, generating, and storing hazardous chemicals at a workplace. These duties include:

- providing workers with information, training, instruction, and supervision
- maintaining a register of hazardous chemicals
- obtaining the current safety data sheet (SDS) of each hazardous chemical (usually from your supplier) and making it readily available to worker
- ensuring containers are correctly labelled, and safety signs are displayed
- identifying the risks of chemicals being used and controlling those risks in the most appropriate manner
- providing health monitoring to workers, where relevant (e.g. exposure to organophosphate pesticides)
- preparing an emergency plan and providing safety and emergency equipment
- storing and dispensing hazardous chemicals safely.

Because delivery methods of chemicals are complex and varied, risk assessments need to consider:

- how chemicals may enter a worker's body
- to what doses workers may be exposed.

In line with the hierarchy of control, identification of alternatives that eliminate hazardous chemicals should be the starting point in managing exposure.

Common hazards	Common risk controls	Further information
△ Spills and splashes when handling or mixing chemicals △ Spray drift that exposes operator or others △ Storage and mixing in proximity to ignition sources or incompatible chemicals △ Premature re-entry into spray zones	● Non-chemical methods of weed control such as slashing, mulching, grazing, or heat kill methods where effective in the longer term ● Only store the lowest practical quantity of flammable substances ● Use precise dosing methods and technologies to minimise exposure ● Use of less hazardous chemicals or minimum necessary application rates ● Procedures and signage for workers re-entering area that has been sprayed ● Enclosed canopies in vehicles to deliver chemicals ● Suitable separation distances to prevent exposure to other workers ● Defined areas for storing chemicals ● Personal protective equipment (PPE) as prescribed in safety data sheets	● WHS Regulations Chapter 7 – Hazardous chemicals ● Managing risks of hazardous chemicals in the workplace Code of Practice ● Australian Pesticides and Veterinary Medicines Authority (APVMA) guidelines and Codes of Practice

6.7 Fatigue

Fatigue is a state of tiredness or exhaustion that results in a degree of impairment. This impairment may be physical and/or mental and can result in an increased risk of workplace errors or incidents.

An assessment of fatigue should include these factors:

- **mental and physical demands of the job –** heavy physical demands, high concentration levels on demanding tasks (rough terrain, slopes)
- **environmental conditions –** weather extremes, noisy workplaces, whole body vibration
- **work schedules –** working or travelling through the night regularly, limited opportunity for quality sleep, requirement to travel long distance to work, lack of regular break from work
- **working time –** regular shifts longer than 12 hours, inadequate breaks between and within shifts, intrusion on time to get regular night sleep
- **individual –** nutrition and hydration, sleep disorders, non-work impacts on sleep opportunity and quality, mental health status, medical conditions**.**

Fatigue can be assessed using objective working time, time of day, and rest break indicators but can be supplemented by experience-based measures such as self-reported sleep time and indicators of alertness. Use of experience-based measures requires appropriate training, policy transparency, and high levels of worker engagement for effective risk reduction.

Common hazards	Common risk controls	Further information
△ Physically and mentally demanding work △ Lack of opportunity for quality sleep △ Working long days (>14 hrs) and long weeks (>55 hrs) △ Working at night or into the 0am to 6am period △ Inadequate breaks within and between workdays △ Sleep disorders △ Impact of out of work demands on sleep opportunity and quality	● Work–rest schedules that reflect task and operating conditions (e.g. slope, visibility) ● Planning to include contingencies for delays and disruptions ● Contractual arrangements that do not provide incentives to work excessive hours ● Work schedules that maximise opportunities for sleep at normal sleep times ● Minimise night working and working into night hours ● Training and information on fatigue and sleep disorders and countermeasures such as nutrition and hydration ● Training in use of any self-reporting or fatigue risk scales and the process to use results to reduce risk	● WorkSafe Victoria *Fatigue management guidelines for the forestry industry* ● LITA Fatigue Working Group *Guidelines for developing and implementing a fatigue management policy in forestry*

6.8 Working alone

Working alone means to work at a worksite where, because of the location, time, or nature of the work, you cannot get easy access to help if you are injured, ill, or there is an emergency. In short, working alone means the person cannot be seen or heard by others.

Risk assessments should cover factors such as:

- hazards that expose a lone worker to greater risk (e.g. machinery that one person cannot operate safely, objects too heavy for one person, chemicals that pose particular risk for lone worker)
- ability to communicate with worker
- ability to execute emergency and rescue plans
- likelihood of rapidly changing environmental conditions.

Any risk controls should be based on firstly establishing whether the need to work alone can be eliminated.

Common hazards	Common risk controls	Further information
▲ All the common hazards described in this code ▲ Unreliable or poor communication systems ▲ Remote locations where emergency response is slow ▲ Early morning log loading ▲ Manual felling	● For tasks assessed as suitable for working alone there is an agreed procedure for location, plan for movement, time of work completion, and last report back time ● Effective communication system with a fail to safety back up ● Check in and report back procedures ● Suitable first aid arrangements ● Use of lone worker technology such as GPS, self and device activated alarms, and smartphone apps	● WHS Regulations r48 –Remote or isolated work ● Approved Code of Practice *Managing the work environment and facilities*

6.9 Solar UV radiation

Exposure to ultraviolet radiation (UVR) can damage the skin and eyes. The most serious health effect of exposure to solar UVR is skin cancer. Forest workers may be exposed to the sun for long periods, so their risk of developing skin cancer or other solar UVR-related illness is increased unless control measures are used.

Common hazards	Common risk controls	Further information
△ Working at time of year and time of day when UVR exposure highest △ Extended periods working outdoors	● Forest machines are equipped to limit exposure through canopy, tinting, and use of non-reflective surfaces ● Work in shade where practicable ● Rotate workers to reduce individual exposure ● Reschedule work to early morning or late afternoon if possible ● Use of PPE including sun protective clothing and hats, sunscreen, sunglasses	● Safe Work Australia *Guide on exposure to solar ultraviolet radiation (UVR)*

6.10 Working at night

Forestry operations may be conducted in failing light or at night. Where this can be anticipated (e.g. shorter daylight periods) scheduling to minimise time spent working at night is recommended. Where night shifts are part of regular operations, fatigue management measures set out in *Section 6.7* should be referenced. Additional measures to improve lighting should also be considered.

Common hazards	Common risk controls	Further information
△ Poor visibility to conduct operations △ Being struck by machines △ Unable to see instability in log stacks △ Inability to estimate separation distances and maintain safe work areas	● Suitable illumination of work area including log stacks, projected path of booms, tops of pins on trucks being loaded ● Suitably placed lighting on mobile equipment ● Illuminated and marked safety zones ● Fatigue management practices ● Use of luminous high-visibility clothing	● Approved Code of Practice *Managing the work environment and facilities*

6.11 Extreme weather

Extreme weather in forestry operations includes extreme heat, low temperatures, snow, ice, fog, and high winds. These extremes both affect the body and create hazards for all workers.

Risk assessments should cover these exposures and include:

- **air temperature –** how hot or cold the surrounding air is
- **humidity –** the moisture content in the air – higher humidity will increase the effects of high air temperature
- **radiant heat –** from the sun or from the plant or a work process
- **rain –** a combination of weather conditions may contribute to reduced core body temperature causing hypothermia
- **air movement –** air or wind speed and air circulation can reduce the effect of high air temperature
- **wind –** strength and effect on trees (e.g. breaking branches)
- **snow and ice –** impact on traction for both ground workers and machines and access to and from the forest
- **fog –** impact on visibility and the ability to maintain separation distances and safe access to and from the forest
- **time –** how long workers will be exposed to extreme conditions.

When combined with the physical condition and capability of the worker, the physical effort required by the worker, and the clothing including PPE the worker is required to wear, may lead to conditions like heat stress or hypothermia.

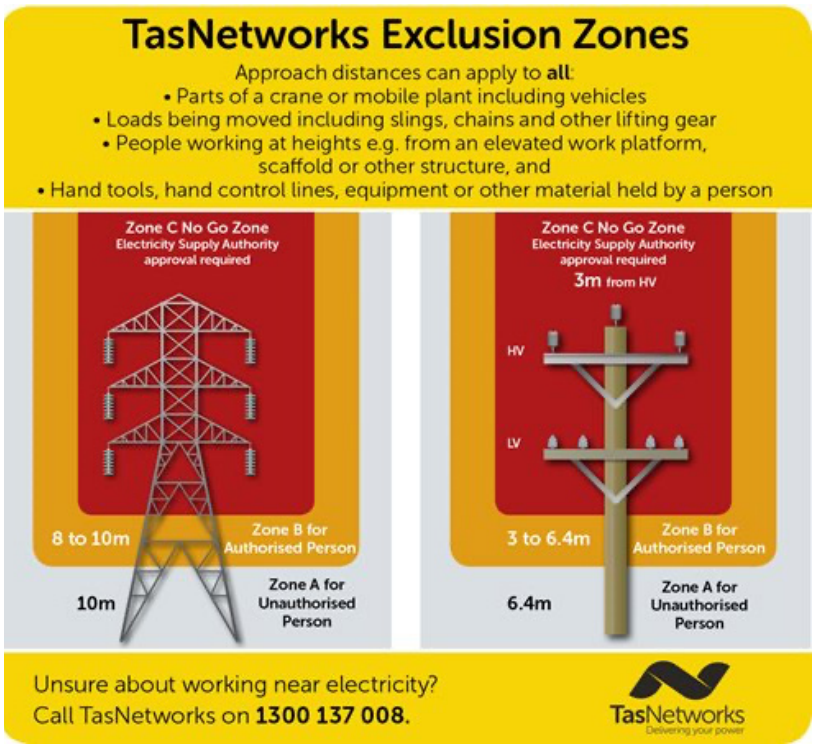
Common hazards	Common risk controls	Further information
△ Extreme heat △ Extreme cold △ Heavy rain, snow, and ice reducing traction △ High winds creating falling object hazards △ Fog creating poor visibility	● Agreed procedures for cessation of work because of extreme weather ● Agreed procedures for restart, including risk assessment ● Communication protocols for poor visibility ● Adjustment of machinery and methods where traction and slippage an issue ● Climate control in machines ● Work–rest regimes to manage heat and cold extremes ● Scheduling of high exertion tasks to less extreme weather times of the day ● Provision of suitable clothing for conditions ● Availability of cold and hot liquids relevant to conditions ● Suitable weather protection in breaks ● Use of PPE particularly for weather protection, visibility, and to reduce slipping	● Approved Code of Practice *Managing the work environment and facilities* ● Safe Work Australia *Guide for managing the risks of working in heat* ● WorkSafe Tasmania *Working in heat*

6.12 Working near power lines

Contact with energised electric lines by forestry operations equipment or materials can cause death, electric shock, or other injury caused directly or indirectly by electricity. An electric shock can also occur without contact with overhead electric lines. A close approach to line conductors may allow a 'flashover' to occur. The risk of flashover increases as the line voltage increases.

There is also the hazard created by falling trees too close to power lines. The energy regulator (TasNetworks) defines exclusion zones for different voltage levels (*see Figure 7*). Specified clearance distances, permits, and training requirements are part of the exclusion zone system.

Figure 7: Example of the TasNetworks exclusion zone system



For untrained operators, 'No Go Zones' mandate that no one may work within:

- 10 metres of transmission or extra high voltage power lines
- 6.4 metres of distribution high voltage and low voltage power lines or telecommunications cables.

Assessment of risk should include consideration of:

- the location, height, arrangement, and visibility of overhead electric lines and supporting structures (e.g. poles, towers, and stay wires)
- the voltage of electric lines and exposed energised parts and whether they are insulated or bare
- the working position and arc of machines
- weather and ground conditions.

Common hazards	Common risk controls	Further information
△ Felling trees near power lines △ Using machinery that at full extension could touch overhead power lines △ Extreme weather conditions that could bring down lines	● Incorporate location of power lines in coupe planning and harvest plans ● Ensure separation distance of two tree lengths for tree felling maintained near power lines ● Comply with 'No Go Zone' requirements ● Use zone limiting devices on machinery ● Fit proximity sensors to equipment ● Use procedures to ensure work is not conducted near or under energised power lines ● Use of felling machines with precise directional falling capability ● Use PPE with electrical insulation properties ● Avoid work near power lines during strong wind, foggy, or smoky conditions	● Safe Work Australia general guide *Working in the vicinity of overhead and underground electric lines guidance material* ● Safe Work Australia information sheet *Agricultural work near overhead electrical lines* ● *ENA NENS 04-2006 National guidelines for safe approach distances to electrical and mechanical a*pparatus

6.13 Biological hazards

Biological hazards in forestry operations include exposure to fungi, spores, and sawdust which may result in skin infections such as contact dermatitis or allergic reactions to plants or wood products. Biohazards include:

- △ viruses
- △ toxins from biological sources
- △ poisonous snakes and spiders
- △ bees, wasps, and other biting insects
- △ spores
- △ fungi
- △ pathogenic microorganisms
- △ parasitic diseases
- △ bio-active substances.

Common hazards	Common risk controls	Further information
△ Irritants in plants and wood products △ Bites, stings, and infections from animals and insects △ Bacteria in soil △ Community transmitted viruses △ Cleaning products such as solvents	● Provide SDS for substance such as solvents ● Hand cleaning facilities and hand hygiene practices ● Induction and training on viruses such as COVID-19 ● Separation distances, minimal close contact, etc. as per universal precautions for COVID-19 ● Suitable first aid ● Specific PPE, particularly where requirement increases risk (e.g. sweating)	● Tasmanian Timber *COVID-19 recommended practices for Tasmanian forestry industry operations* ● WorkSafe Tasmania *COVID safe* workplace guidelines forestry industry

6.14 Psychosocial hazards

Psychosocial hazards or factors are anything in the design or management of work that increases the risk of work-related stress.

A stress response is the physical, mental, and emotional reactions that occur when a person perceives the demands of their work exceed their ability or resources to cope. Work-related stress if prolonged, and/or severe, can cause both psychological and physical injury.

Psychosocial factors are tied to the system and nature of work and can include:

- high job demands (long hours, high workloads in demanding conditions)
- lack of resources to meet demands (poor equipment, lack of time to complete job)
- lack of reward/recognition
- lack of support at work
- poor work relationships including bullying
- inadequate problem-solving processes to address work relationships promptly and fairly.

These factors are not easily accommodated by a traditional risk management approach as the hazard is not easily identifiable, the likelihood and consequence of the risk is difficult to reliably calibrate, and controls are organisational and interrelated.

The hazards, risk assessment, and risk controls for forestry operations set out in this Code are inevitably underpinned by the work culture of the business.

A positive safety culture minimises many of the psychological hazards by:

- intervening early because of open communication throughout the business
- responding appropriately because of good support systems and active managers and supervisors
- encouraging open discussion of issues without fear of reprisal or stigmatisation
- using agreed and fair processes to resolve interpersonal issues
- maintaining integrity in all health and safety procedures by addressing breaches and failures openly
- training and informing workers so that there is a clear understanding of the individual and shared responsibility to manage risks.

The hazards and controls below should be read in conjunction with the role of a positive safety culture.

Common hazards	Common risk controls	Further information
△ Tolerance of inconsistent safety practices △ Inflexible work schedules and workloads △ No clear processes to resolve issues △ Lack of regular communication on work issues △ Little commitment from managers to address stress and bullying issues △ Lack of consultation on processes to manage psychological hazards △ Lack of training and information on psychological hazards	● Regular opportunities to address issues and resolve problems (e.g. crew meetings) ● Planning that allows a flexible response to work schedules and workloads ● Clear communication of what is acceptable behaviour and processes to deal with non-compliance ● Access to support services ● Training and information on psychological hazards	● Safe Work Australia national guidance material *Work-related psychological health and safety: A systemic approach to meeting your duties*

6.15 Drugs and alcohol

Drug and alcohol use (including legitimate over the counter or prescribed medications) can affect a person's ability to work safely. Even if someone drinks alcohol or uses drugs outside working hours, it can impair their judgement, coordination, concentration, and alertness while on the job.

Typical activities in forestry operations where impaired performance would affect the health and safety of the individual or other workers include:

- operation of machinery
- work-related driving
- situations where concentration or motor coordination is relied on to carry out a task
- use of hazardous chemicals.

Managing alcohol and drug issues is part of a PCBU's responsibility to provide a safe and healthy workplace and every worker's responsibility not to put themselves or others at risk.

A risk assessment should cover issues such as:

- work-related contributors such as workload, isolation, schedules
- inadequate supervision and poor communication practices
- schedules that encourage drug use (e.g. long shifts and drugs to stay awake)
- availability and culture of acceptance of workplace use
- out of work contributors such as grief, relationship breakdown, health concerns.

Development of a drugs and alcohol policy should take into account the nature and extent of the problem and developed through a consultative process.

While the WHS Act and Regulations do not mandate, require, or prohibit testing, some workplaces may choose to include testing as part of their drugs and alcohol management plan.

Introduction of testing should be commensurate with the size and nature of the problem and should be introduced with consultation, training, and information to ensure agreement and acceptance of the approach.

A testing program should be clear on:

- the purpose, type, and integrity of tests
- when testing takes place
- who administers tests
- what happens if a positive test is recorded
- the nature of support and assistance post testing.

Management of risk associated with alcohol and drug use requires high levels of engagement with the workforce (including other contractors), agreed processes to manage impairment issues, and suitable and confidential assistance programs to help recovery.

Common hazards	Common risk controls	Further information
△ Operation of machines, vehicles, and equipment in an impaired state △ Work culture that accepts drug and alcohol use on the job △ Lack of regular and open communication on drug and alcohol issues △ Punitive approach to drug and alcohol use without an agreed process to manage issues	● An agreed policy based on extensive consultation ● Eliminating or minimising any schedules or work patterns that provide an incentive to use drugs or alcohol ● Positive work culture that encourages self-reporting, monitors and responds in a non-punitive way, and provides access to assistance and support ● Across the workplace consistency by engaging other contractors and visitors ● Training and information on drugs and alcohol	● WorkSafe Victoria *Guide for developing a workplace alcohol and other drugs policy* ● WorkSafe Victoria *Management of alcohol and drugs in mines: A handbook for the earth resources industry*

7 SITE ACCESS AND ROADING

7.1 Planning

The planning and risk assessment process to develop a Forest Operations Safety (FOS) Plan includes the planning of roads, traffic management, and other requirements to enable safe access and egress from the site.

Requirements for road and bridge construction are outlined in the WHS Regulations *Chapter 6 Construction* and the related approved Code of Practice *Construction work*.

While the risk assessment and safety planning approach in these regulations is closely aligned to the approach in this Code, duty holders should ensure construction activities comply with their regulatory duties.

The related issue of log landings is covered in *Section 10 Landings, stockpiles, and log loading*.

Site access and roading work is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
△ Traffic flow and traffic levels that create collision risks △ Poor line of sight, blind intersections △ Inadequate visitor controls △ Unclear or inappropriate signage △ Inappropriate speed limits △ Evacuation routes not defined △ Type of equipment using roads and their specifications (e.g. width, axle load) creates instability of vehicle and damage to road △ Passing bays inadequate for expected traffic	● All baseline risk factors are applicable to site preparation (refer *Table 2*)

Risk controls

Baseline risk controls are all relevant to site access and roading work and operation-specific applications are listed below.

Road construction

- Requirements of construction-specific regulations (above) followed.
- Hazardous trees removed or identify them with marking or tape and add to FOS Plan.
- Road lines should be logged before road construction.
- Road design should be capable of carrying the intended volume of traffic and configuration of vehicles.
- Where road lines are not harvested before road construction, all trees pushed or felled should be pulled/pushed clear of standing trees and left in a safe position.
- Stumps will be left in a stable position and not leaning against standing trees.
- Standing trees which have had their roots disturbed or undermined by roading activity should be felled or pushed over to eliminate the risk of accidental fall.
- Avoid damaging branches in retained trees.
- Traffic control measures including signage used during construction.
- Equipment used compliant with standards in *Appendix C.*
- Operator competencies as set out in *Appendix B.*

Bringing heavy machinery onsite

- Ensure roads are appropriate for low loaders to bring machinery onsite.
- Ensure there is enough space to safely unload and load heavy machines.
- Operators hold a statement of attainment for Load and unload plant RIIHAM308F.

Signage and traffic control

Suitable signage is required for both traffic control on access roads and to mark any harvesting operations that could present a risk to others.

- Signage clearly legible and placed to allow adequate warning to persons approaching.
- Signage at entrance to the site and to areas where high risk forestry operations are underway (e.g. felling, log landing, spraying).
- Road signage is displayed when operations pose a risk to road users (e.g. 'log trucks entering').
- Traffic management and or road closure arrangements are implemented when trees are being felled/pushed within two tree lengths of a road. This distance should be increased in steeper terrain.
- Signage for road closures.
- Signage to advise of:
  - access restrictions (e.g. 'do not enter')
  - personal protective equipment (PPE) requirements
  - communications protocols, including appropriate radio channels.
- Signage to direct visitors to contact points.
- One way traffic flow systems should be applied.

