TERMS OF LICENCE UNDER THE THREATENED SPECIES CONSERVATION ACT 1995

UPPER NORTH EAST REGION

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APPENDIX B – UPPER NORTH EAST

Preamble

Authorisation

This licence is issued by the NPWS to the Forestry Commission of New South Wales and any person carrying out forestry operations identified in the Integrated Forestry Operation Approval (IFOA) under Part 4 of the *Forestry and National Parks Estate Act* 1998 of which this licence is Annexure B.

This licence commences on the day on which the IFOA is granted by the Ministers in accordance with Part 4 of the *Forestry and National Park Estate Act* 1998 and is to apply to the conduct of the forestry operations covered by the IFOA within the Upper North East Region

This licence authorises the conduct of forestry operations within SFNSW estate within the Upper North East Region, as shown on Map 1 in the IFOA that are likely to result in:

1. Harm to a threatened species (being an animal) or protected fauna;
2. The picking of a threatened species (being a plant) or a protected native plant; or
3. Damage to the habitat of a threatened species.

This licence does not authorise the carrying out of an activity that is likely to:

1. Harm an endangered population or an endangered ecological community (as far as animals are concerned);
2. Result in the picking of a plant that is part of an endangered population or endangered community;
3. Damage critical habitat; or
4. Damage to the habitat of an endangered population or endangered community.

This licence is issued subject to the licence holder complying with the conditions and requirements set out in the licence. A contravention of the terms of this licence makes the person carrying out the forestry operations liable for an offence under the National Parks and Wildlife Act 1974 for eg. harming a threatened species under Section 118A of the National Parks and Wildlife Act 1974.

Intent

The objectives of this licence are to set out the minimum measures to protect threatened species and protect the habitat of threatened species from activities associated with timber harvesting.

The licence sets out habitat protection measures that are to apply across the SFNSW estate in the form of general conditions. Protection of features such as: rainforest, high conservation value old growth forest, habitat trees and riparian habitats make substantial contribution to the conservation of a range of threatened species, protected fauna and protected native plants.

For those species that have been assessed as not being adequately protected by the general conditions of this licence, a series of species-specific conditions are required to ensure significant habitat features are protected around known occurrences of these species.

For those species which are particularly rare or poorly known such that it could not be determined if the general conditions were adequate for the conservation of the species and appropriate species-specific conditions could not be developed, appropriate protective measures will be developed on a case by case basis where these species occur on SFNSW estate.

An integral part of the licence is the requirement for SFNSW to conduct operational and pre-logging and pre-roading surveys to assess presence of species requiring species-specific or site-specific conditions.

Qualifying notes

Notes provided in this licence are in italicised text within parentheses. These notes are provided to assist in the interpretation of the condition. They do not constitute a condition of the licence and, as such, are not enforceable.

Definitions and Abbreviations

Words and abbreviations used in this licence have the meaning provided below, unless otherwise stated in a particular condition of the licence.

"AMG" means Australian Map Grid co-ordinates. This definition continues to apply to any future updated system of geographical co-ordinates.

"Australian Group Selection" refers to a silvicultural practice, which in relation to a tract of forested land has the following elements:

i. in any one harvesting operation:

(a) one or more groups of trees are selected for logging on a part or (where more than one group of trees is selected) parts of the tract, and

(b) the area of each group of trees selected for logging, as measured from the outermost crown edges of trees standing on the outer boundary of the group prior to logging, is no more than 0.25 hectares, and

(c) the total area selected for logging within the tract, being the sum of each area of each group of trees selected for logging on the tract (measured in accordance with paragraph (b)), is no more than 22.5% of the net harvestable area of the tract; and

(Note to paragraph (b): 0.25 hectares is the area of a square of 50m x 50m).

ii. once a harvesting operation has been completed, no logging (other than thinning) is carried out again on the relevant part or parts of the tract until at least 3 further harvesting operations (of the kind described in element (i) or involving Single Tree Selection) have been completed on different parts of the tract; and

iii. there is a period of at least 5 years (and an average of at least 7 years over any 4 consecutive harvesting operations of the kind described in element (i)) between the completion of logging in one harvesting operation of the kind described in element (i) and commencement of another on the tract; and

iv. logging is carried out with the objective of ensuring that following any 4 consecutive harvesting operations of the kind described in element (i), there remains an area within the tract which has not been logged in any of those operations (or in any Single Tree Selection or thinning carried out during that period), comprising an area of at least 10% of the net harvestable area in existence immediately before commencement of the first of those four operations.

(Note 1. The above description of "Australian Group Selection" is consistent with the silvicultural practice commonly referred to as "Australian Group Selection medium".

Note 2. The expression "tract of forested land" has been used in the above description of Australian Group Selection as a convenient means of referring to any area of forested land in which this silvicultural practice may be carried out. The relevant tract may, for example, comprise the whole, or only a part of, a compartment of State forest; it may occur across more than one compartment; and it may also be comprised of Crown-timber land other than State forest, and consequently not be managed on a compartment based system.)

(Note 3: The above description of "Australian Group Selection" is consistent with the silvicultural practice commonly referred to as "Australian Group Selection medium" and the definition contained in the IFOA.)

"Boundary to area ratio" means the length of the boundary of an area relative to the size of the area, expressed as a proportion.

AMENDMENT 2
28 April 2003
Definitions added
Ref Appendix E

"Brush-tailed Phascogale habitat Category 1" means the following Research Note 17 Forest Types:

37, 39, 56, 61, 62, 64, 70, 71, 72, 74, 76, 81, 82, 83, 84, 85, 92, 93.

"Brush-tailed Phascogale habitat Category 2" means the following Research Note 17 Forest Types:

30, 31, 38, 40, 41, 97, 117, 119, 126, 130.

AMENDMENT 2
28 April 2003
Definition added
Ref Appendix E

"Buffer zone" means a protective area where specified forestry activities may only be conducted if in accordance with the relevant condition.

"Bumper trees" means trees used as pivot points for logs being snigged during timber extraction.

"Cliff" means a rocky slope greater than 70 degrees steep and greater than three metres in height.

"Commencement date" means the date on which the IFOA is granted by the relevant Ministers in accordance with Part 4 of the FNPE Act.

"Compartment" means an area of forest designated for forestry management purposes, principally for the cutting and removal of timber. In the case of Crown-timbered Land, compartment means an area to which SFNSW conducts, permits or authorises specified forestry activities. A compartment is an area of forest identified by a compartment number and a State Forest name. Compartment boundaries are delineated on SFNSW Geographic Information System (GIS). The term may be used to describe a part of a compartment, a group of compartments or a single compartment covered by a single Harvesting Plan.

"CRAFTI" refers to aerial photograph interpretation undertaken as part of the regional forest assessment for the areas covered by the Forest Agreements for the Upper North East Region.

"Critical habitat" means critical habitat as defined by the TSC Act.

"Critical weight range" or "CWR" refers the following species: Bush Stone-curlew, Black-striped Wallaby, Brush-tailed Phascogale, Spotted-tailed Quoll, Eastern Quoll, Rufous Bettong, Long-nosed Potoroo, Parma Wallaby, Red-legged Pademelon and Brush-tailed Rock Wallaby.

AMENDMENT 2
28 April 2003
Definition added
Ref Appendix E

"Crown" means the upper branches of a tree.

"Dam" means a body of water held by a barrier constructed to hold back water, forming a reservoir.

"Daytime" means the time of day between sunrise and sunset.

"Den", (other than the den of a Spotted-tailed Quoll), means tree hollows and other holes, crevices or fissures in trees into or out of which the subject species is seen entering or leaving. Dens are used by mammals for roosting, sleeping, resting, breeding, raising young and communal congregations.

"Diameter at breast height over bark" or "dbhob" means the measurement of the diameter of a tree, made at a height of 1.3 metres above the ground on the uphill side of the tree, using a diameter tape measured at right angles to the axis of the tree. Where the tree is branched or deformed at 1.3 metres above the ground, the measurement must be taken above this point where the stem becomes more cylindrical.

AMENDMENT 2
28 April 2003
Definition added
Ref Appendix E

"Directional felling" means the felling of a tree by cutting the tree at a particular angle so that it falls in a pre-determined direction.

"Drainage line" means a channel down which surface water naturally concentrates and flows. Drainage lines exhibit one or a combination of the following features which distinguish them from drainage depressions:

a) evidence of active erosion or deposition - e.g., gravel, pebble, rock, sand bed, scour hole, nick points; or

b) an incised channel of more than 30 centimetres depth with defined bed and banks;

"Dusk" means that time of the afternoon when the sun is below the horizon however there is still soft light in the sky.

"Early morning" means the time of day between sunrise and up to three hours after sunrise.

"Eucalypt feed tree" means mature or late mature individuals of any of the following eucalypt species: white mahogany *E. acmenoides, E. umbra, E. carnea*; ironbark species *E. siderophloia, E. paniculata, E. fetgusonii, E. placita, E. ancophila, E. fusiformis, E. caleyi, E. crebra, E. fibrosa. E. tetrapleura, E. sideroxylon, E.ophitica*; swamp mahogany *E. robusta*; forest red gum *E. tereticornis*; bloodwood species *Corymbia spp.*; box species *E. rudderi, E. conica, E. molucanna, E. largeana, E. rummeryi* (including yellow box *E. melliodora* and white box *E. albens*); spotted gum species *Corymbia spp.*; mountain gum *E. dalrympleana*; manna gum *E. viminalis*; needlebark stringybark *E. planchoniana*; Tyndale stringybark *E. tindaliae*; red stringybark *E. macrorhyncha*.

"First order stream": Refer to Schedule 1 of this licence for definition and determination of stream order.

"Flying-fox camp" means an area where more than a hundred Flying-foxes congregate to roost on tree branches. These camps may contain a single species or more than one species of flying-fox.

"FNPE" means *Forestry and National Park Estate Act* 1998.

"Forest Agreement" means an agreement made under Part 3 of the *Forestry and National Park Estate Act* 1998.

"Forest types" or "FT" means forest type as defined and described in *"Research Note No. 17 Forest types in New South Wales" Forestry Commission of New South Wales, Sydney 1989,* and/or mapped on Forestry Commission of New South Wales forest type maps.

"Forestry operation" has the same meaning as the definition in the IFOA under Part 4 of the *Forestry and National Parks Estate Act* 1998.

"Fourth order stream": Refer to Schedule 1 of this licence for definition and determination of stream order.

"Gross area" means the total area of land within a compartment (in hectares).

AMENDMENT 2
28 April 2003
Definition modified
Ref Appendix E

"Harvesting machinery" means rubber-tyred skidders, bulldozers and mechanical and other harvesters.

"Harvesting operations" means timber felling (except miscellaneous forestry operations), construction and operation of log dumps, construction and operation of snig tracks, road construction and road re-opening.

"Hazard reduction work" has the same meaning as "bush fire hazard reduction work" as defined in the *Rural Fires Act* 1997.

"Heath and scrub" means areas dominated (greater than 50% crown cover, where crown cover is the area of ground covered by projecting the outline of the crown vertically to the ground) by woody shrubs and graminoids generally less than two metres tall at maturity, but up to seven metres tall. Heath and scrub include, but are not limited to, all areas of FT "heath" (FT no. 223) and "scrub" (FT no. 224).

AMENDMENT 2
28 April 2003
Definition replaced
Ref Appendix E

AMENDMENT 3
17 May 2004
Definition modified
Ref Appendix E

"High Conservation Value Old Growth Forest" means the following areas of land within the Upper North East Region:

i. land depicted in the Geographic Information System theme in ESRI grid format called "hcovog1_prtctd" in the sub-directory called "Protected HCVOG" on the CD-Rom having the volume label "991221_1516 (21 Dec 1999)" and held by Resource and Conservation Division, and further described in the corresponding metadata on the CD-Rom; and

ii, "old growth" land depicted in the Geographic Information System theme in ESRI grid format called "ogtoprotect2" in the sub-directory called "Additional Protected OG" on the CD-Rom having the volume label "030423_1132 (23 April 2003)" and held by Resource and Conservation Division, and as may be further described on corresponding metadata on the CD-Rom.

"Hollow-bearing tree" means a tree where the base, trunk or limbs contain hollows, holes and cavities that have formed as a result of decay, injury or other damage. Such hollows may not be visible from the ground, but may be apparent from the presence of deformities such as burls, protuberances or broken limbs, or where it is apparent the head of the tree has been lost or broken off.

"Incidental browse tree" means a Brushbox, Turpentine, Apple (*Angophora* spp.) or Bloodwood.

"Integrated Forestry Operations Approval" or "IFOA" means an approval granted under Part 4 of the *Forestry and National Park Estate Act* 1998 for the Upper North East Region to which this licence forms a part.

"Known or potential habitat" where it relates to flora means:

i. a compartment with a record of the species; OR

ii. within "likely habitat" and within the species' "distribution", as described in Schedule 2 of this licence.

"Known habitat" where it relates to fauna means:

i. the area within a two kilometres radius of a record (except for Spotted-tailed Quoll and microchiropteran bats where the area within a five kilometres radius of a record constitutes known habitat);

ii. a record referred to in i) above includes, in addition to other types of records, a record of a species in a scat.

"Koala high use area" means an area where any of the following features are located:

i. Three out of any ten consecutive trees inspected are found to have Koala scats beneath them; OR

ii. a sighting of Koala; OR

iii. a tree with more than 20 Koala scats beneath; OR

iv. any trees with Koala scats of two distinctly different sizes beneath;

AND

i. where the subsequent star search locates at least an additional three out of any ten consecutive trees inspected as having Koala scats beneath them.

"Koala intermediate use area" means:

i. the area in a single compartment outside the Koala high use area where a Koala high use area is identified in the compartment; OR

ii. a single compartment where Koala scats have been detected under two of any ten consecutive trees searched within that single compartment; OR

iii. a single compartment where a Koala high use area is identified by only three of any ten consecutive trees having Koala scats, and where the Koala high use area indicated by the star methodology does not go beyond the initial ten trees, OR

iv. Both ii) and iii) above.

"Late afternoon" means the time of day between three hours before sunset and sunset.

"Late mature" means, using the modified Jacobs growth stage assessment, a tree which exhibits the following structural characteristics: Crown shape irregular; a proportion of limbs dead or dying, but not fallen; branch hollows are common, but are small to medium size. Refer to Schedule 3 of this licence.

"Log dump" means an area within a compartment where timber and other forest products are collected for processing and sorting prior to loading onto a truck.

AMENDMENT 2
28 April 2003
Definition added
Ref Appendix E

"Mechanical harvester" means a ground-based, tracked or wheeled machine equipped with an attachment containing a cutting device (for example a hydraulically driven disc or saw) for the purpose of felling trees. A mechanical harvester is operated from within a protective cabin and may have the ability to move trees after falling.

"Mature" means, using the modified Jacobs growth stage assessment, a tree which exhibits the following structural characteristics: Crown opening up with crown limbs healthy; dead branches are few throughout the crown, and when present, are small; few branch hollows, and when present, are very small. Refer also to Schedule 3 of this licence.

a plant "Metapopulation Unit" refers to a geographically discrete part of the plant species' range. Descriptions of species Metapopulation Units referred to in the licence are provided in Schedule 2 of this licence.

(*Note: Metapopulations are discrete population units within which the dynamics of the populations making up the metapopulations are largely restricted to within the metapopulation. They are isolated from adjacent metapopulations by areas of unsuitable habitat that restricts dispersal of individuals to such a degree to prevent effective recolonisation between metapopulations if suitable habitat is vacated*.)

"Miscellaneous forestry operations" means the felling of timber for the construction of causeways and bridges for the purposes of forest management; OR cutting of posts for neighbour boundary fencing.

"Modelled habitat" means:

i. For all fauna species, except for ii. below or as otherwise specified, Class 1 and Class 2 modelled habitat* as developed during the Comprehensive Regional Assessment for Upper North East Region.

ii. For Masked Owl, Powerful Owl, Eastern Bristlebird, Rufous Scrub Bird, *Philoria* sp. 3 (*richmondensis*), *Philoria loveridgei*, *Philoria spagnicolus*, *Philoria kundagungan*, and *Mixophyes fleayi*, Class 1, Class 2 and Class 3 modelled habitat* as developed during the Comprehensive Regional Assessment for Upper North East Region.

* a) as depicted in the spatial data layers of the ESRI Shape files in the sub-directory "CRA_Fauna_Models", located on the CD ROM labelled "Upper North East Region and Lower North East Region Integrated Forestry Operations Approvals Appendix B: Threatened Species Licence" created on 21 December 1999 (held on the DUAP Data Archive and State Archive); and

b) further described in the corresponding metadata for that spatial data layers located on the CD ROM labelled "Upper North East Region and Lower North East Region Integrated Forestry Operations Approvals Appendix B: Threatened Species Licence" created on 21 December 1999 (held on the DUAP Data Archive and State Archive).

iii. For flora species:

a) as depicted in the spatial data layers of the ESRI Shape files in the sub-directory "CRA_Flora_Models", located on the CD ROM labelled "Upper North East Region and Lower North East Region Integrated Forestry Operations Approvals Appendix B: Threatened Species Licence" created on 21 December 1999 (held on the DUAP Data Archive and State Archive); and

b) further described in the corresponding metadata for that spatial data layers located on the CD ROM labelled "Upper North East Region and Lower North East Region Integrated Forestry Operations Approvals Appendix B: Threatened Species Licence" created on 21 December 1999 (held on the DUAP Data Archive and State Archive).

OR

i. An appropriate model as agreed jointly by NPWS and SFNSW.

"NPW Act" means the *National Parks and Wildlife Act* 1974.

"NPWS" means the New South Wales National Parks and Wildlife Service.

"Nest": A nest includes, but is not limited to, a structure built by birds, or a tree-hollow, or a site on the ground or in a cave used by birds for the purposes of the incubation and/or rearing of young. A nest also includes a site where the actual nest can not be seen or found, however there is clear evidence of breeding nearby and it is considered likely that a nest occurs nearby (ie. within 50 metres).

"Net logging area" means, unless otherwise specified, the gross area of a compartment less Preferred Management Priority or subsequent Forest Management Zones and Special Management Zones where timber harvesting is prohibited, protection zones, Ridge and Headwater Habitat exclusion zones, Rainforest, Rainforest exclusion zones, High Conservation Value Old Growth Forest and Rare Non-commercial Forest Types.

"Net survey area" means the net logging area less areas of the following mapped features: inherent hazard level 4 and mapped drainage filter strips (as defined in the relevant Pollution Control Licence), and physically inaccessible areas.

"Nighttime" means the time between sunset and sunrise when it is dark.

"Non-regrowth zone" means all areas to the west of the line within the IFOA area:

i. depicted in the spatial data layers of the ESRI Shape files called "CRAreg_zone.shp" in the sub-directory "RegrowthZone", located on the CD ROM labelled "Upper North East Region and Lower North East Region Integrated Forestry Operations Approvals Appendix B: Threatened Species Licence" created on 21 December 1999 (held on the DUAP Data Archive and State Archive); and

ii. further described in the corresponding metadata for that spatial data layers located on the CD ROM labelled "Upper North East Region and Lower North East Region Integrated Forestry Operations Approvals Appendix B: Threatened Species Licence" created on 21 December 1999 (held on the DUAP Data Archive and State Archive).

"Outcropping rock cover" means escarpments, scree slopes (ie. slopes covered with small loose stones), and rock outcrops (ie. areas where rocks or exposed boulders cover more than 70% in any 0.1 hectare area).

"Permanent stream" means a water course that, except in periods of low rainfall, maintains a discernible flow or contains pools generally greater than two metres in length.

(*Note: the intention of this definition is to identify areas that may constitute suitable foraging habitat for Large-footed Myotis.)*

"Post-logging burning" means burning associated with the cutting and removal of timber which is carried out within 18 months after the timber being cut and removed.

AMENDMENT 2
28 April 2003
Definition (added)
Ref Appendix E

"Potential habitat" where it relates to fauna means:

i. "macrohabitat" and "microhabitat" within the species "distribution", all defined in the document "Habitat of Threatened Species in north-east NSW" as agreed to by NPWS and SFNSW; OR

ii. in the absence of an agreed "Habitat of Threatened Species in north-east NSW" in (i) above, modelled habitat, OR "macrohabitat" and "microhabitat" within the species "distribution", as defined in Schedule 4 of this licence.

"Preferred forest types" means Research Note 17 forest types that either (1) contain primary browse species that are listed as the 'dominant' species', 'dominant stand' or 'most common species' for the forest type; or (2) where primary browse species are referred to as closely associated with the forest type or listed as associated with the forest type, for forest types listed below; and are present in the field at more than 20 trees >30 centimetres dbhob per hectare.

	North Coast	**Tablelands**
Primary browse as dominant species	30, 45, 47, 60, 62, 64, 65, 67, 74, 81, 85, 92.	120, 131, 136, 138, 140, 148, 150, 151, 152, 153, 155, 156, 159, 160, 163, 168.
Primary browse as associated species	31, 32, 36, 37, 38, 39, 42, 46, 48, 49, 51, 53, 54, 61, 70, 71, 72, 76, 80, 82, 87, 93.	98,110, 111, 112, 113, 114, 122, 141, 142, 154, 158, 161, 164, 167, 172.

"Primary browse tree" means species listed below for the different forest areas.

North Coast	**Tablelands**
Tallowwood *E. microcorys*	Tallowwood *E. microcorys*
Grey Gum *E.* spp.	Manna Gum *E. viminalis*
Forest Red Gum *E. tereticornis*	Messmate *E. obliqua*
Swamp Mahogany *E. robusta*	Snow Gum *E. pauciflora*
	Mountain Gum *E. dalrympleana*
	Forest Ribbon Gum *E. nobilis*
	Sydney Blue Gum *E. saligna*
	New England Blackbutt *E. andrewsii*

The North Coast list of primary browse species applies to forest types: 1 to 26, 30 to 33, 36 to 42, 45 to 54, 60 to 68, 70 to 76, 80 to 88, 92 and 93 as defined in Research Note 17. The Tablelands list of primary browse species applies to forest types: 97 to 131, 136 to 143, 147, 148, 150 to 169, 171 to 178, 180 to 185, 188 to 195, 199, 200, 202 to 210, 211 to 215, 223 to 227 as defined in Research Note 17.

"Protected fauna" means those species defined as protected fauna under the *National Parks and Wildlife Act* 1974.

"Protected native plants" means those species listed on Schedule 13 of the *National Parks and Wildlife Act* 1974.

"Protection zone" means a protection zone (hard) and protection zone (soft). (Note: a protection zone is not equivalent to a buffer zone, which is defined separately in this document).

AMENDMENT 2
28 April 2003
Definition added
Ref Appendix E

"Protection zone (hard)" means a protective area set aside on each of side of a stream where specified forestry activities, unless excepted, are prohibited.

AMENDMENT 2
28 April 2003
Definition added
Ref Appendix E

"Protection zone (soft)" means a protective area adjoining a protection zone (hard) within which modified harvesting practices specified in the licence are permitted whilst minimising impacts to riparian habitat.

"Rainforest" means those areas:

i. depicted in the spatial data layers of the ESRI Shape files called "une_rf" in the sub-directory "Rainforest", located on the CD ROM labelled "Upper North East Region and Lower North East Region Integrated Forestry Operations Approvals Appendix B: Threatened Species Licence" created on 21 December 1999 (held on the DUAP Data Archive and State Archive); and

ii. further described in the corresponding metadata for that spatial data layers located on the CD ROM labelled "Upper North East Region and Lower North East Region Integrated Forestry Operations Approvals Appendix B: Threatened Species Licence" created on 21 December 1999 (held on the DUAP Data Archive and State Archive).

"Rare Non-commercial Forest Types" means those areas:

i. depicted in the spatial data layers of the ESRI Shape files called "all_rnc" in the sub-directory "Rare_Non_Commercial_Forest", located on the CD ROM labelled "Upper North East Region and Lower North East Region Integrated Forestry Operations Approvals Appendix B: Threatened Species Licence" created on 21 December 1999 (held on the DUAP Data Archive and State Archive); and

ii. further described in the corresponding metadata for that spatial data layers located on the CD ROM labelled "Upper North East Region and Lower North East Region Integrated Forestry Operations Approvals Appendix B: Threatened Species Licence" created on 21 December 1999 (held on the DUAP Data Archive and State Archive).

"Record":

- Where the record pertains to fauna, includes an observation of a live or dead individual of a species, or any part of an individual (hair, feathers, skin, bone, teeth or eggs), or a sign that indicates the species' presence (species' call heard, tracks, diggings, incisions, species' scat, raptor pellet, owl pellet, nest, roost or den); that is:

  i. Recorded on the NPWS Atlas of NSW Wildlife with a record reliability of 1 - 5 (1 = specimen in a public museum; 2 = specimen in other collection; 3 = voucher specimen; 4 = specialist reliability; 5 = standard reliability) and collected in the period 20 years prior to the approval of the Harvesting Plan by the relevant SFNSW Regional Manager;

  ii. Recorded by SFNSW during pre-logging and pre-roading surveys (as required in condition 8 of this licence), during compartment mark-up surveys (as required in condition 5.2 of this licence), during harvesting operations; OR

  iii. Any other information about the location of a threatened species held by SFNSW.

- Where the record pertains to flora, includes any part of a plant including, but not limited to, roots, stems, branches, leaves, fruits, seeds and flowers; that is:

i. Recorded on the NPWS Atlas of NSW Wildlife with a record reliability of 1 - 5 (1 = specimen in a public museum; 2 = specimen in other collection; 3 = voucher specimen; 4 = specialist reliability; 5 = standard reliability) and collected in the period 20 years prior to the approval of the Harvesting Plan by the relevant SFNSW Regional Manager;

ii. Recorded by SFNSW during pre-logging and pre-roading surveys (as required in condition 8 of this licence), during compartment mark-up surveys (as required in condition 5.2 of this licence), during harvesting operations; OR

iii. Any other information about the location of a threatened species held by SFNSW.

A record remains valid unless SFNSW and NPWS jointly agree the record is invalid or, in the case of flora records, surveys carried out to the satisfaction of NPWS demonstrates that the plant is no longer at the location or cannot be relocated.

Where a species requiring the application of a species-specific prescription is identified from within a predator scat or pellet, SFNSW may consult with NPWS to determine where the prescription shall be applied.

A record can relate to a single individual or a number of individuals. The definition of record relates to all previously existing and new records.

"Recovery Plan" means a recovery plan as defined under the *Threatened Species Conservation Act* 1995 or the *Endangered Species Protection Act* 1992.

"Recruitment tree" means a mature or late mature tree, using the modified Jacobs growth stage assessment, that appears to have good potential for hollow development and long term survival.

(Note: Recruitment trees exhibit the following structural characteristics: Good crown development; minimal butt damage; tree not suppressed. Suppressed trees are those whose growth has been significantly inhibited by surrounding trees or overstorey. Suppressed trees usually have a smaller stem diameter than the surrounding dominant trees and are not as tall as the surrounding trees.)

"Regrowth zone" means all areas to the east of the line within the IFOA area:

i. depicted in the spatial data layers of the ESRI Shape files called "CRAreg_zone.shp" in the sub-directory "RegrowthZone", located on the CD ROM labelled "Upper North East Region and Lower North East Region Integrated Forestry Operations Approvals Appendix B: Threatened Species Licence" created on 21 December 1999 (held on the DUAP Data Archive and State Archive); and

ii. further described in the corresponding metadata for that spatial data layers located on the CD ROM labelled "Upper North East Region and Lower North East Region Integrated Forestry Operations Approvals Appendix B: Threatened Species Licence" created on 21 December 1999 (held on the DUAP Data Archive and State Archive).

"Relevant Act" means an act of Parliament referred to in section 33 of the *Forestry and National Parks Estate Act* 1998.

"Relevant Licence" means a licence referred to in section 33 of the *Forestry and National Park Estate Act* 1998.

"RN 17" or "Research Note 17" means the publication: *"Research Note No. 17 Forest types in New South Wales" Forestry Commission of New South Wales, Sydney 1989.*

"Road" means any route used for vehicular access to, and the transport of logs from, a log dump within a compartment.

"Road construction" means the construction of a road where no previous road has existed.

AMENDMENT 2
28 April 2003
Definition modified
Ref Appendix E

"Road re-opening" means the clearing, scraping or treating of an existing revegetated road where any of the trees on the road have adbhob of 20cm or more.

(Note: Identical amendments to the above are made by this instrument to the Integrated Forestry operationa Approvals for the Eden and Lower North East Regions (Schedules 1 and 2).)

"Rocky outcrop" means an area where rocks or exposed boulders cover more than 70% of any 0.1 hectare area (30 metres by 30 metres); OR areas with skeletal soils (areas with shallow soils where rocks are exposed), supporting heath or scrub (sometimes with occasional emergent trees); OR a combination of both. These sites may occur where the geology varies from the surrounding area (eg. rhyolite outcrops). Rocky outcrops include, but are not limited to, all areas of FT "rock" (FT no. 234).

"Roost": Where the roost relates to a microchiropteran bat tree roost, "roost" includes: a tree or stag where there is clear evidence that a microchiropteran bat has roosted, such as a tree with a hollow at its base within which there is an accumulation of bat excreta; OR a tree where a microchiropteran bat has been seen flying into or out of a hollow, crevice or other hole in the tree. (This definition does not relate to 'subterranean roost sites'.)

"Where the roost relates to a threatened owl roost, "roost" includes a site where an owl has been observed roosting (that is sheltering or resting during the day); OR a site where there is clear evidence that an owl has roosted such as where there are owl pellets, remains of prey, or owl excreta; OR both.

AMENDMENT 2
28 April 2003
Definition modified
Ref Appendix E

"Routine road maintenance" means the means the clearing, scraping or treating of an existing revegetated road where all of the trees growing have a dbhob of 20 centimetres or more.

"Sap feed tree" means a tree with recent V-notch incisions or other incisions made by a Yellow-bellied Glider or Squirrel Glider. Recent incisions are incisions less than two years old as evidenced by non-occlusion of the incision (ie. where the incision has not closed).

"Secondary browse tree" means species listed below for the different forest areas with stems with a dbhob of 20 centimetres or greater.

North Coast	**Tablelands**
Eucalypt species other than primary browse Spotted Gum *Corymbia spp.* *Casuarina* and *Allocasuarina* spp. Broad leaf Paperbark *Melaleuca quinquinervia*	Eucalypt species other than primary browse Forest Oak *Allocasuarina torulosa*

The North Coast list of secondary browse species applies to forest types: 1 to 26, 30 to 33, 36 to 42, 45 to 54, 60 to 68, 70 to 76, 80 to 88, 92 and 93 as defined in Research Note 17. The Tablelands list of secondary browse species applies to forest types: 97 to 131, 136 to 143, 147, 148, 150 to 169, 171 to 178, 180 to 185, 188 to 195, 199, 200, 202 to 210, 211 to 215, 223 to 227 as defined in Research Note 17.

"Second order stream": Refer to Schedule 1 of this licence for definition and determination of stream order.

"SEPP 14" means State Environment Planning Policy No. 14 - Wetlands.

"SEPP 26" means State Environment Planning Policy No. 26 - Littoral Rainforest.

"SFNSW" means State Forests of New South Wales which is the trading name of the Forestry Commission of New South Wales.

"SFNSW estate" means land vested in the control of SFNSW.

"Single Tree Selection" refers to a silvicultural practice, which in relation to a tract of forested land has the following elements:

(a) trees selected for logging have trunks, that in cross-section, measured 1.3 metres above ground level, have a diameter (including bark) of 20cm or more (that is, a diameter at breast height over bark of 20 cm or more); and

(b) trees are selected for logging with the objective of ensuring that the sum of the basal areas of trees removed comprises no more than 40% of the sum of the basal areas of all trees existing immediately prior to logging within the net harvestable area of the tract.

"Snig track" means a route along which logs are hauled or dragged from the location of felling to a log dump, landing or stockpile.

"Snigging" means the practice of dragging or hauling a log from the location of its felling to a log dump.

"Soaks, seepages and bogs" means a depression in the ground in which water collects, on or below the surface; a place where water oozes slowly out of the ground; or a place where the ground is wet and spongy.

"Species new to science" means a species, sub-species or variety of plant or animal that is uniquely distinct from any other species, sub-species or variety and has not been previously described.

"Specified forestry activities" means, unless excepted:

i. Timber felling (excluding miscellaneous forestry operations);
ii. Construction and operation of log dumps;
iii. Construction and operation of snig tracks;
iv. Road construction (NB. routine road maintenance is not a specified forestry activity);
v. Road re-opening;
vi. Commercial collection of firewood;
vii. Harvesting of tea tree oil;
viii. Bush fire hazard reduction work; and
ix. Grazing activities.

"Spotted-tailed Quoll latrine site" means any site where three or more Spotted-tailed Quoll scats are detected within a five metres radius, or a site where a Spotted-tailed Quoll scat has been noted on more than one occasion within a five metres radius. For the purposes of this licence Spotted-tailed Quoll scats detected on roads will not constitute a latrine site. Once a latrine site has been identified it will be considered as such for the duration of this licence.

"Spotted-tailed Quoll maternal den" means any den which is used by a female Spotted-tailed Quoll with young which the juvenile Spotted-tailed Quoll occupy after becoming free from the teat until independence. For the purposes of this licence any Spotted-tailed Quoll den is considered a maternal den if it is being used during the period June to November, unless it can be demonstrated to the satisfaction of the NPWS that the individual using the den is male or that the female using the den does not have young. Once a maternal den has been identified it will be considered as such for the duration of this licence.

"Spotted-tailed Quoll permanent den" means any den site that is used by Spotted-tailed Quoll on more than one occasion. For the purposes of this licence any Spotted-tailed Quoll den is considered a permanent den unless there is documented evidence that the individual that used the den was a transient animal. Once a permanent den has been identified it will be considered as such for the duration of this licence.

"Stag" means a standing dead and dry tree greater than 30 centimetres dbh, and greater than three metres in height.

"Statutory reserves" means lands reserved (or gazetted) under the *National Parks and Wildlife Act* 1974 as National Parks, Nature Reserves, Karst Conservation Reserves, Wilderness Areas, Wild and Scenic Rivers and State Recreation Areas; and lands reserved (or gazetted) as Flora Reserves under the *Forestry Act* 1916.

"Stream" means any stream or watercourse shown on the relevant topographic map(s) for the compartment, from a 1:25,000 map sheet produced by the Land Information Centre (formerly the Central Mapping Authority). Where a 1:25,000 map sheet is not available for the compartment, then the best available scale map sheet produced by the Land Information Centre must be used. Determination of stream order is provided in Schedule 1 of this licence.

"Third order stream": Refer to Schedule 1 of this licence for definition and determination of stream order.

"Threatened species" means any species of plant or animal listed in Schedule 1 Part 1 (endangered species), Part 4 (presumed extinct) and Schedule 2 (vulnerable species) of the *Threatened Species Conservation Act* 1995.

AMENDMENT 2
28 April 2003
Definition added
Ref Appendix E

"Timber logs" means timber products identified in clause 5 (2) of part 1 of the IFOA other than pulp grade timber or low quality timber.

"TSC Act" means the *Threatened Species Conservation Act* 1995.

AMENDMENT 2
28 April 2003
Definition added
Ref Appendix E

"Walk-over" means timber extraction or snigging where disturbance to the existing natural groundcover is minimised and where no snig track construction or blading off is performed.

"Wetland" means a vegetated depression with a seasonal, permanent or intermittent water table at or slightly above the floor of the depression. The vegetation type in a wetland typically indicates a wetter micro-environment than the surrounding country. Wetlands include, but are not limited to, areas of SEPP 14 wetlands and areas of FT "swamp mahogany" (FT no. 30), "paperbark" (FT no. 31), "swamp oak" (FT no. 32), "mangrove" (FT no. 33), "swamp" (FT no. 231), and "water surfaces" (FT no. 235).

Condition 1. Species Considered

1.1 Species Requiring Ameliorative Measures

a) The conditions of this licence apply to the threatened species of fauna and flora listed in Schedule 5 of this licence, condition 1.2 (a) i. of this licence**,** and those species listed in Schedule 1 Part 4 of the TSC Act as presumed extinct.

b) The conditions of this licence also apply to Protected Fauna and Protected Native Plants.

(*Note: Schedule 5 of this licence includes tables detailing:*

i. *threatened fauna species that are considered adequately covered by the General conditions;*

ii. *threatened fauna species that are considered adequately covered by Species-specific conditions;*

iii. *threatened flora species that require Species-specific conditions; and*

iv. *protected fauna and protected native plants that require Species-specific conditions*.)

1.2 Species Requiring Site-specific conditions

a) The following species require the development of Site-specific conditions in accordance with conditions 1.2 (b) and (c) of this licence:

i. *Litoria castanea*, *Litoria piperata*, *Heleioporous australiacus*, Broad-headed Snake, Black-breasted Button-quail, Black-throated Finch, Double-eyed Fig Parrot, Eastern Bristlebird, Red Goshawk, Red-tailed Black-Cockatoo, Black-striped Wallaby, Broad-toothed Rat, Eastern Quoll, maternity roosts of *Miniopterus australis*, maternity roosts of *Miniopterus schreibersii*;

ii. Species regarded as new to science and considered likely to be subject to Condition 1.3;

iii. Species listed on the TSC Act Schedule 1 Part 4 as presumed extinct; and

iv. Threatened species other than those listed in schedule 5 of this licence, and in addition to those species listed in conditions 1.2 (a) i. and 1.2 (a) ii. of this licence recorded within the compartment, or within five kilometres outside the boundary of the compartment, which are likely to be affected by forestry activities.

b) If, while compiling data pursuant to condition 8.5, SFNSW becomes aware of a record of a species listed in condition 1.2 (a) of this licence within the compartment or within 100 metres outside the boundary of the compartment (or in the case of Eastern Quoll, Red Goshawk, *Litoria piperata* and *Litoria castanea*, within five kilometres outside the boundary of the compartment), the following must apply:

i. The NPWS must be notified by SFNSW within two working days of SFNSW becoming aware of finding the record to develop an appropriate Site-specific condition.

ii. Specified forestry activities must not commence in the compartment until a Site-specific condition has been developed by NPWS and agreed to by SFNSW.

iii. SFNSW must consult with NPWS to consider: if the record is valid; if the record is indicative of a permanent territory or regular habitat use; appropriate management actions; and any other relevant matters.