Signage should be compliant with:

- *AS 1319-1994 Safety signs for the occupational environment*
- *AS 1743:2018 Road signs – Specifications*
- *AS 1742.1-2014 Manual of uniform traffic control devices – Part 1: General introduction and index of signs.*

The following signs must be used. Examples of signs are shown below (*Figure 8*).

Figure 8: Typical signage

Visitor control

Section 2.2 indicates that the primary duty of persons conducting a business or undertaking (PCBUs) also covers 'other people'. This includes visitors to an active forestry operations site. To meet this responsibility the following controls are recommended:

- signage displayed to direct visitors to contact points
- a designated person in the crew at the main work site responsible for meeting and inducting visitors
- a sign-in process for visitors including a process for informing visitors of site hazards, site procedures, emergency procedures, and the required PPE to be worn
- visitors remain in safe zones separated from the activity by the designated distance (e.g. two tree lengths, outside chain shot danger zones).

Visitors have a duty to follow all reasonable instructions such as following agreed safe work practices and wearing required PPE.

In the case of unauthorised persons within a forestry operations site (e.g. protestors, illegal firewood collectors), the following process is recommended:

- cease activity
- secure the site and equipment
- request people leave if safe to do so
- contact the relevant authorities
- collect any relevant information
- inspect the site and equipment to ensure persons are not at risk before recommencing work.

Communications

Forestry operations occur in environments where noise, terrain, line of sight, and remote locations place a high reliance on communication systems.

Communication systems are required for access to the coupe as well as for operators both in machines and on the ground to communicate with each other. Communication practices to reduce risks include:

- an effective ultra high frequency (UHF) radio system for access, on site, and emergency purposes
- a radio protocol that is documented and understood by all workers
- testing of the radio system to ensure all workers can communicate intended movements and be confident that messages are heard and understood
- entry signage that displays the UHF channel used in the coupe
- an effective UHF radio system that allows communication of:
  - operator exiting a machine or truck
  - operator moving into or out of a safe work area
  - advising of entry to the site
  - warning other drivers of movement on access roads
- communication of entry into another worker's exclusion zone must be directed by the 'owner' of that zone and any request must be answered before entry

- no use of mobile phones in vehicles or machines while operating
- backup hand or voice signals where radio system not operable
- a backup emergency contact system, in case of failure of the primary system (e.g. location of nearest farmhouse, mobile phone transmission point)
- ground workers such as **manual fellers** be equipped with radio units, global positioning system (GPS) or other working alone technologies (e.g. man down alarm) to enable both safe work and emergency communication.

8 TIMBER HARVESTING

The type of felling method will be determined by decisions made at the planning stage of new operations. The options available include:

- **manual felling**
- mechanised felling
- a combination of both methods.

Steep slope traction assisted methods may also need to be considered.

8.1 Manual felling

Planning

Planning should assess and outline what type or combination of felling methods will be utilised. This assessment should involve all operators involved in felling and extraction.

The plan should detail things such as:

- What felling method will be used first and why?
- How will the system of work maintain safe separation distances?
- How will any manually felled trees be fallen into clear and open areas?
- How will ground hazards be eliminated or minimised for the manual feller?
- How will overhead hazards be eliminated for the manual feller?
- How will remaining hazards, such as overhead hazards, be identified?
- What system of communication will be used between the mechanical felling machines, extraction machines, and manual fellers if concurrently felling and extracting?

Manual felling is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
△ Standing woody vegetation in the intended direction of fall △ Thick undergrowth that can't be cleared △ Being struck by the butt of the tree △ Kickback or recoil from the chainsaw △ Weather conditions including heat, wind, rain, and cold △ Rocks and rough terrain that restrict the faller's movement △ Fatigue	● Tree species and characteristics ● Tree felling boundaries and information on any adjacent mechanised felling operations ● Environmental restrictions ● Felling direction, and extraction method and direction

Consultation, cooperation, and coordination

Specific operational plans and methods should be supplemented by a walk through before operations commence and adjusted when there are significant changes in operating conditions (e.g. weather, wind, visibility, traction).

Crew meetings should be held prior to commencement to ensure specific felling plans are understood by all workers and contractors.

Common risk controls

To safely fell a tree manually, specific control measures are necessary and depend on the nature of the work area. Two overriding requirements must be followed:

- Only fell trees in daylight hours.
- At no time is the practice of **driving trees** (felling a second tree into another tree in order to bring down the first tree) to be undertaken.

Baseline risk controls are all relevant to manual falling and operation-specific applications are listed below.

Assess trees as safe to fall

- Identify all hazardous trees (see *Section 6.2* on Hazardous trees).
- Identify other features that make trees dangerous to fell manually (see below).
- Use mechanical help where possible for trees with excessive natural lean away from the intended direction of fall (see *Section 8.2.3* on Machine-assisted manual tree felling).
- Carry out ongoing checks for hazards, especially overhead hazards and changing conditions.
- Cease felling in high winds.

Features that make trees dangerous to fell manually
△ Heavy forward lean △ Lean or side-lean away from the fall zone △ Lightning damage △ Burnt out trees and those with fire damaged butts △ Hung up trees that can be removed safely △ Limbs interlocked with other trees or vines △ Species prone to free splitting and adverse reactions during falling △ Complex multi-stems △ Diameter of tree greater than chainsaw bar length

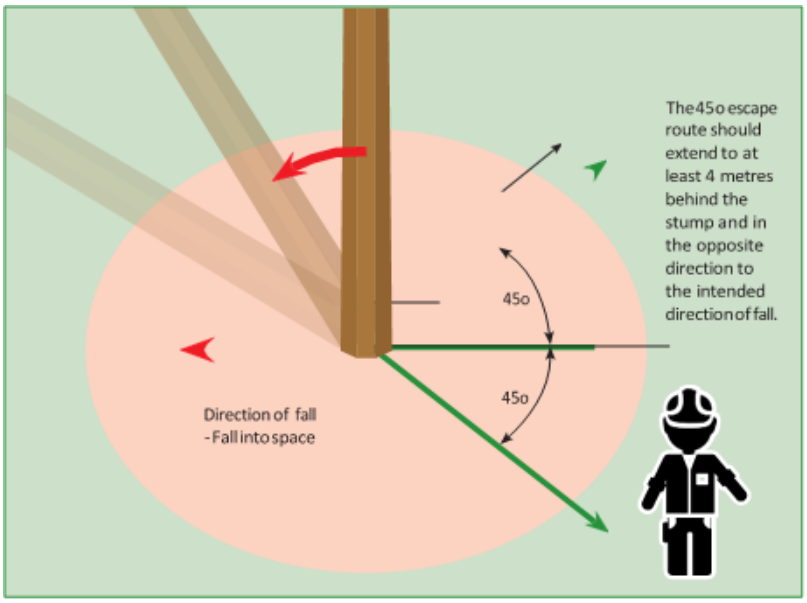
Exclusion zone and safe work areas

- Maintain a separation distance of two tree lengths.
- When a trainee **feller** is under instruction the supervising/instructing feller may be located at the immediate base of the tree outside the kickback zone of the chainsaw and be able to intervene in the procedure.
- On steep ground where there is a risk of felled trees sliding or rolling downhill, ensure no one is working below the tree feller.
- Maintain radio communication with other forest workers.
- Use signs and manage traffic where work area is close to roads.
- Close roads if needed (e.g. falling within two tree lengths of road).

Ensure escape routes

- Where escape routes are impeded by undergrowth, remove material around the base of the tree using the blade of a machine before felling.
- An escape route should be located in a 45-degree arc behind the tree and extend to an area at least 4 metres away from the stump. A second alternative escape route should be located in an adjacent 45-degree arc (*see Figure 9*).

Figure 9: Escape route and direction of felling



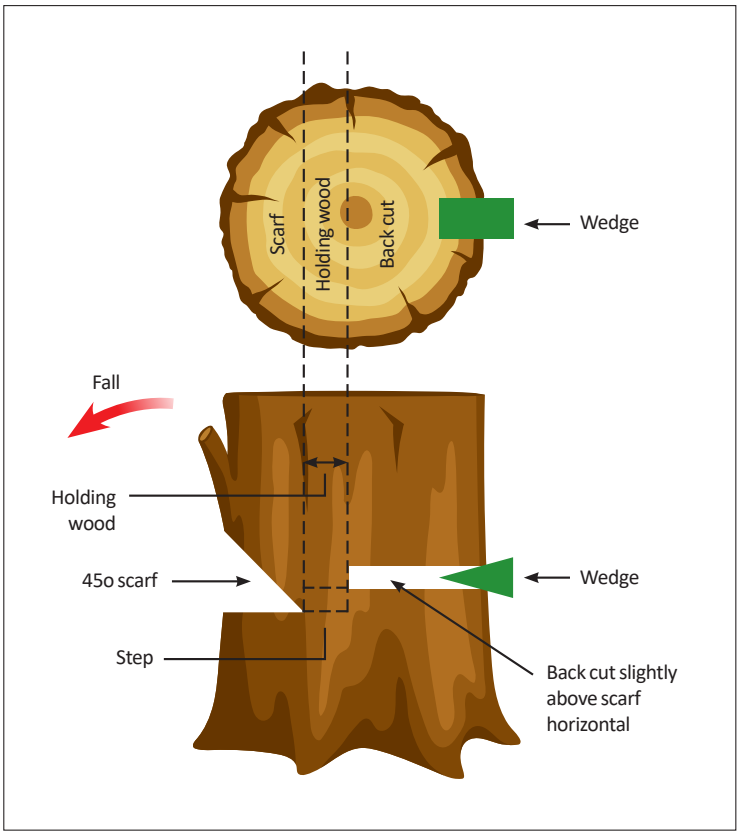
Use chainsaw safely

- Hold the relevant competency for the complexity of the tree to be fallen.
- Hold FWPHAR3209 Harvest trees manually (advanced) to fall hazardous trees and trees with the other dangerous features listed on p.41.
- Complete reassessment with registered training organisation every three years.
- Follow safe work practices, for example as in *AS 2727-1997 Chainsaws – Guide to safe working practices.* Also see *Figures 10 and 11.*
- Ensure equipment is maintained including safety features of chainsaw (e.g. hand guard and chain brake).
- Carry felling equipment including an axe or suitable size hammer, lifting and holding wedges suitable for the trees to be felled, a two-way communication device, wound dressings, chainsaw fuel and oil in approved containers.
- Use personal protective equipment (PPE) suitable for the task being carried out, for example a safety helmet with hearing protection, eye protection, high-visibility clothing, safety footwear, and leg protection. PPE should be reasonably comfortable for the wearer and should be well maintained.

Minimise risks from elevated hazards

- Fell trees into an open area where possible. Ensure falling trees do not strike brush or other standing trees as they fall.
- Avoid using wedges where there is a chance limbs may be dislodged.
- Where the tree is assessed as hazardous, apply the practices described in the section on hazardous trees (*Section 6.2*).
- Consistently apply suitable felling methods – see *AS 2727-1997 Chainsaws – Guide to safe working practices* (*see Figures 10 and 11*).

Figure 10: Tree falling



Information on manual tree felling techniques is in the relevant chainsaw operator's manuals, *AS 2727-1997 Chainsaws – Guide to safe working practices,* the *Chainsaw operator's manual* and the *Tree faller's manual*.

Except for trees with a clear lean in the intended felling direction, a holding wedge should be inserted into the back cut of each tree manually felled with a chainsaw.

If a tree sits back during felling the tree feller should follow a safe system of work in accordance with the accepted

procedures (See Safe Work Australia *Guide – Timber Harvesting, Appendix A Procedures for bringing down trees that sit back during felling).*

8.2 Specific hazards and controls

In addition to common hazards there are specific hazards found in manual felling that require assessment and particular techniques to safely fall. They include:

- felling hazardous trees
- delimbing
- machine-assisted tree felling
- wind throw
- **thinning**
- tree jacking.

8.2.1 Felling hazardous trees

Dead or hazardous trees (*refer Section 6.2*) are unpredictable and extra care should be taken to identify hazards and put control measures in place to protect the feller. For example, these trees are more likely to fall unexpectedly or have branches break off.

An accredited feller should only fell a hazardous tree which is within their competency.

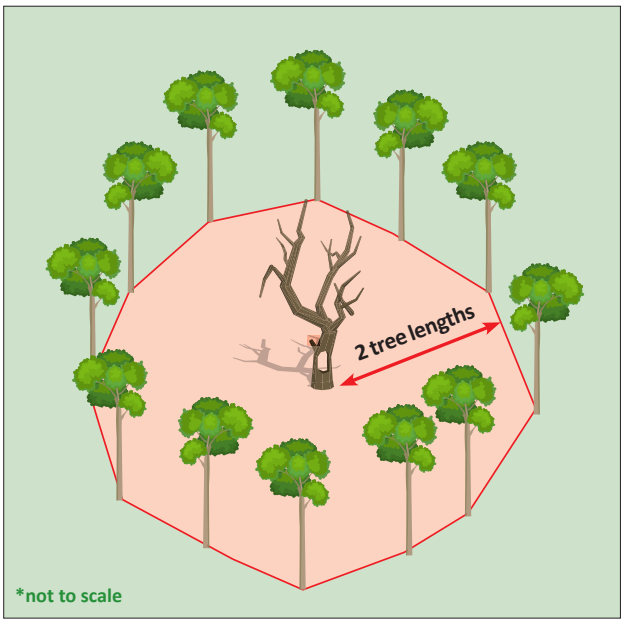
Identify hazardous trees

- Check for presence of any features shown in *6.2 Hazardous trees.*

Prohibit work near the hazardous tree

- If the tree is assessed as being too high risk to fell, then clearly identify the tree without placing yourself or others at risk. Mark the tree with a yellow painted circle with an overlaid yellow 'X' and record its location on the Forest Operations Safety (FOS) Plan.
- The hazardous area around the tree should be clearly marked with high-visibility tape to a distance of two tree lengths (*Figure 11*).
- No work should be carried out in the hazardous zone until the tree is brought down.

Figure 11: Hazardous tree exclusion zone



Consider using mechanical equipment as the first option

- If the hazardous tree is assessed as high risk, first consider using mechanical equipment to fell the tree.
- Use a harvester, dozer, excavator, or skidder with a protective structure to remove the tree.

Manual felling assessed as manageable

Where the risk is assessed as manageable by manual felling techniques, the system of work should have the following

minimum risk control measures in place:

- The felling should only be done by a feller assessed as competent against the relevant national unit of competency for the manual harvesting of trees and have current industry experience.
- Maintain the separation distance of two tree lengths from other workers.
- Use a recognised safe felling method (see *AS 2727-1997 Chainsaws – Guide to safe working practices*). A hand feller may place preliminary cuts in the tree before using a machine to push the tree. When felling a widow maker or brittle top, the feller should work under a protective structure.
- Ensure the area around the base of the tree is scrubbed mechanically, where possible, and escape routes are in place.
- Radio communication should be maintained between all operators.

Use of explosives to remove tree

Where a risk assessment has indicated other felling methods pose a higher risk, a person with experience and the required licences and permits to use blasting explosives to remove the tree should be used.

The use of explosives in removing trees must be done in compliance with the *Explosives Act 2012* (Tas) and the *Explosives Regulations 2012* (Tas).

In addition to the requirements of the legislation above (e.g. permits) the common risk controls of manual felling apply including:

- maintain exclusion zones and separation distances
- ensure all people, vehicles, and machinery are located a safe distance away
- ensure escape routes
- minimise risks from elevated hazards.

8.2.2 Delimbing

Delimbing involves the work in removing limbs and branches from the tree. This work can be done manually or mechanically.

Where done manually the risk controls for manual felling listed above apply. Further measures include:

- Delimbing or cross cutting should not be carried out from the downhill side of the log if the log has the potential to roll.
- Wherever practical, standing on the log should be avoided when delimbing or crosscutting.
- Workers should approach all branches with caution, examine the branch to see if it is under tension, up or down, or bent sideways, and determine the correct method of work. Request machine assistance if in doubt.
- Overhung or suspended logs should only be cut using recommended methods (e.g. *AS 2727-1997 Chainsaws – Guide to safe working practices*).
- Logs suspended above shoulder height should not be crosscut.
- In steep or undulating terrain, the crosscutter should not work immediately above or below operations or people.

8.2.3 Machine-assisted manual tree felling

Machine-assisted manual tree felling should only be carried out by an operator with training and experience relevant to the task.

Machinery used in felling operations must have the capacity to push or back pull the tree safely, must have an operator protective structure and falling object protective structure suitable for forestry operations, and have sufficient height reach and be able to safely control the felling direction of the tree.

The machine must have the capacity to push the tree safely and to clear the under-storey around the tree and create a safe footing for the manual feller to work on. Hazardous trees should be cleared from within two tree lengths of the tree to be felled.

Before starting a machine-assisted manual tree felling operation, workers must be consulted and told about the operation to be carried out. The control measures and sequence of events must be agreed and understood.

Consultation should include assessing the tree to be felled and the surrounding trees for visible hazards that may present an unacceptable risk. In machine-assisted manual tree felling the feller must always have control of the felling operation and be in radio and visual contact with the machine operator.

Pushing

Where a machine is to be used to push the tree in a direction other than its natural lean, the machine should be placed in position before the tree feller approaches the tree.

The machine attachment to push the tree should be:

- in contact with the trunk of the tree with only enough push force applied to prevent the tree sitting back during the felling operation
- high enough above the ground so the machine can provide enough force to push the tree after the felling cuts are made
- when the machine is in position:
  - the controls should be isolated to stop the machine or attachments from moving unexpectedly
  - once the controls have been isolated the tree feller may approach the tree and place the scarf cuts. The depth of the scarf should be approximately one-third of the tree's diameter and not exceed one-half of the diameter of the tree.

After the scarf is removed the feller should place a back cut in the tree but leave sufficient even holding wood to stop the tree moving backwards.

At no time while the back cut is being made should the machine operator apply extra force to the trunk of the tree, unless told to by the feller, as the tree may split or cap up.

Once the scarf cuts and the back cuts are done the tree feller should leave the area by the safest route to a safe zone. This zone should be agreed between the feller and the machine operator before starting work.

The machine operator may then push the tree steadily and in a controlled way until it is committed to fall. If the tree will not fall the machine operator should isolate the controls with the attachment still in contact with the tree trunk and ask the feller by radio to return to the tree and remove more hinge wood.

Once the tree feller removes more hinge wood the tree feller should go back to the safe zone before the machine operator starts to push the tree again.

The feller should ensure the width of the hinge wood is not reduced below five per cent (5%) of the diameter of the tree.

If the hinge wood has been progressively reduced to five per cent (5%) and the tree will still not fall the feller should stop the operation and assess the risk of continuing.

Back pulling

Back pulling is a mechanically assisted method of felling a tree against its natural lean. A line is attached to the tree being felled and cuts are placed in the tree by a feller. The line is tensioned using mobile plant to bring the tree down.

This technique is useful where the natural fall direction of the tree would bring it into contact with electric lines or other structures or would otherwise create an unsafe situation. The operation should always be under the direction of a competent person.

The feller and the machine operator should be able to communicate clearly with each other and, where possible, be able to see each other at all times. Systems like two-way radios, mobile telephones and agreed hand signals or whistles can be used to communicate.

The machine used for back pulling should be capable of pulling the tree and be able to operate safely on the terrain where the tree is being felled.

The line attached to the tree should be firmly fixed as high as possible and tension applied and maintained on the line before felling starts.

Where possible the machine used for pulling the tree should be operated at least two times the length of the tree being pulled away from this tree.

If this is not possible a risk assessment should be carried out to identify an alternate safe method to bring the tree down.

Tree climbing for back pulling

Tree climbing may be required when setting up a tree for back pulling operations.

Where there is a risk of a person falling from height the person conducting the business or undertaking (PCBU) must implement control measures to minimise this risk, so far as is reasonably practicable.

Safety belts or harnesses should be worn when working above 2 metres in height. Climbing equipment should be suitable for its intended use and used, maintained, inspected, tested, and stored according to the manufacturer's recommendations.

Refer to *Section 11 Silviculture* for more details on tree climbing.

8.2.4 Wind throw

Wind-thrown trees are those that have been brought down by strong winds.

All the common risk controls of manual felling listed above apply (e.g. chainsaw safety) but further measures are required because of the presence of partial or complete breaks, and of shatter and tension in trees which may be standing but weakened, leaning, or fallen.

The pattern and method of work may be dictated by the direction of wind throw rather than the topography, and this adds to the difficulty and dangers.

The following additional risk controls are recommended:

- Mechanical methods of salvaging wind-thrown trees are to be used where practicable.
- Workers should approach all trees with caution, and then examine the tree to see if it is under tension, up or down, or bent sideways, and determine the correct method of work.
- When a tree is resting on its roots the worker should ensure that the cut is made in such a manner that neither they nor other workers are in danger from movement of either the stump or the log.
- Bent or heavy leaning trees should be uprooted with a machine. Where this is not practicable, other safe systems of felling must be used.

8.2.5 Thinning

Thinning is a selective felling operation which may include one or more of the following:

- **commercial thinning –** thinning to extract small piece size material and thinning for saw log and small produce
- **non-commercial thinning –** thinning to waste and thinning for stand improvement.

The safety procedures for thinning operations are like those for felling other trees. However, the controls outlined below should also be used by everyone involved in thinning operations:

- Identify hazardous trees by referring to features in *Section 6.2.*
- Fellers should keep watch on the falling tree and look out for limbs and branches that may be thrown back.
- Fall trees into open areas free from woody vegetation in the intended fall direction.
- Ensure trees do not brush or strike retained trees as they fall.
- Bring hung-up trees to the ground.
- Where a tree is hung up it should be brought to the ground as soon as possible.
- The feller should not leave the area until the tree is grounded, except to seek assistance. Before leaving to seek assistance, the feller should make other people in the immediate area aware of the danger and should mark the hung-up tree as per hazardous tree marking procedure. Whenever a tree cannot be completely felled, undertake a risk assessment so an alternative way of bringing it to the ground safely can be used.

8.2.6 Tree jacking

Tree jacking is the process of felling a tree by inserting a purpose-built jack into a hole cut into the tree to bring down the tree in a chosen direction.

The worker carrying out the jacking operation should be trained and assessed as competent to carry out the procedure.

Before using a jack to fell a tree a thorough assessment should be made of the surrounding area for visible hazards and the quality of the wood in the tree to be felled. Tree jacks should only be inserted into holes cut into solid wood.

Workers not involved in the tree jacking operation should move to a safe place at least two tree lengths away from the tree until the tree has been safely brought down.

A suitable jack, for example a hydraulic jack, should be used to bring the tree down. Bottle jacks should not be used.

8.3 Mechanical felling

Many hazards identified for manual felling also apply to mechanical felling. However, risks to the machine operator are minimised by the protection provided by the machine.

Machinery used for mechanical felling includes custom-built feller-bunchers, single grip harvesters, and processors and excavator-type machinery with aftermarket felling heads.

Planning

Prior to commencement of mechanical harvesting a similar planning process to that described in *Section 8.1* should be undertaken.

The FOS Plan and specific contractor safety plans need to be consulted before commencement of work. These plans will have identified hazards that should be confirmed by a site assessment.

Mechanical felling is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
△ Machine selected is not suitable to harvest the tree size in the coupe or harvesting site △ High winds affecting the fall direction △ Slips, strains, and falls getting onto and off the machine to both operate and maintain the machine △ Loose objects in the operator's compartment △ On site machine maintenance while machine running △ Mechanical failure △ Machine rollover	● Environmental issues and constraints ● Boundaries ● Condition and lean of timber ● Traffic flow and management in the harvesting area

Consultation, cooperation, and coordination

Prior planning and assessments should be supplemented by a walk through before operations commence and when there are significant changes in operating conditions (e.g. weather, wind, visibility, traction).

- Crew meetings should be held prior to commencement to ensure operational plans, including exclusion zones and safe work areas, are understood.
- Use radios or other communication systems to maintain oral and visual communication with other workers.
- Establish and maintain relevant falling and traffic signage.

Common risk controls

Baseline risk controls are all relevant to mechanical falling and operation-specific applications are listed below.

Equipment design and operation

- The weight and power of mechanical harvester is suitable for the site conditions and tree size.
- The machine is operated in accordance with manufacturer's specifications.
- Suitable **rollover protective structure (ROPS)** is fitted.
- Suitable **falling object protective structure (FOPS)** is fitted.
- Suitable **operator protective guards (OPG)** is fitted to provide front, side, and rear protection using screens and guards.
- Protective structures should be suitable to the machinery, conditions, and size of trees being felled and compliant with the relevant technical standards (*see Appendix C*).
- Cabin visibility allows the operator to see and check for hazards, especially overhead, and changing conditions.
- Installation of chain shot guard or catcher and where relevant a limit switch to prevent the saw operating at angles (e.g. saw bar directly aligned with the cab) where operators are at risk.
- Handrails and steps are clean and well maintained.
- Machines are shut down and isolated and attachments are grounded during routine maintenance such as greasing and changing bars and chains.

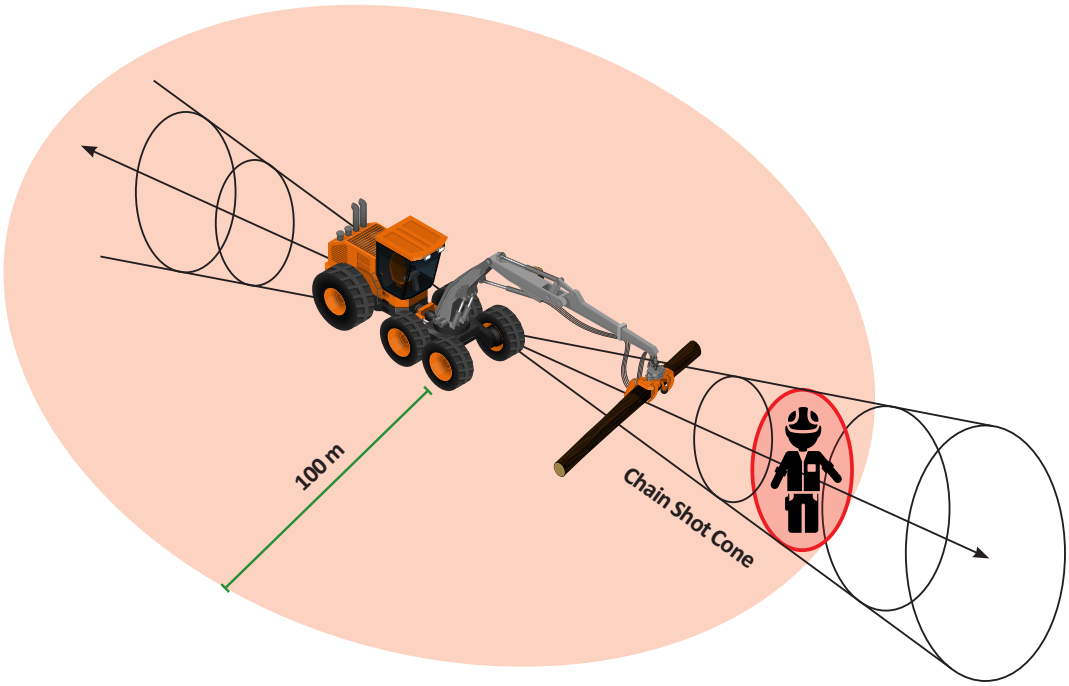
Operator requirements

- Machine operators hold a statement of attainment in relevant competency units such as single grip harvester and feller buncher (*see Appendix B*).
- The operator is trained in working limits of machine and techniques for different trees and ground conditions.
- The operator's seat is maintained and the seat belt worn.
- PPE is suitable for use and correctly maintained - e.g. high-visibility clothing, safety footwear, hearing protection, safety helmet when outside the cabin, and two types of protective gloves available for handling fuels or sharpening chains (*see Appendix E*).

Exclusion zone and safe work areas

- Work at least two tree lengths away from overhead power lines, fall in parallel or away from lines or, if necessary, arrange for power to be switched off.
- Operation is within a defined exclusion zone at least two tree lengths separation from others.
- Others at least 100 metres away from harvesters and away from the 'chain shot cone' (the likely path of chain shot when the saw chain breaks and approximately 15 degrees either side of the plane of the saw bar). *See Figure 12* below.
- Machinery with polycarbonate sheeting and FOPS in all windows that conforms with the Forest machine Guarding Best Practice Guidelines may enter the 100-metre exclusion zone.

Figure 12: Chain shot cone



8.4 Steep slope harvesting

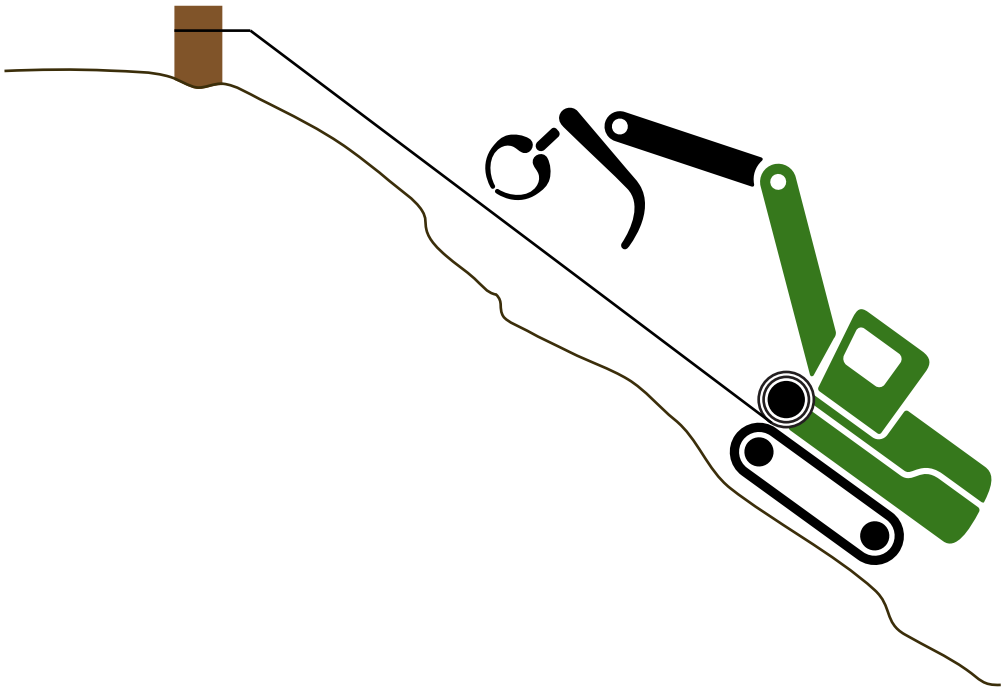
To enable mechanical harvesting on steeper slopes which otherwise may have been designated for manual felling, a winch assist system may be used in several configurations.

Winch assist systems consist of a cable winch mounted on a piece of equipment that is either mobile or stationary.

The mechanical influence of the winch assist system is used for enhanced traction and mobility on steep slopes (often called 'traction assist') or for enhanced safety on steep slopes (preventing machine sliding and overturning).

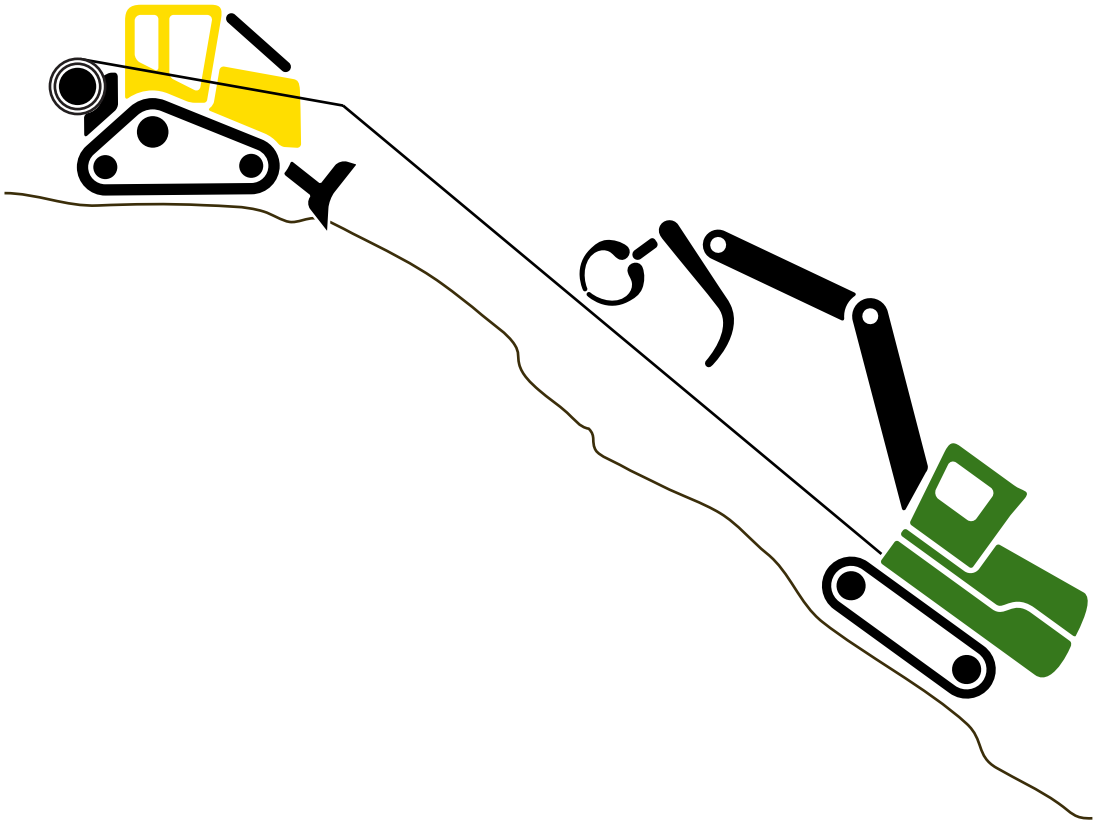
A winch may be fitted to a harvesting machine such as a feller buncher, harvester, or forwarder either as an integrated part of the machine or as an aftermarket winch attachment. The cable is anchored to either another machine or a suitable stump (*Figure 13*).

Figure 13: Winch fitted to machine



Another variation is that the machines are anchored by cable to a winch fixed or attached on another machine that acts as an anchoring point (*Figure 14*).

Figure 14: Winch attached to anchor machine or stump



Planning

Decisions to use steep slope machinery need to be based on the Forest Practices Code following consultation between the contractor and the landowner or forest manager. In addition to consideration of road access, location of landings, roadside stockpiles, tree species, and harvest timing attention needs to be given to traction-related issues such as type of soil and erodibility. The distance that winch assist machines can operate based on winch range and load limitations and the impact on other harvesting and extraction methods should also be considered.

Winch-assisted steep slope harvesting felling is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
△ Incorrect wire rope tension or overloading △ Poor visibility and traction loss due to slash and downed logs in front of machine △ Wire rope side wash by bending around stumps at greater than 45 degrees creating overload or slipping off stump △ Broken or damaged wire, shackles, or connections on felling machine or base machine △ Base machine sitting on soft edge or shoulder of road △ When using stump as anchor, incorrect notching of stump (too shallow, too deep, or too close to top of stump) △ Anchor stump not suitable species or lacking root strength △ Incorrect strap angle when attaching to stump	● Soil condition and erodibility ● Topography ● Space for base machine position ● Suitability of tracked or wheeled machines for all the above factors

This risk assessment should assist in determining what methods of harvesting should be used in various parts of the coupe and how they should be managed.

Selection of equipment

Information should be sought from equipment suppliers on suitability for winch-assisted operations for the harvesting method proposed.

The slope that wheeled or tracked machines can safely operate within design limits is particularly important along with the stability features of the machine.

An equipment supplier has a duty to provide information and training to the end user on the safe operation of the equipment. In the case of steep slope machinery this should include:

- the purpose for which the machine or winch attachment was designed and manufactured
- the design limits of the machine in relation to:
  - slope
  - traction
  - manoeuvrability
  - load and lifting
  - stability.
- any risk assessments or other calculation related to the matters above
- frequency and type of maintenance required
- information on the access to and safe use of the equipment
- information on emergency procedures (e.g. exit, rollover)
- information on the operator qualifications or competencies required to safely operate the machine.

In addition, winches, wires, and attachments such as shackles are also covered by the duty of care of the manufacturer and supplier and similar relevant information should be supplied.

Common risk controls

The risk controls for operating on steep slopes using some form of winch assistance should be read in conjunction with the safe operating specifications of the machines in normal use (e.g. FOPS, ROPS, OPG requirements).

The selected machinery should be able to operate safely on the terrain before considering additional issues related to winch assist. Winch assist systems or tethering machines reduce some risks (e.g. rollover because of loss of traction on steep slopes) but are primarily ways of extending the range of machinery that can be considered for use on slopes.

Use of felling machines

- The machine needs to be designed for steep slope work using a winch assist system.
- The machine needs to have an overriding braking system in case of loss of power.
- The machine needs a system to monitor how much wire rope is left on the winch drum and an alarm and automatic stop mechanism when the wire is less than five wraps on the drum.
- Have a way of monitoring wire tension and the safe working load and keep within thirty-three per cent (33%) of breaking load.
- Have a way of measuring slope such as a clinometer.
- Have sensors that indicate any stability movement in the base machine.
- All wire, shackles, connectors, and other winch assist attachments are compliant with relevant technical standards (e.g. shackles meet the specifications of *AS 2741-2002 Shackles*).
- Keep tracks facing downhill and do not operate across a side slope.
- Minimise use of stumps to side wash wire and if this directional technique is used the angle should be less than 45 degrees.
- All wire, shackles, connectors, and other winch assist attachments are regularly inspected and maintained.

Attachment to base machine

The base machine should:

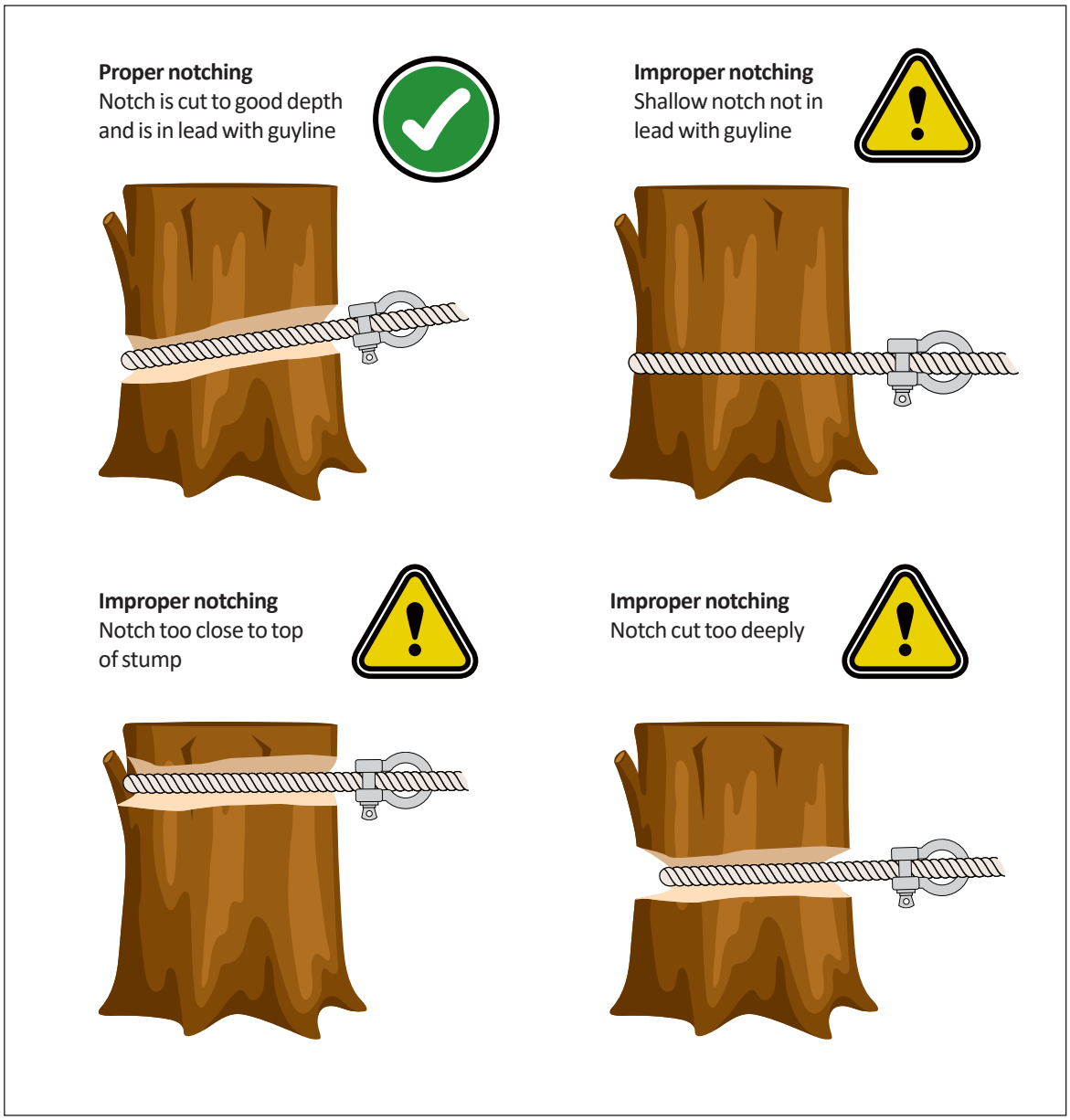
- be capable of receiving live wire tension status from felling machine
- be designed with an automatic stopping system in case of mechanical failure or excessive machine movement
- have the same warning devices about wire as felling machine
- have attachments, such as buckets and blades, grounded
- have buckets, rippers and blades dug into the ground to improve stability and reduce the risk of movement
- have sensors that detect movement in the base machine that are communicated to falling machine
- have all wire, shackles, connectors and other tethering attachments regularly inspected and maintained.