(Note: NPWS will consult with SFNSW in the development of a site-specific prescription. This prescription must be agreed to within 30 working days of notification, or longer if agreed.)

c) If a species listed in condition 1.2 (a) of this licence is recorded during the carrying out of specified forestry activities in a compartment, or within 100 metres outside the boundary of the compartment (or in the case of Eastern Quoll, Red Goshawk, *Litoria piperata* and *Litoria castanea*, within five kilometres outside of the boundary of the compartment), the following must apply:

   i. Specified forestry activities must immediately cease within the compartment and within 100 metres outside the boundary of the compartment.

   ii. The NPWS must be notified by SFNSW within two working days of the record being made in order to develop an Site-specific condition.

   iii. Within one week of NPWS being notified of the record, NPWS must consult with SFNSW when preparing a preliminary determination on whether specified forestry activities may recommence in the compartment.

   iv. Unless otherwise agreed in writing by NPWS, specified forestry activities must not re-commence in the compartment until a Site-specific condition has been developed by NPWS and agreed to by SFNSW.

   v. SFNSW must consult with NPWS to consider: if the record is valid; if the record is indicative of a permanent territory or regular habitat use; appropriate management actions; and any other relevant matters.

d) Any Site-specific condition developed under this condition must be implemented.

(Note: NPWS will consult with SFNSW in the development of a site specific prescription. This prescription must be agreed to by NPWS within 30 working days of notification, or longer if agreed.)

1.3 Threatened Species Conservation Act - proposed new listings

a) SFNSW must comply with conditions 1.3 (b), (c) and (d) on receiving a written notice from NPWS to the effect of the following:

   i. There is evidence that a species is present, or is likely to be present, in any part of the Upper North East Region or in any area likely to be affected by the carrying out of forestry operations; and

   ii. There is evidence that the carrying out of forestry operations has, or is likely to have, an adverse effect on the species; and

      1. the Minister administering the *National Parks and Wildlife Act* 1974 has requested that the Scientific Committee consider a proposal to insert the species in Schedule 1 or 2 to the *Threatened Species Conservation Act* 1995; or

      2. the Director-General of National Parks and Wildlife has nominated the species for insertion in Schedule 1 or 2 to the *Threatened Species Conservation Act* 1995; or

      3. the Scientific Committee has initiated for consideration a proposal to insert the species in Schedule 1 or 2 to the *Threatened Species Conservation Act* 1995; or

      4. the Scientific Committee has made a preliminary determination that a proposal to insert the species in Schedule 1 or 2 to the *Threatened Species Conservation Act* 1995 should be supported; and

   iii. the species is not already listed in Schedule 1 or 2 to the *Threatened Species Conservation Act* 1995.

(Note: There is nothing in the Threatened Species Conservation Act 1995 to prevent a relevant nomination or proposal being made by more than one person. Accordingly, the Director-General may nominate a species for insertion in Schedule 1 or 2 to the Act, even where the Director-General is aware that another person has made an identical proposal.)

b) SFNSW must, as far as is reasonably practicable, mitigate any adverse effect of forestry operations on animals or plants of the species occurring prior to notification by NPWS.

c) SFNSW must ensure that any adverse effect of forestry operations on animals or plants of the species is minimised until one of the following occurs:

i. it receives a written notice from NPWS to the effect that it need no longer comply with the requirements of this sub-clause;

ii. where amendments to the approval relating to the species are submitted to the Ministers, until this approval is amended for that purpose or until a decision is made not to amend this approval for that purpose;

iii. the Scientific Committee has made a final determination not to insert the species in Schedule 1 or 2 to the *Threatened Species Conservation Act* 1995; or

iv. a period of 12 months has elapsed since the date of the relevant written notice under condition 1.3 (a).

(Note: Section 32(2) of the Threatened Species Conservation Act 1995 provides that the Scientific Committee must make a determination about a nomination within six months after it is made, or if it has requested additional information about the nomination, after that information has been provided or the period specified in the request by the Scientific Committee has expired.)

d) In determining, for the purposes of condition 1.3 (b) and (c), how to mitigate or minimise any adverse effect of forestry operations on animals or plants of the species concerned, SFNSW must be guided by any relevant advice provided by NPWS.

e) In this clause "adverse effect" in relation to a species (or an animal or plant of a species), includes:

i. harm to,

ii. the picking of, or

iii. damage to any habitat of,

the species concerned (or an animal or plant of the species concerned);

f) Where a Threatened Species is removed from the TSC Act Schedules, SFNSW must consult with NPWS to consider whether the species still requires a condition as part of this licence.

Condition 2. General and Transitional provisions

2.1 General

a) This licence has effect from 1 January 2000 to 31 December 2018.

b) Where the application of these conditions results in twenty percent or more of the area of net logging area of a compartment being made unavailable because of exclusion zones, SFNSW may request that NPWS review the conditions applying to that compartment. Areas retained in lieu of conducting pre-logging and pre-roading surveys as described in condition 7 (b) of this licence must not be counted towards the twenty percent. In compartments where exclusion zones have been retained under condition 6.9.2 of this licence (Large Forest Owl Landscape Approach), a maximum of 3% of the area specifically retained in the compartment as owl exclusion zones can be counted towards the twenty percent. Areas of the net logging area that are made unavailable due to the prohibition of new roads or snig track through High Conservation Value Old Growth Forest can be included in calculations towards the 20% threshold.

c) All specified forestry activities and miscellaneous forestry operations must be conducted in accordance with the conditions of this licence.

d) All specified forestry activities and miscellaneous forestry operations to which this licence applies must be carried out in a competent and reasonable manner.

e) SFNSW must ensure that all employees, contractors, sub-contractors, agents or SFNSW licensees engaged in any aspect of specified forestry activities or miscellaneous forestry operations covered by this licence understand the conditions applying to the specified forestry activities or miscellaneous forestry operations prior to their involvement in those activities.

f) SFNSW must ensure that a SFNSW employee is present at each compartment while harvesting operations are occurring under this licence for the purposes of ensuring compliance with this licence, for at least the equivalent of one full working day per week per harvesting operation.

g) Where there is a conflict between the conditions of this licence and the documents with which this licence requires compliance, the conditions of this licence prevail.

h) Where there is a conflict between the conditions set out in this licence and the conditions set in any other relevant licence issued under the *Forestry and National Parks Estate Act* 1998 SFNSW must consult with the NPWS and the agency responsible for the administration of the relevant legislation to resolve the conflict. Specified forest activities in the compartment where the conflict has occurred must cease until the conflict has been resolved.

i) Where a record has been on the NPWS Atlas of NSW Wildlife for greater than ten years, it may be reviewed by SFNSW as to whether it can be omitted from triggering requirements for protective measures. SFNSW must consult with NPWS in conducting this review. This review must consider:

   i. Original collection information;

   ii. Subsequent surveys or records;

   iii. Species Life History;

   iv. Relevant research; and

   v. Distribution.

j) Where a review of a NPWS Wildlife of NSW Atlas record greater than ten years old is undertaken by SFNSW in accordance with Condition 2.1(i) above, SFNSW must obtain approval in writing from NPWS prior to the rejection or acceptance of the record.

(Notes: Where a condition of this licence requires a matter to be notified to the NPWS, approved by the NPWS, or some other action by the NPWS, then NPWS means the NPWS Manager, Conservation Planning and Programs, Northern or his or her delegate, unless stated otherwise. Condition 2.1 (h) refers to conflict between conditions set out in this licence and conditions of Pollution Control Licence administered by the Environmental Protection Authority and Threatened Fish Species Conservation Protocols administered by New South Wales Fisheries.)

2.2 Transitional provisions

a) Transitional provisions are contained in schedule 11 of this licence.

AMENDMENT 2
28 April 2003
Condition 2.3 added
Ref Appendix E

2.3 Accidental felling of trees

a) For the purposes of this licence, a tree is accidentally felled into an area such as an exclusion zone only if it is apparent that:

   i. techniques of directional felling were used in an attempt to fell the tree away from the area; or
   ii. an attempt was made using some other method (such as a mechanical harvester) to fell the tree away from the area.

b) However, a tree is not accidentally felled into the area if the person responsible for the felling of the tree knew, or could reasonably have been expected to know, that the tree would fall into the area.

Condition 3. Planning Documentation

AMENDMENT 2
28 April 2003
Condition 3a) replaced
Ref Appendix E

a) SFNSW must prepare planning documentation that demonstrates that operational planning has taken account of the requirements of the conditions of this licence. This must include showing all exclusion zones, buffer zones and protection zones on the relevant harvesting plan operational map, except where the scale of the map does not allow small area features to be adequately represented; in which case the location of the zone should be adequately indicated. The harvesting plan

operational map legend must, to the greatest extent practicable, indicate to which feature or species the exclusion or buffer zones relates.

b) The Harvesting or Operational Plan must state which Species-specific conditions will be applied in the area of operations.

c) The Harvesting or Operational Plan must contain the Site-specific conditions relevant to the area of operations as approved by and provided in writing by NPWS (as per condition 1.2 of this licence).

d) The Harvesting or Operational Plan and any relevant planning documentation must be kept on file at the relevant SFNSW Regional Office.

e) All the requirements of conditions 3 (a), (b), (c) and (d) of this licence, including any variations approved by NPWS, must be met prior to specified forestry activities commencing in the compartment.

f) All records, documentation and registers required by this licence must be kept for at least three years after the action or event took place in respect of which the record has been created.

g) All records, documentation and registers must be kept in a legible form.

h) Copies of records, documentation and registers requested in writing by NPWS must be received by the nominated NPWS office within ten working days of the request, unless otherwise agreed.

Condition 4. Reporting and Information Requirements

4.1 Provision of Data to NPWS

SFNSW must provide the NPWS with:

AMENDMENT 2
28 April 2003
Condition 4.1a) replaced
Ref Appendix E

a) Harvesting Plans or Operational Plans, approved by the relevant SFNSW Regional Manager, Pre-logging and Pre-roading Survey Reports, registers and maps showing exclusion zones and protection zones, as requested by NPWS within ten working days of the request. These can be provided as hard copy or electronically.

b) A colour copy of the operational and location map, when available, for all compartments in which SFNSW undertake specified forestry activities.

c) A list of compartments in which specified forestry activities has either been undertaken in the previous calender month or is proposed to be undertaken in the next calender month by the second Monday of each calender month or the next working day. This list must detail the following: SFNSW region; state forest name; compartment number; and as relevant: date operations commenced (day/ month/ year); date operations finished (day/ month/ year); date operations proposed to commence; whether operations are current. This list must be provided by the relevant SFNSW Regional Manager in both digital and hard copy formats.

d) Maps at an appropriate scale showing the location of Ridge and Headwater Habitat (as per condition 5.8 of this licence) within each SFNSW Management Area by 31 March 2000.

e) Records suitable for the NPWS Atlas of NSW Wildlife for all threatened species recorded on SFNSW estate. These must be forwarded by agreed electronic means to NPWS Head Office GIS Unit at three monthly intervals. These data should be provided prior to specified forestry activities commencing in the area surveyed.

f) Each SFNSW Regional Manager responsible for the land to which this licence applies must keep a register of every incident of non-compliance with the conditions of this licence. The register must contain the following information known to SFNSW:

   i. the date, time and duration of the non-compliance;

   ii. the date upon which SFNSW became aware of the non-compliance;

   iii. the exact location of the non-compliance, either marked on the operational map or in the form of Australian Map Grid co-ordinates;

   iv. the name of the person who caused the non-compliance;

   v. the nature of the non-compliance;

vi. the reasons for the non-compliance;

vii. whether the non-compliance resulted in any environmental harm;

viii. any remedial action taken by SFNSW or any other person in relation to the non-compliance and the dates upon which it was taken;

ix. any disciplinary action taken by SFNSW against any of its contractors, employees, licensees or agents and the dates upon which it was taken;

x. any measures taken or proposed to be taken to prevent or mitigate the recurrence of such a non-compliance;

xi. the name of the Supervising Forestry Officer that was responsible for the supervision of SFNSW staff and other people involved in the forestry operation that caused the non-compliance;

xii. a full report from the officer causing the non-compliance; and

xiii. what pre harvesting audit and post harvesting audit check were carried out to check compliance.

4.2 Availability of Data

a) Copies of the following documents must be made available for inspection by any person at each SFNSW Regional Office or relevant Operational Centre responsible for land to which this licence applies:

i. this licence; and

ii. all planning documentation and registers relating to harvesting operations, including Harvesting and Operational Plans and Site-specific conditions.

b) Copies of all planning documentation for harvesting operations which are the responsibility of the SFNSW Regional Office or relevant Operational Centre must be made available to any person for photocopying at a reasonable cost.

c) Condition 4.2 (a) does not apply where SFNSW has received a direction in writing from NPWS that certain specified documents that reveal the location of a threatened species are not to be disclosed.

d) SFNSW shall not disclose or provide any person not directly involved in the planning or the conduct of the specified forest activities with any documentation or information for which a notice under condition 4.2 (c) has been issued.

Condition 5. General conditions

5.1 Operational Requirements

AMENDMENT 2
28 April 2003
Condition 5.1a) replaced
Ref Appendix E

a) For all exclusion zones implemented under the conditions of this licence the following must apply (except where otherwise indicated in this licence):

i. All specified forestry activities are prohibited in exclusion zones. In the case of exclusion zones surrounding wetlands, except for SEPP 14 wetlands, harvesting of tea tree oil is permitted as per conditions 5.9 Wetlands and condition 5.19 Tea Tree Protection of this licence.

ii. Trees must not be felled into exclusion zones (except where expressly permitted by another condition of this licence). If a tree accidentally falls into an exclusion zone, then no part of that tree can be removed, except as referred to in condition 5.1 (a2).

iii. Harvesting machinery is prohibited from operating in exclusion zones, except for:

1. road re-opening and routine road maintenance;

2. the construction and operation of roads and snig tracks in accordance with conditions 5.1 (b), 5.3 (i), 5.4 (e), 5.5 (i) and 5.7 (r to u); and

3. the traversing of exclusion zones on existing roads; and

4. in the case of exclusion zones identified in conditions 5.8, 5.11, 5.13, 5.14, 6.1 – 6.10, 6.12 – 6.18, 6.20 – 6.25 and 7.0 (b) accessing trees in the net logging area using harvesting machinery where:

   i. the technique of directional felling could not be used to fall a tree that is outside the exclusion zone (and within the net logging area) away from the zone; and

   ii. the tree contains a timber log; and

   iii. the only practicable method of felling that tree is to enter the exclusion zone with harvesting machinery and fell the tree; and

   iv. the tree is felled away from the exclusion zone; and

   v. the wheels or tracks of the machinery remain wholly within 5 metres of the boundary of the exclusion zone with the net logging area; and

   vi. the use of the harvesting machinery only involves the use of walkover techniques and minimises to the greatest extent practicable skewing of machine tracks; and

   vii. the harvesting machinery operates with any blades, rippers or similar attachments positioned so that they do not disturb the ground, vegetation or soil.

AMENDMENT 2
28 April 2003
Condition 4.1 a1)-a4)added
Ref Appendix E

a1) Condition 5.1 (a) is not breached where a tree is accidentally felled into an exclusion zone.

a2) An accidentally felled tree may be removed from the exclusion zone despite condition 5.1 (a), but only if this is expressly permitted by another condition of this licence applying to the exclusion zone.

a3) Harvesting machinery that has entered an exclusion zone for the purpose of accessing trees in the net logging area (under condition 5.1 (a) (iii)) may also be used to remove any tree that has been felled into the exclusion zone in accordance with another condition of this licence (such as condition 6.13 (Hastings river mouse), condition 6.15 (Spotted-tailed Quoll) and condition 6.16 (Squirrel Glider)) or that is otherwise permitted to be removed (such as an accidentally felled tree) from the zone.

a4) However, the wheels or tracks of the harvesting machinery may not (to any significant extent) be repositioned or moved solely for the purpose of removing the tree. In other words, they may be repositioned or moved only if this is necessary for a purpose related to accessing trees in the net logging area. For the avoidance of doubt, the restrictions on the operation of the harvesting machinery set out in condition 5.1 (a) (iii) (such as the wheels or the tracks remaining within 5 metres of the boundary of the exclusion zone) apply to the operation of the machinery when removing the tree.

AMENDMENT 2
28 April 2003
Condition 5.1.b) replaced
Ref Appendix E

AMENDMENT 3
17 May 2004
modified
Ref Appendix E

AMENDMENT 4
22 Nov 2007
Deleted 6.13A
Inserted 6.13B

b) The construction, reopening and operation of tracks used for the purposes of snigging and roads in exclusion zones implemented under the following conditions 5.13 Bird Nest and Roost Site Protection, 5.14 Bat Roost Protection, 6.1 Pouched Frog, 6.2 Green and Golden Bell Frog, 6.3 Giant Barred Frog, Fleay's Frog, Stuttering Frog, 6.4 Philoria spp, 6.5 White-crowned Snake, 6.6 Pale-headed Snake, 6.7 Albert's Lyrebird, 6.8 Marbled Frogmouth, 6.9 Powerful Owl, Masked Owl, Barking Owl, 6.10 Rufous Scrub-bird, 6.12 Brush-tailed Phascogale, 6.13 Hastings River Mouse, 6.13B Hastings River Mouse (Special provisions for various compartments), 6.14 Koala, 6.15 Spotted-tailed Quoll, 6.16 Squirrel Glider, 6.17 Yellow-bellied Glider, 6.18 Wombat, 6.20 Golden-tipped Bat, 6.21 Large-footed Myotis, 6.22 Threatened Flora, 6.23 Threatened Flora, 6.24 Threatened Flora, 6.25 Threatened Flora, 6.26 Threatened Flora and 6.28 Threatened Flora that are contained within areas of High Conservation Value Old Growth Forest referred to in Condition 5.3, Rainforest and exclusion zones around warm temperate Rainforest referred to in condition 5.4, Rare Non Commercial Forest Types referred to in condition 5.5 or in protection zones referred to condition 5.7 is only permitted with the prior written approval of the NPWS. Matters that SFNSW must address in order to seek NPWS approval are detailed in Schedule 6 of this licence.

c) An approval granted under condition 5.1 (b) may be issued subject to conditions. The conditions that form part of that approval also form part of the conditions of this licence. NPWS may apply conditions for the mitigation or amelioration of impacts as it determines appropriate.

d) Buffer zones must be managed in accordance with the relevant conditions in this licence.

e) All distances must be measured on the ground independent of slope.

f) All exclusion zone and buffer zone boundaries must be marked in the field, except where specified forestry activities will not come within 50 metres of such boundaries. The outer edge of lines shown on the map is considered to represent the boundary of the mapped feature when marking the feature in the field.

g) Subject to the statutory requirements under the *Rural Fires Act* 1997, hazard reduction work must not be conducted in exclusion zones and buffer zones.

h) Marking-up must be conducted at least 100 metres in advance of harvesting operations, road construction and road re-opening operations (unless otherwise specified in this licence) so relevant exclusion and buffer zones can be implemented prior to harvesting, road construction and road re-opening occurring.

i) SFNSW must develop a standard tree marking-up code to apply to all operations, unless specifically excluded, by 30 June 2000. The code must include, but not be limited to, tree marking criteria for the following: exclusion zone boundaries, buffer zone boundaries, hollow-bearing trees, recruitment trees, eucalypt feed trees, Yellow-bellied Glider and Squirrel Glider sap feed trees.

j) Where a provision in this licence allows the re-opening or the construction of a road or snig track that provision is also taken to authorise the use of the road , or use of tracks for the purposes of snigging, unless that use is specifically prohibited or restricted.

5.2 Compartment Mark-up Surveys

5.2.1 General Requirements

a) An adequately trained person must conduct a thorough search for, record and appropriately mark the following threatened and protected species features during or before the marking-up of a compartment.

   i. Nests and roosts for those species listed in condition 5.13 of this licence;

   ii. Dens of the following species: Yellow-bellied Glider, Squirrel Glider and Brush-tailed Phascogale;

b) Koala high use and intermediate use areas (see condition 5.2.2 below for requirements);

   i. Flying-fox camps;

   ii. Latrine and den sites of the Spotted-tailed Quoll;

   iii. Distinctive scats (eg. Spotted-tailed Quoll, Koala);

   iv. *Allocasuarina* spp. with more than 30 crushed cones beneath;

   v. Yellow-bellied Glider and Squirrel Glider sap feed trees;

   vi. Microchiropteran bat tree roosts;

   vii. Microchiropteran bat subterranean roosts (caves, tunnels and disused mineshafts);

   viii. Swift Parrot and Regent Honeyeater feed or nest trees;

   ix. Wombat burrows (north of the Oxley Highway only);

   x. Permanent soaks and seepages in *Philoria* spp. potential habitat; and

   xi. Threatened flora and protected native plant species likely to occur within the compartment requiring protection under conditions 6.22, 6.23, 6.24, 6.25, 6.26 and 6.27 of this licence.

c) Searches for threatened species features must be conducted within that portion of the net logging area where harvesting will occur, and within 50 metres outside this area.

d) Harvesting Operations are prohibited in areas which have not been subject to compartment mark up surveys.

e) Where any of these features are found, the feature must be recorded, the Harvesting Plan, including the Operational map, must be amended accordingly and the appropriate condition applied.

5.2.2 Koala Mark-up Searches

a) In compartments which contain preferred forest types, marking-up must be conducted at least 300 metres in advance of harvesting operations.

b) During the marking up of the compartment, an adequately trained person must inspect trees at ten metres intervals. Primary browse trees must be inspected. In the event that there are no primary browse trees, secondary browse trees must be inspected. In the event that there are no primary browse trees or secondary browse trees, other trees and incidental browse trees must be inspected. Inspections must include thoroughly searching the ground for scats within at least one metre of the base of trees greater than 30 centimetres dbhob.

c) Koala Star search

i. A Koala Star search must be conducted when:

- Three out of any ten consecutive trees inspected are found to have one or more scats beneath them; OR
- a sighting of Koala; OR
- a tree with more than 20 scats beneath; OR
- any trees with scats of two distinctly different sizes beneath.

ii. The star search comprises eight transects radiating out from a central point. The central point of the Star must be centred on the feature listed in condition 5.2.2 (c) i. above.

iii. A search for Koala scats must be conducted along each of the eight transects. Each transect must be a minimum 100 metres length. In any one 100 metres section of each transect, ten trees must be inspected for scats. Inspections must include thoroughly searching the ground for scats within at least one metre of the base of the tree. Primary browse trees must be inspected, in the event that there are no primary browse trees, secondary browse trees must be inspected. In the event that there are no primary browse or secondary browse trees, other trees and incidental browse trees must be inspected. Trees inspected should be approximately ten metres apart along the transect and should have a dbhob of greater than 30 centimetres.

iv. The eight transects must continue for at least 100 metres outside the boundary of any Koala high use area.

v. Instead of conducting the eight transects in conditions 5.2.2 (c) ii. and iii. above, the boundary of a potential high use area can be estimated in the field. The area of potential high use must be protected as high use. Eight transects must be conducted for at least 100 metres outside the boundary of the potential high use area. Searches along these transects must be consistent with condition 5.2.2 (c) ii, iii and iv above.

vi. Condition revoked (Amendment 2).

vii. Where a Koala high use area is detected within 50 metres of the boundary of the net logging area, surveys of adjacent habitat on public land must be undertaken. These surveys must include inspecting trees for Koalas and inspecting the base of trees for Koala scats.

viii. An inspection of the boundary of the Koala high use area must be made, and any relevant observations should be recorded on data sheets.

ix. The Harvest Plan Operational Map must be amended to indicate the location and extent of the Koala high use area.

AMENDMENT 2
28 April 2003
Condition 5.3 replaced
Ref Appendix E

5.3 High Conservation Value Old Growth Forest

a) Specified forestry activities, except tree felling in accordance with condition 5.3 (b), road and snig track construction in accordance with condition 5.3 (i), and road re-opening, are prohibited within all areas of High Conservation Value Old Growth Forest.

b) The felling of trees across the boundary of High Conservation Value Old Growth Forest is prohibited except where no more than six (6) trees containing a timber log are felled across the boundary in any 200 metre length of the boundary of the High Conservation Value Old Growth Forest, whatever 200 metre length of boundary is considered.

c) Condition 5.3 (b) is not breached where a tree is accidentally felled into High Conservation Value Old Growth Forest.

d) A tree that is accidentally felled into High Conservation Value Old Growth Forest may be removed from the forest but only if the tree contains a timber log. The tree may be removed even if the total number of trees removed in the harvesting operation concerned will, as a result, exceed the number calculated by applying the principle set out in condition 5.3 (b).

e) A tree that is felled into High Conservation Value Old Growth Forest under condition 5.3 (b), or felled accidentally, may be removed only in accordance with the following rules:

   i. the crown must be cut off from the trunk and left where it has fallen, except where the whole of the tree is lifted out of the forest, or lifted and moved within the forest, using a mechanical harvester; and

   ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

f) Harvesting machinery is prohibited within areas of High Conservation Value Old Growth Forest, except for:

   i. the purpose of routine road maintenance, road and snig track construction in accordance with condition 5.3 (i), and road re-opening; and

   ii. accessing trees in the net logging area using harvesting machinery where:

      1. the technique of directional felling could not be used to fall a tree that is outside the High Conservation Value Old Growth Forest (and within the net logging area) and away from the Forest; and

      2. the tree contains a timber log; and

      3. the only practicable method of felling that tree is to enter the High Conservation Value Old Growth Forest with harvesting machinery and fell the tree; and

      4. the tree is felled away from the High Conservation Value Old Growth Forest; and

      5. the wheels or tracks of the machinery remain wholly within 5 metres of the boundary of the High Conservation Value Old Growth Forest with the net logging area; and

      6. the use of the harvesting machinery only involves the use of walkover techniques and minimises to the greatest extent practicable skewing of machine tracks; and

      7. the harvesting machinery operates with any blades, ripper or similar attachments positioned so that they do not disturb the ground, vegetation or soil.

g) Harvesting machinery that has entered High Conservation Value Old Growth Forest for the purpose of accessing trees in the net logging area (under condition 5.3 (f)) may also be used to remove any tree that has been felled into the Forest under condition 5.3 (b) or accidentally.

h) However, the wheels or tracks of the harvesting machinery may not (to any significant extent) be repositioned or moved solely for the purpose of removing the tree. In other words, they may be repositioned or moved only if this is also necessary for a purpose related to accessing trees in the net logging area. For the avoidance of doubt, the restrictions on the operation of the machinery set out in condition 5.3 (f) (ii) (such as the wheels or tracks remaining within 5 metres from the boundary) apply to the operation of the machinery when removing the tree.

i) A road and snig track may be constructed, and used in any area that is, or is within, High Value Conservation Old Growth Forest, only where:

i. there is no practicable alternative site available for the purposes of the construction; and

ii. there has been no record made of any threatened species on the site of the proposed construction; and

iii. prior to the construction, the SFNSW Regional Manager that is responsible for managing the land on which the construction is proposed to be carried out (or a more senior officer), has prepared a report addressing the matters in Schedule 6 of this licence and has authorised the construction in writing; and

iv. all practicable measures are taken to minimise any adverse impacts of the construction on the environment; and

v. such areas are not in exclusion zones relating to threatened species referred to in condition 5.1 (b) unless carried out in accordance with condition 5.1 (b).

j) A copy of the written approval of the SFNSW Regional Manager which addresses the matters raised in Schedule 6 of this licence must be faxed to NPWS, as soon as possible after the approval has been issued.

k) In the construction and the operation of snig tracks in High Conservation Value Old Growth Forest in accordance with condition 5.3 (i), hollow-bearing trees must not be used as bumper trees for moving logs.

l) Where an exclusion zone referred to in condition 5.1 (b) as it relates to a threatened species is located either wholly or partially within an area of High Conservation Value Old Growth Forest, then SFNSW is only permitted to construct roads and snig tracks in accordance with condition 5.1 (b).

m) The boundary on the ground of High Conservation Value Old Growth Forest must be identified using the line work as depicted:

AMENDMENT 3
17 May 2004
modified
Ref Appendix E

i. in the Geographic Information System theme in ESRI grid format called "hcovog1_prtctd" in the sub-directory called "Protected HCVOG" on the CD-Rom having the volume label "991221_1516 (21 Dec 1999)" and held by Resource and Conservation Division, and further described in the corresponding metadata on the CD-Rom; and

ii. in the Geographic Information System theme in ESRI grid format called "ogtoprotect2" in the sub-directory called "Additional Protected OG" on the CD-Rom having the volume label "030423_1132 (23 April 2003)" and held by Resource and Conservation Division, and as may be further described on corresponding metadata on the CD-Rom.

5.4 Rainforest

a) Specified forestry activities, except road and snig track construction in accordance with condition 5.4 (e), and road re-opening, are prohibited within all areas of Rainforest and exclusion zones around warm temperate Rainforest.

b) A 20 metres wide exclusion zone must be implemented around all areas of warm temperate rainforest, as defined by RN 17 and mapped on Forestry Commission of New South Wales Forest Type maps.

c) Trees must not be felled into Rainforest and exclusion zones around warm temperate Rainforest referred to in condition 5.4 (a) and b) above. If a tree falls into an area of Rainforest or a Rainforest exclusion zone, then no part of that tree can be removed from that area.

(*Note: NPWS does not intend to take proceedings where SFNSW can demonstrate that the tree was accidentally felled into Rainforest. The tree will not be considered to have been accidentally felled in the felling is a result of poor judgement on the part of the faller.*)

AMENDMENT 2
28 April 2003
Condition 5.4c1)-c3) added
Ref Appendix E

c1) Condition 5.4 (c) is not breached where a tree is accidentally felled into rainforest or an exclusion zone around warm temperate Rainforest.

c2) Despite condition 5.4 (c), where a tree that is accidentally felled into a Rainforest and or an exclusion zone around warm temperate Rainforest in the course of a harvesting operation may be

removed, but only if the tree contains a timber log. For the avoidance of doubt, the whole of the tree (subject to condition 5.4 (c3) (i)) may be removed even though the timber product that any part of the tree will produce is not a timber log.

c3) The following rules apply to the removal of the tree:

i. the crown must be cut off from the trunk and left where it has fallen except where the whole of the tree is lifted out of, or lifted and moved within, the Rainforest or exclusion zone using a mechanical harvester;

ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

d) Harvesting machinery is prohibited within areas of Rainforest, except for the purpose of routine road maintenance, road and snig track construction in accordance with condition 5.4 (e) and road re-opening.

AMENDMENT 2
28 April 2003
Condition 5.4e) replaced
Ref Appendix E

e) A road and snig track may be constructed, and used in any area that is, or is within, a Rainforest or an exclusion zone around warm temperate Rainforest, only where:

i. there is no practicable alternative site available for the purposes of the construction; and

ii. there has been no record made of any threatened species on the site of the proposed construction; and

iii. prior to the construction, the SFNSW Regional Manager that is responsible for managing the land on which the construction is proposed to be carried out (or a more senior officer), has prepared a report addressing the matters in Schedule 6 of this licence and has authorised the construction in writing; and

iv. all practicable measures are taken to minimise any adverse impacts of the construction on the environment; and

v. such areas are not in exclusion zones relating to threatened species referred to in condition 5.1 (b) unless carried out in accordance with condition 5.1 (b).

f) A copy of the written approval of the SFNSW Regional Manager must be faxed to NPWS, which address the matters raised in Schedule 6 of this licence, as soon as possible after the approval has been issued.

g) In the construction and the operation of snig tracks in Rainforest in accordance with condition 5.3 (d), hollow-bearing trees must not be used as pivot or bumper trees for moving logs.

h) Where an exclusion zone referred to in condition 5.1 (b) as it relates to a threatened species is located either wholly or partially within an area of Rainforest, or wholly or partially within an exclusion zones around warm temperate Rainforest, then SFNSW is only permitted to construct roads and snig tracks in accordance with condition 5.1 (b).

AMENDMENT 2
28 April 2003
Condition 5.5 replaced
Ref Appendix E

5.5 Rare Non-Commercial Forest Types

a) Specified forestry activities, except tree felling in accordance with condition 5.5 (b), road and snig track construction in accordance with condition 5.5 (i), road re-opening and harvesting of tea tree oil, are prohibited within all Rare Non-Commercial Forest Types.

b) The felling of trees across the boundary of a Rare Non-Commercial Forest Type area is prohibited except where no more than six (6) trees containing timber logs are felled across the boundary in any 200 metre length of the boundary of the Rare Non-Commercial Forest Type area, whatever 200 metre length of boundary is considered.

c) Condition 5.5 (b) is not breached where a tree is accidentally felled into a Rare Non-Commercial Forest Type area.

d) A tree that is accidentally felled into a Rare Non-Commercial Forest Type area may be removed from the area, but only if the tree contains a timber log. The tree may be removed even if the total number of trees removed in the harvesting operation concerned will, as a result, exceed the number calculated by applying the principle set out in condition 5.5 (b).

e) A tree that is felled into a Rare Non-Commercial Forest Type area under condition 5.5 (b), or felled accidentally, may be removed only in accordance with the following rules:

   i. the crown must be cut off from the trunk and left where it has fallen, except where the whole of the tree is lifted out of, or lifted and moved within, the area using a mechanical harvester; and

   ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

f) Harvesting machinery is prohibited within areas of a Rare Non-Commercial Forest Type area, except for:

   i. the purpose of routine road maintenance, road and snig track construction in accordance with condition 5.5 (i), road re-opening; and

   ii. accessing trees in the net logging area using harvesting machinery where:

      1. the technique of directional felling could not be used to fall a tree that is outside the Rare Non-Commercial Forest Type area (and within the net logging area) away from that area; and

      2. the tree contains a timber log; and

      3. the only practicable method of felling that tree is to enter the Rare Non-Commercial Forest Type area with harvesting machinery and fell the tree; and

      4. the tree is felled away from the Rare Non-Commercial Forest Type area; and

      5. the wheels or tracks of the machinery remain wholly within 5 metres of the boundary of the Rare Non-Commercial Forest Type area with the net logging area; and

      6. the use of the harvesting machinery only involves the use of walkover techniques and minimises to the greatest extent practicable skewing of machine tracks; and

      7. the harvesting machinery operates with any blades, rippers or similar attachments positioned so that they do not disturb the ground, vegetation or soil.

g) Harvesting machinery that has entered Rare Non-Commercial Forest Type area for the purpose of accessing trees in the net logging area (under condition 5.5 (f)) may also be used to remove any tree that has been felled into the Forest under condition 5.5 (b) or accidentally.

h) However, the wheels or tracks of the harvesting machinery may not (to any significant extent) be repositioned or moved solely for the purpose of removing the tree. In other words, they may be repositioned or moved only if this is also necessary for a purpose related to accessing trees in the net logging area. For the avoidance of doubt, the restrictions on the operation of the machinery set out in condition 5.5 (f) (ii) (such as the wheels or tracks remaining within 5 metres from the boundary) apply to the operation of the machinery when removing the tree.

i) A road and snig track may be constructed, and used in any area that is, or is within, Rare Non-Commercial Forest Types, only where:

   i. there is no practicable alternative site available for the purposes of the construction;

   ii. there has been no record made of any threatened species on the site of the proposed construction; and

   iii. prior to the construction, the SFNSW Regional Manager that is responsible for managing the land on which the construction is proposed to be carried out (or a more senior officer), has prepared a report addressing the matters in Schedule 6 of this licence and has authorised the construction in writing; and

   iv. all practicable measures are taken to minimise any adverse impacts of the construction on the environment; and

   v. such areas are not in exclusion zones relating to threatened species referred to in condition 5.1 (b) unless carried out in accordance with condition 5.1 (b).

j) A copy of the written approval of the SFNSW Regional Manager which addresses the matters raised in Schedule 6 of this licence must be faxed to NPWS, as soon as possible after the approval has been issued.

k) In the construction and the operation of snig tracks in Rare Non-Commercial Forest Types in accordance with condition 5.5 (i), hollow-bearing trees must not be used as bumper trees for moving logs.

l) Where an exclusion zone referred to in condition 5.1 (b) as it relates to a threatened species is located either wholly or partially within an area of Rare Non-Commercial Forest Type, then SFNSW is only permitted to construct roads and snig tracks in accordance with condition 5.1 (b).

m) Harvesting of tea tree oil must comply with condition 5.19 Tea-tree Protection of this licence.