Attachment to stump anchor

If a stump is used to anchor the felling machine, it is important to ensure that the stump:

- has high holding capacity indicated by root system and soil density
- is tied back to distribute load, if necessary, using straps
- is correctly notched (*see Figure 15*).

Figure 15: Notching of anchor stump



All wire, shackles, connectors, and other winch assist attachments need to be:

- compliant with relevant technical standards
- regularly inspected and maintained
- straps attached to stump at correct angle (less than 90 degrees angle of strap eyes).

Exclusion zone and safe work areas

- Have a clear plan of the harvesting process, particularly when hand felling is used, so that clear exclusion zones and separation distances are identified.
- If hand felling is required for parts of the coupe it is recommended that it is undertaken before the steep slope harvesting process begins.
- There should be a separation distance around the base machine and on the slope below when in operation so that it is clear of ground workers.

Operator requirements

- Have experience operating machine before undertaking any winch assist operations.
- Opportunity to work on lower slopes where winch effect minimal and gradually advance to higher slopes where safe to do so.
- Have a map of the operational area including hazards and 'No Go Zones'.
- Have understanding of the importance of the wire tension and safe working loads.
- Have knowledge and experience in using **side wash** techniques.
- Understand the procedure for emergencies and breakdowns on steep slopes.

9 LOG EXTRACTION

Log **extraction** includes forwarding, **skidding**, **snigging**, shovel logging, and cable logging.

In this section extraction on both level ground and steeper slopes are covered. Steep slope work covers common hazards and controls but where winch-assisted or tethered systems are used additional measures are required.

These largely reflect the controls used with winch-assisted felling.

Cable logging is another method of extraction used on steeper slopes.

Planning

Extraction methods are generally specified in the Forest Practices Plan. Identified hazards should be confirmed by a site assessment prior to commencing work. The extraction method, identified hazards and related management plans should be recorded in the Forest Operations Safety (FOS) Plan following consultation.

Log extraction is carried out in an environment in which most of the baseline hazards, and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
△ Being struck by materials being moved, causing trees and spars to be pulled over △ Inadequate and unreliable communication systems △ Equipment failure △ Objects penetrating the cabin △ Instability of machinery and risk of rolling over or sliding △ Slips, strains, and falls when getting in and out of machinery	● The proposed felling and extraction plan and pattern of work ● Communication systems for ground workers and machine operators ● Traffic flow and management in the harvesting area

Consultation, cooperation, and coordination

Prior planning and assessments should be supplemented by a walk through before operations commence and when there are significant changes in operating conditions (e.g. weather, wind, visibility, traction).

Crew meetings should be held prior to commencement to ensure operational plans are understood.

Common risk controls

Baseline risk controls are all relevant to log extraction and operation-specific applications are listed below in *Table 4*.

Table 4: Focus points for risk control in log extraction

Baseline risk controls	Maintain focus on equipment design and operation	Maintain focus on operator requirements	Maintain focus on safe work areas	Maintain focus on communications systems
Continue to use baseline risk controls for manual & mechanical felling	• The weight and power of machines such as a forwarder is suitable for the terrain and tree size • Machine is operated in accordance with manufacturer's specifications • Suitable protective structures fitted • Cabin visibility allows the operator to see and check for hazards, especially overhead, and changing conditions • Handrails and steps • Extraction tracks are clear and suitably located	• Operator is trained in working limits of machine and techniques for different trees and ground conditions • Operator seat maintained and the seat belt worn • PPE is suitable for use and correctly maintained (e.g. high visibility clothing, safety footwear, hearing protection, safety helmet when outside the cabin, and two types of protective gloves available for handling fuels or sharpening chains) (*see Appendix E*)	• Operation is within a defined safe work area - at least two tree lengths separation from others • Awareness of chain shot cone around harvesting machines	• Use of radio, GPS or other communication or location finding systems to maintain oral and visual communication with other workers

9.1 Steep slope extraction

Where log extraction is undertaken on steeper slopes using conventional methods the issue of instability of machines and felled logs is at a higher risk. Baseline risk controls are applicable, and *Table 5* below outlines additional controls for particular equipment and methods.

Table 5: Additional controls for specific equipment and methods on steeper slopes

	Forwarders	Snigging with skidder or dozer with winch or grapple	Shovel logging
Standard log extraction controls			
Method specific controls	● The loader or carrier should never be loaded over the manufacturer's specifications or loaded above the level of the headboard or stanchions ● Stanchions should not be extended without the manufacturer's authorisation ● Drag logs closer to the forwarder before lifting ● Avoid travelling across side slopes in excess of manufacturer's specifications ● Load the topside of the cart or truck first ● Do not overload the grapple ● Do not overload the log bunk ● When loading on sloping ground, park straight up or down the slope ● Logs being loaded in the loader should be fully encircled by the holding jaws when the jaws are closed	● Logs should not be extracted on gradients or side slopes greater than those specified by the equipment designer, manufacturer, importer, or supplier ● When snigging heavy logs downhill, hook up 'short' and low to the ground to avoid logs overtaking the skidder or dozer ● When snigging heavy logs uphill, raise the log and, if necessary, use a series of 'winch - move forward - winch again' moves ● Avoid turning the machine on a slope ● Avoid travelling across side slopes in excess of manufacturer's specifications ● When travelling downhill, keep the winch rope taut so the snig does not bump or pass the rear of the machine ● Avoid winching logs at a sharp angle to minimise the risk of rolling over	● When working on a slope, keep the grab as low as possible ● When travelling downhill, keep the boom facing downhill ● When travelling uphill, keep the boom facing uphill and fully extended with the grab as low as possible ● Do not shovel logs towards or onto a live landing ● Test loads before extending the boom to ensure the machine remains stable during load movement ● Avoid turning the machine tracks on a slope ● Avoid travelling across side slopes without using a side cut track ● If travelling across side slopes is unavoidable, keep the boom facing downhill ● Where practical, always work on slopes with the tracks in the direction of the slope ● If the machine starts to tip or slide, lower the boom immediately in a controlled way

9.2 Winch-assisted log extraction

Winch-assisted systems are likely to be used on steeper slopes beyond the normal operating limits of wheeled or tracked machines.

Common risk controls

The risk controls for log extraction on steep slopes using some form of winch assistance should again be read in conjunction with the safe operating specifications of the machines in normal use (e.g. falling object protective structures (FOPS), rollover protective structures (ROPS), operator protective guards (OPG) requirements).

The risk controls set out for winch-assisted felling machines also apply to extraction machines as the winch assist systems are similar but there are some additional controls relevant to extraction.

Additional controls for winch-assisted log extraction

- Use stability-improving options (e.g. wheel spacers, wide 'floatation' tires).
- Consider using tracked machines or purpose-built machines.
- Ensure tracked machines have tracks that are in good condition and outfitted to provide superior traction.
- Make smaller turns to avoid overloading or overbalancing the machine.
- Carry logs as low to the ground as possible without hanging up on stumps and rocks.

9.3 Cable logging

Cable logging is a system that is used to move trees from the felling face to a log landing for processing. Cable logging systems are complex, requiring expertise and specific customised equipment to undertake these operations.

The focus of guidance in this Code is on interaction between equipment and ground workers rather than the technical specifications and engineering integrity of equipment.

The integrity of yarders, towers, guy lines, rigging, blocks and shackles, and wire rope are defined in technical guidance, as are the appropriate load bearing limits for cable logging systems (e.g. skyline, high lead).

- Detailed guidance on these issues can be found in the Safe Work Australia *Guide to managing risks in cable logging* (2013).

Planning

One of the specific planning issues for cable logging is the design of the log landing. In addition to the requirements set out in *Section 10 Landings, stockpiles, and log loading*, additional requirements include:

- the landing chute should be long enough to land a whole tree or, at the minimum, two-thirds of the tree volume
- where the yarding is uphill the landing chute should be flat or slope backwards to the yarder
- be large and level enough to land and deck logs so that they will not slide or roll in the direction of persons or equipment
- include a safe area separated from landing hazards
- be large enough to heel and swing logs without striking standing timber, rigging, or other equipment or objects
- the outer edge of the landing chute and any other area subject to disturbance by moving cables or machines should be free from overburden, cast material, rocks, or stumps.

Log extraction is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered. The focus in this section is on the hazards of hooking up and unhooking logs.

Additional hazards to baseline	Additional risk factors to baseline
△ Being struck by chokers or bells as they are returned down the hill or released from the log △ Being struck by planned or unplanned machinery movement △ Being struck by line, block, or stump due to failure of line set-up △ Being struck by rigging cables or tower collapse △ Being struck by rolling or sliding debris dislodged by moving lines or that has escaped from the landing chute	● Suitability of the system (e.g. skyline) for the site conditions and timber to be extracted ● Impact on adjacent operations and suitable separation distances ● Operating limits of system given extreme conditions such as high fire danger, high winds, poor visibility, or other adverse conditions ● Capacity to inspect and maintain equipment on a regular basis

Risk controls

Risk controls for specific equipment and logging systems can be found in the Safe Work Australia *Guide to managing risks in cable logging*. These centre on regular inspection and testing and the stability and security of equipment.

Baseline risk controls are all relevant to cable logging and operation-specific applications are listed below.

The controls focus on hooking up and unhooking stages of cable logging.

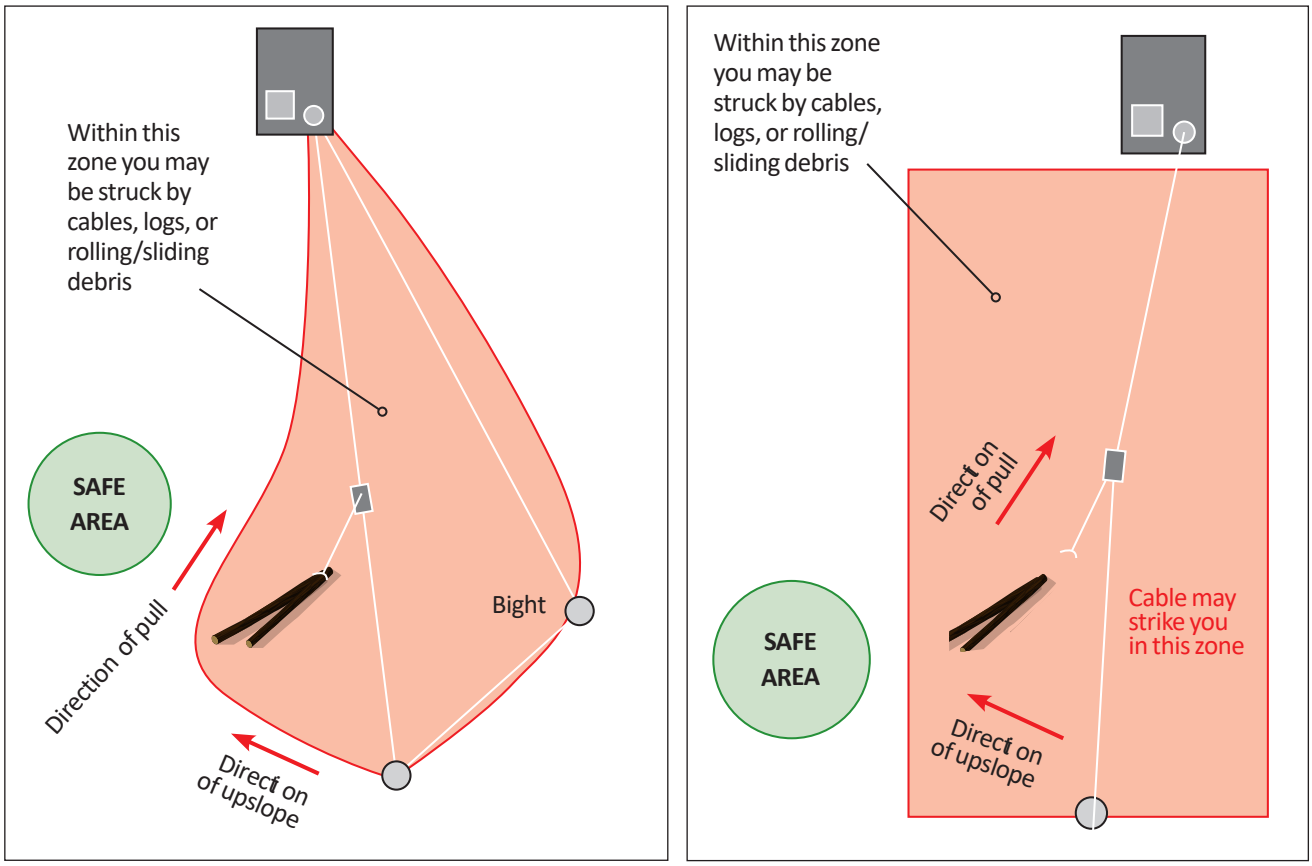
Exclusion zones and safe work areas

Hooking up

- Establish an exclusion zone that separates ground workers from hazards (e.g. rolling logs) by distance or by physical barrier (e.g. stumps) and ensures safe area is in the logged off area and out of the bight.
- Identify the safe work area for the choker setter(s) and record where the safe area is.
- The safe work area must be at least the length of the longest strop plus 5 metres away from rigging or carriage. Never stand closer than 6 metres, regardless of strop lengths.

Examples of safe work areas and exclusion zones when hooking up are shown in *Figure 16*.

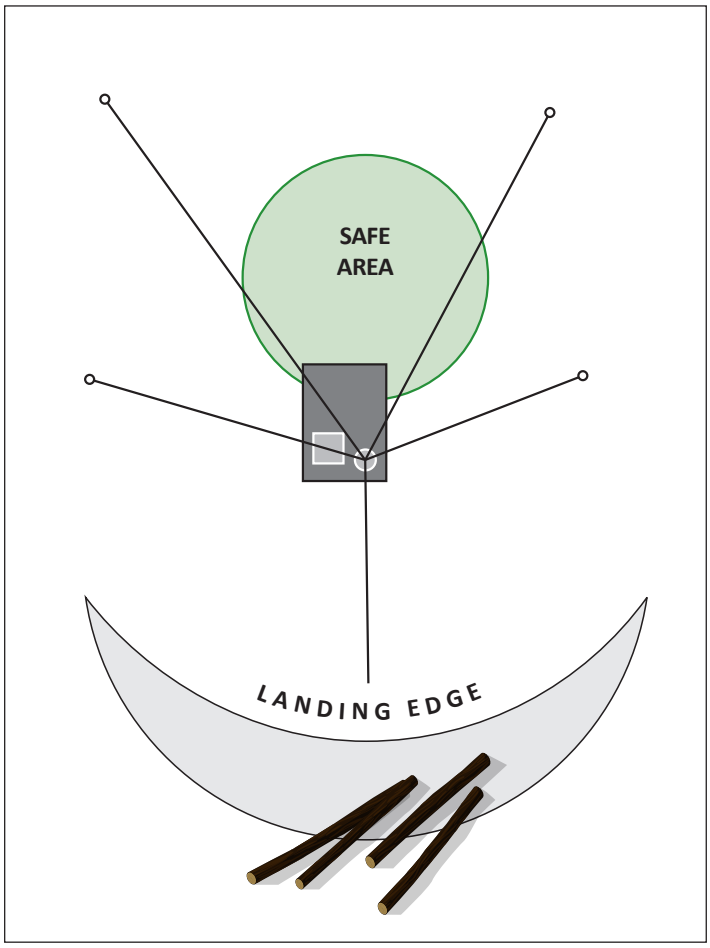
Figure 16: Examples of exclusion zones and safe work areas



Unhooking

- A safe work area for unhooking should aim to be:
  - out of the direct line of pull e.g. 45 to 90 degrees to the line of pull
  - on the opposite side of the yarder to the line of pull, where possible
  - a safe distance away from guy lines
  - at least two times the length of a log located in a log stack
  - maintained so when working with a swing yarder it will not endanger the safety of the chaser – see the manufacturer's safe operating instructions
  - well away from the operating area of mobile plant – at least the length of the longest log to be handled or the manufacturer's specified safe working distance, whichever is the greater.
- The safe work area protects ground workers on the landing from being in the 'shot cone' of processors operating on the landing (*see Figure 12*).
- The designated safe work area for the chaser should consider adjacent hazards such as plant and must maintain the integrity of the cable and guy line system (*see Figure 17*).

Figure 17: Yarder safe work area



Safe work procedures

Hooking up

- Stay out of the bight while lines are under tension.
- Retreat to a safe work area before blowing tooter to signal for the turn to be hauled to the landing.
- Always approach and set chokers from the upper side of the log unless instructed otherwise.
- During inhaul and unhook, plan the next turn while in the safe work area.
- Choker setters must control when the line stops through the tooter and the yarder operator does not move lines until signalled.
- Stay in the safe work area until carriage has returned and rigging has settled on the ground.
- If working under tensioned lines (not loaded) is required (e.g. to gather chokers), minimise the time under the line and ensure process is closely monitored.

Unhooking

- Stand in the safe work area until all logs have been landed, machinery has stopped, and the yarder operator signals that it is safe to enter their work area.
- Logs should not be landed if the chaser's location is not certain or if they are not located in the identified safe area.
- Do not change position without telling the yarder operator.
- During yarding the landing chute should be cleared of logs before the next turn of logs is landed unless:
  - the logs are fully contained in the landing chute
  - there is no possibility people working on or below the landing may be hit by rolling objects coming off the landing or log stacks.
- Always unhook bottom log first.
- Regularly inspect and maintain landing edge and slash heap to prevent debris escaping down the landing chute, putting choker setters at risk.

Personal protective equipment (PPE)

- Choker setters should wear suitable safety boots and spiked boots where conditions create slippery logs.
- Eye protection must be worn, when cutting wire rope.
- Leather gloves must be worn to protect against **sprags**.
- All other standard PPE must be worn (high-visibility clothing, safety helmet).

10 LANDINGS, STOCKPILES, AND LOG LOADING

The landings, stockpiles, and loading areas bring together ground workers and machinery operations and creates risks which should be carefully managed. Planning and construction of these areas is necessary to ensure the safe and efficient handling of logs and workflows with minimal problems.

Planning

The location and size of log landings are detailed in the **Forest Practices Plan**. The design principles for safety on log landings include:

- positioned on the flattest area as practicable and be located where the slope of the ground enables good drainage
- large enough to enable activities carried out on it to be safe and with as little intrusion as possible between tasks
- be cleared of all hazardous trees for a distance of at least two tree lengths
- clear of any power lines
- kept clear of hazardous debris
- have a safe pedestrian access and visitor control procedures
- allow space for:
    - the safe passage of other traffic which may need to pass the operation
    - the safe storage of logs and the volume to be handled
    - parking, turning, maintenance, and storage of fuel and chemicals
    - a safe area for ground workers to retreat to for sharpening saws and other tasks
    - a safe area for drivers to view the loading process
- be located so as to allow safe rehabilitation after the forest operation.

Work on log landings is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
△ Moving machinery △ Chain shot or other material thrown or moved by machinery working on landing △ Slips and trips △ Skin exposure to hazardous chemicals	● Communication systems for ground workers and machine operators ● Control of visitors to the landing

Common risk controls

- Common risk controls for all operations on the log landing are aimed at minimising interaction between operations and protecting ground workers. Those working under a canopy should rely on the risk controls set out for machinery (e.g. operator protective guards (OPGs)) outlined earlier in this Code. Baseline risk controls are all relevant to work on log landings and operation-specific applications are listed below.

Exclusion zones and safe work areas

- Display warning signs at entry to the site.
- Where practicable ensure there is a physical barrier (e.g. a log stack or another machine between machines and ground workers).
- While a machine is handling logs ensure no one enters the area within the full swing radius plus half the log length in the beak (or the manufacturer's specified safe working distance, whichever is greater).
- The intended path of travel for skidders and forwarders should be clear of ground workers.
- Do not swing logs above or within the reach of ground workers.
- Ensure separation distances to protect ground workers from chain shot injury (*see Figure 12*). *Figure 12* shows a 'cone-shape' danger zone. This zone changes as the cutting head is repositioned. A minimum 100 metre exclusion zone is required for unprotected workers unless effective protective barriers are used.

Communication between operators

- Use radio communications to monitor movement onto and within the landing.
- Entry into a designated work area should only be with the permission of the area controller.
- Extraction machinery does not enter the area until it is safe to do so (e.g. when they are signalled to enter the area by the authorised person like the landing attendant, processor operator, or loader operator).
- Operators of extraction machinery communicate with landing workers, reduce speed when entering the landing, and ensure logs are fully dropped before unhooking.