5.6 Tree Retention

The following condition must be applied within the non-regrowth zone:

a) Non-regrowth Zone Hollow-bearing Tree Retention

i. A minimum of ten hollow-bearing trees must be retained per two hectares of net logging area. Where this density is not available, the existing hollow-bearing trees must be retained plus additional trees must be retained to meet the requirement of ten per two hectares. The additional trees retained must be those with the largest dbhob.

ii. Retained, hollow-bearing trees must be selected from the trees with the largest dbhob and must be live trees and should have good crown development and minimal butt damage.

iii. Retained hollow-bearing trees must represent the range of hollow-bearing species that occur in the area. Preference should be given to selecting those species or trees which are most suitable for the threatened species known or likely to occur in the area.

iv. Trees retained outside the net logging area must not be counted as hollow-bearing trees. Stags must not be counted as hollow-bearing trees.

v. Hollow-bearing trees must be scattered throughout the net logging area, except where compliance with condition 5.6 (a) ii. above prevents such retention.

b) Non-regrowth Zone Recruitment Tree Retention

i. A minimum of ten recruitment trees must be retained per two hectares of net logging area.

ii. Retained recruitment trees must show potential for developing into hollow-bearing trees. Retained recruitment trees must have good crown development and should have minimal butt damage and should not be suppressed. Mature and late mature trees must be retained as recruitment trees where they are available.

iii. Retained recruitment trees must represent the range of species in the mature and late mature growth stages that occur in the area. Preference should be given to selecting those species or trees which are most suitable for the threatened species known or likely to occur in the area.

iv. Trees retained outside the net logging area must not be counted as recruitment trees.

v. Recruitment trees must be scattered throughout the net logging area, except where compliance with condition 5.6 (b) ii. above prevents such retention..

The following condition must be implemented within the regrowth zone:

c) Regrowth Zone Hollow-bearing Tree Retention

i. A minimum of ten-hollow bearing trees must be retained per two hectares of net logging area. Where this density is not available then those hollow-bearing trees present within the net logging area must be retained.

ii. Retained, hollow-bearing trees must be selected from the trees with the largest dbhob and must be live trees and should have good crown development and minimal butt damage.

iii. Retained hollow-bearing trees must represent the range of hollow-bearing species that occur in the area. Preference should be given to selecting those species or trees which are most suitable for the threatened species known or likely to occur in the area.

iv. Trees retained outside the net logging area must not be counted as hollowing-bearing trees. Stags must not be counted as hollow-bearing trees.

v. Hollow-bearing trees must be scattered throughout the net logging area, except where compliance with condition 5.6 (c) ii. above prevents such retention.

d) Regrowth Zone Recruitment Tree Retention

i. For each hollow-bearing tree retained under condition 5.6 (c) above, one recruitment tree must be retained.

ii. Retained recruitment trees must show potential for developing into hollow-bearing trees. Retained recruitment trees must have good crown development, and should have minimal butt damage and should not be suppressed. Mature and late mature trees must be retained as recruitment trees where available.

iii. Retained recruitment trees must represent the range of species of mature and late mature growth stages that occur in the area. Preference should be given to selecting those species or trees which are most suitable for the threatened species known or likely to occur in the area.

iv. Trees retained outside the net logging area must not be counted as recruitment trees.

v. Recruitment trees must be scattered throughout the net logging area, except where compliance with condition 5.6 (d) ii. above prevents such retention..

The following conditions must be implemented in both the regrowth and non-regrowth zones:

e) Stag Retention

i. Where more than ten stags per two hectares occur in the net logging area, a minimum of ten stags must be retained per two hectares of net logging area where it is safe to do so. If there are less then ten stags per two hectares, then all stags should be retained where it is safe to do so.

ii. Stags must not be counted as hollow-bearing trees or recruitment trees.

f) Significant Food Resources

i. Where more than 30 crushed *Allocasuarina* seed cones have been found beneath an individual of *Allocasuarina* spp., indicating intensive use by the Glossy Black-Cockatoo, the tree must be retained and protected from specified forestry activities.

ii. Specified forestry activities should be conducted in such a manner as to minimise damage to stands where *Allocasuarina* spp. dominate the canopy, sub-canopy or understorey.

(Note: it is not the intention to stop harvesting operations in areas identified in condition 5.6 (f) ii. above.)

iii. At least six eucalypt feed trees must be retained in every two hectares of net logging area where they occur. Where a retained eucalypt feed tree also meets the requirements of a hollow-bearing or recruitment tree, the eucalypt feed tree can be counted as a hollow-bearing or recruitment tree.

iv. All Yellow-bellied Glider and Squirrel Glider sap feed trees must be retained. Where a retained sap feed tree also meets the requirements of a hollow-bearing or recruitment tree, the sap feed tree can be counted as a hollow-bearing or recruitment tree.

v. Damage to flowering or fruiting banksias and *Xanthorrhoea* spp. should be avoided during forestry operations.

g) Protection of retained trees

i. When conducting specified forestry activities and post-logging burning, damage to trees retained under conditions 5.6 (a), 5.6 (b), 5.6 (c), 5.6 (d), 5.6 (e) and 5.6 (f) of this licence must be minimised to the greatest extent practicable. During harvesting operations, the potential for damage to these trees must be minimised by utilising techniques of directional felling.

ii. In the course of conducting specified forestry activities, logging debris must not, to the greatest extent practicable, be allowed to accumulate within five metres of a retained hollow-

bearing tree, recruitment tree, stag, *Allocasuarina* with more than 30 crushed cones beneath, eucalypt feed tree, or Yellow-bellied Glider or Squirrel Glider sap feed tree. Logging debris within a five metres radius of retained trees must be removed or flattened to a height of less than one metre. Disturbance to ground and understorey must be minimised to the greatest extent practicable within this five metres radius. Habitat and recruitment trees must not be used as bumper trees during harvesting operations.

iii. Retained trees referred to in conditions 5.6 (a) i., 5.6 (b) i., 5.6 (c) i., 5.6 (d) i., 5.6 (e) i., 5.6 (f) i., 5.6 (f) iii. and 5.6 (f) iv. of this licence must be marked for retention. The only exception to the marking of the retained trees can occur where the understorey consists of thick impenetrable lantana greater than one metre high or other impenetrable understorey.

SFNSW must clearly document and justify such situations in harvest planning documentation either during pre-planning or as it becomes apparent during compartment mark-up.

AMENDMENT 2
28 April 2003
Condition 5.7 replaced
Ref Appendix E

5.7 Riparian Habitat Protection

a) Protection zones (hard) must be retained along the entire length of all streams and must have the minimum widths either side of the stream in accordance with Table 1. The width of the protection zone (hard) must be measured from the top of the bank of the incised channel or, where there is no defined bank, from the edge of the channel. Where there is no incised channel, the protection zone (hard) must be measured from the centreline of the drainage feature.

b) Protection zones (soft) must be retained along the entire length of all protection zones (hard) and must have a minimum width either side of the protection zone (hard) in accordance with Table 1. The width of a protection zone (soft) must be measured from the edge of the protection zone (hard) furthest from the stream.

c) The determination of stream order for the purposes of Table 1 must be carried out in accordance with Schedule 1 of this licence.

Table 1: Minimum protection zone (hard) and protection zone (soft) widths for streams (metres - measured along the ground surface).

Stream Order	Protection zone (hard)	Protection zone (soft)
1st Order	5	5
2nd Order	5	15
3rd Order	5	25
4th Order or greater	5	45

Operations within protection zones (hard)

d) Specified forestry activities, except road and snig track construction in accordance with conditions 5.7 (r to u) and road re-opening, are prohibited within the protection zone (hard).

e) Trees must not be felled into the protection zone (hard).

f) Condition 5.7 (e) is not breached where a tree is accidentally felled into the protection zone (hard).

f1) A tree that is accidentally felled into a protection zone (hard) may be removed from that zone if it contains a timber log. For the avoidance of doubt, the whole tree may be removed even though the timber product that any part of the tree will produce is not a timber log.

f2) The following rules apply to the removal of the accidentally felled tree:

i. the crown must be cut off from the trunk and left where it has fallen unless the whole of the tree is lifted out of, or lifted and moved within, the zone using a mechanical harvester;

ii. the wheels or tracks of any harvesting machinery used to remove the accidentally felled tree (or any logs into which it is cut) must remain outside the protection zone (hard). Where harvesting machinery has entered the adjoining protection zone (soft) to fell a tree within the net logging area it may also be used to remove the accidentally felled tree, but only if its

wheels or tracks remain wholly within 5 metres of the boundary between the protection zone (soft) and the net logging area;

iii. the wheels or tracks of harvesting machinery that is within a protection zone (soft) may not be moved or repositioned solely for the purpose of removing the accidentally felled tree. (In other words, they may be moved or repositioned only if this is necessary for a purpose related to accessing trees in the net logging area.) The restrictions on the operation of the harvesting machinery set out in condition 5.7 (p) (such as the requirement to use walkover techniques) apply to the operation of the machinery to remove the accidentally felled tree or logs into which it has been cut.

g) SFNSW must document the date on which the tree was accidentally felled into the protection zone (hard) and its location.

h) Harvesting machinery including mechanical harvesters must not enter the protection zone (hard), except for the construction and use of a road crossing or snig track crossing in accordance with conditions 5.7 (r to u) below.

i) Trees located within the protection zone (hard) must not be felled, except for the purpose of removing vegetation that is in the area of a proposed road crossing or snig track in accordance with section 5.7 (r to u) below.

Operations within protection zones (soft)

j) Specified forestry activities, except road and snig track construction in accordance with conditions 5.7 (r to u) and road re-opening, are prohibited within the protection zone (soft).

k) Trees may be felled into a protection zone (soft).

l) Where a tree is felled into a protection zone (soft), then the crown must not be removed from the protection zone (soft) except where the whole of the tree is lifted out of, or lifted and moved within, the zone using a mechanical harvester.

m) Harvesting machinery that has entered the protection zone (soft) for the purpose of felling a tree within the net logging area may also be used to remove a tree that has been felled into the protection zone (soft).

n) However, the wheels or the tracks of the harvesting machinery may not (to any significant extent) be repositioned or moved solely for the purpose of removing the tree felled into the protection zone (soft). (In other words, they may be moved or repositioned only if this is also necessary for a purpose related to accessing trees in the net logging area under condition 5.7 (p).) The restrictions on the operation of the machinery set out in condition 5.7 (p) also apply to the operation of the machinery to remove the tree felled into the protection zone (soft).

o) Trees located in a protection zone (soft) must not be felled, except for the purpose of removing vegetation that is in the area of a proposed road crossing or snig track in accordance with section 5.7 (r to u) below.

p) Harvesting machinery is permitted to operate in a protection zone (soft) for the purposes of felling a tree within the net logging area that contains a timber log where:

i. the technique of directional felling could not be used to fell the tree so that it falls outside the protection zone (soft) and within the net logging area;

ii. the only practicable method of felling that tree so that it falls outside the protection zone (soft) is to enter the protection zone (soft) with harvesting machinery and fell the tree;

iii. the tree is felled away from the protection zone (soft);

iv. the wheels or tracks of harvesting machinery remain wholly within 5 metres of the boundary of the protection zone (soft) with the net logging area;

v. the use of the harvesting machinery only involves the use of walkover techniques and minimises to the greatest extent practicable skewing of machine tracks; and

vi. the harvesting machinery operates with any blades, rippers or similar attachments positioned so that they do not disturb the ground, vegetation and soil.

q) Harvesting machinery must not operate in a protection zone (soft) when the soil is saturated.

Road and snig track construction

r) A road and snig track may be constructed, and used in any area that is, or is within, either a protection zone (hard) or protection zone (soft), but only where:

i. there is no practicable alternative site available for the purposes of the construction; and

ii. there has been no record made of any threatened species on the site of the proposed construction; and

iii. prior to the construction, the SFNSW Regional Manager that is responsible for managing the land on which the construction is proposed to be carried out (or a more senior officer), has prepared a report addressing the matters in Schedule 6 of this licence and has authorised the construction in writing; and

iv. all practicable measures are taken to minimise any adverse impacts of the construction on the environment; and

v. such areas are not in exclusion zones relating to threatened species referred to in condition 5.1 (b) unless carried out in accordance with condition 5.1 (b).

s) A copy of the written approval of the SFNSW Regional Manager which addresses the matters raised in Schedule 6 of this licence must be faxed to NPWS, as soon as possible after the approval has been issued.

t) In the construction and the operation of roads and snig tracks in protection zones (hard) and protection zones (soft) in accordance with condition 5.7 (r), hollow-bearing trees must not be removed or used as bumper trees for moving logs.

u) Where an exclusion zone referred to in condition 5.1 (b) as it relates to a threatened species is located either wholly or partially within a protection zone, then SFNSW is only permitted to construct roads and snig tracks in accordance with condition 5.1 (b).

AMENDMENT 2
28 April 2003
Condition 5.8 replaced
Ref Appendix E

5.8 Ridge and Headwater Habitat exclusion zones

a) For every 500 hectares of areas within the Upper North East Region as identified in Clause 4 of this approval, SFNSW must implement:

i. a minimum of two exclusion zones at least 40 metres wide which connect second order streams,

OR

ii. a minimum of one exclusion zone at least 80 metres wide which connects third order streams.

iii. stream order is to be determined in accordance with Schedule 1 of this licence for the purpose of this condition.

b) Exclusion zones implemented under condition 5.8 (a) (i) and (ii) must, wherever possible, establish links between streams of different third order catchments.

c) The felling of trees across the boundary of a Ridge and Headwater Habitat exclusion zone is prohibited except where no more than six (6) trees containing timber logs are felled across the boundary in any 200 metre length of the boundary of the Ridge and Headwater Habitat exclusion zone, whatever 200 metre length of boundary is considered.

d) Condition 5.8 (c) is not breached where a tree is accidentally felled into a Ridge and Headwater Habitat exclusion zone.

e) A tree that is accidentally felled into a Ridge and Headwater Habitat exclusion zone may be removed from the zone, but only if the tree contains a timber log. The tree may be removed from the zone even if the total number of trees removed in the harvesting operation concerned will, as a result, exceed the number calculated by applying the principle set out in condition 5.8 (c).

f) A tree that is felled into a Ridge and Headwater Habitat exclusion zone under condition 5.8 (c), or felled accidentally as described in condition 5.8 (e), may be removed only in accordance with the following rules:

i. the crown must be cut off from the trunk and left where it has fallen, except where the whole of the tree is lifted out of, or lifted and moved within, the zone using a mechanical harvester; and

ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

g) Where the Ridge and Headwater Habitat exclusion zones do not link different third order streams, a minimum length of 250 metres must be established for each exclusion zone in condition 5.8 (a) (i) (eg. total length 500 metres), or a 500 metres minimum length established for the exclusion zone in condition 5.8 (a) (ii).

h) Exclusion zones implemented under condition 5.8 (a) above should connect the relevant second or third order stream via the associated lower order stream(s). Areas of identified High Conservation Value Old Growth Forest, Rare Non-commercial Forest Types and Rainforest may be used as the basis of exclusion zones.

i) Ridge and Headwater Habitat exclusion zones must not, to the greatest extent practicable, cross existing roads.

j) Except as provided by conditions 5.1 and 5.8 (c) – (f), specified forestry activities other than road construction and road re-opening where there is no other practical means of access, are prohibited in these exclusion zones.

5.9 Wetlands

a) Specified forestry activities, except harvesting of tea tree oil, are prohibited in all wetlands, irrespective of the size of the wetland and their surrounding exclusion zones.

AMENDMENT 2
28 April 2003
Condition 5.9a1)-a3) added
Ref Appendix E

a1) Condition 5.9 (a) is not breached where a tree is accidentally felled into a wetland or exclusion zone established around a wetland under conditions 5.9 (c), (d) or (e).

a2) Despite condition 5.9 (a), where a tree is accidentally felled into a wetland or exclusion zone established around a wetland under conditions 5.9 (c), (d) or (e), in the course of a harvesting operation, it may be removed, but only if the tree contains a timber log. For the avoidance of doubt, the whole of the tree (subject to condition 5.9 (a3)) may be removed even though the timber product that any part of the tree will produce is not a timber log.

a3) The following rules apply to the removal of the tree:

i. the crown must be cut off from the trunk and left where it has fallen unless the whole of the tree is lifted out of, or lifted and moved within, the wetland or exclusion zone using a mechanical harvester;

ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

b) Harvesting of tea tree oil is prohibited in all areas of SEPP 14 wetlands and their surrounding exclusion zones. Harvesting of tea tree oil in other wetlands and their surrounding exclusion zones must comply with condition 5.19 of this licence.

c) Exclusion zones of at least ten metres wide must be implemented around all wetlands less than 0.5 hectare (approx. 70 metres x 70 metres) surface area.

d) Exclusion zones of at least 20 metres wide must be implemented around all wetlands between 0.5 hectare (approx. 70 metres x 70 metres) and 2.0 hectares (approx. 150 metres x 150 metres) surface area.

e) Exclusion zones of at least 40 metres wide must be implemented around all SEPP 14 wetlands irrespective of size, and other wetlands greater than 2.0 hectares surface area.

f) The area of wetlands and their surrounding exclusion zones must be measured from the edge of the current saturated zone or from the outer edge of where the vegetation type indicates a wetter micro-environment than the surrounding country, whichever is larger.

g) Wetlands less than 0.5 hectare surface area must be marked in the field for protection and recorded as accurately as possible on harvest plan operational maps.

h) Grazing and associated burning should be excluded from wetlands.

5.10 Heath and Scrub

a) Specified forestry activities are prohibited from all areas of heath and scrub greater than 0.2 hectares (approx. 45 metres x 45 metres) surface area.

b) Exclusion zones of at least 20 metres wide must be implemented around all heath and scrub of more than 0.2 hectares surface area.

c) The area of heath and scrub, and exclusion zones around heath and scrub, must be measured from the outer edge of areas of heath and scrub.

5.11 Rocky Outcrops and Cliffs

a) Specified forestry activities are prohibited within areas of rocky outcrops and cliffs.

b) In addition, exclusion zones of at least 20 metres wide must be implemented around all rocky outcrops more than 0.1 hectare (approx. 30 metres x 30 metres), and all cliffs.

AMENDMENT 2
28 April 2003
Condition 5.11b)-f) added
Ref Appendix E

c) The felling of trees across the boundary of exclusion zones around rocky outcrops and cliffs is prohibited except where no more than six (6) trees containing timber logs are felled across the boundary in any 200 metre length of the boundary of the exclusion zones, whatever 200 metre length of boundary is considered.

d) Condition 5.11 (c) is not breached where a tree is accidentally felled into a Rocky Outcrops and Cliff exclusion zone.

e) A tree that is accidentally felled into a Rocky Outcrops and Cliff exclusion zone may be removed from the zone, but only if the tree contains a timber log. The tree may be removed even if the total number of trees removed in the harvesting operation concerned will, as a result, exceed the number calculated by applying the principle set out in condition 5.11 (c).

f) A tree that is felled into a Rocky Outcrops and Cliff exclusion zone under condition 5.11 (c), or accidentally, may be removed only in accordance with the following rules:

   i. the crown must be cut off from the trunk and left where it has fallen, except where the whole of the tree is lifted out of, or lifted and moved within, the zone using a mechanical harvester; and

   ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

(Note: It is not intended to exclude SFNSW from all areas that have a scattered or stony or rocky ground cover. Only those areas where rocks and exposed boulders cover greater than 70% of at least a 0.1 hectare area. Those areas that fall within the definition of Rocky Outcrops and Cliffs are considered to contain likely habitat for threatened flora and fauna.)

5.12 Threatened Frog General Protection Measures

a) A buffer zone of at least ten metres wide must be implemented around all dams. Trees must not be felled within the buffer zone. Trees should not be felled into the buffer zone. Harvesting machinery must not enter the buffer zone.

b) Where a group of more than ten male threatened species of frogs per hectare are detected, any new stream crossings within 500 metres of that group must, to the greatest extent practicable, be constructed using methods which do not significantly alter stream flow (eg. bridge or box culvert).

AMENDMENT 2
28 April 2003
Condition 5.13 replaced
Ref Appendix E

5.13 Bird Nest and Roost Site Protection

a) The following exclusion zones must be applied around nest and roost sites:

i.	Powerful Owl nest	50 metres radius
ii.	Powerful Owl roost	30 metres radius
iii.	Masked Owl nest	50 metres radius
iv.	Masked Owl roost	30 metres radius
v.	Sooty Owl nest	50 metres radius
vi.	Sooty Owl roost	30 metres radius
vii.	Barking Owl nest	50 metres radius
viii.	Barking Owl roost	30 metres radius
ix.	Bush Stone-Curlew nest	100 metres radius
x.	Albert's Lyrebird nest	100 metres radius
xi.	Turquoise Parrot nest	30 metres radius
xii.	Osprey nest	100 metres radius
xiii.	Square-tailed Kite nest	100 metres radius
xiv.	Regent Honeyeater nest	20 metres radius

b) Where nests and roosts of Powerful Owl, Masked Owl, Sooty Owl and Barking Owl are recorded after the development of a landscape approach for an area, and they occur outside areas retained as part of that landscape approach, the appropriate exclusion zone in condition 5.13 (a) above must be implemented around the roost or nest.

c) An exclusion zone at least 50 metres radius must be implemented around all Glossy Black-Cockatoo nests. The felling of trees across the boundary of Glossy Black Cockatoo nest exclusion zones is prohibited except where no more than six (6) trees containing timber logs are felled across the boundary in any 200 metre length of the boundary of the Glossy Black-Cockatoo nest exclusion zones, whatever 200 metre length of boundary is considered.

d) Condition 5.13 (c) is not breached where a tree is accidentally felled into a Glossy Black-Cockatoo nest exclusion zone.

e) A tree that is accidentally felled into a Glossy Black-Cockatoo nest exclusion zone may be removed from the zone, but only if it contains a timber log. The tree may be removed even if the total number of trees removed in the harvesting operation concerned will, as a result, exceed the number calculated by applying the principle set out in condition 5.13 (c).

f) A tree that is felled into a Glossy Black-Cockatoo nest exclusion zone under condition 5.13 (c), or accidentally, may be removed only in accordance with the following rules:

   i. the crown must be cut off from the trunk and left where it has fallen, except where the whole of the tree is lifted out of, or lifted and moved within, the zone using a mechanical harvester; and

   ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

g) Nest exclusion zones for the following species must be implemented for the duration of this licence: Powerful Owl, Masked Owl, Sooty Owl, Barking Owl and Osprey.

h) Nest exclusion zones for the following species may be removed where surveys conducted during two consecutive breeding seasons establish to the satisfaction of the NPWS that the nest or nest site is not being used: Square-tailed Kite, Albert's Lyrebird, Regent Honeyeater, Glossy Black-Cockatoo, Bush Stone-Curlew and Turquoise Parrot.

i) Trees which contain raptor nests, other than those referred to in condition 5.13 (a) above, must be retained and marked for retention. During harvesting operations, the potential for damage to these

trees must be minimised by utilising techniques of directional felling.

j) When ten Glossy Black-Cockatoo nests are recorded on SFNSW estate over a two year period separated by at least two kilometres within a 15 kilometres radius, SFNSW may apply to the NPWS for a review of this condition.

(Note: The NPWS will advise SFNSW of the recommendation, made by NPWS in relation to condition 5.13 (j) above, to the relevant Ministers, prior to consideration by the relevant Ministers.)

5.14 Bat Roost Protection

5.14.1 Tree Roost Protection

a) Likely microchiropteran bat roost trees must be inspected prior to harvesting operations approaching within 100 metres of such trees. Likely roost trees are stags greater than 30 centimetres dbhob, large trees with accessible base hollows, or hollow-bearing trees.

b) If a bat roost tree is located an exclusion zone of at least 30 metres radius must be implemented around the tree roost.

5.14.2 Subterranean Roost Protection

This condition applies to the following bats: Large-eared Pied Bat *Chalinolobus dwyeri*, Little Pied Bat *Chalinolobus picatus*, Eastern Cave Bat *Vespadelus troughtoni*, Common Bentwing-bat *Miniopterus schreibersii*, Little Bentwing-bat *Miniopterus australis*, Large-footed Myotis *Myotis adversus*.

a) An exclusion zone of at least 100 metres radius must be implemented around all entrances to all caves, rock overhangs, tunnels and disused mineshafts, with the exception of open pits which are less than three metres in depth, until surveys for the presence of bats have been conducted in accordance with condition 8.8.10A of this licence.

b) Where no bats or evidence of bats have been recorded, these exclusion zones may be reduced to ten metres radius.

c) Without limiting the requirements of condition 5.14.3 below, where bats or evidence of bats have been recorded, an exclusion zone of at least 50 metres radius must be implemented around the roost site.

(Note: Exclusion zones that are required to be applied around bat roosts are as follows: 100 metres for an unconfirmed roost, 50 metres for a confirmed roost and ten metres for cave, rock overhang, tunnels and disused mineshaft where no bats were found. The 100 metres exclusion zone applies to an unconfirmed roost because it maybe confirmed as a significant roost site as determined in condition 5.14.3 below.)

5.14.3 Significant Subterranean Roost Protection

This condition applies to the following bats: Large-eared Pied Bat *Chalinolobus dwyeri*, Little Pied Bat *Chalinolobus picatus*, Eastern Cave Bat *Vespadelus troughtoni*, Common Bentwing-bat *Miniopterus schreibersii*, Little Bentwing-bat *Miniopterus australis*, Large-footed Myotis *Myotis adversus*, Eastern Horseshoe Bat *Rhinolophus megaphyllus* and Cave Bat *Vespadelus pumilus*.

(Note: Significant roosts are those used for hibernation, overwintering, dispersal and acclimatisation. For Eastern Cave Bat, Large-eared Pied Bat, Little Pied Bat, Eastern Horseshoe Bat Cave Bat, and Large-footed Myotis maternity sites are also considered significant roosts. Maternity sites for the two Miniopterus species are dealt with in condition 1.2 of this licence. Significant roost sites are often used seasonally. This means that surveys may not result in the species being located, even though the species may be present at another time of the year. As such, only conducting surveys (anabat or harp trapping) for individuals is not adequate for identifying significant roosts. However, SFNSW may choose to conduct multi-season surveys to determine the status of potentially significant roost sites.)

a) A significant subterranean roost site is characterised by a combination of at least two of the following features:

- Mines or caves that are mainly near-horizontal drives (adits). Complexity ranging from short drives of several metres long, to deep complex mines or caves with interconnecting passageways. Vertical shafts are infrequently used.

- The presence of standing water, or at least a damp floor.
- Usually have a domed area where temperature and humidity are elevated - either through a natural accumulation of heat, or by retaining body heat of adult and young bats.
- Generally high humidity which can be provided by the mine containing water, damp soil, or the mine being located within the water table.
- Significant subterranean roost sites may also be characterised by the following features:
- Airflow is often restricted by partial collapse of the entrance or passageways.
- Usually deep enough to have a fully dark isothermal zone (area where temperatures are constant). However, some species may roost close to the entrance of the mine or cave.

b) An exclusion zone of at least 100 metres radius must be implemented around the entrance or entrances of significant subterranean roost sites.

5.14.4 Protection of Flying-fox camps

a) If there is a record of a flying-fox camp in a compartment, or a flying-fox camp is detected during pre-harvest inspections or during harvesting operations, specified forestry activities must be excluded from the full extent of the camp.

b) Where the camp contains Black Flying-fox *Pteropus alecto* an exclusion zone of at least 50 metres wide must be implemented around the camp. SFNSW must also consider implementing an exclusion zone of up to 200 metres wide to allow for expansion or movement of the camp.

5.15 Grazing

a) The areal extent of grazing authorities issued by SFNSW must not be extended except where they fulfil SFNSW responsibilities under the *Rural Fires Act* 1997.

b) Grazing Management Plans for all SFNSW estate subject to domestic grazing must be prepared by the first five yearly review of the Integrated Forestry Operations Approval. Grazing Management Plans must consider the habitat requirements of threatened species and include management actions to protect threatened species and their habitats. SFNSW should consult with NPWS during the preparation of these Plans.

5.16 Burning

When fulfilling its responsibilities under the *Rural Fires Act* 1997, SFNSW must take account of the following principles:

a) Hazard reduction work must take account of wildfire history, intensity, frequency and seasonality, and reflect the ecological requirements of any threatened species, or their habitat, known or likely to occur in the area.

b) Hazard reduction work must be conducted in a manner which promotes and maintains an understorey mosaic which includes significant areas of dense understorey vegetation.

c) Hazard reduction work must be conducted in a manner which minimises the impact on large fallen logs (greater than 40 centimetres diameter and greater than five metres in length).

(*Note: It is acknowledged that hazard reduction work will be covered by a Bush Fire Risk Management Plan and that this plan is required to take into account the impact of burning activities on threatened species including areas where fire intervals are less than five years.*)

5.17 Ground Habitat Protection

a) SFNSW must, to the greatest extent practicable, protect ground habitat from specified forestry activities. Ground habitat includes, but is not limited to, understorey vegetation, ground cover vegetation, thick leaf litter and fallen timber.

b) Commercial firewood collection must not be permitted in compartments with records of the following species: Bush Stone-Curlew, Sand Goanna, White-crowned Snake, Pale-headed Snake, Rufous Bettong, Brush-tailed Phascogale, Spotted-tailed Quoll or *Drysdalia coronoides*.

c) Domestic firewood collection permits issued by SFNSW must include the following conditions:

i. Firewood may only be collected from within 20 metres of either side of a permanent road or within a 20 metres radius of a log dump. A permanent road is defined as a road shown on a harvesting plan operational map that remains open to public vehicular traffic after the completion of a harvesting operation.

AMENDMENT 2
28 April 2003
Condition 5.17c) ii replaced
Ref Appendix E

ii. Firewood must not be collected from High Conservation Value Old Growth Forest, Rainforest, Rare Non-Commercial Forest Types and protection zones.

iii. Only timber that has fallen or has already been felled may be collected. Timber greater than 40 centimetres diameter must not be collected or damaged. Logs with hollows, irrespective of the diameter of the log, must not be collected or damaged. Standing dead trees or stags must not be felled.

d) In compartments with records of CWR species (other than those listed in condition 5.17 (b) above), commercial and domestic firewood licenses should specify that fallen hollow logs greater than 40 centimetres diameter must not be collected or damaged during the course of the collection of firewood.

5.18 Feral and Introduced Predator Control

a) SFNSW, in consultation with NPWS, must finalise the Draft Feral and Introduced Predator Control Plan (see Schedule 7 of this licence) by 31 December 1999.

b) SFNSW must implement the final Feral and Introduced Predator Control Plan within the first five years of the Integrated Forestry Operations Approval.

5.19 Tea-tree Melaleuca *spp. Protection*

a) Harvesting of tea tree oil is prohibited within exclusion zones, except Rare Non-Commercial Forest Type 31 Paperbark and non-SEPP 14 wetlands and their surrounding exclusion zones.

b) Harvesting of tea tree oil is prohibited from a minimum 20% of tea tree individuals of the compartment. This 20% must be retained in clusters greater than 20 metres diameter. Clusters should be spread throughout the compartment.

c) SFNSW, in consultation with NPWS, must prepare a Plan of Management for Harvesting of tea tree oil within two years of the commencement date.

d) Harvesting of previously uncut tea-tree *Melaleuca* is prohibited.

e) The road construction solely for the purpose of tea-tree harvesting is prohibited.

f) Access to tea-tree harvesting areas should be avoided during very wet weather.

g) The threatened species *Melaleuca tamarascina* spp. *irbyana* must not be harvested.

5.20 Miscellaneous Forestry Operations

a) Cutting of posts for neighbour boundary fencing and the felling of timber for the construction of causeways and bridges for the purposes of forest management must only involve the felling of up to 50 trees of a maximum 80 centimetres dbhob, at a maximum density of five trees per hectare up to a maximum area of 50 hectares of the compartment.

AMENDMENT 2
28 April 2003
Condition 5.20b) – c) replaced
Ref Appendix E

b) When conducting and / or supervising miscellaneous forestry operations, SFNSW must implement conditions 5.1 Operational Requirements, 5.3 High Conservation Value Old Growth Forest, 5.4 Rainforest, 5.7 Riparian Habitat Protection, 5.8 Ridge and Headwater Habitat, 5.9 Wetlands, 5.10 Heath and Scrub, 5.11 Rocky Outcrops and Cliffs, 5.12 Threatened Frog General Protection Measures, 5.13 Bird Nest and Roost Site Protection and 5.14 Bat Roost Protection of this licence in areas where these operations are conducted.

AMENDMENT 3
17 May 2004
modified
Ref Appendix E

AMENDMENT 4
Delete 6.13A
Insert 16.13B

c) Miscellaneous forestry operations are prohibited in exclusions zones established under the requirements of conditions 5.4 Rainforest, 5.8 Ridge and Headwater Habitat, 5.9 Wetlands, 5.10 Heath and Scrub, 5.11 Rocky Outcrops and Cliffs, 5.13 Bird Nest and Roost Site Protection, 5.14 Bat Roost Protection, 6.9 Powerful Owl, Masked Owl, Barking Owl, 6.12 Brush-tailed Phascogale, 6.13 Hastings River Mouse, 6.13B Hastings River Mouse (Special provisions for various compartments) and 6.16 Squirrel Glider, and in protection zones established under condition 5.7 Riparian Habitat Protection of this licence.

d) Miscellaneous forestry operations are prohibited in areas of High Conservation Value Old Growth Forest referred to condition 5.3, Rainforest referred to in condition 5.4, Rare Non-commercial Forest Types referred to in condition 5.5, Wetlands referred to condition 5.9, Heath and Scrub referred to in condition 5.10, Rocky outcrops and cliffs referred to in condition 5.11 and Flying-fox camps referred to condition 5.14.4.

e) SFNSW is exempted from the other conditions in this licence when conducting miscellaneous forestry operations other than those conditions mentioned above and those necessary to comply with the above.

5.21 Condition Revoked (Amendment 2)

Condition 6. Species-specific conditions

6.1 Pouched Frog Assa darlingtoni

This condition applies only to the SFNSW Dorrigo Management Area. Where there is a record of *Assa darlingtoni* with the compartment or within 50 metres outside the boundary of the compartment, the following must apply:

a) An exclusion zone of at least 50 metres radius must be implemented around the record.

b) When ten of these sites are recorded on SFNSW estate over a two year period separated by at least two kilometres within a 15 kilometres radius, SFNSW may apply to NPWS for a review of this condition.

(*Note: The NPWS will advise SFNSW of the recommendation, made by NPWS in relation to condition 6.1 (b) above, to the relevant Ministers, prior to consideration by the relevant Ministers.)*

6.2 Green and Golden Bell Frog Litoria aurea

a) Where there is a record of *Litoria aurea* in a compartment or within 50 metres outside the boundary of the compartment, an exclusion zone of at least 50 metres radius must be implemented around the record.

b) In addition, where the record is associated with a wetland or dam, a 50 metres wide exclusion zone must be implemented around the wetland or dam.

c) The exclusion zone around wetlands must be measured from the edge of the current saturated zone or from the outer edge of where the vegetation type indicates a wetter micro-environment than the surrounding country, whichever is larger.

d) The exclusion zone around dams must be measured from the highest point of the dam wall or barrier.

6.3 Giant Barred Frog Mixophyes iteratus, *Fleay's Frog* Mixophyes fleayi, *Stuttering Frog* Mixophyes balbus

Where there is a record of *Mixophyes balbus*, *M. iteratus* or *M. fleayi* in a compartment or within 200 metres outside the boundary of the compartment, the following must apply:

a) Exclusion zones of at least 30 metres wide must be implemented on both sides of all streams within 200 metres of the record.

b) The width of exclusion zones must be measured from the top of the bank of the incised channel or, where there is no defined bank, from the edge of the channel.

c) When ten of these sites for a particular species are recorded on SFNSW estate over a two year period separated by at least two kilometres within a 15 kilometres radius, SFNSW may apply to NPWS for a review of this condition.

(*Note: The NPWS will advise SFNSW of the recommendation, made by NPWS in relation to condition 6.3 (d) above, to the relevant Ministers, prior to consideration by the relevant Ministers.)*

6.4 Philoria *spp.*

Where there is a record of *Philoria* spp. within a compartment, or within 50 metres outside the boundary of the compartment, the following must apply:

a) An exclusion zone of at least 50 metres radius must be implemented around the record.

b) When ten of these sites for a particular species are recorded on SFNSW estate over a two year period separated by at least two kilometres within a 15 kilometres radius, SFNSW may apply to NPWS for a review of this condition.

(*Note: The NPWS will advise SFNSW of the recommendation, made by NPWS in relation to condition 6.4 (b) above, to the relevant Ministers, prior to consideration by the relevant Ministers.)*

6.5 White-crowned Snake Cacophis harriettae

Where there is a record of *Cacophis harriettae* in a compartment or within 30 metres outside the boundary of the compartment, an exclusion zone of at least 30 metres radius must be implemented around the record.

6.6 Pale-headed Snake Hoplocephalus bitorquatus

Where there is a record of the *Hoplocephalus bitorquatus* in a compartment or within 300 metres outside the boundary of the compartment, the following must apply:

a) An exclusion zone of at least 100 metres radius must be implemented around the record.

b) If harvesting operations are being conducted during the months after May, June, July, August or September, an additional 200 metres wide buffer zone must be implemented around the exclusion zone implemented in condition 6.6 (a) above. Within this buffer zone the following must apply:

   i. All hollow bearing trees must be retained;

   ii. All stags must be retained where it is safe to do so; and

   iii. During harvesting operations, the potential for damage to these trees must be minimised by utilising techniques of directional felling.

6.7 Albert's Lyrebird Menura alberti

Where there is an Albert's Lyrebird record within a compartment, or within 300 metres outside the boundary of the compartment, the following must apply:

a) An exclusion zone of at least 20 metres wide must be implemented on both sides of all first order streams within 300 metres of the record.

b) An exclusion zone of at least 30 metres wide must be implemented on both sides of all second order streams within 300 metres of the record.

c) The width of exclusion zones referred to in condition 6.7 (a) and (b) above, must be measured from the top of the bank of the incised channel or, where there is no defined bank, from the edge of the channel.

d) Specified forestry activities are prohibited in exclusion zones implemented under conditions 6.7 (a) and (b).

e) Condition 6.7 (d) above does not apply to road construction and road re-opening where:

   i. There is no other practical means of access; and

   ii. Written approval of the NPWS is obtained in accordance with condition 5.1 (b).

f) A feral predator monitoring and control program targeting the control of fox and wild dog populations should be developed and implemented for the compartment and the surrounding area, consistent with the Regional Predator Management Program.

6.8 Marbled Frogmouth Podargus ocellatus

Where there is a record of Marbled Frogmouth within a compartment or within 30 metres outside the boundary of the compartment, the following must apply:

a) An exclusion zone of at least 20 metres wide must be implemented on both sides of all first order streams in the compartment.

b) An exclusion zone of at least 30 metres wide must be implemented on both sides of all second order streams in the compartment.

c) The width of exclusion zones referred to in condition 6.8 (a) and (b) above, must be measured from the top of the bank of the incised channel or, where there is no defined bank, from the edge of the channel.

d) Specified forestry activities are prohibited in exclusion zones implemented under conditions 6.8 (a) and (b).

e) Condition 6.8 (d) above does not apply to road construction and road re-opening where:

iii. There is no other practical means of access; and

iv. Written approval of the NPWS is obtained in accordance with condition 5.1 (b).

6.9 Powerful Owl Ninox strenua, *Masked Owl* Tyto novaehollandiae, *Barking Owl* Ninox connivens

SFNSW has two options for protecting large forest owls in SFNSW estate. SFNSW must apply either the "Site Based Approach" or the "Landscape Approach".

a) SFNSW must notify NPWS in writing within six months after the date of this licence which approach will be applied in each state forest.

b) In general, SFNSW can choose to change from the Site Based Approach to the Landscape Approach after that date; however, SFNSW cannot change from the Landscape Approach to the Site Based Approach. SFNSW must notify NPWS of a change from the Site-based Approach to the Landscape Approach within ten working days of the change of approaches.

c) Where a change from the Site Based Approach to the Landscape Approach has occurred, SFNSW should retain habitat previously retained in the Site Based Approach, where it is suitable habitat as defined in the Landscape Approach.

d) Where information indicates that Greater Gliders occur at densities of more than one per hectare within the compartment being planned for harvesting, eight hollow-bearing trees per hectare must be retained within the net logging area.

AMENDMENT 2
28 April 2003
Condition 6.9e)-j) added
Ref Appendix E

e) The felling of trees across the boundary of an exclusion zone established under conditions 6.9.1 (b and h) and 6.9.2 (c) below is prohibited except where no more than six (6) trees containing timber logs are felled across the boundary in any 200 metre length of the boundary of the owl exclusion zones, whatever 200 metre length of boundary is considered.

f) Condition 6.9 (e) is not breached where a tree is accidentally felled into an Owl exclusion zone.

g) A tree that is accidentally felled into an Owl exclusion zone may be removed from the zone, but only if it contains a timber log. The tree may be removed even if the total number of trees removed in the harvesting operation concerned will, as a result, exceed the number calculated by applying the principle set out in condition 6.9 (e).

h) A tree that is felled into an Owl exclusion zone under condition 6.9 (e), or accidentally, may be removed only in accordance with the following rules:

i. the crown must be cut off from the trunk and left where it has fallen, except where the whole of the tree is lifted out of, or lifted and moved within, the zone using a mechanical harvester;

ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

6.9.1 Large Forest Owls: Site Based Approach

(*Note: The site based approach attempts to ensure that sufficient habitat suitable for large forest owls is protected in the vicinity of a record of the species. Habitat protection aims to protect roost and nest sites and sufficient habitat in suitable condition to support populations of prey species and in suitable condition for the foraging behaviour of the owl species. Habitat models are to be used to determine what is suitable habitat. The site based approach is most appropriate for single records or small scattered patches of forest or both.)*

Where there is a record of Powerful Owl, Masked Owl or Barking Owl within a compartment or within two kilometres outside the boundary of the compartment, the following must apply:

a) A two kilometres radius planning area must be identified. This planning area must be centred on the record or records of the same species of owl. The radius of the planning area must be measured from the record. Where there is more than one record of the same species of owl, the radius of the planning area must be measured from a point located equidistant from the majority of records, where possible.

b) Within this planning area an exclusion zone, or exclusion zones, of a total of 300 hectares must be implemented.

c) Where there are records of nests or roosts of one or more of these species, these must be contained within exclusion zones. Planning and placement of exclusion zones should maximise the inclusion of other types of owl records within exclusion zones.

d) The exclusion zone must encompass Category 1 habitat available in the planning area. In the event that there is not sufficient area of Category 1 habitat to meet the requirements of condition 6.9.1 (b) above, Category 2 habitat must be utilised. In the event that there is not sufficient area of Category 1 and 2 habitat to meet the requirements of condition 6.9.1 (b) above, Category 3 habitat must be utilised. In the event that there is not sufficient area of Category 1, Category 2 and Category 3 habitat to meet the requirement of condition 6.9.1 (b) above, Category 4 habitat must be utilised. In the event that there is not sufficient area of Category 1, Category 2, Category 3 and Category 4 habitat to meet the requirements of condition 6.9.1 (b) above, Category 5 habitat must be utilised.

e) Habitat categories are ranked as follows, from highest to lowest:

   i. Category 1: Class 1 modelled habitat;

   ii. Category 2: Class 2 modelled habitat;

   iii. Category 3: High Conservation Value Old Growth Forest;

   iv. Category 4: Class 3 modelled habitat; and then

   v. Category 5: any other areas of suitable habitat.

f) Modelled habitat and High Conservation Value Old Growth Forest occurring in statutory reserves within the two kilometres radius may be used to meet the exclusion zone requirements, where it is consistent with the requirements of condition 6.9.1 (c) and (d) above.

g) The shape of exclusion zones should minimise the boundary to area ratio. Where appropriate, exclusion zones should be circular in shape. Long and linear strips should be avoided where possible.

   (*Note: Circular or compact areas have the lowest boundary to area ratio, while linear or fragmented ones the highest. Areas which generally conform to a circular or square shape have a low boundary to area ratio. As a guide, "low" could be considered to be an area where the longer axis of the area is less than twice as long as the shorter axis.*)

h) Where there are records of more than one species of owl within the two kilometres planning area, exclusion zones totalling 300 hectares for each species must be implemented. These exclusion zones must be consistent with the requirements of this condition. Areas retained for different owl species may overlap.

i) Where there are two or more records of one species of owl consecutively less than two kilometres apart but collectively spreading over an area greater than two kilometres in any direction then advice on the location of the planning area must be sought from the NPWS.

j) If a record of one of these species is on private property within two kilometres of SFNSW estate, then the 1,200 hectare (equivalent to two kilometres radius) planning area must be positioned on public land as close as possible to the record.

6.9.2 Large Forest Owls: Landscape Approach

(*Note: The landscape approach attempts to ensure that a network of habitat is maintained within the area being planned. The landscape approach is most suitable for large forested areas, especially with numerous records of large forest owls. As part of this approach large areas of habitat are to be protected. Habitat to be retained is to be identified using habitat models. The condition provides a mechanism for apportioning habitat to be retained between the existing reserves and the production forest*.)

a) The planning area should be between 5,000 to 15,000 hectares in size. Smaller or larger planning areas should be avoided, but may be appropriate in particular circumstances. Where SFNSW uses smaller or larger planning areas, the justification for this must be clearly documented. This documentation must be kept on the relevant file and be made available on request by NPWS.

b) The planning area can only contain public lands, private land must not be included.

c) A minimum of 25% of the planning area must be retained as exclusion zones. Areas of statutory reserves can be used to meet the requirements of exclusion zones, where consistent with the requirements of condition 6.9.2 (d), (e) and (f) below. Other exclusion zones within SFNSW estate outside of statutory reserves (eg., high conservation value old growth forest, stream exclusion zones etc) can be used to meet the exclusion zone requirements, where consistent with the requirements of condition 6.9.2 (d), (e) and (f) below.

d) Of the areas to be retained in condition 6.9.2 (c) above, a minimum of 30% must be retained as exclusion zones in SFNSW estate outside of statutory reserves. Where existing statutory reserves comprise 25% or more of the planning area, then the minimum area to be retained in SFNSW estate outside of statutory reserves must be 10% of SFNSW estate outside of statutory reserves within the planning area.

e) Of the areas to be retained in SFNSW estate outside of statutory reserves, referred to condition 6.9.2 (d) above, a minimum of 30% must be retained in patches at least 50 hectares in size. The shape of exclusion zones should minimise the boundary to area ratio. Long, linear strips must not be counted towards meeting the requirement to retain these patches.

(*Note: Circular or compact areas have the lowest boundary to area ratio, while linear or fragmented ones the highest. Areas which generally conform to a circular or square shape have a low boundary to area ratio. As a guide, "low" could be considered to be an area where the longer axis of the area is less than twice as long as the shorter axis*.)

f) In selecting areas to be retained as exclusion zones within the planning area the following design rules must be followed:

   i. Both the Powerful Owl and Masked Owl must be catered for. Where these two species are being planned for, the retained habitat must comprise 50% Masked Owl and 50% Powerful Owl habitat. Where there is either a record of a Barking Owl; OR Barking Owl modelled habitat within the planning area; OR both, then the Barking Owl must be catered for in addition to Powerful Owl and Masked Owl. In these cases the retained habitat must comprise 45% Powerful Owl habitat, 45% Masked Owl habitat and 10% Barking Owl habitat.

   ii. The area of retained habitat for each of the species must be based on the proportion of each modelled habitat class that is present within the planning area.

   iii. Where there are records of nests or roosts of one or more of these species, these must be contained within exclusion zones. Planning and placement of exclusion zones should maximise the inclusion of other types of owl records within exclusion zones.

g) The worked example of the application of the Landscape Approach in Schedule 8 of this licence should be followed when applying this condition.

6.10 Rufous Scrub-bird Atrichornis rufescens

If there is a record of Rufous Scrub-bird in a compartment or within 300 metres outside the boundary of a compartment, the following must apply:

An exclusion zone must be implemented which encompasses all Rufous Scrub-bird microhabitat (as defined in Schedule 9 of this licence) within a 300 metres radius of the record.

a) An additional exclusion zone of at least 20 metres wide must be implemented around all microhabitat referred to in condition 6.10 (a) above.

6.11 Swift Parrot Lathamus discolor*, Regent Honeyeater* Xanthomyza phrygia

Where there is a record of Swift Parrot or Regent Honeyeater in a compartment, the following must apply:

a) At least ten eucalypt feed trees must be retained within every two hectares of net logging area.

b) Where a Swift Parrot or Regent Honeyeater is observed feeding, the tree in which it is feeding must be retained.

c) The trees referred to in condition 6.11 (a) and (b) above must be marked for retention. Where retained eucalypt feed trees also meet the requirements of hollow-bearing or recruitment trees, the retained eucalypt feed tree can be counted as a hollow-bearing or recruitment tree.

AMENDMENT 2
28 April 2003
Condition 6.12 replaced
Ref Appendix E

6.12 Brush-tailed Phascogale Phascogale tapoatafa

a) Where there is a Brush-tailed Phascogale record in a compartment or within 500 metres outside the boundary of a compartment SFNSW must, for the purpose of protecting the Brush-tailed Phascogale and its habitat, apply either the Site Based Approach as set out in condition 6.12.1 or the Landscape Approach as set out in condition 6.12.2.

b) SFNSW must notify NPWS in writing of the areas to which the Landscape Approach will be applied by 1 December 2003 or, if specified forestry activities are due to commence in an area prior to that date, the notification must occur prior to the commencement of activities. Notification must demonstrate compliance with condition 6.12.2, and include a map at an appropriate scale showing the relevant areas.

c) SFNSW may change from the Site Based Approach to the Landscape Approach, in accordance with condition 6.12.2. However, SFNSW may not change from the Landscape Approach to the Site Based Approach. SFNSW must notify NPWS of a change from the Site-based Approach to the Landscape Approach within ten working days of the change of approaches and prior to specified forestry activities commencing in the area.

d) Where a change from the Site Based Approach to the Landscape Approach has occurred, SFNSW must continue to retain habitat previously retained in the Site Based Approach.

6.12.1 Brush-tailed Phascogale: Site Based Approach

(*Note: The Site Based Approach attempts to ensure that sufficient suitable Brush-tailed Phascogale habitat is protected in the vicinity of a record of the species. Habitat protection aims to protect den sites and sufficient habitat in suitable condition to support the foraging behaviour of Brush-tailed Phascogale. The Site Based Approach is most appropriate for single records or scattered records or both.)*

Where SFNSW has chosen to apply the Site Based Approach in accordance with condition 6.12(a), the following applies:

a) A 500 metres radius planning area must be identified. This planning area must be centred on the record or records of Brush-tailed Phascogale. The radius of the planning area must be measured from the record. Where there is more than one record the radius of the planning area must be measured from a point located equidistant from the majority of the records.

b) Within this planning area an exclusion zone, or exclusion zones, totalling 20 hectares must be implemented.

c) Trees within the exclusion zone must not be used to meet tree retention requirements of condition 5.6.

d) Specified forestry activities, with the exception of road re-opening and snig track re-opening and use, where there is no other practical means of access, are prohibited in these exclusion zones.

e) Where there are records of Brush-tailed Phascogale dens, these must be contained within exclusion zones. Planning and placement of exclusion zones should maximise the inclusion of other types of Brush-tailed Phascogale records within exclusion zones.

f) The exclusion zone must encompass Category 1 habitat available in the planning area. In the event that there is not sufficient area of Category 1 habitat to meet the requirements of condition 6.12.1 (b) above, Category 2 habitat must be utilised. In the event that there is not sufficient area of Category 1 and 2 habitat to meet the requirements of condition 6.12.1 (b) above, Category 3 habitat must be utilised. In the event that there is not sufficient area of Category 1, Category 2 and Category 3 habitat to meet the requirement of condition 6.12.1 (b) above, Category 4 habitat must be utilised.

g) Habitat qualities are ranked as follows (from highest to lowest):

   i. Category 1: Brush-tailed Phascogale habitat - Category 1;

   i. Category 2 Brush-tailed Phascogale habitat - Category 2;

   ii. Category 3: Class 1 & Class 2 modelled Brush-tailed Phascogale habitat;

   iii. Category 4: any other areas of suitable Brush-tailed Phascogale habitat.

h) Category 1, 2 and 3 habitat occurring in statutory reserves within the 500 metres radius may be used to meet the exclusion zone requirements, where it is consistent with the requirements of condition 6.12.1 (e) and (f) above.

i) Individual patch size of exclusion areas must exceed 7 ha.

j) The shape of exclusion zones should minimise the boundary to area ratio. Where appropriate, exclusion zones should be circular in shape. Long and linear strips should be avoided where possible.

k) (Note: Circular or compact areas have the lowest boundary to area ratio, while linear or fragmented ones have the highest boundary to area ratio. Areas which generally conform to a circular or square shape have a low boundary to area ratio. As a guide, “low” could be considered to be an area where the longer axis of the area is less than twice as long as the shorter axis.)

l) Where there are two or more Brush-tailed Phascogale records consecutively less than 500 metres apart but collectively spreading over an area greater than 500 metres in any direction then advice on the location of the planning area must be sought from the NPWS.

m) If a record of Brush-tailed Phascogale is on private property within 200 metres of SFNSW estate, then a 500 metres radius planning area must be located on State Forest as close as possible to the record.

n) The felling of trees across the boundary of a Brush-tailed Phascogale exclusion zone is prohibited except where no more than six (6) trees containing timber logs are felled across the boundary in any 200 metre length of the boundary of the zone, whatever 200 metre length of boundary is considered.

o) Condition 6.12.1 (m) is not breached where a tree is accidentally felled into a Brush-tailed Phascogale exclusion zone.

p) A tree that is accidentally felled into a Brush-tailed Phascogale exclusion zone may be removed from the zone, but only if it contains a timber log. The tree may be removed even if the total number of trees removed in the harvesting operation concerned will, as a result, exceed the number calculated by applying the principle set out in condition 6.12.1 (m).

q) A tree that is felled into a Brush-tailed Phascogale exclusion zone under condition 6.12.1 (m), or accidentally, may be removed only in accordance with the following rules:

   i. the crown must be cut off from the trunk and left where it has fallen, except where the whole of the tree is lifted out of, or lifted and moved within, the zone using a mechanical harvester; and

ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

6.12.2 Brush-tailed Phascogale: Landscape Approach

(*Note: The Landscape Approach attempts to ensure that preferred foraging and den trees are maintained within the planning area. The Landscape Approach is most suitable for large areas of suitable habitat, especially with numerous records of phascogales. Habitat features are to be retained across each hectare of production forest in the landscape).*

Where SFNSW has chosen to apply the Landscape Approach in accordance with condition 6.12(a), the following applies:

a) SFNSW must identify a planning area where the Landscape Approach is to be applied. The planning area may only contain SFNSW estate, and must be made up of adjacent, entire compartment units totalling at least 1000 ha.

b) Within identified landscapes a minimum of eight rough-barked trees must be retained per two hectares of net logging area for foraging by Brush-tailed Phascogales. Retained trees must represent the range of rough-barked tree species that occur in the area. Trees retained to meet this condition must be in addition to those trees retained to meet the requirements of condition 5.6.

c) Trees for retention must be selected from late mature, over-mature or senescent trees, where available.

d) Trees for retention must be selected from trees greater than 70 cm dbhob. Where trees greater than 70cm dbhob are not present, then trees with the next largest dbhob must be retained.

e) Retained trees must be marked for retention.

f) Large, hollow-bearing stags which are potential den trees, should be retained where their retention is consistent with safe working practice.

g) Where there is a conflict between condition 6.12.2(b) and 6.12.2(d), the requirement for the retention of trees greater than 70cm dbhob must prevail.

(Note: Preferred rough-barked trees for foraging include bloodwoods, ironbarks, mahoganies, boxes, tallowwood and stringybarks. Where these are not available turpentine, blackbutt and grey-gums are also suitable rough-barked foraging trees.)

AMENDMENT 2
28 April 2003
Condition 6.13 replaced
Ref Appendix E

6.13 Hastings River Mouse Pseudomys oralis

Where there is a record of the Hastings River Mouse in the compartment or within 800 metres outside the boundary of the compartment the following must apply:

a) Within 800 metres of a record of Hastings River Mouse, specified forestry activities are prohibited from all areas assessed as Hastings River Mouse habitat of moderate or high suitability.

b) An exclusion zone of at least 200 metres radius must be implemented around all records of Hastings River Mouse. This minimum exclusion zone must be applied where Hastings River Mouse habitat within 200 metres of the record is assessed as being unsuitable habitat.

c) The felling of trees across the boundary of the Hastings River Mouse habitat (assessed under condition 6.13 (a) above) or an exclusion zones (established under condition 6.13 (b) above) is prohibited except where no more than six (6) trees containing timber logs are felled across the boundary in any 200 metre length of the boundary of the Hastings River Mouse habitat or exclusion zone, whatever 200 metre length of boundary is considered.

d) Condition 6.13 (c) is not breached where a tree is accidentally felled into a Hastings River Mouse habitat or exclusion zone.

e) A tree that is accidentally felled into a Hastings River Mouse habitat or exclusion zone may be removed from the habitat or zone, but only if it contains a timber log. The tree may be removed even if the total number of trees removed in the harvesting operation concerned will, as a result, exceed the number calculated by applying the principle set out in condition 6.13 (c).

f) A tree that is felled into a Hastings River Mouse habitat or exclusion zone under condition 6.13 (c), or accidentally, may be removed only in accordance with the following rules:

i. the crown must be cut off from the trunk and left where it has fallen, except where the whole of the tree is lifted out of, or lifted and moved within, the habitat or zone using a mechanical harvester; and

ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

g) Suitability of Hastings River Mouse habitat must be assessed according to condition 8.8.9A of this licence.

AMENDMENT 4
17 May 2004
Deleted 6.13A
Inserted 6.13B
Ref Appendix E

6.13A Hastings River Mouse Pseudomys oralis *(Special provisions for Compartment 23, Gibraltar Range State Forest)*

6.13B Hastings River Mouse Pseudomys oralis (Special provisions for various compartments)

Where and when this condition applies

a) This condition (condition 6.13B) applies to the following compartments (the "relevant compartments"):

- Marengo State Forest Compartments 10, 11, 12, 14, 15, 16, 115
- Chaelundi State Forest Compartments 170, 172, 174
- Ellis State Forest Compartments 204, 205, 206, 207, 208, 209, 210, 211
- Glen Elgin State Forest Compartments 14, 15
- Hyland State Forest Compartments 33, 46, 49, 317, 318, 319, 320, 321
- Mount Mitchell State Forest Compartments 16, 17, 18

b) This condition applies on and from its commencement for a period of two years. Condition 6.13 does not apply to a relevant compartment during that two year period.

HRM exclusion zones and HRM operational zones to be established

c) If a specified forestry activity (or miscellaneous forestry operation) is to be carried out in a relevant compartment, any HRM exclusion zone and HRM operational zone for that compartment must be established or identified. For the avoidance of doubt, no other zone for the protection of the Hastings River Mouse is required to be established in the relevant compartment under another term of this licence (including condition 7).

Note: See paragraph (r) of this condition for definitions of "HRM exclusion zone" and "HRM operational zone" and see Schedule 10B for maps which show the location of HRM exclusion zones and HRM operational zones within the relevant compartments.

What can be done in an HRM operational zone?

d) The terms of this licence (in particular, condition 5.1) apply to and in relation to an HRM operational zone as if it were an exclusion zone, except as provided by this condition.

e) Timber may be removed by snigging via a route (whether or not it is the route of an existing snig track) through an HRM operational zone if:

i. there is no practicable alternative route available; and

ii. the manager of the regional office of Forests NSW that is responsible for managing land that includes the relevant compartment (or more senior officer) has authorised, in writing, the use of the route for snigging.

f) A snig track may be constructed (or re-opened) on the proposed route (for example, by clearing trees or other vegetation) if the manager's authorisation for the purposes of condition 6.13B (e) includes an authorisation to do so.

g) A road may be constructed or re-opened in an HRM operational zone to provide access to and from a log dump if:

i. there is no practicable alternative route available; and
ii. the manager of the regional office of Forests NSW that is responsible for managing land that includes the relevant compartment (or more senior officer) has authorised, in writing, the construction or re-opening of the road.

Note: Condition 5.1 (which applies to an HRM operational zone because of paragraph (d) above) authorises the use of a road by harvesting machinery in an HRM operational zone. Routine road maintenance may also be carried out in an HRM operational zone (because this is not a specified forestry activity that would otherwise be prohibited by condition 5.1).

h) Harvesting machinery may enter, and be operated within, an HRM operational zone for the purpose of constructing or re-opening a road or snig track as authorised by condition 6.13B (e), (f) or (g).

i) Forests NSW must ensure that all practical measures are taken to minimise any adverse impact of any snigging (including construction of a snig track) or road construction or re-opening on the environment, including the habitat of any threatened species.

Undisturbed areas

j) In any harvesting operation (for the purpose of timber production) within a relevant compartment, Forests NSW is to ensure that an area that contains non-merchantable timber or provides habitat connectivity (being an area that is not to be logged in the harvesting operation) is identified in the field. The area is to be marked on the harvesting plan operational map for the operation (unless the size of the area makes that impracticable in light of the scale of the operational map). Forests NSW is to provide the Department of Environment and Climate Change with a copy of the updated harvesting plan operational map on the completion of the harvesting operation.

Protection of ground habitat in net logging area etc

k) Forests NSW must protect ground habitat in a relevant compartment by ensuring that disturbance to the ground is minimised to the greatest extent practicable during a harvesting operation. Accordingly:

i. the construction of new roads and snig tracks is to be kept to a minimum;
ii. any harvesting machine must be operated using walkover techniques and in such a way that skewing of machine tracks is minimised to the greatest extent practicable;
iii. any harvesting machine must be operated, where practicable, with any blades, rippers or similar attachments positioned so that they do not disturb groundcover vegetation or soil; and
iv. damage to, or disturbance of, any log or branch that contains a hollow and that is on the ground when the harvesting operation commences must be avoided or minimised.

Felling of trees into HRM exclusion zones and HRM operational zones

l) Techniques of directional felling are to be used, where practicable, to avoid trees falling into an HRM exclusion zone or HRM operational zone in a harvesting operation (for the purposes of timber production). However, a tree that contains a timber log may be felled into, and removed from, such a zone if it is not practicable to fell the tree away from the zone using these techniques. A tree that is accidentally felled into the zone may also be removed from the zone if it contains a timber log.

m) The following rules apply to the removal of a tree from an HRM exclusion zone or HRM operational zone under condition 6.13B (l):

i. the crown must be left where it has fallen unless the whole of the tree (or the whole of that part of the tree that has fallen into the zone) is lifted out of, or lifted and moved within, the zone using a mechanical harvester;
ii. in removing any part of the tree (or logs into which it has been cut) from the zone, disturbance to the groundcover vegetation and soil must be minimised to the greatest extent practicable.

Bush fire hazard reduction work

n) In so far as its obligations under the *Rural Fires Act 1997* allow, Forests NSW is to carry out any bush fire hazard reduction work in a relevant compartment when weather and fuel moisture conditions will enable the following outcomes to be achieved:

i. the maintenance of a mosaic of burnt and unburnt patches within the compartment;
ii. the maintenance, within the net logging area of the compartment, of a significant proportion of understorey vegetation and groundcover vegetation that is unburnt;
iii. minimal impact on large fallen logs.

o) If bush fire hazard reduction work is carried out in, or results in fire spreading to, an HRM exclusion zone or an HRM operational zone, or an area that contains non- merchantable timber or that provides habitat connectivity (as identified by Forests NSW for the purpose of condition 6.13B (j)), Forests NSW is to record, in writing, the following details:

i. the location of the zone or other area in which the bush fire hazard reduction work is carried out or into which fire spreads;
ii. the date on which the bush fire hazard reduction work is carried out in the zone or other area or on which fire spreads to the zone or other area;
iii. the extent of the area burnt, or otherwise affected by the work, within the zone or other area.

These details are to be provided to the Department of Environment and Climate Change on completion of the bush fire hazard reduction work.

Operation of other terms of the licence

p) This condition (condition 6.13B) does not affect the operation of condition 6.13 when a specified forestry activity (or miscellaneous forestry operation) is carried out in a compartment other than a relevant compartment. Accordingly, a record of a Hastings River Mouse in a relevant compartment may require an exclusion zone to be established in accordance with condition 6.13 in a compartment in the vicinity of a relevant compartment.

q) For the avoidance of doubt, a pre-logging or pre-roading survey with respect to the Hastings River Mouse is not required to be carried out in a relevant compartment for the purpose of carrying out an operation within the compartment.

Identification of HRM exclusion zone or operational zone

r) In this condition (condition 6.13B):

"HRM exclusion zone" means any area of land depicted in the spatial data layer of the ESRI Shape file called "HRM_exclusion" located on the CD Rom labelled "UNE IFOA Appendix B Condition 6.13B", as it was on 28 August 2007, and held by the Department of Environment and Climate Change; and

"HRM operational zone" means any area of land depicted in the spatial data layer of the ESRI Shape file called "HRM_operational" located on the CD Rom labelled "UNE IFOA Appendix B Condition 6.13B ", as it was on 28 August 2007, and held by the Department of Environment and Climate Change.

Note: See Schedule 10B for maps which show the location of the HRM exclusion zones and HRM operational zones for the relevant compartments. These maps are for guidance only. The zones are to be identified for the purpose of applying the requirements of this condition by using the CD-Rom as referred to above.

6.14 Koala Phascolarctos cinereus

a) In areas where there is a Local Koala Management Plan which has been prepared in consultation with, and approved in writing by, the NPWS, this Plan must be implemented.

b) Specified forestry activities must not commence in Pine Creek SFNSW until the Local Koala Management Plan has been approved by NPWS.

c) Where a Local Koala Management Plan has not been approved by NPWS, for an area other than Pine Creek State Forest, the following must apply:

i. Specified forestry activities are prohibited from within all Koala high use areas. A 20 metres wide exclusion zone must be implemented around the boundary of Koala high use areas.

ii. In Koala intermediate use areas, per two hectares of net logging area ten primary browse trees must be retained where available. These trees must be marked for retention. Within intermediate use compartments, Australian Group Selection silvicultural techniques are prohibited in preferred forest types.

AMENDMENT 2
28 April 2003
Condition 6.14d)-i) added
Ref Appendix E

d) The felling of trees into a Koala high use area is prohibited. The felling of trees across the boundary of the exclusion zone established under condition 6.14 (c) (i) is prohibited except where no more than six (6) trees containing timber logs are felled across the boundary in any 200 metre length of the boundary of the exclusion zone, whatever 200 metre length of boundary is considered.

e) Condition 6.14 (d) is not breached where a tree is accidentally felled into a Koala high use area or exclusion zone.

f) A tree that is accidentally felled into an exclusion zone may be removed from the zone, but only if it contains a timber log. The tree may be removed even if the total number of trees removed in the harvesting operation concerned will, as a result, exceed the number calculated by applying the principle set out in condition 6.14 (d).

g) A tree that is felled into an exclusion zone under condition 6.14 (c), or accidentally, may be removed only in accordance with the following rules:

i. the crown must be cut off from the trunk and left where it has fallen, except where the whole of the tree (including the crown) is lifted out of the zone using a mechanical harvester; and

ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

(Note: A failure to comply with the requirements of a Local Koala Management Plan will be regarded as a breach of this licence.)

6.15 Spotted-tailed Quoll Dasyurus maculates

AMENDMENT 2
28 April 2003
Condition 6.15 replaced
Ref Appendix E

a) An exclusion zone of at least 12 hectares must be implemented around Spotted-tailed Quoll maternal den sites. This exclusion zone must be linked to protection zones implemented in condition 5.7.

b) An exclusion zone of at least 3.5 hectares must be implemented around Spotted-tailed Quoll permanent den sites. This exclusion zone must be linked to protection zones implemented in condition 5.7.

c) An exclusion zone of at least 12 hectares must be implemented around Spotted-tailed Quoll latrine sites.

d) Planning and placement of exclusion zones referred to in condition 6.15 (a), (b) and (c) above must maximise the inclusion of Spotted-tailed Quoll records.

e) The felling of trees across the boundary of an exclusion zone established under conditions 6.15 a), (b) or (c) above is prohibited except where no more than six (6) trees containing timber logs are felled across the boundary in any 200 metre length of the boundary of the Tiger Quoll exclusion zone, whatever 200 metre length of boundary is considered.

f) Condition 6.15 (g) is not breached where a tree is accidentally felled into a Tiger Quoll exclusion zone.

g) A tree that is accidentally felled into a Tiger Quoll exclusion zone may be removed from the zone, but only if it contains a timber log. The tree may be removed even if the total number of trees removed in the harvesting operation concerned will, as a result, exceed the number calculated by applying the principle set out in condition 6.15 (e).

h) A tree that is felled into a Tiger Quoll exclusion zone under condition 6.15 (e), or accidentally, may be removed only in accordance with the following rules:

   i. the crown must be cut off from the trunk and left where it has fallen, except where the whole of the tree is lifted out of, or lifted and moved within, the zone using a mechanical harvester; and

   ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

i) Protection zones must not be counted towards exclusion zones referred to in condition 6.15 (a) and (b) above.

AMENDMENT 2
28 April 2003
Condition 6.16 replaced
Ref Appendix E

6.16 Squirrel Glider Petaurus norfolcensis

Where there is a Squirrel Glider record in a compartment or within 250 metres outside the compartment boundary (unless specified otherwise in this condition), the following must apply:

a) A 250 metres radius planning area must be identified. This planning area must be centred on the record, or records, of the Squirrel Glider. The radius of the planning area must be measured from the record. Where there is more than one record the radius of the planning area must be measured from a point located equidistant from the majority of records, where possible.

b) Within this planning area an exclusion zone, or exclusion zones, totalling eight hectares must be implemented.

c) The felling of trees across the boundary of a Squirrel Glider exclusion zone established under conditions 6.16 b) below is prohibited except where no more than six (6) trees containing timber logs are felled across the boundary in any 200 metre length of the boundary of the Squirrel Glider exclusion zones, whatever 200 metre length of boundary is considered.

d) Condition 6.16 (c) is not breached where a tree is accidentally felled into a Squirrel Glider exclusion zone.

e) A tree that is accidentally felled into a Squirrel Glider exclusion zone may be removed from the zone, but only if it contains a timber log. The tree may be removed even if the total number of trees removed in the harvesting operation concerned will, as a result, exceed the number calculated by applying the principle set out in condition 6.16 (c).

f) A tree that is felled into a Squirrel Glider exclusion zone under condition 6.16 (c), or accidentally as described in condition 6.16 (e), may be removed only in accordance with the following rules:

   i. the crown must be cut off from the trunk and left where it has fallen, except where the whole of the tree is lifted out of, or lifted and moved within, the zone using a mechanical harvester; and

   ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

g) Where there are records of Squirrel Glider dens, these must be contained within exclusion zones. Planning and placement of exclusion zones should maximise the inclusion of other types of Squirrel Glider records within exclusion zones.

h) The exclusion zone must encompass Category 1 habitat available in the planning area. In the event that there is not sufficient area of Category 1 habitat to meet the requirements of condition 6.16 (b) above, Category 2 habitat must be utilised. In the event that there is not sufficient area of Category 1 and 2 habitat to meet the requirements of condition 6.16 (b) above, Category 3 habitat must be utilised. In the event that there is not sufficient area of Category 1, Category 2 and Category 3 habitat to meet the requirement of condition 6.16 (b) above, Category 4 habitat must be utilised. In the event that there is not sufficient area of Category 1, Category 2, Category 3 and Category 4 habitat to meet the requirement of condition 6.16 (b) above, Category 5 habitat must be utilised.

i) Habitat categories are ranked as follows (from highest to lowest):

   i. Category 1: Class 1 modelled habitat;

   i. Category 2: Class 2 modelled habitat;

   ii. Category 3: High Conservation Value Old Growth Forest;

   iii. Category 4: Class 3 modelled habitat;

   iv. Category 5: any other areas of suitable habitat.

j) Modelled habitat and High Conservation Value Old Growth Forest occurring in statutory reserves within the 250 metres radius may be used to meet the exclusion zone requirements, where it is consistent with the requirements of condition 6.16 (g) and (h) above.

k) The shape of exclusion zones should minimise the boundary to area ratio. Where appropriate, exclusion zones should be circular in shape. Long and linear strips should be avoided where possible.

   (Note: Circular or compact areas have the lowest boundary to area ratio, while linear or fragmented ones have the highest. Areas which generally conform to a circular or square shape have a low boundary to area ratio. As a guide, "low" could be considered to be an area where the longer axis of the area is less than twice as long as the shorter axis.)

l) Where there are two or more Squirrel Glider records consecutively less than 250 metres apart but collectively spreading over an area greater than 250 metres in any direction then advice on the location of the planning area must be sought from the NPWS.

m) If a Squirrel Glider record is on private property within 100 metres of SFNSW estate, then the equivalent of a 250 metres radius planning area must be located on public land as close as possible to the record.

n) When ten of these sites are recorded on SFNSW estate over a two year period separated by at least two kilometres within a 15 kilometres radius, SFNSW may apply to NPWS for a review of this condition.

(Note: The NPWS will advise SFNSW of the recommendation, made by NPWS in relation to condition 6.16 (n) above, to the relevant Ministers, prior to consideration by the relevant Ministers.)

AMENDMENT 2
28 April 2003
Condition 6.17 replaced
Ref Appendix E

6.17 Yellow-bellied Glider Petaurus australis

a) A 50 metres radius exclusion zone must be implemented around Yellow-bellied Glider dens.

b) The felling of trees across the boundary of an exclusion zone established under conditions 6.17 a) above is prohibited except where no more than six (6) trees containing timber logs are felled across the boundary in any 200 metre length of the boundary of the Yellow-bellied Glider exclusion zone, whatever 200 metre length of boundary is considered.

c) Condition 6.17 (b) is not breached where a tree is accidentally felled into a Yellow-bellied Glider exclusion zone.

d) A tree that is accidentally felled into a Yellow-bellied Glider exclusion zone may be removed from the zone, but only if it contains a timber log. The tree may be removed even if the total number of trees removed in the harvesting operation concerned will, as a result, exceed the number calculated

by applying the principle set out in condition 6.17 (b).

e) A tree that is felled into a Yellow-bellied Glider exclusion zone under condition 6.17 (b), or accidentally, may be removed only in accordance with the following rules:

   i. the crown must be cut off from the trunk and left where it has fallen, except where the whole of the tree is lifted out of, or lifted and moved within, the zone using a mechanical harvester; and

   ii. in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

f) All Yellow-bellied Glider sap feed trees must be retained. All Yellow-bellied Glider Sap feed trees must be marked for retention.

g) Where there is a record of a Yellow-bellied Glider in a compartment or within 100 metres outside the boundary of the compartment, the following must apply:

   i. Within a 100 metres radius of each retained Yellow-bellied Glider sap feed tree, observation or den site record, 15 feed trees must be retained. Yellow-bellied Glider sap feed trees must not be counted towards these 15 feed trees. Retained feed trees must have good crown development and should have minimal butt damage and should not be suppressed. Mature and late mature trees must be retained as feed trees where these are available.

   ii. Within a 200 metres radius of a Yellow-bellied Glider call detection site record, 15 feed trees must be retained. Retained feed trees must have good crown development and should have minimal butt damage and should not be suppressed. Mature and late mature trees must be retained as feed trees where these are available.

   iii. The feed trees retained in condition 6.17 (g) (i) and (ii) must be of the same species as the identified sap feed tree or identified den tree, or should be trees that shed their bark in long strips, eg. species from Blue, Flooded, Grey, Red and White Gum groups.

   iv. The feed trees retained in condition 6.17 (g) (i) and (ii) must be marked for retention.