Safe use of mobile plant

- When using a mechanical processor or cut off saw ensure the line of the cut is never directed at ground workers to avoid the chain shot zone.
- Ground machine implements when the machine is parked.
- Do not walk under an implement supported only by the machine's hydraulics.
- Logs are only approached after they are completely landed and, if necessary, stabilised.
- Machinery operators do not carry logs over ground crew.
- Ground workers on the landing should face operating machines.

Stability of log stacks

- Ensure there is enough separation between stacks and machines to minimise the risk of disturbing any stacked logs.
- Log stacks should be kept to a safe height on level ground and angled to maximise stability.
- Logs stacks should not be higher than the capacity of the log handling equipment.
- Avoid working at the base or downhill from a log stack.
- Logs should be chocked or placed on a notched log to stop rolling when cross cutting or measuring.
- Use bearer logs under log stacks to avoid rocks or other contamination being loaded onto log trucks and becoming a potential danger to road users.
- Work on the topside of a log when manually cross cutting, grading, or measuring.
- Avoid exposure to hazards from moving logs by not working in front of, climbing onto, or working on logs placed in log stacks or dumps.
- Do not use chainsaws to cut logs on a log truck or climb on the load for any reason.

Minimise slips, trips, and falls

- Assess the work area for uneven surfaces and high edges.
- Ensure bark and other debris is regularly removed from the work area of ground workers.
- On corded landings, do not walk on the corded area while machines are operating.
- Arrange the work area so the ends of logs can be marked or painted while standing on the ground.
- Ensure safety footwear is in good condition and does not have worn soles.
- Use handrails and steps when climbing up onto and stepping down from a machine maintaining three points of contact.
- Ensure safe ground-based access to the landing area for operators.

10.1 Log preparation, measurement, and marking

Where logs are prepared, measured, and marked at the log landing ground workers are at risk from being hit or crushed and it is important to ensure precautions are put into place to minimise the risk to health and safety of those preparing and measuring logs.

Common risk controls

- Ensure machine operators are aware of ground worker location.
- When handling logs to be marked or measured with an excavator the landing should be set up so as when the marker or measurer leaves their work area to move towards the excavator, they approach towards the operator's door not the boom side of the excavator.
- Hazardous trees to be removed or identify them with marking or tape and add to Forest Operations Safety (FOS) Plan.
- Machine operators hold the relevant national operator competency qualification such as FWPHAR2207: Trim and Cut Harvested Trees, which is mandated by industry for commercial harvesting operations.

Table 6 outlines some additional measures to the baseline risk controls that apply to these tasks.

Table 6: Additional controls for log preparation, log measurement, and log marking

	Log preparation	Log measurement	Log marking
Common log landing controls			
Activity specific controls	● When using a mechanical processor or cut off saw ensure the line of the cut is never directed at ground workers ● Where a chainsaw is fitted to a machine and used for preparing logs limit the risk of chain shot by keeping the 'shot cone' area clear of other workers ● Bark removal should be carried out away from the swing path of the loader boom ● Whenever chainsaws are used the techniques described in *AS 2727-1997 Chainsaws - Guide to safe working practices* should be used and logs should be secured before cutting	● Checking hazards to workers and equipment before starting measuring ● Use electronic measuring devices ● Putting the log in a designated area away from other working operations and in a safe position for measuring e.g. on a notched log ● Inspecting the log to ensure it is adequately chocked to prevent it rolling or sliding ● Do not work below logs when measuring ● Measuring the length of the log by hooking the tape on the lower end of the log and reading from the raised end ● Branding the raised end of the log ensuring there is space to swing the hammer	● Stay in marking work area and out of the machine's work area until the load or beak is grounded and stable and the operator has given permission to enter ● The area around the log should be clear of obstructions that could impede the use of tools required to mark or tag the log ● Ensure that the walkway to where logs are marked or tagged is kept free of obstacles and debris that could become slips and trip hazards ● Give the machine operator permission to recommence operation after marker has returned to work area and is out of the machines work area ● Use log marking paint or grease according to the instructions on the label and the safety data sheet

10.2 Loading

The person conducting a business or undertaking (PCBU) involved with arranging for the transport of forest produce from the forest should plan to ensure that the load can be loaded and transported safely. These parties could include:

- the forest manager
- the harvesting contractor
- the haulage contractor
- the receiver of the forest produce.

Planning

The planning should include:

- ensuring that the form and specification of forest produce reduces the risk of losing produce during transport as far as practicable
- estimating the likely friction characteristics of logs to be transported
- ensuring vehicles are fitted with the right equipment to transport logs safely
- ensuring loader operators and drivers are trained to construct safe loads.

Log loading is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
△ Driver injured while tensioning lashings △ Exposure to extreme weather △ Slips and trips while checking load △ Back strain from throwing lashings	● Communication systems for ground workers and machine operators ● Control of visitors to the landing

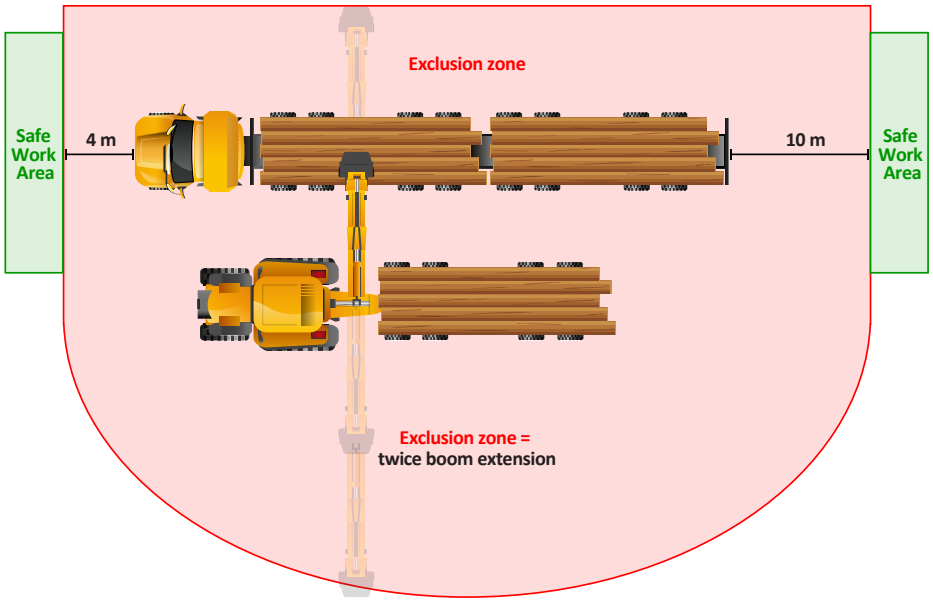
Common risk controls

Baseline risk controls are all relevant to log loading and operation-specific applications are listed below.

Exclusion zones and safe work areas

- On arrival at the workplace, communication between the truck driver and loader operator should be established.
- During loading operations, the loader operator is to ensure that the area in the immediate vicinity is clear of all persons (*Figure 18*).
- The driver and any other person is to be no closer than 4 metres to the front or 10 metres to the rear of the vehicle being loaded and should maintain visual contact with the loader operator or machine throughout the loading operation.
- If the driver is delayed abnormally during loading, adequate shelter and amenities should be provided.
- The driver must notify loader operators and receive an acknowledgement before entering an exclusion zone to:
  - check scales, load construction, or the lay of logs
  - secure the load with relevant **lashings**.
- In multi-bunk configurations, the driver must not be in the cabin during loading of the front bunk. Once the front bunk has been secured the driver may return to the cabin for the remainder of the loading.

Figure 18: Safe work area for drivers during loading



Self-loading trucks

- Self-loading truck are to be fitted with outriggers and stabilisers that firmly stabilise the unit while loading.
- Outriggers and stabilisers are to be fitted in accordance with *AS 1418.5-2002 Cranes, hoists and winches – Part 5: Mobile cranes.*
- Booms need to be designed so that the free fall of the boom is prevented in the event of a malfunction.
- Access to the log loading position has been well designed and is fit for purpose.

Load design

- The driver must ensure that the load is constructed so that it meets the requirements of the Heavy Vehicle National Law and the Log Haulage Code.
- This means that the load must be placed on the vehicle to ensure:
  - the load can be restrained effectively
  - the load does not destabilise the vehicle
  - the load remains stable when applying and removing lashings
  - the load is not contaminated with items that can fall from the vehicle in transit.
- No more than fifty per cent (50%) of the end diameter of any log is to be above the top of a **cab guard**, **headboard**, **tailboard**, or **stanchion**.

- Outside logs that are in contact with the stanchion must have no part of that log above the height of the stanchion.
- All loads of logs must be crowned to ensure load security.
- Outer ends of the outside logs should extend 300 mm beyond stanchions.
- All logs are to be secured by at least two load restraints, either directly by contact with the stanchion or lashing, or indirectly, if bound by surrounding logs.
- Drivers are to ensure that:
    - logs are secure prior to moving their vehicle
    - lashings are regularly checked during transit to correct the tensions
    - loose bark is identified and removed
    - if necessary, adjustment to loading configuration is undertaken by suitable log handling equipment.

Correct load restraint devices

- Load restraint devices must be designed to comply with the requirements of the Heavy Vehicle National Law and the Log Haulage Code.
- The method of applying lashings should ensure that the risk of manual strain injuries is minimised.
- Lashings and **tensioners** should be inspected and maintained regularly to ensure they are fit for purpose.
- Where practical, a rear restraint device should be fitted to prevent logs sliding from the back of the load.
- Where stanchion extensions are used, they must be securely fastened.

Over-centre lever load binders (dogs)

Over-centre lever load binders (dogs) are hazardous items of equipment. The lever and associated extension bars can release energy very quickly and cause injury to users. Alternative tensioners should be used.

11 SILVICULTURE

Silviculture is the science and practice of managing the establishment, growth, composition, quality, health, protection, and utilisation of stands of trees or forests.

The growth and management of forests encompasses a wide variety of activities ranging from regeneration burning, harvest residue management, site and soil preparation, seed collection, tree planting, and chemical use through to tree competition control, pruning, thinning, and harvesting.

Planning

Planning for planting and replanting is an opportunity to design in safety aspects for future operations and learn from risks evident in the previous rotation or operation. Planting methods that consider future harvesting and reforestation risks, consider site hazards previously identified, and consider use of existing landings are all matters that can minimise risks.

Health and safety planning for the growth and management of forests is undertaken in the context of the requirements of the Forest Practices Code and any specific Forest Practices Plan that applies to the site.

The baseline hazards and risk factors outlined in *Section 3.10* should be included in the development of a Forest Operations Safety (FOS) Plan for the specific operation.

11.1 Mechanical site preparation

Machinery such as bulldozers, excavators, or large tractors may be used in site preparation often to clear previously harvested sites of logging debris. Preparation of the soil and planting site may involve machinery-dependent processes known as windrowing, mound ploughing, mechanised spot cultivation, chopper rolling, and other forms of cultivation like disc trenching.

Site preparation is carried out in an environment in which all baseline hazards and risk factors are present.

Additional hazards to baseline	Additional risk factors to baseline
△ All baseline hazards are applicable to site preparation	● All baseline risk factors are applicable to site preparation

Risk controls

Operation of machines in site preparation includes many common hazards and risk controls that are outlined in *Section 6 Common hazards and risk controls*. Of relevance are the sections on:

- *Noise*
- *Hazardous manual handling*
- *Working alone*
- *Plant maintenance*
- *Extreme weather.*

Baseline risk controls are all relevant to site preparation and operation-specific applications are listed below.

Equipment design and operation

- Machine is operated in accordance with manufacturer's specifications.
- Machine is suitable for slope and work pattern.
- Protective structures (rollover protective structures (ROPS), falling object protective structures (FOPS), operator protective guards (OPG)) should be suitable to the machinery conditions, and type of work and compliant with the relevant technical standards (*see Appendix C*).
- Operators to wear seatbelts where fitted and ensure there are no loose objects inside the machine's cabin.
- Machine has handrails and steps.
- Form windrows and heaps with larger stumps or logs at the base of the windrow/heap and other smaller material around them to increase windrow/heap stability.
- Machine to be parked on flat level ground whenever possible.
- Complete shutdown and isolation of machinery while doing maintenance.

Operator requirements

- Operators must hold a statement of attainment for the unit of competency relevant to the skill or machine type required by the forest activity (*see Appendix B*).
- Operator is trained in working limits of machine and techniques (e.g. limits for working on steep slopes).
- Operator's seat is maintained and the seat belt worn.
- Operator has awareness of any identified site hazards such as power lines and underground assets.
- Personal protective equipment (PPE) is suitable for use and correctly maintained (e.g. high-visibility clothing, safety footwear, hearing protection, safety helmet when outside the cabin (*see Appendix E*).

Exclusion zones and safe work areas

- Ensure separation distances and safe work areas identified and maintained.
- Ensure a distance of greater than two tree lengths between the machine and any material being pushed or pulled by the machine and any ground-based persons. Where two tree lengths is not applicable a safety zone of no less than 100 metres must be maintained.
- Remove any hazardous trees that impinge on safe work areas.
- Machine operators should avoid operating directly above other machines and ground workers where there is a possibility stumps, rocks, or logs may roll or slide down the slope.
- Suitable separation distances from overhead power lines and other infrastructure, and compliance with any 'No Go Zones'.

Communication

- Maintain oral and visual communication with other workers.
- Establish and maintain relevant warning signage.

11.2 Seed collection

A key stage in regenerating forests is seed collection. Seeds are usually collected from an area within close range of the harvested area to ensure the same mix of tree and plant species grow back.

Planning

Seed collection for native species occurs within the overall longer-term planning process. Understanding the interaction of operations and any concurrent or residual risks should be considered when scheduling seed collection. Coordination with adjacent activities should be achieved by site induction and sign-in procedures set out in the FOS Plan.

Collection times such as road construction, concurrent with or after harvesting or after fire damage, all provide opportunities to foresee and minimise risks.

Seed collection is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
△ Falls from height △ Cuts and scratches to the body, face, and eyes △ Bites and stings from insects, snakes, and other wildlife △ Cuts from secateurs △ Hazardous manual tasks	● Assessment of site-based hazards prior to commencing seed collection ● Timing and scheduling of seed collection in relation to other operations

Risk controls

Seed collection includes many common hazards and risk controls that are outlined in *Section 6 Common hazards and risk controls*. Of relevance are the sections on:

- *Working alone*
- *Solar UVR exposure*
- *Fatigue*
- *Extreme weather.*

Baseline risk controls are all relevant to seed collection and operation-specific applications are listed below.

Tools and equipment

- Safe use of machetes when collecting at ground level such as wrist strap to prevent tool dislodging during cutting.
- Machete enclosed in scabbard while moving through site.
- Safe use of secateurs (*see Section 11.5 Tree pruning*).
- Flexible cutting saws, long-handled secateurs, and telescopic pole pruners used when collecting seeds from above head height are designed to minimise use of force and awkward postures.
- Firearms are used in compliance with the *Firearms Act 1996* (Tas).
- Use of purpose-built and securely anchored ladders for above head height seed collection.

Personal protective equipment and first aid

- Access to suitable first aid for bites and stings.
- Suitable clothing to protect from insects, snakes, and minimise cuts and scratches.
- PPE including footwear for uneven ground, cut resistant gloves, and eye protection.
- Exclusion zones and safe work areas.
- A distance of greater than two tree lengths between other operations such as falling or road construction.
- Seed collectors should avoid operating directly below other machines and ground workers where there is a possibility stumps, rocks, or logs may roll or slide down the slope.
- Use of firearms is separated by time or distance from adjacent operations.
- Maintain a safe working distance of at least 5 metres from other seed collection workers.

Communication

- Maintain oral and visual communication with other workers.
- Establish and maintain relevant warning signage.

11.3 Tree climbing

When growing and managing forests, tree climbing may be necessary for tree measurement and seed collection activities. The main risk associated with tree climbing is the potential to fall from height.

Planning

The WHS Regulation in Section 4.4 – Falls sets out obligations to manage risks of falling from one level to another where there is the likelihood of injury.

The regulation states that if it is not practicable to eliminate the risk of falling, a hierarchy of controls must be followed with a fall prevention device preferred (e.g. elevating work platform), then a work positioning system (e.g. rope access system), and finally a fall-arrest system (e.g. individual fall-arrest system).

Before a climber begins a climbing activity, a written climber rescue plan should be developed and communicated to all persons associated with the climbing activity.

If a fall-arrest system is used, emergency and rescue procedures must be maintained.

- Further information on managing the risk of falls is in the approved Code of Practice *Managing the risk of falls at workplaces.*

Tree climbing is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered. In line with the WHS Regulations the practicability of an alternative to climbing should be examined in the risk assessment stage.

Additional hazards to baseline	Additional risk factors to baseline
△ Falls from height △ Ants, bees, wasps, snakes, and other biting or stinging hazards △ Adjacent trees, dead limbs, and intertwining branches △ Working near power lines	● Assessment of individual tree integrity including: ○ age and species ○ health ○ condition of the crown ○ decay ○ proximity of other trees ● Nature of adjacent operations ● Expected weather conditions

Risk controls

Risk controls for tree climbing are outlined below. They are based on an assessment that elimination of the risk is not reasonably practicable.

For example, an assessment shows use of elevating work platforms cannot be used safely in the terrain or remote sensing technologies such as laser scanning and photogrammetry for tree measurement are deemed impracticable because of the nature of the species and forest.

However, each of these options provides a way of undertaking work without the need for climbing that may be considered in other circumstances.

Baseline risk controls are all relevant to tree climbing and operation-specific applications are listed below.

Safe climbing practices

- An assessment of the tree is made to determine suitability for climbing, extra precautions needed, or special techniques required.
- The weather conditions are assessed to determine if it is safe to climb.
- Tree climbing should only be done by operators who hold a statement of attainment for the unit of competency relevant to the skill required by the forest activity (*see Appendix B*). In particular:
  - AHCARB319: Use Arborist Climbing Techniques
  - AHCARB318: Undertake Aerial Rescue.
- A minimum of two persons should be present:
  - one climber
  - one ground person who is also assessed as competent to the above units and able to climb in the event of the first climber being injured and unable to descend the tree.
- If a climber must disconnect the climbing rope or strap in order to move by an obstacle, a second climbing rope or strap to ensure continuous protection while passing the obstacle is to be used.
- No more than one climber is working in a tree. In most situations this is the safest method.

Climbing equipment

- An approved tree climbing harness conforming to *AS/NZS 1891.1:2007: Industrial fall-arrest systems and devices – Harnesses and ancillary equipment* and *AS/NZS 1891.4:2009: Industrial fall-arrest systems and devices – Selection, use and maintenance.*
- All climbing equipment is checked for safety and is in good condition prior to use and throughout the day.
- A climber must use:
  - a safety belt
  - a climbing rope or strap
  - climbing spurs.
- If there is a possibility of a climbing rope or strap being severed in the conditions present at a climbing work site, then:
  - the rope or strap must be made of material that cannot be severed
  - the climber must use a second climbing rope or strap.
- All points of attachment are correctly set and visually inspected before placing weight on them (i.e. knots correctly tied, checked, carabiners closed and locked).
- Anchor points are healthy, sound, and suitably strong. They are positioned in such way that a slip or fall would swing the worker away from power lines or other potential hazards.
- A duplicate set of climbing equipment must be available for immediate use at the climbing work site for emergency rescues.

Exclusion zones and safe work areas

- A distance of greater than two tree lengths between other operations such as falling or road construction.
- A safe zone underneath the climber.
- Safety observers to ensure safe separation distances from overhead power lines are confirmed.

Communication

- Communication methods between the two workers are determined prior to any works.
- Access to mobile phone or other reliable communication device for any emergency calls.

11.4 Tree planting and hand sowing

This section addresses hand planting of trees and sowing of seed which involves lifting and carrying, frequent bending, and heavy physical work.

Planning

The WHS Regulations Part 4.2 – Hazardous Manual Handling applies to this activity.

These activities are performed on a repetitive basis, normally involve high force, and are often carried out in dynamic and unpredictable work environments. Tree planting meets the definition of a hazardous manual task under the WHS Regulations.

A person conducting a business or undertaking must manage risks to health and safety relating to a musculoskeletal disorder associated with a hazardous manual task.