6.18 Wombat Vombatus ursinus

For areas north of Oxley Highway:

a) A 20 metres radius exclusion zone must be established around all entrances to burrows where the burrow is greater than one metre in length.

6.19 Common Blossom Bat Syconycteris australis

In areas of *Syconycteris australis* modelled habitat, at least 75% of mature individuals of each species of *Banksia integrifolia*, *Melaleuca quinquenervia*, *Grevillea robusta* and *Callistemon viminalis* within the net logging area must be protected from damage by specified forestry activities. During harvesting operations, the potential for damage to these trees must be minimised by utilising techniques of directional felling.

6.20 Golden-tipped Bat Kerivoula papuensis

Where there is a record of *Kerivoula papuensis* within a compartment or within 200 metres outside the boundary of the compartment, the following must apply:

AMENDMENT 2
28 April 2003
Condition 6.20a) replaced
Ref Appendix E

a) Exclusion zones at least 30 metres wide must be implemented on both sides of all first order streams and second order streams within a 200 metres radius of the record.

b) The width of exclusion zones referred to in condition 6.20 (a) above must be measured from the top of the bank of the incised channel or, where there is no defined bank, from the edge of the channel.

6.21 Large-footed Myotis Myotis adversus

Where there is a record of *Myotis adversus* in a compartment, or 100 metres outside the boundary of the compartment, the following must apply:

a) Exclusion zones of at least 30 metres wide must be implemented on all dams and permanent water bodies. Permanent water bodies include lakes, lagoons, or any other permanent collection of still water that is not impounded by an artificial structure. The exclusion zone must be measured from the top of the high bank of the permanent water body.

b) Exclusion zones of at least 30 metres wide must be implemented on all permanent streams within 100 metres of the record.

c) The width of exclusion zones must be measured from the top of the bank of the incised channel or, where there is no defined bank, from the edge of the channel.

6.22 Threatened Flora: 50 metres Exclusion Zone, all individuals

Where there is a record of any of the species listed in Table 1 or Table 2 below within the compartment or within 50 metres outside the boundary of the compartment, the following must apply:

a) An exclusion zone of at least 50 metres radius must be implemented around all individuals.

b) An exclusion zone of at least 50 metres wide must be implemented around all groups of individuals. A group is defined as more than one individual located less than 20 metres apart.

Table 1: Threatened plants to which condition 6.22 must be applied that are known to occur, or considered likely to occur, in areas of areas of SFNSW estate outside of statutory reserves.

Asperula asthenes	*Prostanthera askania* (syn. *P.* sp. 6 Strickland State Forest)
Elaeocarpus sp Rocky Creek (syn. E. sp Minyon)	*Prostanthera* sp. Somersby (syn. *P. junonis*)
Grevillea obtusiflora spp. *obtusiflora*	*Sophora fraseri*
Lindsaea fraseri	*Tylophora woollsii*
Lindsaea incisa	*Uromyrtus australis*
Melichrus sp. Gibberagee	

Table 2: Threatened plants to which condition 6.22 must be applied that are not currently known to occur, or not considered likely to occur, in areas of areas of SFNSW estate outside of statutory reserves.

Acalypha eremorum	*Fontainea oraria*
Acronychia littoralis	*Geijera paniculata*
Aldrovanda vesiculosa	*Gentiana wissmannii*
Amorphospermum whitei - North Metapopulation Unit	*Hypolepis elegans*
Amyema scandens	*Lepidium hyssopifolium*
Angiopteris evecta	*Lepidium peregrinum*
Apatophyllum constablei	*Macadamia tetraphylla*
Arthropteris palisotii	*Micromelum minutum*
Austromyrtus fragrantissima	*Muellerina myrtifolia*
Baloghia marmorata	*Myriophyllum implicatum*
Bertya sp. A Cobar-Coolabah	*Neoastelia spectabilis*
Bosistoa selwynii	*Ochrosia moorei*
Bosistoa transversa	*Olax angulata*
Bulbophyllum globuliforme	*Owenia cepiodora*
Cadellia pentastylis	*Persicaria elatior*
Choricarpia subargentea	*Phaius australis*
Corynocarpus rupestris subsp. *rupestris*	*Phaius tankervilliae*
Cryptocarya foetida	*Plectranthus alloplectus*
Davidsonia pruriens var. *jerseyana*	*Prostanthera* sp. Bundjalung (syn. *P. palustris*)
Davidsonia sp. A Mullumbimby Currumbin Creek	*Psilotum complanatum*
Diospyros mabacea	*Randia moorei*
Diospyros major var. *ebenus*	*Rapanea* sp. A Richmond River
Diploglottis campbellii	*Sarcochilus fitzgeraldii*
Elaeocarpus williamsianus	*Sarcochilus hartmannii*
Eleocharis tetraquetra	*Sauropus albiflorus* subsp. *microcladus*
Endiandra floydii	*Syzygium paniculatum*
Endiandra muelleri subsp. *bracteata*	*Syzygium hodgkinsoniae*

Eucalyptus pachycalyx subsp. *banyabba*	*Syzygium moorei*
Euphrasia arguta	*Tarenna cameronii*
Euphrasia bella	*Tasmannia glaucifolia* - North Metapopulation Unit
Euphrasia collina subsp. *muelleri*	*Tinospora tinosporoides*
Euphrasia ruptura (syn. *E.* sp. Tamworth)	*Zieria floydii*
Eucalyptus camphora subsp. *relicta*	*Zieria prostrata*
Floydia praealta	

6.23 Threatened and Protected Flora: 20 metres Exclusion Zones, all individuals

Where there is a record of any of the species listed in Table 3 or Table 4 below within the compartment or within 20 metres outside the boundary of the compartment, the following must apply:

a) An exclusion zone of at least 20 metres radius must be implemented around all individuals.

b) An exclusion zone of at least 20 metres wide must be implemented around all groups of individuals. A group is defined as more than one individual located less than 20 metres apart.

Table 3: Threatened and protected plants to which condition 6.23 must be applied that are known to occur, or considered likely to occur, in areas of areas of SFNSW estate outside of statutory reserves.

Acacia pubescens	*Hicksbeachia pinnatifolia* - Southern Metapopulation Unit
Angophora inopina	*Leucopogon confertus*
Bothriochloa biloba	*Lindsaea brachypoda*
Callitris baileyi	*Marsdenia longiloba*
Corchorus cunninghamii	*Melaleuca biconvexa*
Cryptostylis hunteriana	*Melichrus hirsutus* (syn. M. sp. A)
Cyperus aquatilis	*Oberonia titania* (PNP)
Dendrocnide moroides	*Olearia cordata*
Diuris disposita	*Phebalium glandulosum* subsp. *eglandulosum*
Diuris pedunculata	*Pomaderris brunnea*
Drynaria rigidula	*Pomaderris queenslandica*
Eucalyptus fracta	*Pterostylis cucullata*
Eucalyptus glaucina - Southern Metapopulation Unit	*Pterostylis gibbosa*
Eucalyptus rubida subsp. *barbigerorum*	*Rutidosis heterogama* - Inland Metapopulation Unit
Grevillea guthrieana - Booral Metapopulation.	*Senna acclinis*
Grevillea masonii	*Triplarina imbricata*
Hakea fraseri	*Tylophora linearis*
Hedyotis galioides	*Zieria lasiocaulis*
Hibbertia procumbens	

PNP = Protected Native Plant

Table 4: Threatened plants to which condition 6.23 must be applied that are not currently known, or not considered likely to occur, in areas of areas of SFNSW estate outside of statutory reserves.

Acacia acrionastes	*Eucalyptus parramattensis* subsp. *decadens*
Acacia macnuttiana	*Eucalyptus pumila*
Acacia pubifolia	*Gaultheria viridicarpa* subsp. *merinoensis*
Acacia pycnostachya	*Gaultheria viridicarpa* subsp. *viridicarpa*
Allocasuarina simulans	*Gingidia montana*
Almaleea cambagei	*Grevillea mollis*
Angophora exul	*Homoranthus lunatus*
Arthraxon hispidus	*Isoglossa eranthemoides*
Baeckea sp. Pyramids	*Knoxia sumatrensis*
Bertya ingramii	*Monotaxis macrophylla*
Blumea lacera	*Picris evae*
Boronia granitica	*Pimelea venosa*
Caesia parviflora var. *minor*	*Pseudanthus ovalifolius*
Diuris venosa	*Rutidosis heterogama* - Coastal Metapopulation Unit
Eucalyptus approximans	*Wahlenbergia scopulicola*
Eucalyptus nicholii	

6.24 Threatened Flora: 50 metres Exclusion Zone, 90% of individuals

Where there is a record of any of the species listed in Table 5 or Table 6 within the compartment or within 50 metres outside the boundary of the compartment, the following must apply:

a) An exclusion zone or exclusion zones of at least 50 metres wide must be implemented around 90% of individuals.

b) The exclusion zone or exclusion zones must include areas where the density of individuals is greatest.

(*Note: Where there are few individuals within the compartment and the individuals are widely dispersed within the compartment, an exclusion zone of at least 50 metres radius must be implemented around at least 90% of individuals. Where there are a large number of individuals within the compartment and they occur in groups, the exclusion zone or exclusion zones may be positioned around the group or groups. A group is defined as more than one individual located less than 20 metres apart.*)

Table 5: Threatened plants to which condition 6.24 must be applied that are known to occur, or considered likely to occur, in areas of areas of SFNSW estate outside of statutory reserves.

Hicksbeachia pinnatifolia - Northern Metapopulation Unit

Table 6: Threatened plants to which condition 6.24 must be applied that are not currently known to occur, or not considered likely to occur, in areas of areas of SFNSW estate outside of statutory reserves.

Endiandra hayesii
Fontainea australis
Sarcochilus weinthalii
Symplocos baeuerlenii

6.25 Threatened and Protected Flora: 20 metres Exclusion Zone, 90% of individuals

Where there is a record of any of the species listed in Table 7 or Table 8 within the compartment or within 20 metres outside the boundary of the compartment, the following must apply:

a) An exclusion zone or exclusion zones of at least 20 metres wide must be implemented around 90% of individuals.

b) The exclusion zone or exclusion zones must include areas where the density of individuals is greatest.

(*Note: Where there are few individuals within the compartment and the individuals are widely dispersed within the compartment, an exclusion zone of at least 20 metres radius must be implemented around at least 90% of individuals. Where there are a large number of individuals within the compartment and they occur in groups, the exclusion zone or exclusion zones may be positioned around the group or groups. A group is defined as more than one individual located less than 20 metres apart.*)

Table 7: Threatened and protected plants to which condition 6.25 must be applied that are known to occur, or considered likely to occur, in areas of areas of SFNSW estate outside of statutory reserves.

Acacia bynoeana	*Grevillea scortechinii* subsp. *sarmentosa*
Acacia courtii	*Gastrodia sesamoides* (PNP)
Allocasuarina defungens	*Hibbertia hexandra* - Southern Metapopulation Unit
Asterolasia elegans	*Leptospermum deanei*
Boronia umbellata	*Melaleuca tamariscina* ssp. *irbyana*
Callitris oblonga	*Plectranthus nitidus*
Corokia whiteana - Rhyolite Metapopulation Unit	*Polygala linariifolia*
Cymbidium canaliculatum (PNP)	*Prostanthera densa*
Cynanchum elegans	*Pterostylis nigricans*

Dichanthium setosum	*Quassia* sp. Moonee Creek (syn. *Q.* sp. B)
Dipodium atropurpureum (PNP)	*Styphelia perileuca*
Dipodium pulchellum (PNP)	*Tasmannia glaucifolia* - Southern Metapopulation Unit
Eucalyptus mckieana	*Tetratheca glandulosa*
Grevillea parviflora ssp. *parviflora*	*Tetratheca juncea*
Grevillea banyabba	*Tinospora smilacina*
Grevillea guthrieana - Carrai Metapopulation	*Zieria involucrata*

PNP = Protected Native Plant

Table 8: Threatened plants to which condition 6.25 must be applied that are not currently known to occur, or not considered likely to occur, in areas of areas of SFNSW estate outside of statutory reserves.

Acacia flocktoniae	*Grevillea evansiana*
Corokia whiteana - Coastal Sands Metapopulation Unit	*Grevillea shiressii*
Corokia whiteana - Metasediments Metapopulation Unit	*Homoranthus prolixus*
Darwinia biflora	*Kunzea rupestris*
Diuris praecox	*Lasiopetalum longistamineum*
Eriostemon ericifolius	*Prostanthera staurophylla*
Eucalyptus caleyi subsp. *ovendenii*	*Thesium australe*
Eucalyptus camfieldii	*Velleia perfoliata*
Grevillea beadleana	

6.26 Threatened and Protected Flora: protection of 90% of individuals

Where there is a record of any of the species listed in Table 9 or Table 10 within the compartment, the following must apply:

a) A minimum of 90% of individuals must be protected from specified forestry activities. During harvesting operations, the potential for damage to these plants must be minimised by utilising techniques of directional felling.

(*Note: Where there are few individuals within the compartment and the individuals are widely dispersed within the compartment, at least 90% of individuals must be protected from* specified forestry activities*. Where there are a large number of individuals within the compartment and they occur in groups, the group or groups should be protected. A group is defined as more than one individual located less than 20 metres apart.*)

Table 9: Threatened plants to which condition 6.26 must be applied that are known to occur, or considered likely to occur, in areas of areas of SFNSW estate outside of statutory reserves.

Calophanoides hygrophiloides
Eucalyptus tetrapleura
Goodenia macbarronii
Grevillea rhizomatosa
Hakea trineura (syn. H. sp. aff. *trineura)*
Hibbertia hexandra - Northern Metapopulation Unit
Macrozamia johnsonii
Olearia flocktoniae
Pultenaea campbellii - Northern Metapopulation Unit

Table 10: Threatened plants and protected to which condition 6.25 must be applied that are not currently known, or not considered likely to occur, in areas of areas of SFNSW estate outside of statutory reserves.

Desmodium acanthocladum
Doryanthes palmeri (PNP)
Eriostemon myoporoides ssp. conduplicatus (PNP)
Haloragis exalata subsp. exalata
Haloragis exalata subsp. velutina

PNP = Protected Native Plant

6.27 Threatened Flora: Monitoring program

Where there is a record of any of the species listed in Table 11 or Table 12 within the net survey area or within 50 metres outside the boundary of the net survey area, the following must apply:

a) SFNSW must prepare a monitoring program for the species with the objective of assessing the response of the species to disturbances associated with specified forestry activities.

b) The monitoring program must be submitted to the NPWS for approval. SFNSW must not commence specified forestry activities in the compartment in the area subject to the monitoring program until NPWS has approved the program in writing.

(Note: The NPWS may amend or vary the program or impose conditions relating to the approval of the program.)

c) SFNSW must comply with any conditions imposed on the approval as per condition 6.27 (b) above.

Table 11: Threatened plants to which condition 6.27 must be applied that are known to occur, or considered likely to occur, in areas of areas of SFNSW estate outside of statutory reserves.

Acacia ruppii
Amorphospermum whitei - Southern Metapopulation Unit
Angophora robur
Eucalyptus glaucina - Northern Metapopulation Unit
Grevillea quadricauda
Hibbertia marginata
Parsonsia dorrigoensis
Pultenaea campbellii - Southern Metapopulation Unit
Pultenaea stuartiana
Tasmannia purpurascens

Table 12: Threatened plants to which condition 6.27 must be applied that are not currently known to occur, or are considered not likely to occur, in areas of areas of SFNSW estate outside of statutory reserves.

Clematis fawcettii
Grammitis stenophylla
Melaleuca groveana

6.28 Threatened Flora: Species Management Plans

a) As an alternative to applying conditions 6.22, 6.23. 6.24, 6.25, 6.26 or 6.27, SFNSW may choose, with the prior written approval of NPWS, to develop a Species Management Plan. The reasons for adopting this alternative approach must be clearly documented in the Species Management Plan. Species Management Plans are to apply to a single species, however multiple species plans may be appropriate where species co-occur.

b) In general, Species Management Plans are to apply to areas larger than a single compartment and smaller than a state forest in extent.

c) Species Management Plans are aimed at individual taxa or groups of taxa where it is considered that they can be more appropriately managed by specific measures not included in the conditions listed in conditions 6.22, 6.23. 6.24, 6.25, 6.26 or 6.27.

d) Species Management Plans must be based on a comprehensive survey of potential habitat within the planning area identified in condition 6.28 (b) above. Species Management Plans must document the species' distribution and abundance in the planning area.

e) Species Management Plans must clearly document management measures to be undertaken. Such measures may include modification to timber harvesting practices, control of specified burning or grazing regimes, measures to mitigate weed invasion, weed control or reservation of forest types or species habitat from specified forestry activities.

f) Species Management Plans must incorporate actions specified in approved Recovery Plans where appropriate.

g) Where necessary, Species Management Plans must include a monitoring program that determines the effect of specified forestry activities on the species and assesses the effectiveness of the management measures in providing for the species' conservation. The need for a monitoring program must be assessed as part of the Species Management Plan.

h) Species Management Plans must be prepared in consultation with, and submitted for approval by, the NPWS. A condition of this licence will be the implementation of an approved Species Management Plan.

i) The Species Management Plan must be submitted in writing for approval by the NPWS prior to its implementation and prior to the commencement of specified forestry activities in the compartment.

Condition 7. General survey requirements

a) Subject to condition 7 b) harvesting operations must not be undertaken in any compartment unless pre-logging and pre-roading surveys have been conducted in accordance with condition 8 Pre-logging and Pre-roading Surveys of this licence.

b) Pre-logging and pre-roading surveys are not required for the following species where SFNSW choose to implement the species' prescription, as detailed below.

(*Note: SFNSW may choose to implement one or more of the following prescriptions in lieu of survey.*)

i. ***Assa darlingtoni***: In Dorrigo Management Area only, an exclusion zone, or exclusion zones, must be implemented to protect all modelled habitat within the compartment.

ii. ***Philoria* spp.**: An exclusion zone, or exclusion zones, must be implement to protect all modelled habitat within the compartment.

iii. ***Mixophyes iteratus, M. fleayi* and *M. balbus***: Exclusion zones at least 30 metres wide must be implemented on both sides of those streams that occur within modelled habitat.

iv. ***White-crowned Snake***: An exclusion zone, or exclusion zones, must be implemented to protect all modelled habitat within the compartment. This must be applied in compartments where spotlight surveys as described in condition 8.8.6 have not been conducted.

v. ***Pale-headed Snake***: An exclusion zone, or exclusion zones, must be implemented to protect all modelled habitat within the compartment. This must be applied in compartments where spotlight surveys as described in condition 8.8.6 have not been conducted.

AMENDMENT 2
28 April 2003
Condition 7b)vi replaced
Ref Appendix E

vi. ***Albert's Lyrebird***: An exclusion zone at least 20 metres wide must be implemented on both sides of all first order streams in the compartment. An exclusion zone at least 30 metres wide must be implemented on both sides of all second order streams in the compartment.

vii. ***Powerful Owl, Masked Owl, Barking Owl***: Implement the Landscape Approach as per condition 6.9.2 of this licence; OR for every 1,200 hectares of gross area an exclusion zone or exclusion zones totalling 300 hectares must be implemented as per the requirements of condition 6.9.1 of this licence.

AMENDMENT 2
28 April 2003
Condition 7b)viii replaced
Ref Appendix E

viii. ***Marbled Frogmouth***: exclusion zones at least 20 metres wide must be implemented on both sides of all first order streams in the compartment. Exclusion zones at least 30 metres wide must be implemented on both sides of all second order streams in the compartment.

ix. ***Rufous Scrub-bird***: Protect all microhabitat (as defined in Schedule 9 of this licence) and implement a 20 metres exclusion zone around this habitat.

x. ***Swift Parrot and Regent Honeyeater*:** At least ten eucalypt feed trees must be retained within every two hectares of net logging area. These trees must be marked for retention. Where retained eucalypt feed trees also meet the requirements of hollow-bearing tree or recruitment trees, the retained eucalypt feed tree can be counted as a hollow-bearing tree or recruitment tree. Where a Swift Parrot or Regent Honeyeater is observed feeding, the tree in which it is feeding must be retained.

xi. ***Brush-tailed Phascogale***: In compartments containing modelled habitat, for every 115 hectares of gross area, an exclusion zone or exclusion zones totalling 50 hectares must be implemented as per the requirements of condition 6.12 of this licence.

xii. ***Hastings River Mouse***: An exclusion zone, or exclusion zones, must be implement to protect all modelled habitat within the compartment.

xiii. ***Squirrel Glider***: An exclusion zone, or exclusion zones, must be implement to protect all modelled habitat within the compartment.

xiv. ***Yellow-bellied Glider*****:** All Yellow-bellied Glider sap feed trees must be retained. Within a 100 metres radius of each retained Yellow-bellied Glider sap feed tree, or within a 200 metres radius of a Yellow-bellied Glider call detection site record, 15 feed trees must be retained. Yellow-bellied Glider sap feed trees must not be counted towards these 15 feed trees. Retained feed trees must have good crown development and should have minimal butt damage and should not be suppressed. Mature and late mature trees must be retained as feed trees where these are available. These retained trees should be trees that shed their bark in long strips, eg. species from Blue, Flooded, Grey, Red and White Gum groups. A 50 metres radius exclusion zone must be implemented around Yellow-bellied Glider dens.

AMENDMENT 2
28 April 2003
Condition 7b)xv replaced
Ref Appendix E

xv. ***Myotis adversus*****:** exclusion zones at least 30 metres wide must be implemented on all dams and permanent water bodies in the compartment. Permanent water bodies include lakes, lagoons, or any other permanent collection of still water that is not impounded by an artificial structure. The exclusion zone must be measured from the top of the high bank of the permanent water body. Exclusion zones at least 30 metres wide must be implemented on all permanent streams within the compartment. The width of these exclusion zones applying to streams must be measured from the top of the bank of the incised channel or, where there is no defined bank, from the edge of the channel.

AMENDMENT 2
28 April 2003
Condition 7b)xvi replaced
Ref Appendix E

xvi. ***Kerivoula papuensis*****:** exclusion zones at least 30 metres wide must be implemented on both sides of all first order streams and second order streams within the compartment. The width of these exclusion zones must be measured from the top of the bank of the incised channel or, where there is no defined bank, from the edge of the channel.

c) Condition 7 (b) does not apply to a compartment which contain known habitat or potential habitat of Black-breasted Button-quail. Pre-logging and pre-roading surveys must be conducted in compartments which contain Black-breasted Button-quail known habitat or potential habitat.

d) Where SFNSW chooses to apply a species' condition in accordance with Condition 7 (b) in lieu of pre-logging and pre-roading surveys, that condition must be implemented for the duration of the harvesting operation.

AMENDMENT 2
28 April 2003
Condition 7e) added
Ref Appendix E

e) The same provisions of the relevant species specific condition contained in condition 6 apply to the exclusion zones implemented under condition 7 (b).

Condition 8. Pre-logging and pre-roading surveys

8.1 Survey requirements

a) Pre-logging and pre-roading surveys must consist of the following:

i. Compartment traverse as per condition 8.7 of this licence;

ii. Targeted fauna surveys as per condition 8.8 of this licence; and

iii. The recording of incidental threatened flora and fauna records as per condition 8.6 of this licence.

b) Pre-logging and pre-roading surveys must be conducted within the net survey area, and in areas within 50 metres outside the boundary of the net survey area, in compartments where known or potential habitat occurs.

c) Pre-logging and pre-roading surveys must be carried out in accordance with the following conditions.

(*Note: Any variations to the requirements set out in this condition must be approved in writing by NPWS prior to surveys being conducted.)*

d) Pre-logging and pre-roading surveys must be conducted for those species that require the implementation of species-specific and site-specific prescriptions as per condition 1.2 and condition 6 unless condition 7 is implemented for those species.

e) During pre-logging and pre-roading surveys, all practical steps must be taken to direct survey effort in areas of the highest quality Class modelled habitat, where modelled habitat occurs in the compartment.

f) The pre-logging and pre-roading survey requirements are based on a minimum survey effort for a standard 200 hectares of net logging area. (200 hectares equates to an average compartment size.)

8.2 Survey timing

a) SFNSW must plan and conduct surveys in the most appropriate "Survey season" (where specified in Schedule 2 of this licence for flora species, and as specified in condition 8.8 below for fauna species).

b) SFNSW must not conduct or permit the conduct of harvesting operations in compartments where seasonally appropriate surveys have not been carried out unless SFNSW choose to apply condition 7 (b) where the subject species is listed in that condition.

(*Note: Different fauna groups require survey during different seasons, with most groups best surveyed during spring-summer. As well as this, different weather conditions are more appropriate for certain groups, for instance it is most appropriate to survey for frogs after rain.*)

8.3 Surveyor experience

a) SFNSW must ensure that persons conducting pre-logging and pre-roading surveys are suitably experienced and trained. Suitable experience and training includes, but is not limited to:

   i. Extensive experience with flora and / or fauna survey work.

   ii. Extensive experience in the field identification of flora and / or fauna. Surveyors must be able to identify the threatened species and habitats of threatened species relevant to the region that require species-specific or site-specific conditions, as well as similar species that may be confused with these. Surveyors must be able to identify features referred to in condition 8.7.2 (b).

   iii. Familiarisation with herbarium or museum specimens of threatened species requiring species-specific or site-specific conditions, if not already familiar.

   iv. Relevant tertiary qualifications are preferable but not essential if the above criteria, condition 8.3 (a) i., ii. and iii. are met.

b) SFNSW must maintain a register of surveyors which details the way in which each surveyor meets the experience criteria specified in condition 8.3 (a) above. The entry in the register relevant to the surveyor must be received by NPWS within ten days of NPWS requesting the entry.

8.4 Survey documentation and reporting

a) SFNSW must prepare a pre-logging and pre-roading survey report that must include the following:

   i. Information relating to all of the "Data to Record" sections referred to in this condition.

   ii. All raw data sheets.

   iii. Details of previous reliable surveys including, but not limited to, survey methodology, sampling intensity, sample placement and distribution, season of survey and weather conditions.

AMENDMENT 2
28 April 2003
Condition 8.4b) replaced
Ref Appendix E

b) The Survey Report must be received by NPWS Northern Directorate (or Central Directorate where appropriate) within ten days of NPWS requesting the report.

c) All survey durations are to be interpreted as time worked in the field, not inclusive of travel time to and from the survey area.

8.5 Data compilation

a) The following data must be compiled prior to pre-logging and pre-roading surveys:

   i. All records of threatened species requiring species-specific or site-specific prescription held by, or available to, SFNSW. This must included, but is not limited to, searching the NPWS

Atlas of NSW Wildlife and SFNSW documents, records and other sources of information; and

ii. Maps of modelled habitat (with different Classes of habitat indicated) of those species requiring survey.

iii. The information required to be collated in condition 8.5 (b) below must be provided to persons conducting pre-logging and pre-roading surveys and harvest planning.

b) **Data to Record:**

i. Date(s) of review.

ii. Name of Management Area, State Forest name, compartment number.

iii. Name of person(s) conducting review.

iv. Results of a database search for threatened flora and fauna records within two kilometres or five kilometres, as appropriate, of the compartment boundary. Records with a reliability of 1 to 5, inclusive, must be searched for.

v. Results of a check of SFNSW records for threatened species recorded within two kilometres or five kilometres, as appropriate, of the compartment boundary and any other records readily available.

vi. A summary of those threatened species records collated under condition 8.5 b) iv. and v. above, including species name, Australian Map Grid co-ordinates, date of record, type of record (eg. observed, heard, road kill, hair analysis), observer's name, and source of record where this information is available.

vii. Maps of modelled habitat (with different Classes of habitat indicated) of those species requiring survey. These maps are to assist the surveyor in locating potential habitat.

viii. Habitat descriptions from Schedule 4 of this licence.

8.6 Incidental Threatened Flora and Fauna Records

a) All SFNSW employees and contractors must identify and record all indications that a threatened species is present, or has been present, within a compartment. Indications include, but are not limited to, an observation of a live or dead individual of a species, or any part of an individual (hair, feathers, skin, bone, teeth or eggs), or a sign that indicates the species' presence (species' call heard, tracks, scratchings, incisions, species in scat, species' scat, species in raptor or owl pellet, nest, roost or den).

b) Particular emphasis must be placed on identifying and recording the following species: *Heleioporus australiacus,* White-crowned Snake, Pale-headed Snake, Broad-headed Snake, Red Goshawk, Red-tailed Black-Cockatoo, Double-eyed Fig Parrot, Eastern Quoll.

c) **Data to Record**:

i. Species name.

ii. Number of individuals.

iii. AMG (to within a 100 metres accuracy).

iv. Name of State Forest and compartment number that species recorded in.

v. Type of record (eg. observed, heard, road kill).

vi. Date(s) recorded.

vii. Recorder's name.

8.7 Pre-logging and Pre-roading Compartment Traverse

a) A Compartment Traverse must be conducted to search for threatened and protected flora species and certain threatened and protected fauna features.

b) Samples of flora species that are unfamiliar to the surveyor must be collected and identified or verified by a relevant herbarium.

c) The threatened and protected flora component and threatened and protected fauna features component can both be conducted at the same time if the surveyor is suitably experienced. Where

the two components are conducted at the same time, the minimum survey effort required is ten person hours per 200 hectares of net survey area.

8.7.1 Desktop component

a) For each 200 hectares of net survey area, a traverse at least four kilometres in distance must be planned within which targeted sampling must be conducted as specified in condition 8.7.2 below.

b) Air photographs and forest type maps of a suitable scale (1;15,000 to 1:25,000) must be examined when planning the traverse to identify the full range of forest types and environmental gradients within the compartment. The traverse must cover the full range of forest types and environmental gradients within the compartment.

c) The traverse route must be mapped on a 1:25,000 forest type map.

8.7.2 Field Methodology

a) Threatened and protected flora component

i. For the threatened and protected flora component of the Compartment Traverse, the surveyor(s) must conduct a search in a random meander along the traverse identified in condition 8.7.1 above, searching for and recording those threatened and protected flora species that require species-specific or site-specific conditions. The search should be conducted within the net survey area and in areas 50 metres outside the boundary of the net survey area.

ii. A minimum of six person hours of flora survey per 200 hectares of net survey area must be conducted along the traverse. Threatened and protected flora species requiring species-specific conditions must be searched for continuously along the traverse.

iii. If habitats not previously identified in the desktop component are encountered while sampling along the traverse, a proportion of the sampling time should be used to survey these habitats.

iv. The timing of the threatened and protected flora component of the compartment traverse should take into account flowering periods of the threatened and protected flora species being surveyed (this is particularly relevant to orchids and annual species). Data on known flowering periods of cryptic species is included in Schedule 2 of this licence where this information is available.

v. Where individuals or groups of individuals of threatened or protected plants requiring conditions are found, the individual or the extent of the group of individuals must be flagged (eg. with flagging tape) by the person conducting the flora survey. The location of the individual or group of individuals must also be marked on the Harvesting Plan map to assist the Supervising Forest Officer in finding the flagged plant(s) during compartment mark up.

b) Threatened and protected fauna features component

i. For the threatened and protected fauna features component of the Compartment Traverse, a minimum of four person hours per 200 hectares of net survey area must be spent continuously searching for the following features along the traverse identified in condition 8.7.1 above:

1. Nests and roosts for those species listed in condition 5.13 of this licence;
2. Dens of the following species: Yellow-bellied Glider, Squirrel Glider and Brush-tailed Phascogale;
3. Flying-fox camps;
4. Latrine and den sites of the Spotted-tailed Quoll;
5. Distinctive scats (eg. Spotted-tailed Quoll, Koala);
6. Predator scats (these must be collected for analysis);
7. *Allocasuarina* spp. with more than 30 crushed cones beneath;
8. Yellow-bellied Glider and Squirrel Glider sap feed trees;
9. Microchiropteran bat tree roosts;

10. Microchiropteran bat subterranean roosts (caves, tunnels and disused mineshafts);
11. Swift Parrot and Regent Honeyeater feed or nest trees;
12. Wombat burrows (north of the Oxley Highway only); and
13. Permanent soaks and seepages (for further targeted survey work) in *Philoria* spp. potential habitat.

ii. If habitats not previously identified in the desktop component are encountered while sampling along the pre-determined traverse, a proportion of the sampling time should be used to sample these habitats.

iii. Where threatened or protected fauna features are found, these features are to be appropriately flagged or marked in the field by the person conducting the survey. The location of the feature must also be marked on the Harvesting Plan map to assist the SFO in finding the flagged feature(s) during compartment mark up.

c) **Data to Record**:

i. Name of Management Area, State Forest name, compartment number(s).

ii. Date(s) of survey.

iii. Surveyor(s) name.

iv. The traverse route clearly marked on 1:25,000 forest type map.

v. Length of compartment traverse.

vi. Time spent conducting each component of the field methodology, ie. flora and fauna.

vii. Threatened and protected flora taxa recorded and the number of individuals of each (indicate whether count or estimate).

viii. Threatened and protected fauna features recorded.

ix. AMG (to within a 100 metres accuracy) of threatened and protected flora records and threatened and protected fauna features recorded.

x. Locality description (name and distance from nearest road, track, creek, etc) of threatened and protected flora records.

xi. Locality of threatened and protected flora and threatened and protected fauna features clearly marked on a 1:25,000 forest type map.

xii. List of additional surveys required.

8.8 Targeted Fauna Surveys

8.8.1 General

a) The purpose of targeted fauna surveys is to search within compartments that contain known or potential habitat for those fauna species that require site-specific or species-specific conditions as listed in Table 13 below.

b) The following methodologies must be used to survey for the relevant species within known habitat and potential habitat.

(Note: Any variations to the requirements set in this condition must be approved in writing by NPWS prior to surveys being conducted.)

Table 13: Threatened species requiring pre-logging targeted surveys

Fauna group / Common name	Scientific name	Survey(s) required
Frogs		
Pouched Frog	*Assa darlingtoni*	Riparian frog and non-riparian frog
Giant Burrowing Frog	*Heleioporus australiacus*	Incidental, spotlight, riparian frog
* Green and Golden Bell Frog	*Litoria aurea*	Targeted
* Yellow-spotted Tree Frog	*Litoria castanea*	Targeted
Peppered Frog	*Litoria piperata*	Riparian frog

Stuttering Frog	*Mixophyes balbus*	Riparian frog
Fleay's Frog	*Mixophyes fleayi*	Riparian frog
Giant Barred Frog	*Mixophyes iteratus*	Riparian frog
Mountain Frog	*Philoria kundagungan*	Riparian frog and non-riparian frog
Loveridge's Frog	*Philoria loveridgei*	Riparian frog and non-riparian frog
Sphagnum Frog	*Philoria sphagnicolus*	Riparian frog and non-riparian frog
Reptiles		
White-crowned Snake	*Cacophis harriettae*	Incidental (spotlight survey minimum)
Pale-headed Snake	*Hoplocephalus bitorquatus*	Incidental (spotlight survey minimum)
Broad-headed Snake	*Hoplocephalus bungaroides*	Incidental (spotlight survey minimum)
Birds		
Albert's Lyrebird	*Menura alberti*	Other diurnal birds survey
Barking Owl	*Ninox connivens*	Nocturnal call playback and spotlight
* Black-breasted Button-quail	*Turnix melanogaster*	Targeted
* Black-throated Finch	*Poephila cincta*	Other diurnal birds
* Double-eyed Fig Parrot	*Cyclopsitta diophthalma coxeni*	Incidental
* Eastern Bristlebird	*Dasyornis brachypterus*	Targeted
Marbled Frogmouth	*Podargus ocellatus*	Nocturnal call playback and spotlight
Masked Owl	*Tyto novaehollandiae*	Nocturnal call playback and spotlight
Powerful Owl	*Ninox strenua*	Nocturnal call playback and spotlight
* Red Goshawk	*Erythrotriorchis radiatus*	Incidental
Red-tailed Black-Cockatoo	*Calyptorhynchus banksii*	Incidental
* Regent Honeyeater	*Xanthomyza phrygia*	Other diurnal birds
Rufous Scrub-bird	*Atrichornis rufescens*	Targeted
Swift Parrot	*Lathamus discolor*	Other diurnal birds
Non-flying mammals		
* Black-striped Wallaby	*Macropus dorsalis*	Targeted and spotlight
Broad-toothed Rat	*Mastacomys fuscus*	Targeted
Brush-tailed Phascogale	*Phascogale tapoatafa*	Spotlight
* Eastern Quoll	*Dasyurus viverrinus*	Incidental
* Hastings River Mouse	*Pseudomys oralis*	Targeted
Squirrel Glider	*Petaurus norfolcensis*	Spotlight and nocturnal call playback
Yellow-bellied Glider	*Petaurus australis*	Spotlight and nocturnal call playback
Flying mammals		
Golden-tipped Bat	*Kerivoula papuensis*	Targeted
Large-footed Myotis	*Myotis adversus*	Targeted
Other microchiropteran bats		Subterranean roost

* Species listed in Schedule 1 of the TSC Act.

c) For those fauna species requiring targeted fauna surveys, the following applies:

i. If no previous reliable survey has been conducted, then pre-logging and pre-roading surveys in accordance with condition 8 of this licence are required for that species.

ii. If a previous reliable survey recorded the species, then pre-logging and pre-roading surveys in accordance with condition 8 of this licence within the compartment are required for that species.

iii. If a previous reliable survey did <u>not</u> record the species, surveys are not required for that species.

d) A previous reliable survey is defined as a survey conducted in the compartment, or within two kilometres of the compartment, or within five kilometres in the case of the Large-footed Myotis and Golden-tipped Bat, in similar habitat to the compartment, in the previous ten years that was a survey equal to or better than the survey requirements set out in this condition with respect to survey methodology, sampling intensity, sample placement and distribution, survey season and weather conditions.

e) Surveys for particular species are not required where SFNSW has chosen to apply condition 7 (b) above in relation to that species.

8.8.2 Data to Record:

For each targeted fauna survey method used the following information must be recorded:

a) Name of Management Area, State Forest name, compartment number;

b) Type of survey (including details of methodology used);

c) Date(s) of survey;

d) Surveyor(s) name;

e) Survey location AMG (to within a 100 metres accuracy);

f) Description of locality description (ie. name and distance from nearest road, track, creek, etc);

g) Survey point or transect clearly marked on 1:25,000 forest type map;

h) Survey start time and finish time;

i) Threatened species being targeted;

j) Threatened species recorded;

k) Record observation type, eg. species heard, observed, scat record, track, hair, ultrasonic detection etc. Where bat ultrasonic detection, scat record, the reliability of the record is to be provided also. Name of person conducting bat ultrasonic analysis;

l) For playback surveys: list species played;

m) For trapping surveys: describe baits used in any traps;

n) For riparian and non-riparian frog surveys: mark on map and record time spent at each site surveyed; and

o) For each day or night of survey, on arriving at the survey location the following is to be recorded:

   i. Temperature (degrees Celsius).

   ii. Wind: 0 = calm; 1 = light, leaves rustle; 2 = moderate, moves branches; 3 = strong, impedes progress.

   iii. Rain: 0 = rain during survey; 1 = evidence of rain in last 24 hours; 2 = no evidence of rain in last 24 hours.

   iv. Night light: 1 = very dark, no moon + cloud; 2 = dark; quarter moon or moon with heavy cloud; 3 = detail seen, moon and clear sky; 4 = bright, half moon or more and no cloud.

   v. Date and time these measurements were made.

8.8.3 Frog surveys

(Note: It would be most effective to undertake a local to regional scale frog survey at the most appropriate time of year and under the best weather conditions. Such a survey could cover breeding sites within or immediately adjacent to compartments scheduled to be logged over the following year.)

8.8.3 A Riparian frog survey

Riparian frog surveys must target the following species: *Heleioporus australiacus*, *Mixophyes fleayi*, *Mixophyes iteratus*, *Mixophyes balbus*, *Philoria* species (in wet sclerophyll), *Litoria piperata* and *Assa darlingtoni* (in Dorrigo Management Area only). Riparian frog surveys must be conducted as follows:

a) Surveys must be conducted for a minimum duration of one person hour for areas up to 200 hectares of net survey area, plus an additional 15 minutes per 50 hectares above 200 hectares. If more than one stream is surveyed, a minimum of ten minutes must be spent at each separate site.

b) Three call playback sessions must be conducted per one hour search. After an initial two minute listening period, calls of target threatened frog species must be played for two minutes followed by a minimum five minutes listening period. When an observer is unsure of a species' identification, the call responses should be taped to allow verification by a suitably experienced frog expert.

c) Surveys must be conducted twice, on different nights. Surveys must not commence earlier than 30 minutes prior to sunset and must conclude no later than sunrise.

d) Surveys must not be conducted in cold, windy conditions. All attempts should be made to survey just after rain, during very light rain, or when rain is intermittent.

e) For *Litoria piperata*, surveys should be repeated during the day with particular attention taken to search rocks and debris by the creeks and vegetation overhanging the creeks (search should be conducted so as to not result in damage to habitat).

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28 April 2003
Condition 8.8.3A f) replaced
Ref Appendix E

f) Survey season: 1 August to 31 March.

(Note: Preferred survey seasons - Litoria piperata: summer. Mixophyes fleayi and M. balbus: September to March. Mixophyes iteratus: October to February. Philoria kundagungan: December to March. Other Philoria species: spring to early summer (best in spring), no later than December. Assa darlingtoni: summer.)

8.8.3 B Non-riparian frog search

Non-riparian frog surveys must target the following species: *Assa darlingtoni (*in Dorrigo Management Area only) and *Philoria* species. Non-riparian frog surveys must be conducted as follows:

a) Where soaks, seepages or bogs occur, a minimum of 30 minutes, up to a maximum of two hours, must be spent surveying them within each 200 hectares of net survey area. The length of time spent surveying must be determined by the number and extent of soaks, seepages and bogs in the net survey area.

b) For each additional 50 hectares of net survey area, an additional ten minutes must be added on to the minimum, and an addition 30 minutes must be added on to the maximum time referred to in part a).

c) A minimum of ten minutes should be spent surveying each soak, seepage or bog.

d) Call playback should be conducted at each soak, seepage or bog. Where call playback is conducted, it must consist of two minutes call playback followed by five minutes listening. When an observer is unsure of a species' identification, the call responses should be taped to allow verification by a suitably experienced frog expert.

e) Surveys for *Philoria* species must be conducted either in the late afternoon or early morning.

f) Surveys must not be conducted in cold, windy conditions. All attempts should be made to survey just after rain, during very light showers, or when showers are intermittent.

AMENDMENT 2
28 April 2003
Condition 8.8.3B g) replaced
Ref Appendix E

g) Survey Season: 1 August to 31 March.

(Note: Preferred survey seasons - Philoria kundagungan: December to March. Other *Philoria* spp.: spring to early summer (best in spring), no later than December. *Assa darlingtoni*: summer.*)*

8.8.3 C Litoria aurea and Litoria castanea survey

a) Permanent wetlands or dams of greater than one hectare surface area must be surveyed for a minimum of one hour, both day and night. For large wetlands or dams, survey effort should be proportional to this effort. For smaller wetlands or dams a minimum of 30 minutes survey must be undertaken both day and night.

b) Night searches must be conducted twice on two separate nights. Surveys must not commence earlier than 30 minutes prior to sunset and must conclude no later than sunrise.

c) Call playback must be conducted at 50-100 metres intervals around wetlands / dams perimeter with call played for two minutes followed by a five minute listening period. When an observer is unsure of a species' identification, the call responses should be taped to allow verification by a suitably experienced frog expert.

d) Surveys must not be conducted in cold, windy conditions. All attempts should be made to survey immediately prior to significant rainfall, just after rain, during very light rain, or when rain is intermittent.

e) Survey Season for *Litoria aurea* is September to February. *Litoria castanea*: spring-summer.

(Note: Any variation to this survey technique must be approved in writing by NPWS prior to surveys commencing.)

8.8.4 Diurnal bird surveys

8.8.4 A Black-breasted Button-quail

Surveys for the Black-breasted Button-quail must be conducted as follows:

a) Searches must be conducted for characteristic pivot feeding marks (platelets) for a minimum one hour per ten hectares of potential habitat. (*Note: Birds scrape the litter with their feet alternately in a circular motion leaving, in most instances, a neatly inscribed circle or saucer-shape of exposed soil. The presence of feeding marks suggests the presence of Black-breasted Button-quail and / or Painted Button-quail*.)

b) Where pivot feeding marks are located, further targeted survey and call playback must be conducted to determine the presence of Black-breasted Button-quail. This further targeted survey must include:

   i. Searches of a minimum one hour duration per ten hectares of potential habitat. These searches must be conducted in conjunction with call playback.

   ii. Call playback surveys must consist of two minutes call followed by five minutes of listening. Both adult female "booming" and "bubbling" calls must be played. Both calls must be played three times each.

c) Survey Season: Late summer - autumn, after the breeding season.

8.8.4 B Eastern Bristlebird

Surveys for the Eastern Bristlebird must be conducted as follows:

a) A minimum 30 minutes duration must be spent searching for the species. These searches must be conducted in conjunction with call playback.

b) Call playback must consist of calls being played for five minutes followed by a ten minute listening period. (*Note: Taped calls used in playback should be of local dialect.*)

c) Care should be taken to avoid playing calls too frequently or too loud during the breeding season.

d) Each potential site should be surveyed a number of times as birds may not be detected in the first survey.

e) Surveys should be conducted in the early morning and late afternoon.

f) Survey Season: Spring, during the breeding season when males call to defend territory.

8.8.4 C Rufous Scrub-bird

Surveys for Rufous Scrub-bird must be conducted as follows:

a) The number of survey sites must be determined as follows:

   i. four survey sites in potential habitat patches between one and 50 hectares in size;

   ii. eight survey sites in potential habitat patches between 50 and 100 hectares in size;

   iii. twelve survey sites in potential habitat patches between 100 and 150 hectares in size;

   iv. sixteen survey sites in potential habitat patches between 150 and 200 hectares in size.

b) At each survey site the following survey must be conducted:

   i. the survey must be a minimum ten minutes duration;

ii. survey must consist of a five minute listening period at the beginning of the survey;

iii. SFNSW may choose to play the Rufous Scrub-bird call for a duration of up two minutes, after the five minute listen;

iv. surveys should be conducted in the early morning or late afternoon; and

v. two separate surveys must be undertaken on separate days at each site between August and February (inclusive).

c) The location of survey sites must maximise coverage of the potential habitat area. The surveyor(s) should conduct call playback sessions in different areas of habitat, where appropriate.

d) Survey Season: August to February (inclusive).

8.8.4 D Other Diurnal Birds

Surveys for other threatened diurnal birds requiring species-specific or site-specific conditions must be conducted as follows:

a) Surveys must be conducted for a minimum of one person hour duration for areas up to 200 hectares of net survey area, plus an additional 15 minutes per 50 hectares above 200 hectares.

b) Surveys must be conducted in the early morning.

c) The following species must be searched for: Albert's Lyrebird, Black-throated Finch, Regent Honeyeater and Swift Parrot.

d) Surveys should focus on the following features of these species:

i. Albert's Lyrebird: Particular attention must be given to the identification of nests. Nest locations are characterised by areas where the leaf litter has been intensively raked over. Survey Season: anytime of the year.

ii. Black-throated Finch: In dry seasons or during droughts, extra effort should be employed surveying around permanent water holes. Survey Season: anytime of the year.

iii. Regent Honeyeater: Surveys must be conducted where recent records (ie. within the previous five years) exist within five kilometres of the compartment boundary. Surveys must focus on any permanent water bodies, dams, flowering eucalypts. Survey Season: winter to mid summer.

iv. Swift Parrot: Surveys should concentrate on searching winter flowering eucalypts and other species. Survey season: March to October.

8.8.5 Nocturnal Call Playback

Nocturnal call playback must target the following species: Barking Owl, Masked Owl, Powerful Owl, Marbled Frogmouth, Squirrel Glider and Yellow-bellied Glider. Nocturnal call playback surveys must be conducted as follows:

a) Call playbacks must be conducted at two sites for every 200 hectare of net survey area, plus an additional site per 100 hectares above 200 hectares.

b) Playback sites must be more than one kilometre apart. The location of the playback sites should optimise response.

c) At each call playback site, an initial listening period of ten minutes should be undertaken, then each target species call must be played for five minutes followed by at least a two minute listening period. After the last call at least ten minutes must be spent listening. Calls must be played from a good quality portable tape cassette or CD player and amplified through a nine volt megaphone, or equivalent or better. The Powerful Owl call should be played first.

d) The playback session must be conducted twice, on different nights. Where a species is recorded at a site on the first night of survey, it is not a requirement of this condition that the call of this species be played at that site on the second night of survey.

e) Windy and rainy conditions are to be avoided.

f) Where one transect of two kilometres length is established for spotlighting, call playback can be conducted at the beginning and end of each two kilometres transect. Where two transects of one kilometre length are implemented for spotlighting, call playback can be conducted at the beginning or end of each one kilometre transect.

g) Survey season: Anytime of the year, preferably spring, summer and autumn.

8.8.6 Spotlight Survey

a) Spotlight surveys must target the following species: Brush-tailed Phascogale, Black-striped Wallaby, Squirrel Glider, Yellow-bellied Glider, Greater Glider, Marbled Frogmouth, Powerful Owl, Barking Owl and Masked Owl.

b) When conducting spotlight surveys, particular emphasis must also be placed on identifying and recording the following species: *Heleioporus australiacus,* White-crowned Snake, Pale-headed Snake and Broad-headed Snake.

c) Spotlight surveys must be conducted as follows:

i. For areas up to 200 hectares of net logging area, a spotlight transect totalling two kilometres distance, plus an additional 500 metres for each 50 hectares of net logging area above 200 hectares, must be conducted.

ii. Transects must be a minimum 500 metres in length, and should be one kilometre in length.

iii. This / these transects must be spotlighted twice on two separate nights. On one night, the transect(s) must be spotlighted while walking. On the other night, the spotlighting transect(s) may be conducted from a vehicle. Preferably both transects should be done on foot.

iv. In areas of Brush-tailed Phascogale known habitat or potential habitat, both nights' surveys must be conducted while walking.

v. During vehicle spotlighting, vehicle speed must not exceed five kilometres/hour. Vehicle spotlight must be a minimum one hour duration per 200 hectares.

vi. During walking spotlighting, observers must walk at approximately one kilometre/hour. Walk spotlight must be a minimum one hour duration per 200 hectares.

vii. Survey must involve two observers using 100 watt spotlights for vehicle spotlighting and 50 watt spotlights for walking spotlighting.

viii. Windy, cold and rainy conditions should be avoided.

ix. Survey Season: Anytime of the year, preferably spring, summer and autumn.

(*Note: Walking spotlight survey transects can be established along roads. If potential habitat exists away from roads, SFNSW can opt to establish an off-road survey. Spotlight surveys can be conducted prior to call playback.*)

8.8.7 Broad-toothed Rat

Surveys for the Broad-toothed Rat must be conducted as follows:

a) 75 size A Elliott traps baited with a mixture of rolled oats, peanut butter and honey must be spaced at ten metres intervals, in potential habitat.

b) Traps must be set for a minimum of four nights.

c) Survey Season: Anytime of the year, preferably avoiding cold, wet periods.

8.8.8 Black-striped Wallaby

Black-striped Wallaby surveys must be conducted as follows:

a) Within areas of potential habitat for the Black-striped Wallaby two distinct habitat components should be able to be identified:

i. Day time sheltering habitat: rainforest and wet sclerophyll forest with a dense shrub understorey of either lantana or rainforest species.

ii. Night time feeding habitat: areas of open forest with a grassy understorey or pasture usually within 200 metres of day time sheltering habitat.

b) Surveys to determine the presence of Black-striped Wallaby must consist of a day time survey and a night time survey.

c) Day time Survey: Surveys of day time sheltering habitat must consist of a slow walk through day time sheltering habitat to observe or "flush" individuals, to search for Black-striped Wallaby scats, and to identify where well-used runways and feeding areas intersect. A minimum of four person hours per single compartment must be spent conducting the day time survey surveys.

d) Night time Survey: Surveys of night time feeding habitat must be conducted at dusk in areas where runways intersect with potential feeding areas. The surveyor(s) must sit quietly in these areas and attempt to observe the species. A minimum of four person hours per compartment must be spent conducting the night time surveys.

e) Survey Season: Anytime of the year.

8.8.9 Hastings River Mouse surveys

Surveys for Hastings River Mouse must be conducted as follows:

8.8.9 A Habitat suitability surveys

Surveys to determine habitat suitability must be conducted as follows:

a) Within Hastings River Mouse modelled habitat, classify and map vegetation cover in the survey area using aerial photographs or existing mapped information such as forest type maps. The vegetation should be classified into broad vegetation categories such as: rainforest, wet sclerophyll, dry sclerophyll, woodland and grassland.

b) Each broad vegetation category must be inspected in the field and the following types of vegetation must be mapped at a scale of 1:25,000 or better:

i. wet or dry sclerophyll forests with a grass, sedge or heath understorey;

ii. woodland with a grassy, sedge or heath understorey; and

iii. wet or dry sclerophyll forest or woodland with dispersed patches of sedge, grass or heath.

c) Topographic maps, aerial photographs and field survey must be used to identify and map any areas with outcropping rock cover occurring within or within one kilometre beyond the boundary of the compartment OR vegetation types in condition 8.8.9A (b) above.

d) For every ten hectares of vegetation type mapped in condition 8.8.9A (b) above, one 100 metres microhabitat transect must be established. Each transect must be located to sample a representative area within each ten hectare patch of vegetation type. Transects must be located to sample within 100 metres of outcropping rock cover referred to in condition 8.8.9A (c) above where present. Transects should be oriented parallel to drainage lines or transects should sample areas of high total vegetation cover of sedges, rushes and grass. Where mapped vegetation type is patchy in distribution each patch greater than five hectares should be sampled.

e) A microhabitat transect referred to in condition 8.8.9A (d) above must comprise assessments of:

i. Grass, sedge and rush cover: at ten metres intervals along the 100 metres transect (giving 11 samples) record in a circular plot measuring three metres in radius at each sample point the percentage cover grass, sedge or rushes within the plot. Average the percentage cover across the 11 samples.

ii. Vegetation Cover: within the 11 circular plots referred to in condition 8.8.9A (e) i. above, record the number of times vegetation contacts a one centimetre diameter pole between ten centimetres and 75 centimetres above ground oriented vertical at one point within the plot. Average the number of contacts across all 11 points along the transect.

iii. Heath Cover: record the presence of heath plants in the genera *Leucopogon, Epacris, Oxylobium, Pulteanaea, Daviesia, Dillwynia, Hakea, Leptospermum, Baeckia,* and *Callistemon*, along the transect.

iv. Shelter Index (SI): within 20 metres either side of the entire length of the 100 m transect, conduct a random meander counting the following:

A. the number of natural burrows (individual holes > four centimetres diameter and 30 centimetres depth) to a maximum of 40;

B. the number of large trees with basal cavities (holes > four centimetres diameter and 30 centimetres depth);

C. the number of rock cavities (> four centimetres entrance diameter and >30 centimetres depth) to a maximum of 40; and

D. the number of logs >30 centimetres diameter.

v. Sum the number of holes, tree cavities, rock cavities and logs and divide by four to give the shelter index.

vi. Record whether there is any outcropping rock cover present which is more than 100 metres length and is within 500 metres of the transect.

f) Using the model detailed in Schedule 10 the suitability of habitat must be determined as either:

i. unsuitable, moderate or high suitability using model 1, OR

ii. unsuitable, moderate or high suitability using model 2.

g) Habitat assessments should not be undertaken in areas burnt in the past two years. Where it is unavoidable to undertake habitat assessment of a site that has been burnt within the past two years the scores for grass, sedge and rush cover and vegetation cover must be increased by one category (eg low to moderate).

h) Where habitat is assessed as moderate or high suitability the Targeted Surveys in condition 8.8.9B below must be implemented within such habitat.

(*Notes: Once experience has been gained in the application of this procedure it is anticipated that it will be possible to identify and map areas of potential medium to high quality HRM Habitat by visual inspection. The use of this rapid assessment approach must be subject to training and regular calibration.*

The following references should be consulted with regard to the identification of Hastings River Mouse habitat and the application of the microhabitat model:

A.P. Smith and D.G Quin (1997) Microhabitat Requirements of the Hastings River Mouse (Pseudomys oralis) (Rodentia: Muridae). Unpublished report to the Hastings River Mouse Recovery Team.

NPWS (1993) Interim Hastings River Mouse Habitat Identification Guide. Report prepared by the Hastings River Mouse Recovery Team and NSW NPWS.

S. Wall (1998) A photographic description of the differing habitat classes, and habitat components of the Hastings River Mouse (Pseudomys oralis). Unpublished report to the New South Wales National Parks and Wildlife Service.

Tweedie, T.D. and A. York (1993) Survey Guidelines for the Hastings River Mouse (Pseudomys oralis). Forestry Commission of NSW Technical Research Paper no. 62).

8.8.9 B Targeted surveys

Surveys to determine the presence of the species must be conducted as follows:

a) The minimum specifications for trapping are as follows:

i. The minimum trap effort in a compartment must be 100 size A Elliott traps over four nights (400 trap nights) for areas up to 50 hectares of moderate or high quality habitat or both, plus an additional 400 trap nights (100 traps for four nights) per 50 hectares above 50 hectares.

ii. For each 400 trap nights four transects should be established. Twenty five traps should be placed along each transect. Each trap should be placed at approximately ten metres intervals in sites where suitable micro-habitat occurs.

iii. Transects should be placed in suitable habitat to maximise capture.

b) Survey Season: Anytime of the year, preferable avoiding cold, wet periods.

(Note: The trapping configuration may be varied to allow for local topographic conditions however, the trap effort should remain the same.)

8.8.10 Microchiropteran bat surveys

8.8.10 A Subterranean roost surveys

Subterranean roost surveys must target the following species: *Chalinolobus dwyeri, Chalinolobus nigrogriseus, Falsistrellus tasmaniensis, Miniopterus australis, Miniopterus schreibersii, Vespadelus troughtoni.* Surveys of potential microchiropteran bat subterranean roosts must be conducted as follows:

a) All potential subterranean roosts must be surveyed to determine the presence of these species. Potential subterranean roosts are caves, mines, disused mineshafts (except open pits of less than three metres in depth), tunnels and rock overhangs. A cave is defined as a hollow in the earth especially one opening more or less horizontally into a hill, mountain etc.

b) Surveys must consist of an ultrasonic call recording of 30 minutes duration conducted at dusk. Call detection units must be placed at the entrances of potential subterranean roosts that lie within the net survey area or in areas within 100 metres outside the boundary of the net survey area.

OR

c) A person experienced in bat survey work may physically inspect any potential subterranean roosts.

(*Note: The option described in part condition 8.8.10A (b) above is the most preferred as bats can be critically affected if roost sites are disturbed at inappropriate times of the year. For this reason, a person with extensive knowledge and experience with bat survey work is essential if the option described in condition 8.8.10A(c) above is chosen*.)

d) Windy, cold and rainy weather conditions must be avoided.

e) If a call analysis is undertaken, results of 'definite' and 'probable' will count as records, while 'possible' results will be discounted.

AMENDMENT 2
28 April 2003
Condition 8.8.10A f) replaced
Ref Appendix E

f) Survey season: 1 August to 31 March.

(*Note: - Preferred survey season - October to late March.)*

8.8.10 B Golden-tipped Bat Kerivoula papuensis and Large-footed Myotis Myotis adversus

Surveys for *Kerivoula papuensis* and *Myotis adversus* must be conducted as follows:

a) A minimum of two sites per 200 hectares of net logging area, plus an additional site per 100 hectares above 200 hectares, must be harp trapped. At each site, harp traps must be set for a minimum period of two consecutive nights.

b) Harp traps must be set well before dusk.

c) Harp traps must be set across creeks, pools and other appropriate flyways close to streams to increase the chance of trap success. Supplementary screening should be used where necessary.

d) In known habitat or potential habitat of *Myotis adversus,* a bat detection recording must be conducted for 30 minutes commencing at dusk. Ultrasonic call detection surveys should focus on large permanent bodies of water.

e) Windy, cold and rainy weather conditions must be avoided.

AMENDMENT 2
28 April 2003
Condition 8.8.10B f) replaced
Ref Appendix E

f) Survey Season: 1 August to 31 March.

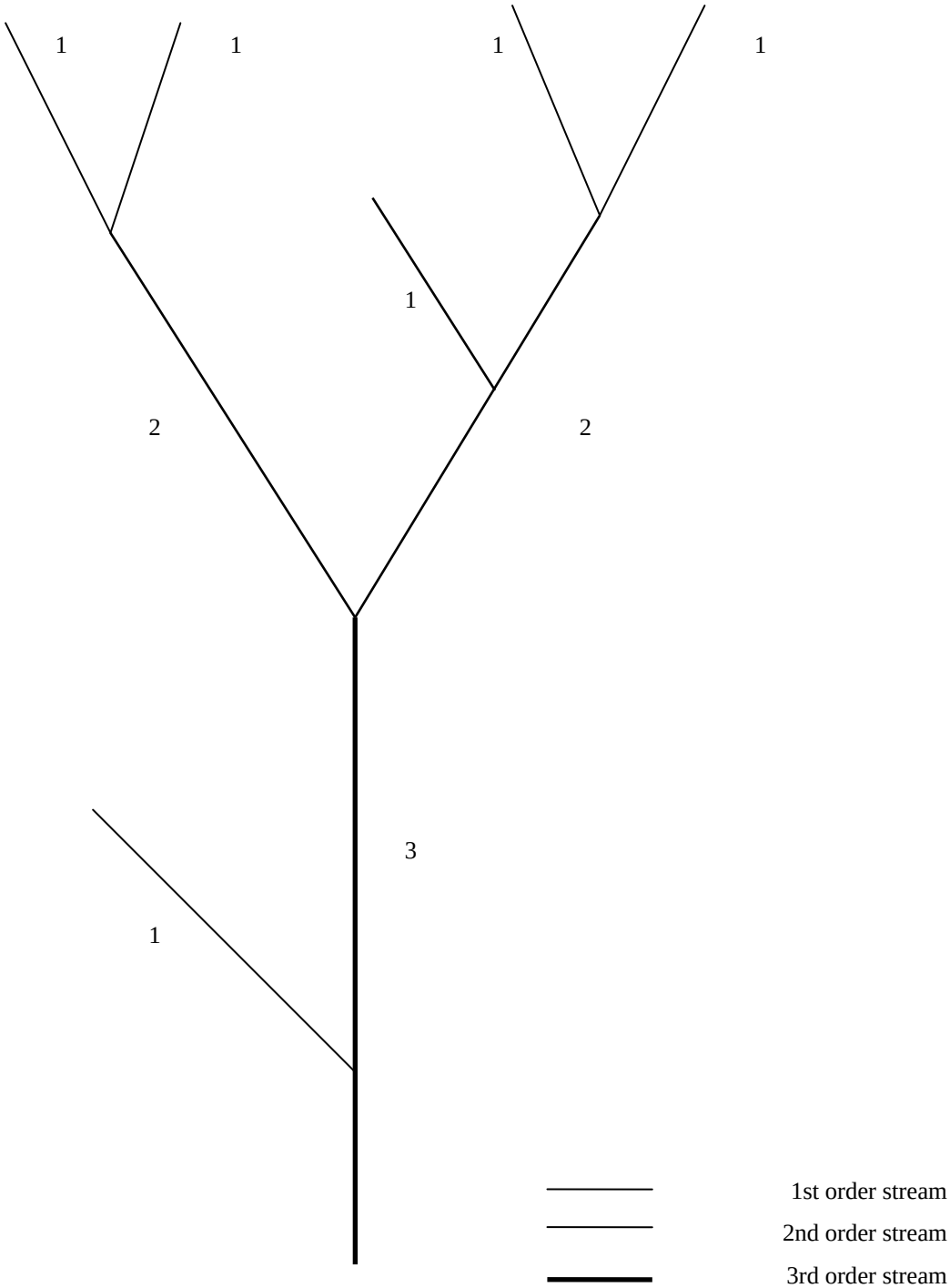
(Note: Preferred survey season: Spring and Summer.)

SCHEDULE 1: Determination of stream order

Stream order must be determined according to the methodology outlined below.

1. A first order stream is defined as that part of a drainage system between its point of origin and the first junction with another stream. A second order stream commences at the junction of two first order streams. A third order stream commences at the junction of two second order streams. A fourth order stream commences at the junction of two third order streams. A schematic diagram of stream order is provided in Figure 1 below.
2. Downstream from the junction of two streams of different stream order, the higher stream order is maintained.
3. The determination of stream order must commence from the catchment boundary, even if that is outside the compartment.
4. Stream order must be derived from the drainage network provided on the relevant topographic map(s) for the compartment, from a 1:25,000 map sheet produced by the Land Information Centre (formerly the Central Mapping Authority). Where a 1:25,000 map sheet is not available for the compartment, then the best available scale map sheet produced by the Land Information Centre must be used.

Figure S1.1: Schematic diagram of stream order



(after Strahler 1964)

SCHEDULE 2: Threatened flora potential habitat and Metapopulation Unit descriptions

Schedule 2 Part A: Threatened Flora Potential Habitat Description

Species

Acacia acrionastes

Distribution: Ashford area, North Western Slopes.
Likely habitat: Dry Sclerophyll Forest.
Additional known habitat details: Recorded on red-brown shallow loamy clay on acid volcanics.

Acacia bynoeana

Distribution: Morisset to Mittagong. Eg. Hazelbrook, Bell, Wheelbarrow Ridge, Marramarra NP, Western Sydney, Lower Portland, West of French's Forest, Berrima, Mittagong, Wyee.
Likely habitat: Heath, dry sclerophyll forest & woodland.
Additional known habitat details: Has been recorded with *Kunzea ambigua, K. capitata, Acacia occicedrus, A. myrtifolia, Corymbia gummifera, E. haemostoma, E. parramattensis, E. sclerophylla, Leptospermum flavescens, Angophora bakeri, Banksia serratifolia, Angophora hispida*. Recorded on laterite flats and sandy soils.

Acacia courtii

Distribution: Kew – Laurieton district. Eg. Middle Brother SF, Dooragon NP and South Brother Mountain.
Likely habitat: Dry sclerophyll forest, on rocky, steeper slopes, from ridge top to lower slope.
Additional known habitat details: On rocky slopes on shallow soils over microgranite, between 40-300 metres alt. Recorded with *Eucalyptus pilularis, E. carnea, E. agglomerata, E. biturbinata, E. siderophloia, Acacia penninervis, A. implexa, Kunzea* sp. A. Flowers spring-early summer.

Acacia flocktoniae

Distribution: Blue Mountains, Little Hartley to Yerranderie. Eg. Megalong Valley, Mount Victoria, Scotts Main Range.
Likely habitat: Dry sclerophyll forest.
Additional known habitat details: Sandstone soils, *Acacia stricta, Podolobium ilicifolium,* 500-1000 metres altitude, flowers mostly in January-September.

Acacia macnuttiana

Distribution: Northern Tablelands. E.g. Boonoo Boonoo Falls, Torrington.
Likely habitat: Dry sclerophyll forest and heath.
Additional known habitat details: Usually on granite, often near streams.

Acacia pubescens

Distribution: Mountain Lagoon (Blue Mountains) to Canterbury (inner western Sydney).
Likely habitat: Open woodland and forest.
Additional known habitat details: Occurs on Tertiary Alluvium, Holocene Alluvium and Wiannamatta Shale, gravelly soils with ironstone. Occasionally on transition between sandstone and shale. 0-650 metres altitude.

Acacia pubifolia

Distribution: Emmaville, Torrington.
Likely habitat: Dry sclerophyll forest, woodland.
Additional known habitat details: On granite.

Acacia pycnostachya

Distribution: Bolivia Hill, Ashford, Bluff Rock (Tenterfield).
Likely habitat: Dry sclerophyll forest.
Additional known habitat details: Granite outcrops.

Acacia ruppii

Distribution: Restricted to the Coaldale area near Grafton. Eg. Fortis Ck NP, Banyabba SF, Copmanhurst.
Likely habitat: Dry sclerophyll forest & shrubland.
Additional known habitat details: Sandy soils over sandstone. Recorded from & on disturbed roadside sites between 50-150 metres alt. Often in Angophora/Bloodwood/Scribbly Gum forest. Flowers July-Sept.

Acalypha eremorum

Distribution: Limpinwood NR, near Lismore, Mooball SF, Nullum.
Likely habitat: Dry rainforest, margins of sub-tropical rainforest.
Additional known habitat details:

Acronychia littoralis

Distribution: Tweed to Port Macquarie, Richmond-Tweed valleys, Red Rock, Bongil Bongil NP, Sawtell, Smokey Cape, Crowdy Bay.
Likely habitat: Littoral -sublittoral rainforest.
Additional known habitat details: Sometimes occurs within sclerophyll forest with a littoral rainforest understorey. Occurs predominantly on marine-aeolian sands, sometimes estuarine sediments.
Survey Season: May, June, July August. Need fruit to confirm species from other *Acronychia* spp.

Aldrovanda vesiculosa

Distribution: Bundjalung NP Evans Head.
Likely habitat: Shallow freshwater lagoons.
Additional known habitat details:

Allocasuarina defungens

Distribution: North from Nabiac to Coffs Harbour area. E.g. Limeburners Ck NR, Yuraygir NP, Waihou FR, Conglomerate SF, Bundjalung NP.
Likely habitat: Moist sand heath (between wet and dry heath) and clay heath.
Additional known habitat details: On sandy or silty sand soils. Associated species include *Banksia oblongifolia, Hibbertia vestita, Epacris pulchella, Xanthorrhoea resinosa.*

Allocasuarina simulans

Distribution: Nabiac to Forster.
Likely habitat: Heath.
Additional known habitat details: On sands.

Almaleea cambagei

Distribution: Ashford, Torrington, Glencoe (SW Glen Innes)
High probability habitat: Wet heath, swamp
Additional known habitat details: On granite, over 1000 metres altitude

Amorphospermum whitei

see Metapopulation Unit Descriptions

Amyema scandens

Distribution: Rocky Creek Dam (Nightcap Range), near Lismore.
Likely habitat: Sub-tropical rainforest.
Additional known habitat details: Host is Rosewood.

Angiopteris evecta

Distribution: North of Tweed District, Cudgera Creek (Burringbar-Pottsville).
Likely habitat: Subtropical rainforest.
Additional known habitat details: Located on creek tributary, humus enriched clay loam soil developed on alluvium and colluvium. Occurs in association with *Alphitonia excelsa, Quintinia verdonii, Guoia semiglauca.*

Angophora exul

Distribution: Northern Tablelands. Eg. Gibraltar Rock, west of Tenterfield.
Likely habitat: Open scree on a ridge of acid volcanic outcrops.
Additional known habitat details: Only known from one population.

Angophora inopina

Distribution: Wallarah catchment between Charmhaven and Wyee.
Likely habitat: In open dry sclerophyll woodland on deep white sandy soils over sandstone.
Additional known habitat details: In Eucalyptus haemastoma and Corymbia gummifera woodland with a dense shrub understorey. Soils often with some gravelly laterite.

Angophora robur

Distribution: From north-west of Coffs Harbour to north-west of Grafton. Eg. Fortis Ck NP, Sherwood NR, Waihou NR, Newfoundland SF.
Likely habitat: Dry sclerophyll forest.
Additional known habitat details: Low site quality dry sclerophyll forest. Restricted to sandy soils on sandstone. Associated with other rough-barked apples, various stringybarks and bloodwoods. Restricted but locally frequent in the Glenreagh-Coaldale sandstone belt.

Apatophyllum constablei

Distribution: Glen Davis, Wollemi NP, Gospers Mountain, Coorongooba Creek.
Likely habitat: Dry sclerophyll forest.
Additional known habitat details: At the base of cliffs and on slopes in association with *Eucalyptus piperita, E. punctata, E. sparsifolia, Callitris glaucophylla, Banksia serrata, Acacia linifolia*. On Triassic Narrabeen Sandstone and Triassic talus debris, with sandy and skeletal soils.

Arthraxon hispidus

Distribution: Recorded from Bellinger Valley, possible Bonville area and historical records from Glen Innes region and Alstonville.
Likely habitat: In rainforest, eucalypt forest & woodland.
Additional known habitat details: On edge of disturbed wet forest, poorly drained areas. Flowers late summer - autumn.

Arthropteris palisotii

Distribution: Richmond River, north from Comboyne Plateau. Known only from historical records.
Likely habitat: tree trunks in rainforest.
Additional known habitat details:

Asperula asthenes

Distribution: Timbertop (Glenreagh), Nulla - Five day (Kempsey), Mt Boss (Wauchope), Forster, Gloucester, Buladelah, Girvan, Coolongolook.
Likely habitat: Damp sites, riparian forest.
Additional known habitat details: Along riverbanks, in gravel on edge of river.

Asterolasia elegans

Distribution: Maroota, Laughtondale Gully Road, Marramarra NP, Dyrabbin, Morans Rock.
Likely habitat: Open forest, wet sclerophyll forest.
Additional known habitat details: In association with *Eucalyptus piperita, Allocasuarina torulosa, Ceratopetalum gummiferum, Elaeocarpus reticularis, Backhousia myrtifolia, Callicoma serratifolia, Astrotricha latifolia*. Occurs on Hawkesbury Sandstone.

Austromyrtus fragrantissima

Distribution: Woodburn on the lower Richmond to the Currumbin Valley, eg. Lismore, Bangalow, The Channon, Ruthven, Boat Harbour NR.
Likely habitat: Known from lowland dry and subtropical rainforest.

Additional known habitat details: On basalt-derived soils or basaltic alluvium.

***Baeckea* sp. Pyramids (syn. Babingtonia granitica)**

Distribution: Giraween NP, north east of Lyra, north west of Ballandean.
Likely habitat:
Additional known habitat details: Rocky outcrops, granite belt, in shallow peaty soil associated with crevices in extensive granite outcrops.

Baloghia marmorata

Distribution: Near Lismore, Rous, Meerschaum Vale
High probability habitat: Lowland subtropical rainforest.
Additional known habitat details: On kraznozem basaltic soils.

Bertya ingramii

Distribution: East south east of Armidale. Eg. Dangar Falls area, Gara River (Armidale), Mihi Falls
Likely habitat: Shrubland and woodland.
Additional known habitat details: Edges and tops of cliffs. Flowers spring-summer.

***Bertya* sp. A Cobar-Coolabah**

Distribution: Kangaroo River SF, Gibraltar SF.
Likely habitat: Open dry forest, woodland.
Additional known habitat details: Shallow soils on ridges, rocky outcrops. Flowers July-August.