- Further guidance is available in the approved Code of Practice *Hazardous manual tasks.*

Tree planting and hand sowing is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
△ Body pain or strain from carrying excessive weight, containers, or trees large distances before planting or from the repetitive and sustained application of force, awkward posture, and frequent bending or kneeling when planting trees △ Blisters and dry skin from handling hand tools and soil △ Fatigue from physical work for extended periods of time △ Exposure to snake and insect bites and stings △ Exposure to extreme weather conditions △ Debris flicking up into the face or eyes	● Ground conditions following use of particular harvesting methods ● Site preparation and debris from previous rotation (e.g. windrowing, mechanical cultivation) ● Type and size of planting stock ● Carrying distances ● Timing and scheduling of work

Risk controls

Tree planting includes many common hazards and risk controls that are outlined in *Section 6 Common hazards and risk controls*. Of relevance are the sections on

- *Hazardous manual handling*
- *Hazardous chemicals*
- *ATV/quad bikes*
- *Solar UVR exposure*
- *Fatigue*
- *Extreme weather.*

Baseline risk controls are all relevant to tree planting and operation-specific applications are listed below.

Manual handling practices

- Use a machine to carry planting stock or seeds to the planting site.
- Use planting tools (e.g. purpose-built spades) that minimise or eliminate the need for bending and minimise force.
- Restock carry frames on the ground or have someone else do it to avoid twisting and lifting while wearing frame.
- Perform warm-up and warm-down exercises before and after planting sessions.
- Provide information and training on techniques to reduce risks (e.g. neutral postures, change of hands) and how to identify best ground for planting.

Slips, trips, and falls

- Review site for hazards before commencement.
- Suitable work–rest regime for the conditions (e.g. heat).
- Access to drinking water.
- Use of safety footwear.

Personal protective equipment and first aid

- Available first aid for specific risks such as stings and bites.
- Communications for emergency situations.
- Suitable protective clothing including steel-toe lace-up footwear providing ankle support and a non-slip sole, high-visibility outer garments, wet weather gear, and ultraviolet radiation (UVR) protection.

Exclusion zone and safe work areas

- Do not work directly above other workers on steep slopes.
- Stay at least 10 metres away from all-terrain vehicles and other machinery on site whilst in operation or until the operator has been contacted, equipment grounded, and the operator has called you in.
- Comply with all warning signs on site.

Communication

- Communication methods between crew is determined prior to starting on a new site.
- Access to mobile phone or other reliable communication device for any emergency calls.

11.5 Tree pruning

Pruning is the removal of branches from the main trunk of a tree to improve the quality and value of the timber produced.

Planning

Many of the hazards and risk controls for seed collection and tree climbing apply to pruning and a limited number of hazards are covered here. The planning and risk assessment issues for tree climbing also apply to pruning.

Tree pruning is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
△ Falling from height △ Slipping on ladders when climbing up or down △ Pruning tools coming loose while working △ Chainsaw hazards such as kickback, one-handed use △ Ladder sway when pruning in windy conditions △ Cuts and abrasions from mishandling pruning equipment △ Being struck by falling limbs or other debris △ Carrying ladders while walking through thick undergrowth	● Ground conditions following use of particular harvesting methods ● Assessment of individual tree integrity including: ○ age and species ○ health ○ condition of the crown ○ decay ○ proximity of other trees

Risk controls

Tree pruning includes many common hazards and risk controls that are outlined in *Section 6 Common hazards and risk controls*. Of relevance are the sections on:

- *Hazardous manual handling*
- *Solar UVR exposure*
- *Fatigue*
- *Extreme weather.*

Baseline risk controls are all relevant to tree pruning and operation-specific applications are listed below.

Safe climbing practices

- Working from ground level where practicable (e.g. use a pole saw).
- Tree assessment, particularly for prune height and access method.
- Workers performing above ground pruning must hold a statement of attainment for the unit of competency relevant to the skill required by the forest activity (*see Appendix B*). In particular, FWPFGM2205: Perform Pruning Operations.
- Ensure cutting methods do not cause limbs to fall into the ladder or climber.
- Do not carry out pruning operations during extreme weather conditions when the movement and dynamic loading on the tree can be unpredictable.
- Establish a clear walking path before moving from one tree to the next.
- Other controls as set out in *Section 11.3 Tree climbing* above.

Ladders

- Use a purpose-built ladder attached to the tree trunk at its top and secured at the base.
- If working from a ladder above 2 metres is unavoidable this should be done with a work positioning harness and a steel core, rope flip-line attached to the tree.
- Other controls as set out in *Section 11.3 Tree climbing* above.

Pruning equipment

- Always use a scabbard or holster to carry pruning equipment (e.g. shears, secateurs, loppers, saws) and always pick up loppers using the handles.
- Chainsaw operators should observe the safety precautions in *AS 2727-1997 Chainsaws – Guide to safe working practices* and *AS 2726:2-2004 Chainsaws – Safety requirements – Chainsaws for tree service.*
- Regular maintenance of pruning equipment.

Personal protective equipment and first aid

- Wear PPE including a safety helmet, eye protection, cut resistant gloves, steel-toe lace-up footwear providing ankle support and a non-slip sole.
- Available first aid for specific risks such as stings and bites.
- Communications for emergency situations.

11.6 Weed control

This section covers manual and chemical weed control practices. Competition or manual weed control involves frequent bending and heavy physical work using implements like axes, shears, and hand-held motorised plant.

Planning

Chemical application of herbicides by persons using spray units or by machines with spray units or booms present different issues related to exposure to hazardous chemicals.

Both these methods are bounded by regulations on hazardous manual handling and hazardous chemicals. The AGVET *Code of practice for ground spraying* and the AGVET *Code of practice for aerial spraying* requirements must also be followed.

Initial coupe planning and risk assessment should provide information on soil types and vegetation that will inform the most appropriate weed control methods and scheduling. Other site hazards should be identified, and controls established before work commences.

Weed control is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
△ Muscular pain or strain from manual weed control work △ Muscular pain or strain from handling and storing chemicals and application methods (e.g. using harnesses) △ Exposure of others working in close proximity to chemicals △ Exposure to snake and insect bites and stings △ Walking or working with machines on steep ground	● Weight and shape of chemical containers ● Walking distances ● Timing and scheduling of work ● Ground conditions following use of particular harvesting methods

Risk controls

Weed control includes many common hazards and risk controls that are outlined in *Section 6 Common hazards and risk controls*. Of relevance are the sections on:

- *Hazardous manual handling*
- *Hazardous chemicals*
- *Solar UVR exposure*
- *Fatigue*
- *Extreme weather.*

Eliminating or minimising risk is the starting point for deciding what controls should be used (e.g. machine rather than manual work, less hazardous chemicals). Baseline risk controls are all relevant to weed control and operation-specific applications are listed below.

Safe work practices

- Obtain the current safety data sheet (SDS) of each hazardous chemical (usually from your supplier) and making them readily available to workers.
- Use manufacturers and suppliers who can provide product in smaller, lighter packaging and provide lifting points or aids to minimise the use of force.
- Ensure workers have relevant competencies for machines or chemical application.
- Site and spray plan accessible and consulted regularly.
- Chemicals supplied in smaller containers where they are required to be physically handled by employees.
- Ensure suitable work–rest regime for the conditions (e.g. heat).

Mechanised weed control

- Select machines with enclosed cabins and air conditioning units with appropriate air filters.
- Use electric pumps to deliver chemicals and water into spray tanks.
- Use chemical-proof PPE when checking and calibrating nozzles.

Brush cutters

- All brush cutters are to be used in accordance with manufacturer's specifications.
- The following Australian Standards (AS) should be followed:
  AS 3575-1995 Clearing saws, brushcutters and grass trimmers – Safety requirements
  AS 3576-1998 Clearing saws, brushcutters and grass trimmers – Guide to safe work practices.
- Wear suitable PPE including a safety helmet, eye protection, steel-toe lace-up footwear providing ankle support.
- Operators must hold a statement of attainment for the unit of competency relevant to the skill required by the forest activity (*see Appendix B*). In particular: FWPFGM2207: Undertake Brushcutting Operations.

Exclusion zones and safe work areas

- A distance of greater than two tree lengths between machine based chemical spraying (dozer/tractor) and other operations.
- A distance of greater than 10 metres between vehicles or trailers fitted with spray units and other ground workers.
- A distance of greater than 5 metres between individuals using spray units and other ground workers.

Personal protective equipment and first aid

- Wear suitable PPE including a safety helmet, eye protection, steel-toe lace-up footwear providing ankle support and a non-slip sole as well as more specific equipment such as:
  - protective chemical proof overalls
  - chemical-proof gloves
  - dust-proof filter mask for powders or granules as specified in the SDS
  - vapour-proof chemical mask as specified in the SDS for liquid chemicals.
- Available first aid for specific risks such as stings and bites and SDS requirements, including arrangements for emergency eye wash.

11.7 Use of tractors and all-terrain vehicles

These vehicles are used for operations including spraying, slashing, and towing seed stock and tools. All-terrain vehicles (ATVs) include side-by-side ATVs (also known as light utility vehicles) and quad bikes, a four-wheeled motor bike.

Planning

The planning for the use of these vehicles mirrors that set out in the equipment design and operation section in the timber harvesting chapter of the Code (e.g. operating specifications, manufacturer information on use).

- More information can be found in Section 11 of the Safe Work Australia *Guide to growing and managing forests.*

The use of ATVs is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
△ Vehicle rollover and run over △ Vehicle instability when carrying or pulling loads △ Unbalanced loads or overloading △ Towing excessive loads with unbraked equipment △ Falling objects, limbs, and debris striking the operator △ Entanglement with unguarded drive and power take-off (PTO) shafts	● Baseline risk factors apply

Risk controls

Risk controls for these vehicles are similar to those set out for mechanical harvesting. Use of these vehicles includes many common hazards and risk controls that are outlined in *Section 6 Common hazards and risk controls*. Of relevance are the sections on:

- *Hazardous chemicals*
- *Hazardous manual handling*
- *Plant maintenance*
- *Solar UVR exposure*
- *Fatigue*
- *Extreme weather.*

Baseline risk controls are all relevant to the use of ATVs and operation-specific applications are listed below.

Equipment design and operation

- Machine is operated in accordance with manufacturer's specifications (e.g. slope, tire pressure, load and towing limitations).
- Use of protective structures (ROPS) and crush protection suitable to the machinery (*see Appendix C*).
- Moving parts and other hazards on tractors and attachments must be guarded.
- Where fitted, operators should wear a seat belt when in the driving position.

Safe work practices

- Assess site for hazards before commencement.
- Identify safe routes for vehicles.
- Check on weight and load distribution prior to operation.
- Operators must hold a statement of attainment for the unit of competency relevant to the machine or skill required by the forest activity (*see Appendix B*).
- Information and training on safe use of vehicles.

Exclusion zones and safe work areas

- A distance of greater than two tree lengths between tractor chemical spraying and other operations.
- A distance of greater than 5 metres between ATVs fitted with spray units and other ground workers.

Personal protective equipment and first aid

- Suitable PPE (e.g. a helmet complying with *AS/NZS 1698:2006 Protective helmets for vehicle users*) when using an ATV or equivalent standard and eye protection.
- Specific PPE required for chemical used (*see Section 6.6 Hazardous chemicals*).
- First aid for specific risks outlined above.

11.8 Crop protection

The purpose of a crop protection permit is to prevent the destruction of, or injury to, any stock or plants caused by wildlife.

Native herbivores, as well as introduced fallow deer, can severely browse young seedlings and small trees.

Methods used to protect forests include:

Lethal control (culling)

- use of firearms or trapping to reduce populations
- poisons.

Non-lethal control

- repellants: application of specific products to the seedlings to discourage browsing
- tree guards: use of fluted plastic tubes for seedlings
- fencing: used to protect high value crops such as seedling stocks.

A landowner or forest manager is required to hold a crop protection permit to poison, trap, and shoot wildlife that is causing damage to pasture and crops.

Use of firearms is regulated by the *Firearms Act 1996* (Tas) and culling is also bounded by the *Wildlife (General) Regulations 2010* (Tas) and related animal welfare codes.

Planning issues relate to the timing and location of culling to ensure adjacent operations are not impacted.

From a workplace health and safety standpoint the hazards and recommended risk controls for crop protection are set out in *Section 6 Common hazards and risk controls*.

Of relevance are the sections on:

- ⚠ *Working alone*
- ⚠ *Working at night*
- ⚠ *Solar UVR exposure*
- ⚠ *Fatigue*
- ⚠ *Extreme weather.*

When using ATVs and firearms all relevant safety precautions should be followed. If conducted at night or in low light conditions additional measures should be taken. An understanding of the braking distance of the vehicle and the length of the headlight beam will assist in avoiding hazards.

11.9 Use of unmanned aerial vehicles (drones)

Unmanned aerial vehicles (UAV) can be used for a range of purposes including mapping, disease identification, planting, sowing, precison chemical application, and evaluating forest growth and post-harvesting waste and can reduce the risk of injury associated with walking over rough terrain.

The Civil Aviation Safety Authority (CASA) is the regulatory body for use of UAVs.

The *Civil Aviation Safety Regulations 1998 (CASR) Part 101 – Unmanned Aircraft and Rockets* (Cwlth) outlines requirements.

Drone safety rules need to be followed and a remotely piloted aircraft operator's certificate is required for commercial use of drones.

An exemption exists for use over your own land but operators still need to be accredited by CASA with registration likely in the future.

Record keeping

In this exempt category certain records need to be kept including:

- location and height flown
- type, model, and ID of the remotely piloted aircraft (RPA)
- dates and time of the operation
- nature and purpose of the operation
- whether the drone is safe to be flown the next day
- regulated matters.

The safe use of UAVs are primarily defined through CASA regulation but generally they include:

- compliance with airspace rules
- compliance with pilot qualifications
- only operated in suitable weather conditions
- operating with line of sight
- operating according to manufacturer's specifications.

Risk controls

Specific issues for forestry include:

- engaging contractors compliant with CASA requirements
- suitable take off and landing area that does not impact on other operations
- communication of flight plans and schedules to adjacent operations
- collision risk assessed (power lines, infrastructure) and separation distances maintained
- emergency procedures established for collision events, medical emergencies, loss of control, malfunction, fire (as a result of battery malfunction, faulty electronic wiring, etc.).

11.10 Working with helicopters

Ground workers may find themselves working under helicopters undertaking tasks such as:

- seeding
- weed control
- crop protection
- coupe surveillance and operational planning
- pre-operational checks for protected species, such as wedge-tailed eagles
- fire-fighting and fire lighting (planned burning)
- emergency evacuation.

Safety requirements for helicopters are regulated by CASA.

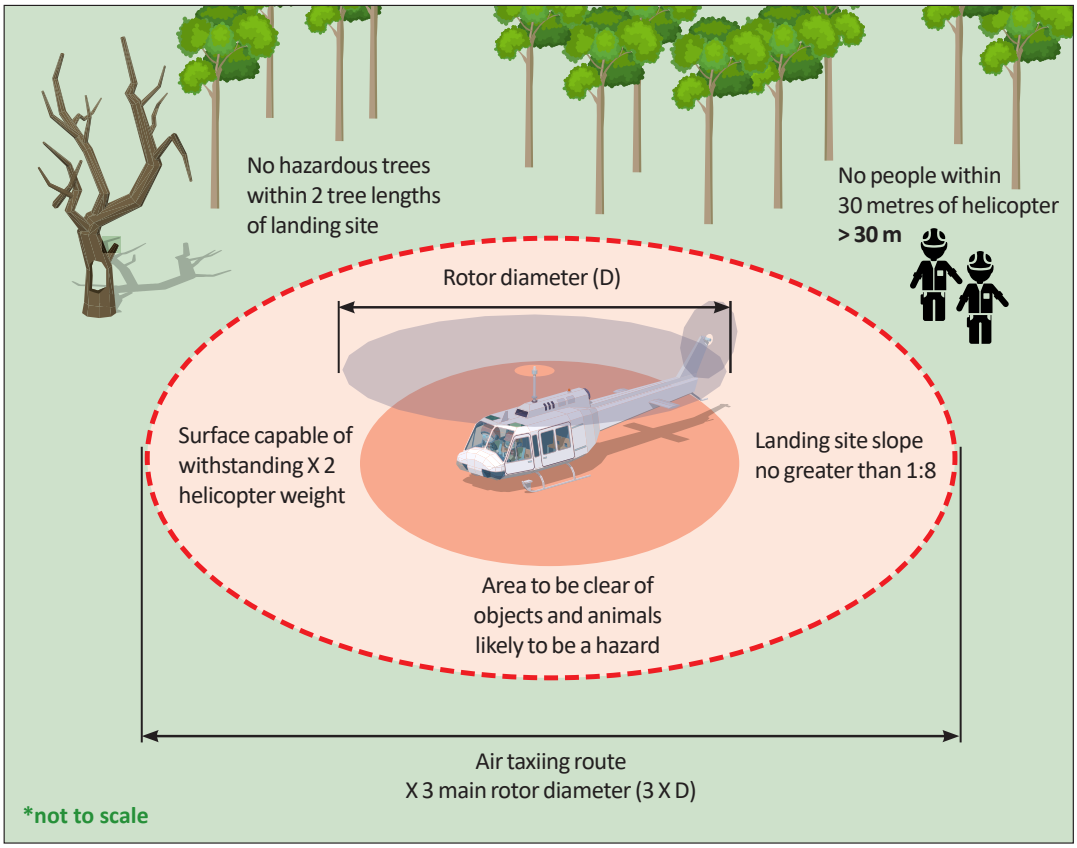
The AGVET *Code of practice for aerial spraying* requirements must also be followed.

Risk controls

For safe interaction between the helicopter and ground staff the essential risk controls are:

- suitable landing site on flat ground, free of loose debris, separated from hazards (e.g. trees, power lines, skylines, guylines) to achieve a safe landing zone (*see Figure 19*)
- planning of operations so that all impacted are aware of scope and timing
- clear line of control between helicopter and ground staff through a designated ground controller
- access to landing zone restricted to authorised persons
- standard safety precautions entering and exiting helicopter (e.g. remove loose items, approach from front visible to pilot, follow hand signals to enter rotor zone)
- emergency plans include helicopter evacuation and relevant information such as type of helicopter to be called and compatibility with first aid arrangements (e.g. size of stretcher)
- dust should be managed.

Figure 19: Safe work around helicopters



- Further information on aerial spraying can be found in *Section 6.6 Hazardous chemicals*.
- More detailed information on helicopter safety can be found in Section 12 of the Safe Work Australia *Guide to growing and managing forests*.

12 IN-FIELD PROCESSING

The planning and risk assessment in the Forest Operations Safety (FOS) Plan should also apply to in-field processing activities such as chipping, portable sawmilling, and firewood collection.

The related issue of log landings is covered in *Section 10* and regard should be given to suitable space to conduct operations safely and to protect others working in the same area.

In-field chipping involves moving large volumes of logs to a dedicated location, removing branches and bark, and processing the logs into chips. Careful planning is important to help ensure the site is big enough and products are removed from the processing site as it is generated to prevent the site becoming cluttered.

Commercial firewood collection must be undertaken by permit or agreement with landowner or forest manager and in accordance with their health and safety policies.

In-field processing operations are carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
In-field chipping ⚠ Struck by falling metal cowls and guards ⚠ Contact with rotating chipper disc or flails ⚠ Falling from height ⚠ Noise **Portable sawmilling** ⚠ Material from saw blade flying towards operator ⚠ Operator's fingers or limbs coming into contact with saw blade ⚠ Moving and locating logs manually **Product processing** ⚠ Kickback or recoil from the chainsaw ⚠ Chain breaks and possible exposure to chain shot ⚠ Contact with other machines **Firewood cutting** ⚠ Sudden uncontrolled movement of either the stump or the log where resting on roots or under tension ⚠ Manually lifting and stacking firewood, boards, posts, or sleepers ⚠ Hand or arm crushed by moving axe, wedge, pressure plate, or wood when using mechanical log splitter	● Potential line of throw of failed equipment parts or cutting line of saw ● Communication systems for ground workers and machine operators ● Traffic flow and management in the work area

Common risk controls

The risk controls for in-field processing are highly dependent on the design and selection of machinery. *Section 5.8* outlines the duty of designers, manufacturers, and suppliers to provide equipment that can safely undertake the task and reduce risks to operators.

All in-field processing should be done by operators with the relevant competencies (*see Appendix B*).

Baseline risk controls are all relevant to work on in-field processing and operation-specific applications are listed below.

12.1 In-field chipping

- Plant and equipment should only be operated within the manufacturer's specifications.
- Plant and equipment must be isolated prior to servicing or repairs being conducted on any plant and equipment.
- Operator trained in the working limits of the machine.
- Exclusion zones (two tree lengths from ground workers and consideration of further in front of debris chute) must be established and maintained for all items of plant and equipment.
- Interlocks on chipper hoods to ensure they cannot be opened while the chipper disc is running down.
- Radio communication or other effective means of contact with other forest workers.
- Suitable and correctly maintained personal protective equipment (PPE) for the work (e.g. high-visibility clothing, hearing protection, safety gloves when handling fuels or chipper blades).
- Designated safe work areas for truck drivers, which must be recorded on the site-specific risk assessments and signed by all truck drivers who visit the site.

12.2 Portable sawmilling

- Plant and equipment should only be operated within the manufacturer's specifications.
- Plant and equipment must be isolated prior to servicing or repairs being conducted on any plant and equipment.
- Exclusion zones must be established and maintained for all items of plant and equipment.
- Operator trained in the working limits of the machine.
- Operator to stand clear of the cutting line of the saw.
- Saw blades are suitably guarded.
- Machine cannot be operated while hands are still in contact with the material being cut.
- Logs moved and lifted by machine fitted with rollover protective structures (ROPS) and falling object protective structures (FOPS) canopy.
- Suitable and correctly maintained PPE for the work (e.g. eye protection, clothing, hearing protection).

12.3 Product processing

- When using a mechanical processor or cut-off saw ensure the line of the cut is never directed at ground workers.
- Where a chainsaw is fitted to a machine and used for preparing logs limit the risk of chain shot by keeping the 'shot cone' area clear of other workers (*see Figure 12*).

- Bark removal should be carried out away from the swing path of the loader boom.
- Whenever chainsaws are used the techniques described in *AS 2727-1997 Chainsaws – Guide to safe working practices* should be used and logs should be secured before cutting.
- Suitable and correctly maintained PPE for the work (e.g. hearing protection, eye protection, safety gloves).
- Radio communication or other effective means of contact with other forest workers.
- Using log marking paint according to the instructions on the label and the safety data sheet.

12.4 Firewood cutting

- Log splitters should only be operated within the manufacturer's specifications.
- Suitable guarding of wedge, axe, and pressure plate on mechanical splitter.
- Mechanical aid to lift boards, posts, or sleepers.
- Suitable and correctly maintained PPE for the work (e.g. hearing protection, eye protection, safety gloves).

13 FIRE MANAGEMENT

Fire management in forest operations must be done in a way that protects the health and safety of those working and to ensure that others are not impacted by the conduct of such operations.

Fire management includes:

- preventing bushfires in forest operations
- conducting **prescribed burns**
- responding to bushfires.

The planning requirements to eliminate or minimise risks to health and safety are responsibilities of landowners and forest managers but also require forest contractors to meet their shared and individual responsibilities (e.g. suitable **fire suppression** equipment installed in machines and vehicles and fire equipment on site, fire weather monitoring equipment).

The Tasmania Fire Service has legislated responsibility for the management of fires that occur on all private land in Tasmania under the *Fire Service Act 1979* (Tas).

The Tasmania Fire Service, Parks and Wildlife Service, and Sustainable Timber Tasmania are part of the Inter-Agency Bushfire Management Protocol that manages fire on remaining forested land.

Planning – general

Fire management plannings, regardless of specific focus, should consider:

- features of the forest area pertinent to fire risk and consistent with the Forest Practices Code requirements
- arrangements to monitor fire season weather
- outline of responsibilities and cooperative arrangements
- communication protocols and emergency plans
- purpose-specific equipment as well as supplementary fire equipment for forest machines and vehicles
- allocation of adequate staff resources and provision of suitable training for the task.

More specific requirements of different fire management operations are outlined below.

Preventing bushfires in forest operations

In this case the objective of fire management planning is to minimise the incidence of bushfires resulting from forest operations. Forest operations must be conducted in a way to eliminate or minimise risks to health and safety from fire and related risks.

A procedure entitled *Fire prevention at forest operations* has been developed by the **Tasmanian Forest Industry Fire Management Committee (FIFMC)** and provides minimum standards on these matters.

It outlines minimum fire equipment requirements for forest operations and procedures to follow to reduce the risk of fire. The procedure outlines measures for high and low risk forest activities. Additional requirements apply during the fire season (normally 1 October to at least 30 April the following year). The procedure also defines the thresholds at which different operations should be suspended.

Forest managers and landowners who are members of the FIFMC have agreed to apply this procedure in their operations. The approach taken has broader application to any business conducting forest operations on private land.

Conducting prescribed burns

Prescribed burning may be undertaken for plantation site preparation, fuel reduction, ecological, or forest **regeneration** purposes. As a planned forest operation, it must be conducted in a way to eliminate or minimise risks to health and safety from fire and related risks.

Planning for these activities should include all the general matters listed above but with a particular emphasis on:

- all requirements such as permits and notifications required by the *Fire Services Act 1979* (Tas) and associated regulations
- all requirements imposed by the Forest Practices Code and associated guidance such as the *Forest industry standard for prescribed silvicultural burning practice 2009*
- written and approved burn plans
- public, neighbour, and stakeholder notification
- specific training in prescribed burning practices.

Responding to bushfires

Planning for bushfire response on land owned by the operator or managed by forest managers must be conducted in a way to eliminate or minimise risks to health and safety from fire and related risks.

Planning for these activities should include:

- regular assessment of fire fighter's health and fitness
- regular inspection and maintenance of fire-fighting equipment in accordance with manufacturer's recommendations and FIFMC requirements.

Bushfire response may be part of interagency and/or memorandum of understanding protocols that include control and allocation of resources by emergency service agencies, or under their protocols and plans. In these circumstances the workplace health and safety requirements of those agencies should be followed.

Consultation, cooperation, and coordination

Management of fire risks whether to prevent or respond to fires require parties to consult, cooperate, and coordinate.

This includes:

- consultation with workers about risks to health and safety in planned and unplanned fire situations
- consultation and coordination with and between landowners, forest managers, and contractors on applicable fire management standards
- consultation and coordination with adjacent properties, stakeholders, or operations that may be impacted by fire activity
- consultation, cooperation, and coordination with lead fire agencies and any memorandum of understanding or interagency protocols.

Fire management is carried out in an environment in which most of the baseline hazards and risk factors are present. The following additional hazards and risk factors need to be considered.

Additional hazards to baseline	Additional risk factors to baseline
⚠ Exposure to smoke and heat ⚠ Working around aircraft and machinery ⚠ Fatigue ⚠ Entrapment by fire ⚠ Lack of signage about access and egress in road system ⚠ Slips, strains, and falls when getting in and out of machinery ⚠ Manual handling ⚠ Working at night	● Weather history and patterns ● Quantity, type, and arrangement of fuels ● Forest operations using equipment such as chainsaws, cables, machinery, vehicles, or tools with potential to create fire hazards ● Coupe accessibility ● Availability of water

Common risk controls

The guidance in *Section 5 Plan and prepare* is relevant to fire management and the following sections apply:

- *First aid*
- *Amenities*
- *Personal protective equipment* including personal protective clothing
- *Emergency planning*.

Where fire management includes the felling and cutting of trees, the requirements set out in *Section 8.2.1 Felling hazardous trees* apply whenever practicable.

Fire management includes many common hazards and risk controls that are outlined in *Section 6 Common hazards and risk controls*. Of relevance are the sections on:

- *Hazardous trees*
- *Fatigue*
- *Working at night*
- *Extreme weather.*

Baseline risk controls are all relevant to fire management and operation-specific applications are listed below.

Safe work procedures

- Forest manager's fire weather monitoring requirements and thresholds for cessation or suspension of work to be followed by contractors.
- Contractors should undertake fire weather monitoring in their work area and advise forest managers of cessation or suspensions of work (*see FIFMC Fire prevention at forest operations procedure*).

In addition, during fire-fighting or prescribed burning:

- Ground workers and machine operators should not work alone.
- A work–rest regime suitable for the current and forecast conditions is applied.
- There is availability of and opportunity for frequent hydration.
- Workers should work from a secure anchor point and avoid being in the unburnt area ahead of, above, or to the flank of the fire.
- Burning trees should be passed on the uphill side or above the lean.

Escape routes and safe zones

- Information and instruction should be provided to ensure everyone is aware of the location of escape routes.
- If workers are cut off by the fire, they should try to move to an area that has already burnt.
- Vehicles should be parked in the direction of the escape route, with doors closed, windows up, keys in the ignition, and in a position to allow other vehicles to pass.
- Roads and **tracks** in the area should be closed to exclude persons not involved in fire-fighting.
- Communication between machine operators and ground workers should be used to maintain safe separation distances.
- Communication between aircraft pilot or authorised ground personnel and ground workers should be used to maintain safe separation distances in the drop zone of the aircraft.

Competencies and readiness

- Workers undertaking planned fire management operations should have the relevant competencies to complete the task safely and must have the following training as a minimum:
  - FWPCOR3203: Evaluate Fire Potential and Prevention
  - FWPCOR2204: Follow Fire Prevention Procedures
  - PUAEQU001: Prepare, Maintain and Test Response Equipment.
- Workers responding to unplanned fire management events should have the relevant competencies to complete the task safely and must have the following training as a minimum:
  - PUALIR204: Respond to Wildfire
  - PUAFIR303: Suppress Wildfire
  - PUAFIR309: Operate Pumps
  - PUAFIR215: Prevent Injury.
- Crew leaders should have additional fire management competencies including:
  - understanding of how weather and topography affect fire behaviour (e.g. FWPCOR3203: Evaluate Fire Potential and Prevention)
  - understanding and practical application of fire-fighting strategies and tactics.
- Fire-fighting duties should be only undertaken by those who have been assessed for their physical capacity to do the anticipated tasks.
- Fire-fighting duties cannot be undertaken while affected by alcohol or drug consumption and the drugs and alcohol policy of the forest operator should be communicated to all fire fighters.

Equipment

- Fire-fighting equipment should be suitable for the fire management operations to be undertaken and regularly inspected, tested, and maintained in accordance with the manufacturer's recommendations and FIFMC requirements.
- Fire-fighting equipment should be kept close to active operation, so that it is readily available when required.
- Machines operated at night should be equipped with at least one forward and one rear light to permit safe working.
- Operations on landings must be compliant with the *Fire Service (Miscellaneous) Regulations 2017* (Tas) with regard to minimum fire equipment standards (e.g. 300 litre tanks, hoses, rakes).
- Operations on landings must be compliant with the *Fire Service (Miscellaneous) Regulations 2017* (Tas) requiring a knapsack pump/extinguisher within 100 metres of chainsaw use.
- The construction of and access to fire lookout towers must be compliant with relevant regulations and technical standards and regularly inspected and maintained.
- Weather monitoring equipment (e.g. digital wind meter, fire danger meter) should be calibrated and maintained in accordance with the manufacturer's instructions.

Personal protective equipment (PPE)

PPE to protect workers undertaking fire management operation should be worn including:

- overalls or a long-sleeved shirt/trouser combination of a suitable material to provide protection from heat radiation, and sparks, in a highly visible colour
- safety helmets suitable for bush fire-fighting including chin strap and neck flap
- goggles and smoke masks when conditions require
- protective gloves which provide protection against cuts, punctures, and heat penetration
- laced or zipped leather steel-capped boots with non-slip soles providing good ankle support.

See *Appendix E* for further information.

Additional controls for prescribed burning

- A written plan that includes the objectives of burn, layout of the burn, lighting pattern, communication plan, and emergency procedures.
- An up-to-date risk assessment of prevailing conditions including restricted visibility caused by smoke that may affect control of operations.
- A crew briefing is provided by the person in control on the burning plan and any relevant industry fire safety protocols.
- The area should be cleared of people and property not directly involved in the operation before lighting commences.
- When using a hand burner, the operator should be within sight and sound of another person, generally not more than 20 metres distant.
- The burn should be conducted with the resources and equipment to enable prompt and effective suppression of any escapes and thorough mopping up and patrol until declared safe by the person in charge.

Additional controls for responding to bushfires

Where bushfire response is managed and controlled by the landowner or forest manager the following should be covered:

- Crew leaders or supervisors should have the competency to manage a fire action plan, conduct risk assessments, and brief fire crew.
- Where landowners or forest managers assume incident controller roles, they do so consistent with existing protocols (e.g. **AIIMS**).
- Fire-fighting is conducted following industry safety procedures such as **LACES**.

GLOSSARY

Approved Code of Practice – a code of practice approved under section 274 of the WHS Act.

Australasian Inter-Service Incident Management System (**AIIMS**) **–** the nationally recognised system of incident management for the nation's fire and emergency service agencies.

AS – Australian Standard – a reference to an Australian Standard, described by numerals and a title; the standard of the Standards Association of Australia as so described and for the time being in force, or any standard of the Association issued in amendment or replacement of that standard.

AS/NZS – Australian/New Zealand Standard – a reference to an Australian/New Zealand Standard, described by numerals and a title; the standard of the Standards Association of Australia as so described and for the time being in force, or any standard of the Association issued in amendment or replacement of that standard.

Cab guard – a permanent vertical frame mounted behind the cabin of the prime mover to protect the driver in the event of a load shift. A cab guard is not recognised as a means of load restraint.

Competent person – a person with sufficient knowledge and skills acquired through qualification, training, or experience to perform the task to which the term relates.

Contractor – a person engaged by a PCBU to perform specific work usually described in a written agreement. A contractor has the duties of a worker but may also hold PCBU responsibilities to any workers they engage.

Coupe – an area of forest of variable size, shape and orientation, on which harvesting takes place, usually to be harvested and regenerated over one or two years.

Driving trees – to fell a tree into one or more trees to bring those trees down.

Exclusion zone – a designated area in which others, apart from the operator, are excluded. An exclusion zone is established by separation distances (usually two tree lengths), physical barriers, or by scheduling activities at different times.

Extraction – the pulling (snigging), carrying (forwarding), shovelling, or hauling of logs from the felling point to a landing by machinery.

Fail to safety back up – is a backup system designed to prevent, or allow recovery from, a primary system failure.

Falling object protective structures (FOPS) – a structure designed to be attached to, or form part of, a mobile equipment for the purpose of reducing the possibility that an operator seated beneath the structure in the driving position being harmed should the FOPS receive a blow from a falling object.

Feller (faller) – the person who cuts or chops a standing tree or part of a standing tree to bring down that tree.

Fell (felling) – to cut, chop, push, or pull down a standing tree or part of a standing tree, or bring down a tree using explosives.

FIFMC – the acronym for Forest Industry Fire Management Committee. FIFCM has issued a procedure entitled *Fire prevention at forest operations* that sets minimum standards on these matters.

Fire suppression – all activity involved with the prevention and suppression of wildfire.

Forestry operations – all activities necessary for establishing, maintaining, harvesting, and processing of wood products within Tasmanian forests.

Forest Operations Safety (FOS) Plan – an operational plan that contains a risk assessment of identified hazards that a PCBU has carried out before or during work on any forest operation.

Forest Practices Plan – a plan for forestry operations as specified in section 18 of the *Forest Practices Act 1985* (Tas).

Forwarding – to extract logs from the logging area where the logs are carried clear off the ground by mobile plant.

Hazard – something in the work environment that has the potential to cause harm to the health and safety of people.

Hazardous chemical – any substance, mixture or article that satisfies the criteria of one or more hazard classes in the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), as modified by Schedule 6 of the WHS Regulations.

Headboard – usually a permanent vertical frame used at the front of a trailer to restrain its load. A headboard can also serve to protect a driver in the cabin and remove the need for a cab guard.

Health – a person's physical and psychological health.

Health monitoring (of a person) – to monitor a person to identify changes in the person's health status because of exposure to certain substances.

LACES – the acronym for the fire safety procedure: **L**ook out, **A**nchor points, **C**ommunication, **E**scape routes, **S**afety zones.

Lashing – a fastening device including chains, cable, ropes, or webbing used to restrain loads.

Log – a tree segment suitable for subsequent processing into sawn timber, pulpwood, chip wood, or other wood products.

Log landing – a log dump, skidway, log yard, or other area used for the cutting up, debarking, measuring, or sawing of logs.

Manual felling – the felling of a tree by a method that requires the faller to stand at the base of a tree to execute the tree felling operation.

Must – 'Must' indicates a legal requirement exists that must be complied with. It is also used in this Code to describe a method, based on the current state of knowledge in the industry, considered as the only way of eliminating or reducing the risk.

Notifiable incident – an incident involving the death, serious injury, or illness of a person, or a dangerous incident that is notifiable under Part 3 of the WHS Act.

Operator protective guarding (OPG) – an operator protective guarding that is attached to the equipment to provide protection from flying objects intruding into the machine.

PCBU – a 'person conducting a business or undertaking' (PCBU), who is usually the employer, has the primary duty of care under the *Work Health and Safety Act 2012* (Tas) (WHS Act) to ensure the health and safety of workers and others at the workplace, so far as is reasonably practicable. A PCBU can include entities such as an employer, sole trader, corporation, association, and partnership.

Plant – any machinery, equipment, appliance, container, implement, and tool; and any component of any of those things; and anything fitted or connected to any of those things.

Prescribed burn – a planned fire that conforms to predetermined parameters and is lit for the purpose of achieving a land management objective.

Regeneration – the renewal of a tree crop arising from planting or from silvicultural practices on a site.

Risk – the chance (or likelihood) that a hazard will cause harm to the health and safety of people.

Risk assessment – a way of estimating the nature and level of risk.

Risk control – an action taken to eliminate or minimise health and safety risks so far as is reasonably practicable.

Road – a path or way with a specially prepared surface, used by vehicles or pedestrians.

Rollover protective structure (ROPS) – a system of structural members whose primary purpose is to reduce the possibility of a seat belted operator being crushed should the equipment roll over.

Safe work area – a designated area outside another operator's exclusion zone. An area on a log landing for maintenance, an area in which a log truck driver is located during loading, an area where a choker setter stands before signalling the turn to be hauled, or an area where log measuring takes place are all examples. Distance, physical barrier, and time are used to define safe work areas.

Safety management system – a coordinated and systematic approach to managing health and safety risks.

Should – 'should statements' apply unless there are alternative methods that will achieve the minimum standard of this Code and acceptable health and safety outcomes. This Code provides the minimum standards that are to be achieved.

Side wash – the use of trees, stumps, ground, or other objects to change the direction of the cable used in a winch assisted system.

Skidding – to pull logs to a landing by wheeled skidders, bulldozers, or tracked loaders.

Snigging – to pull a log by wire, rope chain, or grapple.

Sprag – a broken wire protruding from a worn or damaged rope.

Statement of attainment – a formal certification in the vocational education and training sector by a registered training organisation that a person has achieved: (a) part of an Australian Qualifications Framework (AQF) qualification; (b) one or more units of competency from a nationally endorsed training package; or (c) all the units of competency or modules comprising an accredited short course.

Stanchion – a large upright fixed to the side of a vehicle for sideways restraint.

Substance – any natural or artificial substance, whether in solid or liquid form or in the form of a gas or vapour.

Tailboard – usually a permanent vertical frame used at the rear of the vehicle to contain its load.

Tensioner – a device used to tighten a lashing including winches, dogs, hand ratchets, and auto-tensioners.

Thinning – the felling and removal of part of the forest crop.

Tool – a manually operated tool or a power operated tool.

Tree length – the length of a tree being fallen, or if not applying to a single tree, the length of the dominant trees in the area.

Track – a rough path or way used by vehicles or pedestrians.

Units of competency – the nationally agreed statements of the skills and knowledge required for effective performance in a particular job or job function. They identify the skills and knowledge, as outcomes that contribute to the whole job function. Units of competency are an endorsed component of training packages.

Visitor – any person who is not directly employed or engaged at the workplace and enters the workplace.

Widow makers – a limb or branch of a tree, which may unexpectedly dislodge from a tree and present a high risk of injuring a person.

Workplace – a place where work is carried out for a business or undertaking and includes any place where a worker goes, or is likely to be, while at work. A **place** includes a vehicle, vessel, aircraft, or other mobile structure; and any waters and any installation on land, on the bed of any waters or floating on any waters.

Worker – a person is a worker if the person carries out work in any capacity for a person conducting a business or undertaking, including work as:

(a) an employee

(b) a contractor or subcontractor

(c) an employee of a contractor or subcontractor

(d) an employee of a labour hire company who has been assigned to work in the person's business or undertaking

(e) an outworker

(f) an apprentice or trainee

(g) a student gaining work experience

(h) a volunteer

(i) a person of a prescribed class.

The person conducting the business or undertaking is also a worker if the person is an individual who carries out work in that business or undertaking.

APPENDICES

Appendix A: Forest Operations Safety Plan
Appendix B: Operator competency requirements
Appendix C: Protective structures for forestry machines
Appendix D: Example of contents for first aid kits
Appendix E: PPE for forestry operations
Appendix F: Emergency plan examples

Appendix A: Forest Operations Safety Plan

Conduct of forest operations should be covered by a Forest Operations Safety Plan (FOS Plan) that results from the identification of hazards on the forest coupe and an assessment of the related risks for the planned operations. The plan should be prepared by the landowner or forest manager in conjunction with the planning and operational requirements of the approved coupe Forest Practice Plan. Consultation with contractors on the FOS Plan must be undertaken prior to work commencing so that management plans for specific risks can be discussed and agreed.

Hazard Identification

The FOS Plan should identify the hazards present on the coupe before work commences. These include hazardous trees, steep slopes, uneven and rocky ground, presence of mineshafts, and the presence of overhead power lines or underground utilities. These hazards should be assessed in relation to the proposed operations. For example, the type of harvesting, extraction methods, planting, or site preparation and the type of equipment and methods to be used, and the scheduling and timing of activities need to be assessed.