Blumea lacera

Distribution: North from Richmond Range.
Likely habitat:
Additional known habitat details: Wastelands, roadsides,

Boronia granitica

Model available
Distribution: Northern Tablelands. E.g. Kings Plains NP, near Torrington
Likely habitat: In fissures of granite outcrops, and in forests on granite scree and shallow soils.
Additional known habitat details: Associated species in NSW include *Acacia fimbriata, N. neriifolia, A. triptera, Angophora floribunda, Callitris endlicheri, Correa reflexa, Eucalyptus prava, Hibbertia obtusifolia, Jacksonia, Leucopogon melaleucoides, L. muticus, L. neo-anglicus, Melichrus urceolatus, Olax stricta, Phebalium rotundifolium, Pranthera* and *Xanthorrhoea*.

Boronia umbellata

Distribution: Coffs Harbour district. Eg. Bagawa, Conglomerate, Nana Creek, Wild Cattle Creek & Lower Bucca SFs, Madmans Ck FR.
Likely habitat: Wet sclerophyll forest, on high quartz metasediments.
Additional known habitat details: In tall open forest, adjacent to creek lines and sheltered positions. Recorded with *Eucalyptus acmenoides, E. siderophloia, E. microcorys, E. propinqua, E. pyrocarpa, Syncarpia glomulifera, Corymbia intermedia.* Flowers August to November.

Bosistoa selwynii

Model available
Distribution: North of the Richmond River. E.g. Whian Whian SF.
Likely habitat: Lowland subtropical rainforest and wet sclerophyll forest.
Additional known habitat details: On basaltic soil. Prefers alluvial flats, particularly along creek banks.

Bosistoa transversa

Model available
Distribution: North from Mullumbimby. E.g. Middle Pocket, Couchy Creek, Bilambil.
Likely habitat: Lowland subtropical rainforest.
Additional known habitat details: Up to 150 metres altitude.

Bothriochloa biloba

Distribution: From the Darling Downs south along the western slopes, northern tablelands & the Hunter Valley. Eg. Ewingar SF.
Likely habitat: In grassy woodland.
Additional known habitat details: On poorer soils. Recorded from euchrozem soil on cleared roadsides; brown clay & black soil. Flowers summer.

Bulbophyllum globuliforme

Distribution: MacPherson Range and north to Gladstone. Eg. Grady's Creek (Border Ranges).
Likely habitat: Rainforest.
Additional known habitat details: Epiphyte on Hoop Pine, 300-600 metres altitude.

Cadellia pentastylis

Distribution: Terry Hie Hie, Turkey Ridge, Deriah SF, Eulah Creek, Narrabri, Kelvin, Gravesend, Bininguy, Gunnedah, Warialda.
Likely habitat:
Additional known habitat details: usually the dominant species, other associated species include: *Casuarina glaucophylla, Eucalyptus albens, E. chloroclada, E. viridis, E. pillagensis, E. beyeri, Notelaea microcarpa, Beyeria viscosa, Alstonia constricta, Stipa and Aristida* species, thickets, undulating terrain, variety of soil types - often lithic sandstone, conglomerate or mudstone, usually between 300-450 metres altitude.

Caesia parviflora* var. *minor

Distribution: South from Corindi, northern tablelands to Bingara.
Likely habitat: Heath, woodland, dry sclerophyll forest.
Additional known habitat details: Sandstone substrates.
Survey Season: Spring - summer. Live material needed for positive identification.

Callitris baileyi

Distribution: Far Northern NSW to Qld. Eg. Acacia Creek, Koreelah Creek (Urbenville), Sandilands (Tabulam, older records), inland from Queensland border on north coast.
Likely habitat: Dry Sclerophyll Forest.
Additional known habitat details: Drier ranges, grassy forest, often rocky areas near creeks.

Callitris oblonga

Model available
Distribution: Northern Tablelands.
Likely habitat: Sandy soils.
Additional known habitat details: Usually grows in sand near banks of streams.

Calophanoides hygrophiloides

Model available
Distribution: Brunswick Heads and Hortons Creek, North Coast.
Likely habitat: Rainforest or adjacent wet sclerophyll forest.
Additional known habitat details:

Choricarpia subargentea

Distribution: Mt Chinchogan (Mullumbimby).
Likely habitat: Dry rainforest.
Additional known habitat details: Dense thickets, often regrowth.

Clematis fawcetii

Model available
Distribution: North of the Richmond River.
Likely habitat: Drier rainforest.
Additional known habitat details: Usually found near streams.
Survey season: Flowers September - November.

Corchorus cunninghamii

Distribution: North of Lismore. Chiefly collected in the Lismore district last century. Eg. Toonumbar SF, Bungabee SF.
Likely habitat: Margins of rainforest & wet sclerophyll forest.
Additional known habitat details: Generally grows in narrow ecotone between closed forest & open forest. Favours hill crests or upper slopes, shallow, well-drained soils & south to south-east aspects. Also known from wet sclerophyll forest dominated by Ironbark, Brush Box & Grey Gum, with mesophyitc associate species.

Corokia whiteana

See Metapopulation Unit descriptions

Corynocarpus rupestris* ssp. *rupestris

Distribution: Glenugie Peak, Glenugie SF.
Likely habitat: Dry rainforest.
Additional known habitat details: Dry stony slopes.

Cryptocarya foetida

Model available
Distribution: From near Iluka north to Fraser Island.
Likely habitat: Littoral rainforest on old sand dunes, and subtropical rainforest over slate, and occasionally on basalt.
Additional known habitat details: Associated species include: *Acmena hemilampra, Acronychia imperforata, Cryptocarya triplinervis, Cupaniopsis anacardioides, Flindersia bennettiana, Lophostemon confertus, Syzygium luehmanii.*

Cryptostylis hunteriana

Distribution: South from the Gibraltar Range, chiefly in coastal districts. Eg. Port Stephens district, also extends on to tablelands, eg. Riamukka SF, Gibraltar Range NP.
Likely habitat: Swamp-heath and drier forest.
Additional known habitat details: On sandy soils in small, localised colonies most often on the flat plains close to the coast. Also known from some mountainous areas growing in moist depressions and swampy habitats. Recorded on granite & sandstone.
Survey Season: December – February inclusive, when flowering.

Cymbidium canaliculatum

Distribution: North from the Hunter Valley.
Likely habitat: Drier forests and woodlands of the tablelands and western slopes.
Additional known habitat details: Grows on stout hollow limbs or tree trunks.

Cynanchum elegans

Distribution: Illawarra district to far northern NSW. Gloucester district, Newcastle, Illawarra area & inland to Mt Dangar. Scattered sites along the central coast & north coast areas extending inland to the Hunter Valley. Eg. Delicate Nobby, Fairfield, Camels Hump NR, Woko NP, Boundary Creek SF, Yabbra SF, Coneac SF, Booti Booti SRA, Tomalla SF.
Likely habitat: Dry & subtropical rainforest & sclerophyll forest, mainly ecotonal occurrence.
Additional known habitat details: On clays or clay loams & in scrub or woodland on steep basalt scree slopes. Recorded in Spotted Gum forest 0-200 metres0 metres alt. Also recorded in littoral comunities on coastal sands, dry rainforest / sclerophyll ecotones on metasediments.

Cyperus aquatilis

Distribution: North from Evans Head. Eg. Royal Camp SF, Busby's Flat (Rappville), Bundjalung NP.
Likely habitat: Open ephemerally wet sites.
Additional known habitat details:
Survey Season: Spring-summer; annual herb.

Darwinia biflora

Distribution: Maroota to Macquarie Park, Ku-ring-gai NP, Turramurra, St Ives, Mt Colah, Hornsby, Blue Mountains, Royal NP.
Likely habitat: Woodland, Dry Sclerophyll Forest, Scrub-Heath.
Additional known habitat details: Occurs on edges of weathered shale-capped ridges, intergrading with Hawkesbury Sandstone. In association with *Eucalyptus haemostoma, Corymbia gummifera, E. sclerophylla, E. capetillata, Angophora hispida, Banksia ericifolia, Hakea teretifolia, Persoonia pinifolia, Kunzea capitata, Isopogon anethifolius.*

Davidsonia pruriens* var. *jerseyana

Model available
Distribution: Brunswick and Tweed rivers. Eg. Chillingham, Tumbulgum, Murwillumbah, Mooball, Ocean Shores
Likely habitat: Subtropical rainforest at low altitudes.
Additional known habitat details: Usually found on red and yellow podsolic soils of poor structure over Silurian greywacke, slate, phyllite or quartzite.

***Davidsonia* sp. Mullumbimby Currumbin Creek (syn. *D.* sp. A)**

Distribution: Burringbar, Huonbrook, Wanganui Gorge, The Channon, Tintenbar, Broken Head, between Nimbin and Tweed.
Likely habitat: Subtropical rainforest, edge of wet sclerophyll.
Additional known habitat details: Often disturbed.

Dendrocnide moroides

Distribution: North of the Clarence River, Chillingham, Murwillumbah (Mount Nullum), Bogangar, Mooball SF. Historic record from Drake.
High probability habitat: Subtropical, dry and littoral rainforest, in gaps and edges, ecotonal wet eucalypt forest.
Additional known habitat details: Recorded in association with *Acmena ingens, Diospyros pentamera, Dysoxylum mollissimum, Araucaria cunninghamii, Flindersia australis, Lophostemon confertus, Eucalyptus propinqua, E. siderophloia.*

Desmodium acanthocladum

Model available
Distribution: Lismore district. E.g. Bungabee SF.
Likely habitat: Mainly along rivers and creeks.
Additional known habitat details: On basalt-derived alluviums.

Dichanthium setosum

Distribution: Inverell, Warialda, Tingha, Glen Innes, Backwater, Guyra, Armidale, Tamworth, Ewingar, Tabulam.
Likely habitat: Woodland, grassland.
Additional known habitat details:
Survey Season: Summer, when flowering.

Diospyros mabacea

Distribution: Tweed and Oxley Rivers. Eg. Limpinwood, Tyalgum, Eungella, Murwillumbah, Stotts Island, Mebbin SF.
Likely habitat: Lowland subtropical rainforest and riverine rainforest.
Additional known habitat details: Occurs on lower altitude basalt, 220 to 400 metres altitude, alluvial flats, well drained. Also on margins of adjacent tall open forest with rainforest mid-storey. In association with *Ficus watkinsonia, F. obliqua, Heritiera trifoliolata, Dendrocnide excelsa, Cryptocarya erythroxylon, C. obovata, Toona ciliata, Sloanea woolsii, Randia chartacea.*

Diospyros major* var. *ebenus

Distribution: Tumbulgum, Hogans Scrub.

Likely habitat: Lowland subtropical rainforest.
Additional known habitat details:

Diploglottis campbellii

Distribution: Between Richmond River and Nerang River Qld. Eg. Teven, Mullumbimby, Mt Warning, Chillingham, Durrumbul, Eungella.
Likely habitat: Subtropical, riverine rainforest.
Additional known habitat details: Occurs on gentle slopes, creek flats, lower-mid-upper slopes, occasionally on rocky slopes.

Dipodium atropurpureum

Distribution: Northern tablelands north from Oxley highway.
Likely habitat: Tall open forest and drier eucalypt forests.
Additional known habitat details: On basalt-derived rich red-brown loam or poorer stony clay soils.

Dipodium pulchellum

Distribution: North from Tia Falls, near Walcha. Also Wardell and Grevillia.
Likely habitat: Sclerophyll forest.
Additional known habitat details: On basalt-derived soils.
Survey season: Flowers December - May.

Diuris disposita

Distribution: Kempsey – Willawarrin area. Recorded from Yarravel NR and Old Station SF.
Likely habitat: In grassland in open sclerophyll forest.
Additional known habitat details: In Eucalypt forest with a grassy understorey. Recorded growing in Imperata cylindrica understorey on shale-derived clays. May not produce flowers in dry periods. Flowers recorded Sep – Oct.

Diuris pedunculata

Distribution: Port Jackson to Tenterfield. Eg. Deepwater, Ebor, Mt Boss (Wauchope), NW of Armidale, Walcha, Bendeemer, Scone, Boorolong SF.
Likely habitat: Sclerophyll forest.
Additional known habitat details: Grassy areas.
Seasonal Survey: August to September inclusive, when flowering.

Diuris praecox

Distribution: Ourimbah, Nelsons Bay.
Likely habitat: Sclerophyll forest.
Additional known habitat details: Coastal and near coastal ranges.
Seasonal Survey: July to early Septebmer inclusive, when flowering.

Diurus venosa

Distribution: Barrington Tops, Brackendale & New England NP. Eg. Barrington Tops SF, Barrington Tops NP, north of Riamukka SF (Brackendale), New England NP.
Likely habitat: Grassy understorey of eucalypt woodland or in subalpine grasslands or herbfields.
Additional known habitat details: In moist areas at altitudes > 1100 metres0 metres on dark humic loam or basalt soil. Associated species include E. pauciflora. Recorded from margins of high altitude swamps.
Seasonal Survey: November to January inclusive, when flowering.

Doryanthes palmeri

Distribution: Mt Warning Caldera.
Likely habitat: Exposed rocky outcrops in wet sclerophyll forest.
Additional known habitat details:

Drynaria rigidula

Distribution: north from Clarence River, Maclean, Tanglewood east of Burringbar, Richmond Gap (adjacent Border Ranges NP), Pottsville Beach (Billinudgel NR).

Likely habitat: Rainforest.
Additional known habitat details: On rocks or on plants as an epiphyte, recorded on *Acacia melanoxylon*.

***Elaeocarpus* sp. Rocky Creek (syn. *E*. sp. Minyon)**

Distribution: Nightcap & Koonyum Ranges. Eg. Whian Whian SF, Nullum SF, Snows Gully NR.
Likely habitat: Subtropical & warm temperate rainforest & wet sclerophyll forest.
Additional known habitat details: On deep brown podzolics formed on rhyolite and basalt-rhyolite mix.

Elaeocarpus williamsianus

Model available
Distribution: North of Byron Bay. E.g. Burringbar.
Likely habitat: Regrowth subtropical/warm temperate rainforest.
Additional known habitat details: On palaeozoic metamorphics.

Eleocharis tetraquetra

Distribution: Rocky Creek and Whitemans Creek, Fortis Creek NP (NW Grafton), Boambee to Qld
Likely habitat: Swampy areas
Additional known habitat details: Occurs in and on the edge of freshwater swamp margins and streams, on humic gleyed silts and plastic mottled clays. In association with Isachne globosa, Ischaemum australe var villosum and other sedges.
Survey Season: December to February inclusive, when flowering and seeding. Difficult to detect when not fertile.

Endiandra hayesii

Distribution: North from the Richmond River. Eg. Big Scrub FR, Broken Head FR, Minyon Falls FR, Nightcap NP, Snows Gully FR, Mebbin, Mooball, Nullum, Whian Whian & Wollumbin SFs.
Likely habitat: Subtropical & littoral rainforest, & wet sclerophyll forest.
Additional known habitat details: Sedimentary soils & alluvium in cool, moist, sheltered valleys.

Endiandra floydii

Model available
Distribution: Tweed district.
Likely habitat: Warm-temperate and subtropical rainforest.
Additional known habitat details: To 430 metres0 metres altitude.

Endiandra muelleri* spp. *bracteata

Model available
Distribution: North from Maclean.
Likely habitat: Usually subtropical rainforest.
Additional known habitat details: Chiefly at lower altitudes.

Eriostemon ericifolius

Distribution: Upper Hunter, Pilliga.
Likely habitat: Heath, dry sclerophyll forest.
Additional known habitat details: Damp sandy flats and gullies.

Eriostemon myoporoides* spp. *conduplicatus

Distribution: Grafton, Tenterfield and Howell districts.
Likely habitat: Dry sclerophyll forest and heath.
Additional known habitat details:

Eucalyptus approximans

Distribution: Barren Mountain.
Likely habitat: Mallee shrubland.
Additional known habitat details: Skeletal soil on trachyte, above 1000 metres altitude.

Eucalyptus caleyi* ssp. *ovendenii

Distribution: West of Tenterfield.
Likely habitat: Woodland.

Additional known habitat details: Grassy, drier shallower soils of moderate fertility, on granite.

Eucalyptus camfieldii
Distribution: Gosford to Royal NP, Ku-ring-gai NP, Berowra Valley Regional Park.
Likely habitat: Woodland, coastal scrub heath.
Additional known habitat details: Sandy soils on sandstone with clay lenses and poorly drained laterites, often restricted drainage.

Eucalyptus camphora* ssp. *relicta
Distribution: North east of Guyra. Only known in NSW from Crown Mountain (Warra National Park)
High probability habitat: Tableland swamps, wet open woodland
Additional known habitat details: Recorded in wet heath on coarse sandy soil on leucoadamellite.

Eucalyptus fracta
Distribution: Northern escarpment of the Broken Back Range, near Cessnock Recorded from Pokolbin SF.
Likely habitat: Dry open forest/woodland.
Additional known habitat details: Restricted to shallow soils along the upper escarpment of steep sandstone range.

Eucalyptus glaucina
see Metapopulation Unit description

Eucalyptus mckieana
Distribution: Guyra, Tingha, Longford (Armidale), Bendemeer.
Likely habitat: Woodland, dry sclerophyll forest.
Additional known habitat details: Grassy open forest. Poor sandy loam on acid granite.

Eucalyptus nicholii
Distribution: Niangala to Glen Innes, particularly in the area from Walcha to Glen Innes & east thereof. Eg. Winterbourne SF vicinity, Donnybrook SF, Oxley Wild Rivers NP.
Likely habitat: In grassy or sclerophyll woodland.
Additional known habitat details: Shallow relatively infertile soils on shales & slates. Scattered distribution on rocky ridges especially of porphyry and granite; absent from high, wet granite country in the eastern part of the Northern Tablelands.

Eucalyptus pachycalyx* ssp. *banyabba
Distribution: Banyabba NR.
Likely habitat: Dry sclerophyll forest.
Additional known habitat details: Sandstone substrate.

Eucalyptus parramattensis* ssp. *decadens
Distribution: Tomago to Kurri Kurri & Williamstown.
Likely habitat: In dry sclerophyll woodland.
Additional known habitat details: On infertile sandy soils in low-lying, often swampy sites. Associated trees include *Angophora bakeri*, *Eucalyptus signata* & *E. globoidea*.

Eucalyptus pumila
Distribution: Broken Back Range, Pokolbin SF.
Likely habitat: Sclerophyll shrubland.
Additional known habitat details: Steep sandy skeletal soils.

Eucalyptus rubida* ssp. *barbigerorum
Distribution: Timbarra Plateau, Glenn Innes, Guyra, Tingha.
Likely habitat: Dry sclerophyll forest.
Additional known habitat details: Soils moderately fertile, low-lying areas.

Eucalyptus tetrapleura

Distribution: Kungala to Gibberagee. Eg. Glenugie Peak FR, Wells Crossing FR.
Likely habitat: Dry sclerophyll forest.
Additional known habitat details: Moderately fertile soil, often in lower areas of poorer drainage. Recorded with *Eucalyptus bancroftii, E. seeana, E. eugenioides, E. crebra, Corymbia henryi*.

Euphrasia arguta

Distribution: Bathurst to Walcha area, Hanging Rock – Nundle.
Likely habitat:
Additional known habitat details: Grassy areas near rivers.
Seasonal Survey: October to January inclusive, when flowering.

Euphrasia bella

Distribution: MacPherson Range, Qld-NSW border, The Pinnacle (Border Ranges NP).
Likely habitat: Cool temperate rainforest.
Additional known habitat details: exposed sites, flowers Oct-Dec.

Euphrasia collina* ssp. *muelleri

Distribution: Barren Mountain (New England NP), Dorrigo.
Likely habitat: Grassland and damp places.
Additional known habitat details: Flowers August-November.

***Euphrasia ruptura* (syn *E.* sp. 'Tamworth')**

Distribution: Tamworth.
Likely habitat:
Additional known habitat details:

Floydia praealta

Distribution: North from the Richmond River. Eg. Boatharbour NR, Broken Hd NR, Johnstons Scrub NR, Limpinwood NR, Mt Warning NP, Nightcap NP, Numinbah NP, Victoria Park NR. Whian Whian & Wollumbin SFs.
Likely habitat: Rainforest.
Additional known habitat details: Chiefly riverine and subtropical rainforest.

Fontainea australis

Model available
Distribution: North of Lismore. E.g. Wanganui, Goonengerry, upper Couchy and Crystal Creeks.
Likely habitat: Lowland subtropical rainforest.
Additional known habitat details: Associated species include *Argyrodendron trifoliolatum, Diospyros mabacea, Toona australis, Dendrocnide excelsa*. On basaltic alluvial flats.

Fontainea oraria

Distribution: Lennox Head.
Likely habitat: Low littoral rainforest.
Additional known habitat details: On Kraznozems.

Gastrodia sesamoides

Distribution: North Coast, Northern Tablelands.
Likely habitat: High rainfall forest; sclerophyll forest and rainforest margins.
Additional known habitat details: Usually grows in accumulated litter in moist sites. Often associated with dead trees.
Seasonal survey: Flowers August - January.

Gaultheria viridicarpa* ssp. *merinoensis

Distribution: Mt Merino (MacPherson Range).
Likely habitat: Woodland.

Additional known habitat details: Montane, basalt crevices, cliffs.

Gaultheria viridicarpa* ssp. *veridicarpa

Distribution: Allans Water, Majors Point (Ebor), Point Lookout.
Likely habitat: Woodland.
Additional known habitat details: Montane, basalt crevices, cliffs.

Geijera paniculata

Distribution: Rivertree district, New Italy, Lismore and Wardell districts.
High probability habitat: Dry and subtropical rainforest.
Additional known habitat details: Known from swamp forest-rainforest ecotone and on metamorphic rocks in dry subtropical rainforest.

Gentiana wissmannii

Model available
Distribution: Northern Tablelands. E.g. Yooronah, Guy Fawkes, Sandy Ck and west of Round Mountain.
Likely habitat: In short herbfields, wet heaths and margins of acid swamps.
Additional known habitat details: On moist, peaty, sandy soil on Round Mountain Luecoadamellite. Associated species include *Poa sieberana, Schoenus ericetorum, Dichondra repens, Luzula* sp., *Haloragis heterophylla, Centella asiatica, Leptospermum gregorium, Restio stenocoleus,* and *Sphagnum.*

Gingidia montana

Distribution: Ebor, Tyringham, Point Lookout.
Likely habitat: Woodland, Cool Temperate rainforest.
Additional known habitat details: Occurs on cliff faces and rock crevices at 1400-1500 metres altitude.

Goodenia macbarronii

Distribution: South of Guyra to Inverell. Eg. Moredun (SW Glen Innes), Chandlers Peak (Guyra).
Likely habitat:
Additional known habitat details: Damp sandy soils.

Grammitis stenophylla

Distribution: Whian Whian SF, Sherwood NR, Mt Belmore SF.
Likely habitat: Rainforest, moist forest, dry sclerophyll forest.
Additional known habitat details: Moist sandstone rock faces.

Grevillea banyabba

Model available
Distribution: North west of Grafton. Eg. Fortis Creek, Coaldale, Banyabba, Copmanhurst.
Likely habitat: Open eucalypt forest near or at top of ridges or mid-slopes.
Additional known habitat details: Associated species include *Eucalyptus psammitica, E. pachycalyx* ssp. *banyabba.*

Grevillea beadleana

Distribution: From the Apsley River to the Guy Fawkes River, also near Grafton. Eg. Guy Fawkes River NP, Aspley River, Moona Plains, Shannon Ck (Coutts Crossing), Torrington area.
Likely habitat: Dry sclerophyll forest.
Additional known habitat details: Grows among siliceous granitic outcrops (bluffs, creeks) yielding low nutrient, acidic, well-drained soils. Granite scarps & exposures, cliff edges, dry sclerophyll forest. Also on sandstone and metasediments.

Grevillea evansiana (=G. diffusa* ssp. *evansiana)

Distribution: Currant Mountain Gap area, east of Rylstone.
Likely habitat: Dry sclerophyll forest, woodland.
Additional known habitat details: Usually on Hawkesbury Sandstone, occasionally swampy heath on sandy soil.

Grevillea guthrieana

See Metapopulation Unit description

Grevillea masonii

Distribution: Known only from a few localities near Grafton. Eg. Whiporie and Gibberagee SFs, Lawrence – Casino Rd.
Likely habitat: Dry sclerophyll forest, woodland.
Additional known habitat details: Disturbed road verges & cultivated or grazed pasture at low elevations in what was formerly open eucalypt woodland. Grows in gravelly loams. Recorded in flat, low-lying red gum community on heavier soils.

Grevillea mollis

Distribution: Known only from Gibraltar Range NP
High probability habitat: On granite on steep slopes and along a creek in eucalypt forest.
Additional known habitat details: Recorded in heathy open forest with *Eucalyptus campanulata, Podolobium aestivum.*

Grevillea obtusiflora* ssp. *obtusiflora

Distribution: Clandulla SF near Rylstone, north of Bathurst.
Likely habitat: Dry sclerophyll forest.
Additional known habitat details: Occurs on geology comprised of shale, siltstone, conglomerate and sandstone in sandy loam soils, 720 metres altitude. In association with *Eucalyptus crebra, E. dealbata, E. tenulla, Callistemon linearis, Acacia buxifolia, A. elongata.*

Grevillea obtusiflora* ssp. *fecunda

Distribution: Capertee area.
Likely habitat: Dry sclerophyll sorest.
Additional known habitat details:

Grevillea parviflora* ssp. *parviflora

Distribution: Prospect, Camden, Appin to Arcadia, Putty, Cessnock, Cooranbong.
Likely habitat: Woodland, dry sclerophyll forest.
Additional known habitat details: Southern sites on light clayey soils, northern sites on sandy soils.

Grevillea quadricauda

Model available
Distribution: North-west of Grafton. Eg. Mt Neville NR, Mt Belmore SF.
Likely habitat: Gravelly loam or sand in Eucalypt woodland.
Additional known habitat details: Usually along creeks or drainage lines.

Grevillea rhizomatosa

Distribution: Known only from Dandahra Creek, Gibraltar Range NP
High probability habitat: Dry sclerophyll forest with heath understorey; moist eucalypt forest.
Additional known habitat details: Recorded on brown loam in heathy eucalypt forest, and along creek in wet forest.

Grevillea scortechinii* spp. *sarmentosa

Model available
Distribution: Northern Tablelands. Eg. Backwater, Crown Mountain, Mann River NR.
Likely habitat: Dry sclerophyll forest, woodland and heath on granite soils and sandy podsols over granite and leucoademellite.
Additional known habitat details: Associated species include: *Allocasuarina rigida, Calytrix tetragona, Eucalyptus dalrympleana* spp. *heptantha, E. radiata, E. pauciflora, E. acaciiformis, E. caliginosa, E. codonocarpa, E. nova-anglica, Imperata cylindrica, Kunzea obovata, Leptospermum nova-anglica, Persoonia cornifolia, Monotoca scoparia.*

Grevillea shiressii

Distribution: Gosford area, Mullet Creek (Wondabyne), Mooney Mooney Creek (Brisbane Water NP).
Likely habitat: Wet sclerophyll forest.
Additional known habitat details: Creek banks, sandy alluvial soil on Hawkesbury sandstone.

Hakea fraseri

Model available
Distribution: Upper Macleay gorges and Collarenabri district. E.g. Wollomombi, Dangar, Tia and Apsley Falls.
Likely habitat: Woodland and dry rocky slopes.
Additional known habitat details:

Hakea trineura

Distribution: From Lansdowne to Wauchope. Eg. Starrs Creek and Newbys Creek, Lansdowne SF, Tinebank Mountain area, Mt Boss SF.
Likely habitat: Sclerophyll forest, on sheltered, often rocky, slopes and in gullies on conglomerate or granite.

Additional known habitat details: Restricted to the near coastal ranges, in dry to wet sclerophyll forest, sometimes bordering rainforest gullies. Recorded with *Eucalyptus pilularis, Syncarpia glomulifera, E. microcorys, E. carnea, Acacia elata, E. agglomerata*.

Haloragis exalata* ssp. *exalata

Distribution: Central Coast, South Coast, North Western Slopes, Clifton, Marramarra NP.
Likely habitat: Open forest.
Additional known habitat details: Damp places near watercourses, near wetlands.

Haloragis exalata* ssp. *velutina

Distribution: Dalmorton, Bellbrook (Kempsey), Macleay-Apsley Gorges.
Likely habitat: Riparian shrubland, gravelly riverbeds.
Additional known habitat details: Damp places near watercourses.

Hedyotis galioides (*syn. *Oldenlandia galioides)

Distribution: Gunderbooka Mountains, south of Bourke, also Casino district. Eg. Whiporie SF, Royal Camp SF.
Likely habitat: Dry sclerophyll forest.
Additional known habitat details: Seasonally damp(inundated) areas, herb and grassy areas under open eucalypt forest.
Seasonal Survey: January to May inclusive.

Hibbertia hexandra

see Metapopulation Unit description

Hibbertia marginata

Distribution: Southern Richmond Range. Eg. Mt Belmore SF, Mt Marsh SF, Mt Neville NR, Devils Pulpit SF, Gibberagee SF.
Likely habitat: Dry sclerophyll forest.
Additional known habitat details: Grassy forest on sandstone. Flowers spring.

Hibbertia procumbens

Distribution: Mangrove Mountain area, Strickland SF.
Likely habitat: Heath.
Additional known habitat details: *Banksia ericifolia, Allocasuarina distylla*, skeletal sandy soil over sandstone, 0-300 metres altitude. Flowers October.

Hicksbeachia pinnatifolia

See Metapopulation Unit descriptions.

Homoranthus lunatus

Distribution: Boonoo Boonoo (Tenterfield); Torrington
High probability habitat: Dry sclerophyll forest/woodland
Additional known habitat details: Granite outcrops and ridges

Homoranthus prolixus

Distribution: Howell district (northern tablelands and north western slopes).
Likely habitat: Heath, dry sclerophyll forest.
Additional known habitat details: Sandy, skeletal soils.

Hypolepis elegans

Distribution: Richmond River, Pimlico.
Likely habitat: Open sclerophyll forest.
Additional known habitat details: Open places on margins.

Isoglossa eranthemoides

Distribution: Richmond-Tweed valleys, Eureka (Morton's Scrub), Bangalow (Hermans Scrub), Nashua (Emery's Scrub). Eltham (Dawes Bush), Inner Pocket NR, Mt Warning NP (Breakfast Creek), Booyong Flora and Fauna Reserve, Andrew Johnson NR
Likely habitat: Subtropical Rainforest
Additional known habitat details: lowland subtropical rainforest on volcanics, complex notophyll vine forest, 10-460 metres altitude, sub-alliances 1,3,and 5, palm forest
Survey Season: may be confused with *Pseueranthemum variable*, flowers known in October

Knoxia sumatrensis

Distribution: Mullumbimby.
Likely habitat:
Additional known habitat details:

Kunzea rupestris

Distribution: Glenorie to Maroota (Wisemans Ferry), Jerry's Plain (Singleton), Marramarra NP.
Likely habitat: Heath.
Additional known habitat details: In shallow soil depressions on ridge-top sandstone rock platforms, 95-220 metres altitude. Associated with *Calytrix tetragona, Kunzea capitata, Grevillea speciosa, Lepyrodia scariosa, Schoenus imberbis.*

Lasiopetalum longistamineum

Distribution: Mt Dangar, Gungal, Wybong.
Likely habitat:
Additional known habitat details: Sandy soil with *Callistemon, Leptospermum*.

Lepidium hyssopifolium

Distribution: Narrabri, Maryland (Urbenville), Armidale, Uralla, Dorrigo.
Likely habitat: Woodland.
Additional known habitat details: Grassy Eucalypt woodland, low open *Casuarina* woodland with grassy groundcover, tussock grassland.

Lepidium peregrinum

Distribution: near Queensland border, northern Tablelands.
Likely habitat:
Additional known habitat details:

Leptospermum deanei

Distribution: Garigal NP, Ku-ring-gai NP, Pennant Hills Park, Berowra Valley Regional Park.
Likely habitat: Heath, woodland, forest.
Additional known habitat details: Footslopes above riparian vegetation.

Leucopogon confertus

Distribution: Silent Grove (Torrington).
Likely habitat: Open forest, woodland.
Additional known habitat details: Granitic rocky areas.

Lindsaea brachypoda

Distribution: Tumbulgum, Cudgera, Mullumbimby, Brunswick River, Minyon Falls.
Likely habitat: Subtropical rainforest.
Additional known habitat details: On rocks, banks.

Lindsaea fraseri

Distribution: Hastings Point to Bogangar.
Likely habitat: Swamp forest, open forest.
Additional known habitat details:

Lindsaea incisa

Distribution: Between Woombah & Coffs Harbour. Eg. Newfoundland SF, Fortis Ck NP, Bundjalung NP, Waihou FR.
Likely habitat: Sclerophyll forest, riparian shrubland bordering creeks.
Additional known habitat details: Damp sandy places, open forest, amongst rocks, sedge-dominated drainage lines.

Macadamia tetraphylla

Distribution: Chiefly in the Richmond & Tweed Rivers extending into the Numinbah Valley & Coomera River, Qld. Eg. Goonengerry and Whian Whian SF, Davis Scrub NR, Limpinwood NR, Minyon Falls FR, Mt Warning NP, Nightcap NP, Numinbah NR, Victoria Park NR.
Likely habitat: Rainforest.
Additional known habitat details: Subtropical rainforest near the coast.

Macrozamia johnsonii (*syn. metres. *moorei)

Distribution: Known only from the Dalmorton area. Eg. Chaelundi & Dalmorton SFs, Chandlers Ck FR, Chaelundi NP.
Likely habitat: Wet sclerophyll forest, dry sclerophyll forest & the margins of drier rainforest.
Additional known habitat details: Mostly in foothills of ranges in tall wet sclerophyll forest & margins of rainforest, generally on steep slopes.

Marsdenia longiloba

Distribution: From the Barrington Tops to south-east Qld. Eg. Billilimbra, Edinburgh Castle & Mt Boss SFs.

Likely habitat: Wet sclerophyll forest, with rainforest species in understorey.
Additional known habitat details: Usually occurs in lowland wet sclerophyll forest, in ecotones between rainforest & wet sclerophyll forest, & sometimes in areas with rock outcrops. Also in subtropical rainforest & warm temperate rainforest, mostly below 200 metres alt.

Melaleuca biconvexa

Distribution: From Jervis Bay to Port Macquarie, but mainly in the Gosford/Wyong area. Recently recorded from Wallingat NP.
Likely habitat: Grows in damp places.
Additional known habitat details: The species may occur in dense stands forming a narrow strip adjacent to watercourses, in association with other Melaleuca species or as an understorey species in wet forest.

Melaleuca groveana

Distribution: North from Yengo NP. Eg. Port Stephens, Broken Bago SF, Way Way SF, Wild Cattle Ck SF, Pokolbin SF, Corrabare SF, Mt Boss SF, Keppara SF.
Likely habitat: Rocky ridges and slopes in open dry forest, woodland or heath.
Additional known habitat details: Often in exposed sites. Associated species include *Eucalyptus punctata, E. sparsifolia, E. crebra, E. carnea, E. biturbinata, E. agglomerata, Allocasuarina littorals.*

Melaleuca tamariscina* spp. *irbyana

Distribution: South of Grafton to Casino.
Likely habitat: In open eucalypt forest on poorly drained areas.
Additional known habitat details: Recorded on poorly drained quaternary alluviums and low quartz metasediments in association with *Eucalyptus moluccana, E. siderophloia, E. seeana, Corymbia henryi* and a variety of understorey shrubs and trees usually including other species of *Melaleuca*.

***Melichrus hirsutus* (syn. *Melichrus* species A)**

Distribution: North of Glenreagh to north of Grafton. Eg. Kremnos Ck, Black Swamp Ck, Shannon Ck VCL, Banyabba NR, Wombat Ck, north of Copmanhurst, Pillar Valley, Newfoundland SF.
Likely habitat: Dry sclerophyll forest, with species-rich understorey on quartzitic sandstone.
Additional known habitat details: On sandstone at low altitudes (20-150 metres) in sandy soils including both grey-brown podsolics & lithosols with conspicuous sandstone outcrops. Mean annual rainfall c. 1200-1300 millimtetres. Also in dry sclerophyll forest with well-developed shrub layer of many species. Flowers March – August.

***Melichrus* sp. Gibberagee**

Distribution: Lower Richmond Range, south of Casino. Eg. Gibberagee SF.
Likely habitat: Dry sclerophyll forest.
Additional known habitat details: Tall open forest, grey gum on heavier red clay soils. Recorded with *Eucalyptus propinqua, E. sideropholia, Corymbia henryi* with low, grassy understorey.

Micromelum minutum

Distribution: Lismore - considered extinct in NSW.
Likely habitat: Rainforest.
Additional known habitat details: Drier lowland rainforest.

Monotaxis macrophylla

Distribution: Known from the Backwater district, as well as north-western slopes and plains
High probability habitat: Amongst rock outcrops at high altitude.
Additional known habitat details: rocky ridges and hillsides. Short-lived post-fire coloniser.

Muellerina myrtifolia

Distribution: Legume (MacPherson Range) to Qld. Eg. Acacia Creek, Wilsons Peak (Urbenville)
Likely habitat: Dry rainforest.
Additional known habitat details: Parasitic on *Croton* spp., *Parsonsia* spp. and *Pandorea* spp.

Myriophyllum implicatum

Distribution: Acacia Creek (Urbenville), Wilson's Peak.
Likely habitat:
Additional known habitat details: Damp positions in riparian areas, coastal situations, freshwater seepage.