Risk Assessment

The FOS Plan should assess the risk of matters such as:

- Suitability of equipment and methods for the topography, climatic, and ground conditions of the coupe;
- Impact of hazards such as hazardous trees, overhead power lines, underground assets, mining excavations, or sinkholes and caves on planned operations;
- Ability to identify and allocate operational boundaries for multiple contractors on each coupe (e.g. seed collectors);
- Ability to safely separate and schedule operations given the methods to be used (e.g. manual falling, mechanical falling, seed collection);
- The safe establishment of coupe access and roading;
- The ability to manage the location, access, and control of the designated forest operations;
- The ability to establish reliable communications;
- The capacity to manage unsafe or uncontrolled conditions such as fire given the characteristics of the coupe.

Risk Controls

In consultation with contractors the landowner or forest manager should establish risk controls that eliminate or minimise the risks of undertaking the planned operations in the coupe so far as is reasonably practicable. These agreed risk controls should be outlined in the FOS Plan and in contractor operational plans. These risk controls should be complied with by contractors, visitors or any other person present on the work site.

Within the coverage of the FOS Plan, contractors with direct influence and control over specific forest operations should manage ongoing hazard identification, assess any risks that arise because of changes in conditions, and apply and document additional or specific risk controls.

An example is shown below. The risk rating is based on the matrix shown in *Figure 2*.

Example Forest Operations Safety Plan

Location	Coupe number			
Operation	Timber Harvesting			
Landowner/Forest manager	ABC Forest Management	Date FOSP prepared --/--/--		
Contractor	XYZ Harvesting	Date FOSP agreed --/--/--		
Activity	**Hazards**	**Risk assessment**	**Risk Control**	**Monitor effectiveness**
Construct access road	Hazardous trees near proposed road.	● Assess nature of trees ● Assess distance to road = High likelihood of falling = Serious consequences 1 **High Risk** Stop, Fix	● Remove hazardous trees within 2 tree lengths of proposed road using safe method	Contractor to manage operations to ensure no risk of tree falling within 2 tree lengths of access roads.
Activity	**Hazards**	**Risk assessment**	**Risk Control**	**Monitor effectiveness**
Log measuring and marking	Machinery hitting people in the work area.	● Assess traffic flow in work area ● Assess separation distances between operations ● Assess communication system = Low likelihood of interaction = Serious consequences 2 **Actively Reduce** Minimise the Risk	● Establish exclusion zones and safe work areas ● Manage work patterns and traffic flows ● Maintain radio communication between ground workers and machine operators	Contractor with direct influence and control of log landing to ensure separation distances maintained. Review measures when type of operations on landing change.

Activity	**Hazards**	**Risk assessment**	**Risk Control**	**Monitor effectiveness**
Seed collection	Being struck by falling timber and other debris and objects.	● Assess timing and scheduling of seed collection in relation to other operations ● Assess separation distances between operations = Low likelihood of contact = Serious consequences 2 **Actively Reduce** Minimise the Risk	● Establish exclusion zones and safe work areas ● Maintain oral and visual communication with other workers ● Establish and maintain relevant warning signage	Contractors coordinate and consult on scheduling and to resolve any breakdown in communications and separation distances.
Activity	**Hazards**	**Risk assessment**	**Risk Control**	**Monitor effectiveness**
Tree planting	Slips and trips from tripping on debris from previous tree crops or uneven terrain.	● Ground conditions following use of particular harvesting methods ● Site preparation and debris from previous rotation (e.g. windrowing, mechanical cultivation) ● Type and size of planting stock = High likelihood of slips, trips = Minor consequences 2 **Actively Reduce** Minimise the Risk	● Review site for hazards before commencement ● Use a machine to carry stock to the planting site ● Use of safety footwear	In hot conditions contractor adjusts work patterns, provides drinking water and lightweight protective clothing.

Appendix B: Operator competency requirements

All workers must hold a statement of attainment for units of competency of approved nationally recognised units of competency when undertaking any task that involves:

- driving heavy plant or trucks
- using handheld motorised equipment
- ground-based workers who work near heavy plant or tree falling operations.

For general awareness of hazards in forest operations all workers involved in the above tasks are expected to hold the following units of competency.

Workplace health and safety	Follow WHS policies and procedures	FWPCOR2205

or

Alternative competencies in workplace health and safety for workers who have obtained or are pursuing a Certificate III in Harvesting and Haulage or higher qualification.

In addition to this general requirement, workers are expected to hold a statement of attainment for a unit of competency related to the activity they are conducting. For guidance, the current national units are listed below. For experienced workers, pre-existing assessments against predecessor national units or previously recognised Tasmanian training standards are regarded as sufficient evidence of competency, but it is recommended that persons conducting a business or undertaking (PCBUs) take steps to ensure that workers have up-to-date knowledge about the tools and equipment they are using.

For further details in respect to predecessor units and updated national units refer to *https://training.gov.au/Training/Details/FWP* or from ForestWorks (*www.forestworks.com.au*).

SITE ACCESS AND ROADING		
Dozer	Conduct civil construction dozer operations	RIIMPO323E
Wheeled loader	Conduct civil construction wheeled front end loader	RIIMPO321F
Excavator	Conduct civil construction excavator operations	RIIMPO320F
Grader	Conduct civil construction grader operations	RIIMPO324F
Roller	Conduct roller operations	RIIMPO317F
Tip truck	Conduct tip truck operations	RIIVEH304E
TIMBER HARVESTING		
Single grip harvester	Operate single grip harvester	FWPHAR3229
Processor	Conduct mechanical processor operations	FWPHAR3210
Feller buncher	Operate feller buncher	FWPHAR3226
Commercial hand falling or falling hazardous trees	Harvest trees manually (advanced)	FWPHAR3209
	Harvest trees manually (intermediate)	FWPHAR3205
Trim and cut fallen trees	Trim and cut harvested trees	FWPHAR2209
LOG EXTRACTION		
Forwarder	Operate forwarder	FWPHAR3227
Skidder	Operate skidder	FWPHAR3230
Dozer	Operate crawler tractor	FWPHAR3224
Excavator – for shoveling logs	Operate excavator with log grapple	FWPHAR3225
Cable logging (Choker setter)	Hook up felled trees (choker)	FWPHAR2201
Cable logging (Chaser)	Perform landing duties (chaser)	FWPHAR2202
Cable logging (Yarder)	Operate yarder	FWPHAR3212
LOG LANDINGS AND LOADING		
Forwarder	Operate forwarder	FWPHAR3227
Excavator – for loading	Operate excavator with log grapple	FWPHAR3225
Truck mounted loaders	Licence to operate a vehicle loading crane (capacity 10 metre tonnes and above)	TLILIC0002
Log truck	Transport forestry logs using trucks	FWPCOT3315
Low loader/float	Load and unload plant	RIIHAM308F
SILVICULTURE		
Hand falling associated with plantation silviculture or road and firebreak maintenance operations	Fell trees manually (basic)	FWPCOT225
	Fell trees manually (intermediate)(or a similar unit)	FWPFGM3216
	Fell trees manually (advanced)(or a similar unit)	FWPFGM3217
Scrub/brush cutter	Undertake brush-cutting operations	FWPFGM2207
Tractor	Fell trees manually (advanced)	RIIMPO315E
Heavy vehicle site preparation on steep slopes	Use mechanised equipment for forestry site preparation on steep slopes	FWPHAR3233

Harvesting on steep slope site	Operate harvesting machine with winch-assist system	FWPHAR3232
ATV	Operate quad bikes	AHCMOM217
Side by side (UTV)	Operate side by side utility vehicles	AHCMOM216
Tree pruning	Prune trees	FWPFGM2205
Firearms	Use firearms to humanely destroy animals	AHCPMG304
Aerial rescue	Undertake aerial rescue	AHCARB318
Four-wheel drive	Operate a four wheel drive on unsealed roads (or similar units depending on the work undertaken)	FWPCOT3259
Tree Climbing	Use arborist climbing techniques	AHCARB319

INFIELD PROCESSING

Static mobile chipper based on workplace equipment	Operate integrated or split flail and wood chipper with crane	FWPHAR3203 or
	Operate split flail and wood chipper fed by mobile machine	FWPHAR3204

The relevant competency standards referenced in the Fire Management section of the Code. These units address issues of importance for safe and effective fire management.

FIRE MANAGEMENT	
Respond to wildfire	PUAFIR204
Prevent injury	PUAFIR210
Suppress wildfire	PUAFIR303
Operate pumps	PUAFIR309
Prepare, maintain and test response equipment	PUAEQU001
Interpret and analyse fire weather information	PUAFIR407
Evaluate fire potential and prevention	FWPCOR3203
Follow fire prevention procedures	FWPCOR2204

Appendix C: Protective structures for forestry machines

Machine	Type	ROPS	FOPS	OPG
Dozers	Enclosed cabin	✓	✓	✓
	Open - canopy with attachments	✓	✓	✓
Hydraulic excavators	Landing unit-log-log grab & cut off saw	✓	✓	✓
	Landing unit-log grab only	✓	✓	
	Off-landing-shovel logging	✓	✓	✓
	Feller buncher - processing head	✓	✓	✓
	Construction excavator-Hydro hitch, buckets and rock drill and rock grab	✓	✓	✓
Purpose built forestry units	Tracked or wheel type feller buncher	✓	✓	✓
	Tracked or wheeled type harvester	✓	✓	✓
	Grapple skidder	✓	✓	✓
	Cable skidder	✓	✓	✓
	All forwarders	✓	✓	✓
Wheel loaders	Wheeled loader fitted with a falling or bunching head	✓	✓	✓
	Articulated-enclosed cabin, quick coupler and attachments	✓	✓	
	Articulated-enclosed cabin, pin or multipurpose bucket	✓	✓	
	Articulated-enclosed cabin, onion general purpose bucket	✓	✓	
Skid steer loaders	Enclosed cabin multi-purpose bucket	✓	✓	
	Open-canopy multi-purpose bucket	✓	✓	
Compact truck loaders	Enclosed-cabin multi-purpose bucket	✓	✓	
	Open Canopy multi-purpose bucket	✓	✓	
Backhoe loaders	Enclosed cabin multi-purpose bucket, 4x4 extendable dipper, quick hitch and buckets	✓	✓	
Bobcat and attachments		✓	✓	✓
Motor graders	All motor graders fitted with enclosed cabins	✓	✓	
Agricultural tractors		✓		
All-terrain vehicles (ATV-quad bikes)		✓	*Note: Crush Protection*	

Applicable Standards

Protective structure	Standard	Hydraulic excavator	Purpose built forestry equipment	Earth moving machinery	Yarder
ROPS	ISO 8082, or AS 2294.1 and AS 4100-1998	✓	✓	✓	
	J1194 - purpose built machinery		✓		
	AS1636.1 Conventional tractors		✓		
	Wheel type agricultural - SAE -J1194 United States Department of Labour		✓		
FOPS	ISO 8083	✓	✓	✓	✓
OPG	ISO 8084:2003 or AS 2294.1	✓	✓	✓	✓
	ISO 10262:1998	✓			
	AS 4988:2002	✓			

Appendix D: Example of contents for first aid kits

For most workplaces, a first aid kit should include the following items.

Item	Quantity
Instructions for providing first aid—including cardiopulmonary resuscitation (CPR) flow chart	1
Notebook and pen	1
Resuscitation face mask or face shield	1
Disposable nitrile examination gloves (nitrile is a latex-free rubber suitable for people with latex allergies)	5 pairs
Gauze pieces 7.5 x 7.5 cm, sterile 3 per pack	5 packs
Saline, 15 ml	8
Wound cleaning wipe, single 1% Cetrimide BP	10
Adhesive dressing strips—plastic or fabric, packet of 50	1
Splinter probes, single use, disposable	10
Tweezers/forceps	1
Antiseptic liquid/spray 50 ml	1
Non-adherent wound dressing/pad 5 x 5 cm (small)	6
Non-adherent wound dressing/pad 7.5 x 10 cm (medium)	3
Non-adherent wound dressing/pad 10 x 10 cm (large)	1
Conforming cotton bandage, 5 cm width	3
Conforming cotton bandage, 7.5 cm width	3
Crepe bandage, 10 cm, for serious bleeding and pressure application	1
Scissors	1
Non-stretch, hypoallergenic adhesive tape—2.5 cm wide roll	1
Safety pins, packet of 6	1
BPC wound dressings No. 14, medium	1
BPC wound dressings No. 15, large	1
Dressing—combine pad 9 x 20 cm	1
Plastic bags—clip seal	1
Triangular bandage, calico or cotton minimum width 90 cm	2
Emergency rescue blanket for shock or hypothermia	1
Eye pad, single use	4
Access to 20 minutes of clean running water or, if this is not available, hydrogel 3.5 gram sachets	5 sachets
Instant ice pack for treatment of soft tissue injuries and some stings	1

Medication including analgesics like paracetamol and aspirin should not be included in first aid kits because of their potential to cause adverse health effects in some people including pregnant women and people with medical conditions like asthma. The supply of these medications may also be controlled by drugs and poisons laws. Workers requiring prescribed and over-the-counter medications should carry their own medication for their personal use as necessary.

However, workplaces may consider including an asthma-relieving inhaler and a spacer to treat asthma attacks and epinephrine auto-injector for the treatment of anaphylaxis or severe allergies. These should be stored according to the manufacturer's instructions and first aiders should be provided with appropriate training.

Some types of workplaces may require extra items to treat specific types of injuries or illnesses. These may also require first aiders to have additional training.

Outdoor module

If work is performed outside and there is a risk of insect or plant stings or snake bites, assess whether a first aid kit should include:

- a heavy duty 10 cm crepe bandage for snake bites
- sting relief cream, gel or spray.

Remote module

Where people work in remote locations, a first aid kit should include:

- a heavy duty 10 cm crepe bandage for snake bites
- large clean sheeting, for covering burns
- thermal blanket, for treating shock
- whistle, for attracting attention, and
- torch/flashlight.

The appropriate contents will vary according to the nature of the work and its associated risks.

Burn module

If workers are at risk of receiving burns, a first aid kit should include:

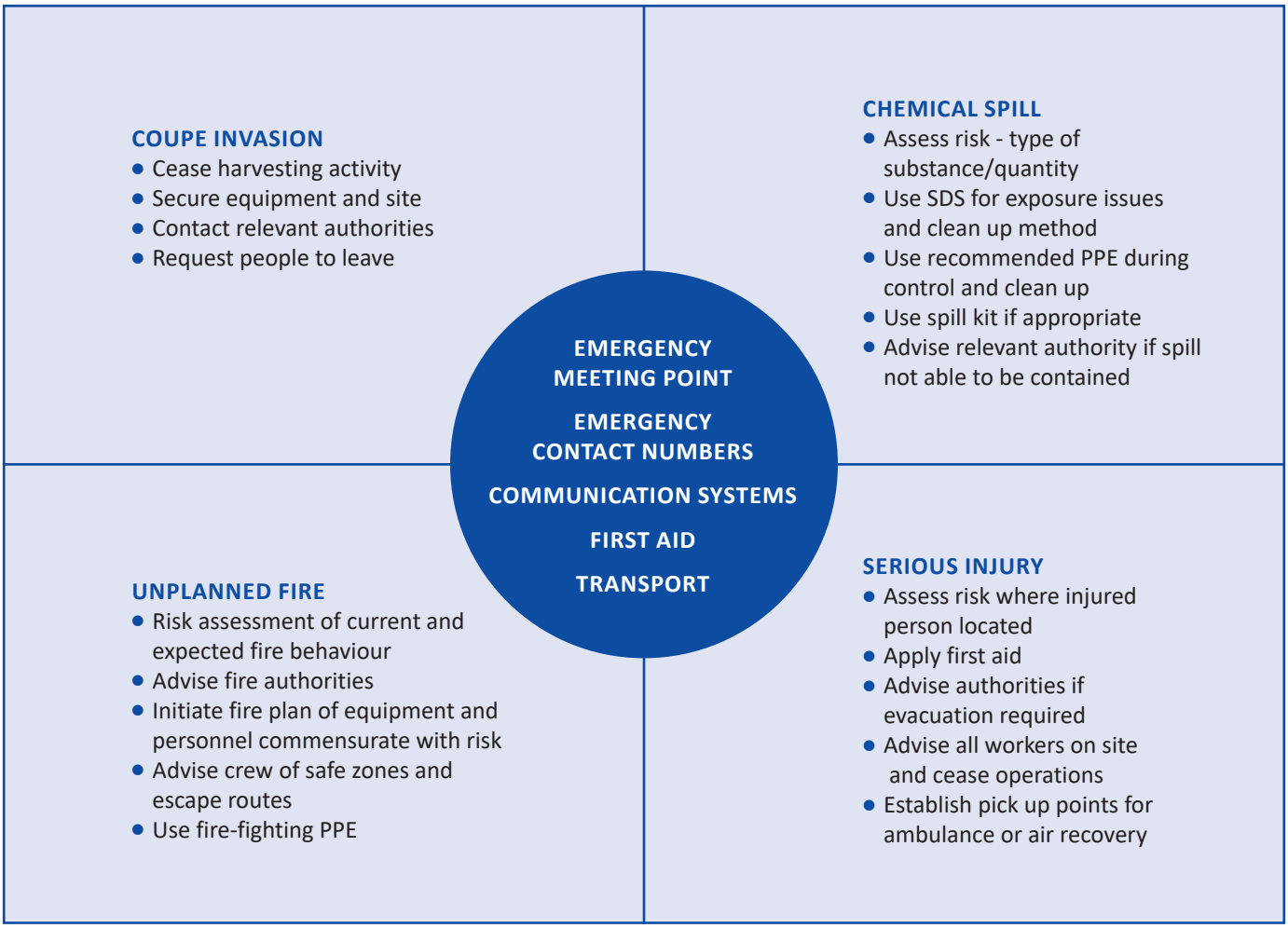
- burn treatment instructions on two waterproof instruction cards: one for the first aid kit and the other to be located on the wall next to the emergency shower or water supply
- hydrogel, 8 x 3.5 gram sachets
- hydrogel dressings
- clean polythene sheets, small, medium and large, and
- 7.5 cm cotton conforming bandage.

(reproduced from the First aid in the workplace Code of Practice, a code approved in Tasmania)

Appendix E: PPE for forestry operations

RELEVANT PPE STANDARDS	Everyone	Chainsaw operator	Machine operator	Herbicide applicator	Fire fighter
High visibility clothing *AS/NZS 4602.1-2011 High visibility safety garments – Garments for high risk applications*	✓	✓	✓	✓	✓
Protective clothing firefighting *AS/NZS 4824:2006* *Protective clothing for firefighters – Requirements and test methods for protective clothing used for wildland firefighting*					✓
Safety helmet *AS/NZS 1800-1998 Occupational protective helmets – Selection, care and use* *See AS/NZS 1801 (Series) Occupational protective helmets* (DIN 7948/EN 12492 is a suitable alternative to helmets complying with AS 1801 (Series) for pruning operations.)	✓	✓	✓	✓	✓
Safety footwear *AS/NZS 2210 (Series) Safety, protective and occupational footwear.* Footwear should provide ankle support.	✓	✓	✓	✓	
Boots firefighting *AS/NZS 4821:2006* *Protective footwear for firefighters – Requirements and test methods*					✓
Hearing protection *AS/NZS 1269-2005 (Series) Occupational noise management* *AS/NZS 1270-2002: Acoustics – Hearing protectors*		✓	✓	✓	
Eye protection *AS/NZS 1336-1997 Recommended practices for occupational eye protection* See *AS/NZS 1337 (Series) Personal eye protection*		✓	✓	✓	✓
Safety gloves See *AS/NZS 2161 (Series)* *Occupational protective gloves*		✓	✓	✓	✓
Leg protection See *AS/NZS 4453 (Series) Protective clothing for users of hand-held chainsaws*		✓			
Respiratory protection See *AS/NZS 1715:1994: Selection, use and maintenance of respiratory protective devices* and *1716:1994 Respiratory protection devices*				✓	✓

Appendix F: Emergency plan examples



FURTHER REFERENCES

Approved Codes of Practice adopted in Tasmania:

- *How to manage work health and safety risks*
- *Work health and safety consultation, cooperation and coordination*
- *First aid in the workplace*
- *Managing the work environment and facilities*
- *Construction work*
- *Managing the risk of falls at workplaces*
- *Hazardous manual tasks*

Safe Work Australia *Guide to managing risks in cable logging* (2013)

Safe Work Australia *Guide to growing and managing forests* (2013)

Safe Work Australia *Guide – timber harvesting, Appendix A Procedures for bringing down trees that sit back during felling* (2014)

Forest Works *Chainsaw operators manual* (2011)

Forest Works *Tree faller's manual* (2011)

Forest Works *Log haulage manual* (2014)

The Forest Industries Research Centre *Forest equipment guarding best practice guidelines* (2020)

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