Neoastelia spectabilis

Distribution: New England NP.
Likely habitat: Warm temperate rainforest, cool temperate rainforest.
Additional known habitat details: Nothofagus moorei forest, rock crevices, seepages, 900-1150 metres altitude.

Oberonia titania

Distribution: North from the Macleay River.
Likely habitat: Coastal districts, including lower ranges.

Additional known habitat details: Particularly on *Melaleuca alternifolia* in coastal swamps and on *Trochocarpa laurina* in mixed forest and rainforest; sometimes on rock faces. Tends to prefer fairly stout limbs and tree trunks.

Ochrosia moorei

Distribution: North from the Richmond River. Eg. Whian Whian & Wollumbin SFs, Big Scrub FR, Boatharbour NR, Numinbah NR, Victoria Park NR.
Likely habitat: Riverine & subtropical rainforest & ecotones.
Additional known habitat details: On deep heavy alluvial soil, usually on basalt, & often near creeks. Associated species include *Aphananthe philipinensis, Capparis arborea, Planchonella australis, Ficus* species. Sporadic flowering.

Olax angulata

Distribution: Yuraygir NP, Sandon Point (Wooli).
Likely habitat: Wet heath, woodland.
Additional known habitat details: On sandy soils near swamps.

Olearia cordata

Distribution: Wisemans Ferry to Wollombi, Yengo NP, Wollemi NP, Colo River, St Albans.
Likely habitat: Woodland to dry sclerophyll forest.
Additional known habitat details: Exposed Hawkesbury sandstone ridges, shallow or skeletal sandy soil, 150-500 metres altitude, steep to gentle slopes. Associated species include *Angophora costata, A. bakeri, Eucalyptus punctata, Corymbia eximia, Allocasuarina torulosa, Acacia linifolia, Persoonia linearis*.

Olearia flocktoniae

Distribution: From Brooklana - Marengo north of the Dorrigo Plateau. Eg. Brooklana, Ellis, Hyland, Marengo, Wild Cattle Ck SFs, Dorrigo NP, Mt Hyland NR.
Likely habitat: Wet sclerophyll forest & warm temperate rainforest edges or gaps, on Brooklana Beds metasediments.
Additional known habitat details: Pioneer species of recently disturbed areas on sedimentary & granitic substrates. Flowers Feb - March.

Owenia cepiodora

Model available
Distribution: North from the Richmond River. E.g. Cherry Tree SF, Unumgar SF, Border Ranges, Whian Whian SF, Clunes, Rosebank, Dorroughby, Hayters Hill.
Likely habitat: Subtropical and dry rainforest, or near ecotone of rainforest and eucalypt forest.
Additional known habitat details: Associated species include *Austromyrtus bidwillii, Araucaria cunninghamii, Lophostemon confertus, Eucalyptus saligna*.

Parsonsia dorrigoensis

Distribution: From Kendall to Woolgoolga. Eg. Kerewong SF, Ingalba SF, Newry SF, Bellinger River NP, Dorrigo NP, New England NP, Conglomerate SF.
Likely habitat: In subtropical and warm-temperate rainforest and wet or dry sclerophyll forest.
Additional known habitat details: Found in subtropical & warm temperate rainforests, especially in more open parts & on rainforest margins, & in wet or dry sclerophyll forests on brown clays overlying metasediments. Associated species include *Lophostemon confertus, Eucalyptus campanulata, E. microcorys, E. pilularis, E. saligna, E. ancophila, E. carnea, E. siderophloia, Schizomeria ovata, Acmena smithii, Trochocarpa laurina, Callicoma serratifolia*.

Persicaria elatior

Distribution: Richmond Range SF, Cherry Tree SF, Coffs Harbour, Raymond Terrace, Gibberagee SF.
Likely habitat: Swamps.
Additional known habitat details: Damp places.

Phaius australis

Distribution: North from Port Macquarie.
Likely habitat: Swamp, rainforest.

Additional known habitat details: Margins of Melaleuca swamp forest, permanently moist soil Cobaki, Bogangar, Cudgen, Byron Bay, Suffolk Park, Ballina, Broadwater, Bundjalung, Coffs Harbour, Port Macquarie area.

Phaius tankervillae
Distribution: North from Port Macquarie.
Likely habitat: Swamps, sclerophyll forest.
Additional known habitat details: Melaleuca forests and swamps margins of *Melaleuca* swamp forest, permanently moist soil.

Phebalium glandulosum* ssp. *eglandulosum
Distribution: Warialda, Torrington District, northern tablelands.
Likely habitat: Heath, open forest.
Additional known habitat details: Amongst rocky granite outcrops.

Picris evae
Distribution: North from Inverell area.
Likely habitat:
Additional known habitat details: Black soils.
Seasonal Survey: Spring-summer, when flowering.

Pimelea venosa
Distribution: Bolivia Hill, Bluff Rock (Tenterfield).
Likely habitat: Open woodland with grassy understorey on granite.
Additional known habitat details: Granite country.

Plectranthus alloplectus
Distribution: Border Ranges and surrounding areas. Eg. Woodenbong, Terania Creek, Bald Knob SF
Likely habitat: Heath and scrub.
Additional known habitat details: Cliffs, steep ledges and flat rocky areas.
Seasonal Survey: January to April inclusive, when flowering.

Plectranthus nitidus
Distribution: North from Hortons Ck. Eg. Terania Ck, Nullum SF, Richmond Range SF.
Likely habitat: Cliff bases adjoining tall forest.
Additional known habitat details: Rocky cliffs in rainforest.
Seasonal Survey: February to May inclusive, when flowering.

Polygala linariifolia
Distribution: Warialda to Weebah Gate (Qld border), and from Casino to Grafton, eg. Royal Camp SF, Southgate SF.
High probability habitat: Dry sclerophyll forest on low-relief, seasonally wet sites with a grass and herb understorey.
Additional known habitat details: Spotted Gum Forest
Survey Season: Annual herb, Flowers September-February

Pomaderris brunnea
Distribution: From Tantawangalo SF to south of Walcha. Eg. Picton area, upper Cordeaux Dam, Wollemi NP, Menangle, Nepean River, Tantawangalo SF, Tuggolo SF.
Likely habitat: Woodland & open forest.
Additional known habitat details: On river bank, intermediate between Silvertop Stringybark & New England Blackbutt.

Pomaderris queenslandica
Distribution: Gloucester district, Bagawa SF (Nana Glen), Wingham area, old record from Wild Cattle Creek SF.
Likely habitat: Moister sclerophyll forest with shrubby understorey.
Additional known habitat details: Temperate areas, wetter climate.

***Prostanthera askania* (syn. *P.* sp. 6 Strickland State Forest)**

Distribution: Gosford-Ourimbah-Narara area. Eg. Strickland SF, Niagara Park, Stella's Brush, Askania Park, Kendalls Glen.
Likely habitat: In or adjacent to rainforest.
Additional known habitat details: On ridges in or adjacent to rainforest dominated by *Cryptocarya microneura, Acacia irrorata, Tristaniopsis collina, Callicoma serratifolia, Eucalyptus saligna, Acmena smithii*. Grows in sandy soils, overlying sandstone. Flowers in Spring.

Prostanthera densa
Distribution: North Coast to South Coast. Eg. Royal NP.
Likely habitat: Dry sclerophyll forest, tall shrubland.
Additional known habitat details: *Corymbia gummifera, Angophora costata, Acacia terminalis, Banksia integrifolia, Epacris longiflora*, coastal headlands near coastal ranges, 0-100 metres altitude, sandstone outcrops, shallow soil.

Prostanthera staurophylla
Distribution: Emmaville, Torrington, Henry River (Backwater), Mt Mitchell (SE Glen Innes).
Likely habitat: Heath, dry sclerophyll.
Additional known habitat details: Moist patches around granite outcrops.

***Prostanthera* sp. Somersby (syn. *P.* junonis)**

Distribution: Somersby Plateau, Somersby, Brisbane Water NP.
Likely habitat: Open forest, low woodland, open scrub, heath.
Additional known habitat details: Occurs on deeply weathered Hawkesbury Sandstone and Hawkesbury Sandstone with components from the Narrabeen Group. In association with Eucalyptus piperita, Angophora costata, *Corymbia gummifera, C. eximia, E. punctata, E. haemostoma, Banksia serrata, B. ericifolia, Hakea teretifolia, Allocasuarina distyla, Baeckea* spp.

***Prostanthera* sp. Bundjalung (syn. *P.* palustris)**

Distribution: Hell Hole, Black Rocks (Bundjalung NP).
Likely habitat: Wet heath, woodland.
Additional known habitat details: On alluvial sandy soils subject to prolonged waterlogging. Associated species include *Eucalyptus robusta, Angophora woodsiana, Banksia oblongifolia, Ptilanthelium deustum, Xanthorrhoea fulva, Aotus ericoides*.

Pseudanthus ovalifolius
Distribution: North from Torrington (Carpet Snake Gap).
Likely habitat: Open forest.
Additional known habitat details: Rocky situations, flowers summer.

Psilotum complanatum
Distribution: Ballina.
Likely habitat: Rainforest.
Additional known habitat details: Often on base of other epiphytes.

***Pterostylis cucullata* (syn. *P.* sp D)**

Distribution: Possibly restricted to Barrington Tops.
Likely habitat: Montane forest.
Additional known habitat details: Moist sheltered slopes in montane forest.
Seasonal Survey: August to October inclusive, when flowering.

Pterostylis gibbosa
Distribution: Nowra to Milbrodale (Hunter Valley), Yallah, Albion Park, Currambene SF, Western Sydney.
Likely habitat: Woodland, dry sclerophyll forest.
Additional known habitat details: In association with *Eucalyptus tereticornis, E. amplifolia, E. longifolia, Melaleuca decora, Leucopogon juniperinus, Themeda australis, Corymbia maculata, E. crebra, E. moluccana, Callitris endlicheri*. Soils from undifferentiated siltstone, shale and sandstone and conglomerate, red and green claystone. 10-30 metres altitude in Illawarra and 150-160 metres in the Hunter Valley.

Seasonal Survey: August to November inclusive, when flowering.

Pterostylis nigricans

Distribution: North from Evans Head.
Likely habitat: Scrub, heath.
Additional known habitat details: Coastal.
Seasonal Survey: March to May inclusive, when flowering.

Pultenaea campbellii

See Metapopulation Unit descriptions

Pultenaea stuartiana

Distribution: Silent Grove (Torrington), Timbarra River, Mt Mitchell (SE Glen Innes), Gara Falls (Armidale).
Likely habitat: Sclerophyll forest, woodland.
Additional known habitat details: Granite, on rocky outcrops.

***Quassia* sp. Moonee Ck (syn. *Quassia* species B; *Quassia* sp. 1)**

Distribution: From Moonee area north of Coffs Harbour to north-east of Grafton. Eg. McRaes Knob; Flaggy Ck area, north-west of Glenreagh; Conglomerate, Orara East, Wedding Bells, Lower Bucca SFs.
Likely habitat: Wet sclerophyll forest and tall dry sclerophyll forest, mainly lower slopes.
Additional known habitat details Tall open forest & disturbed wet sclerophyll forest on clay soil over metasediments. Mean annual rainfall is c. 1500 millimetres. Alt from 5-500 metres.

Randia moorei

Distribution: North from Broken Head. Eg. Brunswick Heads NR, Broken Hd NR, Stotts Is NR
Likely habitat: Rainforest.
Additional known habitat details: Subtropical, riverine & littoral rainforest in deep alluvial soils over basalt or shales or slates. Alt. to 500 metres.

***Rapanea* sp. A Richmond River**

Distribution: Coraki to Mt Warning. Eg. Cambridge Plateau, Ruthven, Mt Warning.
Likely habitat: Rainforest.
Additional known habitat details:

Rutidosis heterogama

See Metapopulation Unit descriptions

Sarcochilus fitzgeraldii

Distribution: Scattered distribution north from Kunderany Brook. Eg. New England NP, Mt Coramba, Dorrigo NP, Limpinwood NR, Mt Warning NP, Numinbah NR.
Likely habitat: Subtropical rainforest & brushbox forest.
Additional known habitat details: Often near streams, alt. between 500-700 metres. On rocks or near base of trees.
Seasonal Survey: October to November inclusive, when flowering.

Sarcochilus hartmannii

Distribution: North from Richmond River. Eg. Mt Warning NP, Nightcap NP.
Likely habitat: On rocks & rockfaces or the base of trees or cycads.
Additional known habitat details: In shallow humus on rocks, often occurring on exposed escarpments, from 500-100 metres alt. Substrates include basalt & greywacke. On boulders, cliff faces & escarpments, usually in quite exposed locations.
Seasonal Survey: October to November inclusive, when flowering.

Sarcochilus weinthalii

Distribution: On coastal ranges north from the Richmond River.
Likely habitat: Rainforest or rainforest edge.

Additional known habitat details: On trees in dry rainforest between 400-700 metres alt, often at edges of clearings. Recorded on Heritiera actinophylla.
Seasonal Survey: August to October inclusive, when flowering.

***Sauropus albiflorus* ssp. *microcladus* (syn. *Phyllanthus microcladus*)**
Distribution: Mullumbimby, Main Arm, Grafton District.
Likely habitat: Rainforest
Additional known habitat details: Along creeks and rivers.

Senna acclinis
Distribution: North from Balgownie (Wollongong area). Eg. Oxley Wild Rivers NP, Toonumbar, Cape Hawke, Richmond Range, Hallidays Point, Big Scrub FR, Kangaroo River SF, Kerewong SF.
Likely habitat: Rainforest & sclerophyll forest.
Additional known habitat details: Littoral & subtropical rainforest, wet sclerophyll (*Eucalyptus grandis*) forest, dry sclerophyll forest (*E. pilularis*).
Seasonal Survey: Spring – summer when flowering and fruiting. Difficult to identify without flowers or fruit. Flowers spring and summer. Fruit summer (flat fruit).

***Sophora fras*eri**
Distribution: North from Casino district. Eg. Toonumbar SF, Bungabee SF.
Likely habitat: Rainforest & wet & dry sclerophyll forest.
Additional known habitat details: In moist situations, often in or near subtropical & dry rainforest. Has been recorded from Eucalypt-Brushbox forest on ridge, & in mixed tall forest of Ironbark & Brushbox on a steep south facing slope on loam.

Styphelia perileuca
Distribution: Snowy Range & Round Mountain on the northern tablelands. Eg. Cathedral Rock NP, New England NP.
Likely habitat: Sclerophyll forest.
Additional known habitat details: In open eucalypt forests (with *Eucalyptus dalrympleana, E. youmanii, E. radiata*) on broad ridges & gentle slopes at 1250-1500 metres alt. In dry sclerophyll forest on sandy soil or light brown sandy loam over granite. One record from heath on trachyte.

Symplocos baeuerlenii
Distribution: North from the Nightcap Range. Eg. Boomerang Falls FR, Mt Warning NP, Nightcap NP, Numinbah NR.
Likely habitat: Rainforest & rainforest with a Eucalyptus species & Lophostemon overstorey.
Additional known habitat details: On rhyolite-derived clay soils & clays derived from metasediments in warm temperate rainforest & subtropical rainforest between 100-1000 metres alt. Associated species include *Cryptocarya erythroxylon, Sloanea woollsii, Ceratopetalum apetalum, & Callicoma serratifolia*.

Syzygium hodgkinsoniae
Distribution: North from the Richmond River. Eg. Big Scrub FR, Boomerang Falls FR, Brunswick Hds NR, Inner Pocket NR, Limpinwood NR, Minyon Falls FR, Mt Warning NP, Nightcap NP, Numinbah NR.
Likely habitat: Rainforest & rainforest with Lophostemon overstorey.
Additional known habitat details: Subtropical or gallery rainforest on rich alluvial soils.

Syzygium moorei
Distribution: North from the Richmond River. Eg. Brunswick Heads NR, Stotts Island NR, Binna Burra; Mullumbimby.
Likely habitat: Rainforest.
Additional known habitat details: Riverine & gully rainforests at low altitude.

Syzygium paniculatum
Distribution: Seal Rocks to Jervis Bay. Eg. Pacific Palms (Forster), Kurnell, Jervis Bay, Ourimbah Creek.
Likely habitat: Littoral rainforest, riparian vegetation.

Additional known habitat details: On sand and stabilised sand dunes, non-littoral records are from larger creek valleys in gallery rainforest.

Tarenna cameronii
Distribution: Lismore.
Likely habitat: Dry rainforest.
Additional known habitat details:

Tasmannia glaucifolia

see Metapopulation Unit description

Tasmannia purpurascens
Distribution: Barrington Tops to Ben Halls Gap. Eg. Barrington Tops NP, Gloucester River, Stewarts Brook & Ben Halls Gap SF.
Likely habitat: Wet sclerophyll forest & rainforest.
Additional known habitat details: In tall wet sclerophyll forest, subalpine woodland, & the ecotone between cool temperate rainforest & tall forest, between 1200-1600 metres alt. Sometimes occurs beside swamps or creeks. Recorded growing on chocolate brown kraznozem on basalt.

Tetratheca glandulosa
Distribution: North of Port Jackson. Eg. Mangrove Mountain, Glenorie, Pennant Hills, Duffys Forest, McPherson SF, Yengo NP, Dharug NP, Ku-ring-gai NP.
Likely habitat: Dry woodland.
Additional known habitat details: Associated species include *Angophora bakeri, Eucalyptus gummifera, E. capitellata, Banksia serrata*. On ironstone gravel & shale.

Tetratheca juncea

Distribution: Bulahdelah to Lake Macquarie. Old records from Botany Bay & Port Jackson. Eg. Awabakal NR, Glenrock SRA, Munmorah SRA, Lake Macquarie area, Bulahdelah SF, Walleroo SF, Awaba SF, Heaton SF.
Likely habitat: Heath & open dry sclerophyll forest.
Additional known habitat details: Sandy swampy areas, neutral clay soils, upper parts of ridges, southerly aspect. Associated species include Angophora costata, E. capitellata, E. haemostoma. Seasonal Survey: September to November inclusive, when flowering. No or a few small leaves, difficult to detect when not flowering.

Thesium australe

Distribution: From Cabramurra to Queensland border. Eg. Crowdy Bay NP, Hat Head NP, Kattang NR, Walcha district, Coffs Harbour coastal district, Glen Innes, Tenterfield, Lismore.
Likely habitat: Grassland or woodland.
Additional known habitat details: Wide range of substrates. Associated species include Themeda triandra, Poa sieberiana, Eucalyptus rossii, E. blakelyi, E. mannifera, E. pauciflora. Often in damp sites.
Seasonal Survey: Spring or summer, particulary mid summer as the adult plants are well established and often display a distinctive yellow-green colour.

Tinospora smilacina
Model available
Distribution: North of the Richmond River.
Likely habitat: Dry rainforest.
Additional known habitat details:

Tinospora tinosporoides
Model available
Distribution: North from Iluka. Eg. Johnstone's Scrub NR, Victoria Park NR, Davis Scrub NR, Snows Gully NR, Minyon Falls FR.
Likely habitat: Wetter subtropical rainforest
Additional known habitat details:

***Triplarina imbricata* (syn. *Baeckia camphorata*)**

Distribution: Timmsvale, near Dorrigo and near Drake. Eg. Upper catchment of Little Nymboida and Nymboida Rivers, Plumbago Creek near Drake.
Likely habitat: Rocky riparian low closed scrub.
Additional known habitat details: Associated species include *Tristaniopsis laurina, Leptospermum polygalifolium, Lomandra longifolia*.

Tylophora linearis

Distribution: Barraba area.
Likely habitat: Dry scrub.
Additional known habitat details:

Tylophora woollsii

Distribution: Clouds Creek area near Dorrigo, Bald Rock near Tenterfield, Boonoo SF, Chaelundi SF.
Likely habitat: Wet sclerophyll forest, often on margins; dry forest near outcrops.
Additional known habitat details: Recorded from brown clay over metasediments in wet sclerophyll forest. Also on granite. Flowers Jan - Feb.

Uromyrtus australis

Distribution: Nightcap Range. Eg. Big Scrub FR, Nightcap NP, Rocky Ck, Whian Whian & Nullum SFs.
Likely habitat: Rainforest & wet sclerophyll forest.
Additional known habitat details: Recorded from warm temperate rainforest on shallow yellow soil over rhyolite in high rainfall areas from 400-770 metres alt. Often associated with Ceratopetalum apetalum. Also in warm temperate rainforest/wet sclerophyll forest ecotone.

Velleia perfoliata

Distribution: Upper Hunter Valley, Hawkesbury District, Colo River, Yengo NP, Dharug NP.
Likely habitat: Heath.
Additional known habitat details: On shallow sandy soil on rock platform, on ridges, rarely in sand under and on rock ledges. In association with Calytrix tetragona, Lepidosperma laterale.
Seasonal Survey: Annual to short-lived, often in seedbank and not extant, flowers all year but mainly peak flowering September-December.

Wahlenbergia scopulicola

Distribution: Mt Lindesay, MacPherson Range.
Likely habitat:
Additional known habitat details: Crevices of rhyolitic outcrops.

***Zieria floydii* ms**

Distribution: Known only from the Guy Fawkes area. Eg. Guy Fawkes River NP.
Likely habitat: Rainforest & dry sclerophyll forest with a possible record from wet sclerophyll forest.
Additional known habitat details: On the fringe of rainforest in hilly country.

Zieria involucrata

Distribution: Blue Mountains, Parr SRA, Yengo NP, Marramarra NP, Marrota SF, Colo Heights, Cornelia Crown Lands (south of Wisemans Ferry).
Likely habitat: Wet sclerophyll forest.
Additional known habitat details: Mid to lower slopes of valleys on Hawkesbury sandstone, shallow sandy soil. 70-320 metres altitude. Steep to gentle slopes. Often associated with *Syncarpia glomulifera, Angophora costata, Eucalyptus agglomerata, Allocasuarina torulosa, Ceratopetalum gummiferum, Backhousia myrtifolia, Acacia linifolia, Persoonia linearis, P. levis.*

Zieria lasiocaulis

Distribution: North-west of Port Macquarie, at headwaters of the Wilson River (eg. Mount Banda Banda and Marowin Mountain, Mount Boss SF)
High probability habitat: Tall open forest, warm temperate rainforest and cool temperate rainforest.
Additional known habitat details: On red-brown kraznozem soil. rocky escarpments, fringes of Nothofagus moorei forest between 750 metres and 1100 metres asl.

***Zieria prostrata* ms**

Distribution: Coffs Harbour area. Eg. Look-at-me-now Headland, Dammerals Head, Diggers Head, Bare Bluff.
Likely habitat: Low heath.
Additional known habitat details: Coastal, on headlands. Metasediments. In association with *Themeda australis, Helichrysum bracteatum, Hibbertia vestida, Banksia integrifolia*.

Schedule 2 Part B: Threatened Plant Metapopulation Unit Descriptions
Species

Amorphospermum whitei

Southern Metapopulation Unit

Distribution: Lower Macleay valley to Coaldale eg, Ingalba SF, Nulla-Five Day SF, Gladstone SF, Newry SF, Pine Creek SF, Orara East and West SFs, Lower Bucca SF, Woolgoolga Creek FR, Punchbowl Creek VCL.
High probability habitat: Warm temperate, subtropical, and littoral rainforest areas, as well as wet sclerophyll forest with rainforest understorey elements.
Additional known habitat details: Recorded on metasediment geology in rainforest patches in moist gullies; wet Tallowwood-Blue Gum forest on lower slopes.

Amorphospermum whitei

Northern Metapopulation Unit

Distribution: From Broken Head area to south-eastern Queensland eg, Broken Head NR, Whian Whian SF, Numinbah NR.
High probability habitat: Wet sclerophyll forest with rainforest understorey elements as well as subtropical and littoral rainforest areas.
Additional known habitat details: Recorded on metasediment, acid volcanic and basic igneous geology.

Corokia whiteana

Rhyolite Metapopulation Unit

Distribution: North from Lismore. eg. Big Scrub FR, Nightcap NP, Whian Whian, Nullum SFs,
Likely habitat: Warm temperate rainforest & wet sclerophyll forest.
Additional known habitat details: On poorer soils. Commonly in ecotones between wet sclerophyll forest & coachwood warm temperate rainforest from 10-800 metres alt. on rhyolite.

Corokia whiteana

Metasediment Metapopulation Unit

Distribution: North from Lismore.
Likely habitat: Ecotones between wet sclerophyll and warm-temperate rainforest.
Additional known habitat details: Associated species include *Ceratopetalum apetalum, Callicoma serratifolia.*

Corokia whiteana

Coastal Sands Metapopulation Unit

Distribution: North from Byron Bay. E.g. Tyagarah, Yelgun.
Likely habitat: Wet sclerophyll forest.
Additional known habitat details: Brushbox forest with littoral rainforest understorey.

Eucalyptus glaucina

Southern Metapopulation Unit

Distribution: From Broke to Taree eg, Gloucester district, Paterson, Uffington SF.
High probability habitat: Grassy woodland or open forest on coastal lowland areas.
Additional known habitat details: Deep, moderately fertile soils, well watered areas. Recorded in association with *E. moluccana, Corymbia maculata*.

Eucalyptus glaucina

Northern Metapopulation Unit

Distribution: Casino district, from Whiporie to Rappville eg. Bungawalbin, Braemar, Myrtle, Carwong SFs, Selection Flat FR.

High probability habitat: Open forest on low relief, low elevation sites.

Additional known habitat details: Deep, moderately fertile soils, well watered areas. Recorded in association with *Corymbia henryi, Eucalyptus siderophloia, E. crebra, E. moluccana.*

Grevillea guthrieana

Carrai Metapopulation Unit

Distribution: From Mt Banda Banda area to the Carrai Plateau
High probability habitat: Open dry forest, woodland or heath on generally rocky sites, especially near cliff edges, and in and adjacent to rocky streamsides.
Additional known habitat details: Recorded on metasediments and granite geology, with *Eucalyptus campanulata, E. notabilis, E. melliodora, E. biturbinata.*

Grevillea guthrieana

Booral Metapopulation Unit

Distribution: Booral Creek area, west of Bulahdelah, eg. Booral Creek, Renwick SF, Alderley Creek.
High probability habitat: Moist eucalypt forest along creeklines, on sandstone-derived loams.
Additional known habitat details: Recorded with *Eucalyptus saligna, E. siderophloia, Syncarpia glomulifera* amongst an understorey containing *Acacia longifolia, Melaleuca nodosa* and *metres. sieberi.*

Hibbertia hexandra

Southern Metapopulation Unit

Distribution: Wauchope district, eg. Landsdowne SF, Mt Boss SF.
High probability habitat: Open eucalypt forest, often in sheltered gullies and on rocky slopes.
Additional known habitat details: Recorded with *Eucalyptus pilularis, E. microcorys, E. carnea, E. agglomerata, Ceratopetalum gummiferum, Hakea trineura.*

Hibbertia hexandra

Northern Metapopulation Unit

Distribution: North of Lismore, eg. Whian Whian SF.
High probability habitat: Wet eucalypt forest with rainforest understorey, warm temperate rainforest, heath. Often in sheltered gullies and on rocky slopes.
Additional known habitat details: Recorded on rhyolite soils.

Hicksbeachia pinnatifolia

Southern Metapopulation Unit

Distribution: Nambucca Valley to Dorrigo district, eg. Never Never SF, Dorrigo NP.
High probability habitat: Rainforest and moist open eucalypt forest, often lower slopes near watercourses.
Additional known habitat details:

Hicksbeachia pinnatifolia

Northern Metapopulation Unit

Distribution: North of Lismore, eg. Whian Whian SF, Nullum SF, Mooball SF.
High probability habitat: Rainforest, wet eucalypt forest with rainforest understorey.
Additional known habitat details: Recorded on basalt-derived soils in association *with Lophostemon confertus, Eucalyptus grandis, E. microcorys, Ceratopetalum apetalum, Schizomeria ovata, Flindersia schottiana, Heritiera trifoliolata, Geissois benthamii.*

Pultenaea campbelli

Southern Metapopulation Unit

Distribution: From Glenrock (Bralga Tops) to Oxley Wild Rivers NP (Tabletop Mtn area). including: Hanging Rock, Nundle SF, Tomalla SF, Tuggolo SF, Walcha district.
Likely habitat: Dry sclerophyll forest.

Additional known habitat details: Recorded on light gravelly soil above 600 metres alt; also on rocky sites, recorded with *Eucalyptus blakelyi, E. laevopinea, E. melliodora, E. campanulata, E. caliginosa, E. bridgesiana*.

Pultenaea campbellii

Northern Metapopulation Unit

Distribution: Enmore area (Mihi Gorge) to Tenterfield including: Tilbuster, Devils Pinch, Parlour Mtns, Guyra district, Backwater, Mann River NR.
Likely habitat: Dry sclerophyll forest, woodland or heath; on stony or sandy substrates.
Additional known habitat details: Recorded with *Eucalyptus blakelyi, E. laevopinea, E. melliodora, Eucalyptus campanulata, E. caliginosa, E. bridgesiana*.

Rutidosis heterogama

Inland Metapopulation Unit

Distribution: Torrington area.
High probability habitat: Heath, open forest and woodland.
Additional known habitat details: On leuco-granitic geology.

Rutidosis heterogama

Coastal Metapopulation Unit

Distribution: Coastal areas from Wooli to Evans Head, eg. Sandon, Brooms Head, Bundjalung NP.
High probability habitat: Heath, open forest and woodland.
Additional known habitat details: In grassland, heath, open forest and woodland on clays. Recorded along roadsides.

Tasmannia glaucifolia

Southern Metapopulation Unit

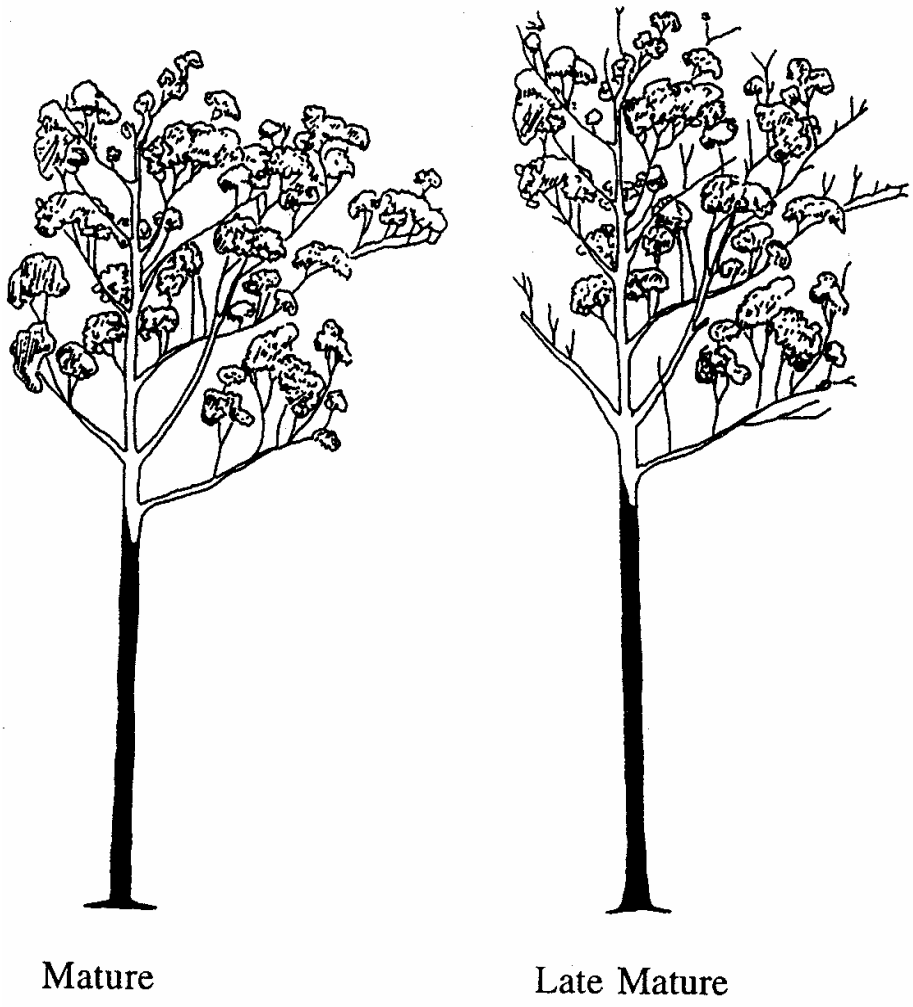
Distribution: Barrington Tops area and Ben Halls Gap.
High probability habitat: Riparian vegetation, usually on basalt soils above c. 1200 metres altitude.
Additional known habitat details: Recorded from *Nothofagus moorei-Elaeocarpus holopetalus* communities as well as *Leptospermum flavescens-Acacia melanoxylon* scrub.

Tasmannia glaucifolia

Northern Metapopulation Unit

Distribution: Ebor-Point Lookout area, New England NP.
High probability habitat: Riparian vegetation, usually on basalt soils. In and on margins of cool temperate rainforest above 1200 metres altitude.
Additional known habitat details: Recorded on chocolate soil on basalt, along drainage channels.

SCHEDULE 3: Figure S3.1 Diagrammatic representation of mature and late mature growth stages



SCHEDULE 4: Threatened fauna potential habitat descriptions

Species	Schedule

Fleay's Frog ***Mixophyes fleayi*** **2**

Distribution: eg. Mid to high elevations from the Conondale Range in south-east Queensland to the Upper Richmond River. Nightcap and Border Ranges. Also found at Terania Creek.
Macrohabitat: Rainforest and wet sclerophyll forest, with moist leaf litter, usually close to permanent running water.
Microhabitat: Usually calls on, or under, the leaf litter along streambanks. Disperses along forest floor during moist conditions and may be found some distance from permanent water, eg. ridge tops.

New England Swamp Frog ***Litoria castanea*** **1**

Distribution: The upper reaches of the Clarence, Macleay and Gwydir valleys.
Macrohabitat: Permanent ponds, dams, still backwaters of rivers, wetlands, slowly moving streams, lagoons in woodlands and improved pastures. Typically where beds of tall reeds occur, but also overhanging grassy banks where reeds are absent.
Microhabitat: Overwinters and shelters under ground debris and fallen timber. Calls while floating in the water; basks in sun. Found on reeds. Breeds typically in warmer months, after reasonable rain.

Peppered Frog ***Litoria piperata*** **2**

Distribution: mid to high elevations (800-1000 metres) in the headwaters of streams flowing east from the New England Tablelands, in an area extending from south east of Armidale to west of the Gibraltar Range.
Macrohabitat: Fast flowing streams in lightly forested, dry New England eucalypt forest.
Microhabitat: Exposed rocky beds and ledges; streamside vegetation usually includes Ribbon Grass, *Lomandra*, *Leptospermum* and *Casuarina*.

Black-throated Finch ***Poephila cincta*** **1**

Distribution: Far northern inland NSW on the north-west slopes and plains.
Macrohabitat: Woodland savannah, open forested grasslands and riparian vegetation.
Microhabitat: Sparse eucalypt or paperbark canopy.

SCHEDULE 5: Species' consideration

Table 1: Threatened fauna species considered adequately protected by the General conditions.

Fauna group / Common name	Scientific name
Frogs	
(alphabetic by scientific name)	
Pouched Frog	*Assa darlingtoni* (except in the Dorrigo MA)
Wallum Froglet	*Crinia tinnula*
Green-thighed Frog	*Litoria brevipalmata*
Olongburra Frog	*Litoria olongburensis*
Glandular Frog	*Litoria subglandulosa*
Red-crowned Toadlet	*Pseudophyrne australis*
Reptiles	
(alphabetic by scientific name)	
Three-toed Snake-toothed Skink	*Coeranoscincus reticulatus*
Stephen's Banded Snake	*Hoplocephalus stephensii*
Border Thick-tailed Gecko	*Underwoodisaurus sphyrurus*
Rosenberg's Goanna	*Varanus rosenbergi*
Birds	
(alphabetic by common name)	
Australasian Bittern	*Botaurus poiciloptilus*
Barred Cuckoo-shrike	*Coracina lineata*
Black Bittern	*Ixobrychus flavicollis*
* Bush Stone-Curlew	*Burhinus grallarius*
Bush-Hen	*Amaurornis olivaceus*
Collared Kingfisher	*Todiramphus chloris*
Comb-crested Jacana	*Irediparra gallinacea*
Glossy Black-Cockatoo	*Calyptorhynchus lathami*
Mangrove Honeyeater	*Lichenostomus fasciogularis*
Olive Whistler	*Pachycephala olivacea*
Osprey	*Pandion haliaetus*
Rose-crowned Fruit-dove	*Ptilinopus regina*
Sooty Owl	*Tyto tenebricosa*
Square-tailed Kite	*Lophoictinia isura*
Superb Fruit-dove	*Ptilinopus superbus*
Turquoise Parrot	*Neophema pulchella*
White-eared Monarch	*Monarcha leucotis*
Wompoo Fruit-dove	*Ptilinopus magnificus*
Non-flying mammals	
(alphabetic by common name)	
Brush-tailed Rock Wallaby	*Petrogale penicillata*
Common Planigale	*Planigale maculata*
Eastern Chestnut Mouse	*Pseudomys gracilicaudatus*
Long-nosed Potoroo	*Potorous tridactylus*
Parma Wallaby	*Macropus parma*
Red-legged Pademelon	*Thylogale stigmatica*
Rufous Bettong	*Aepyprymnus rufescens*

Fauna group / Common name	Scientific name
Flying mammals	
(alphabetic by scientific name)	
Large-eared Pied Bat	*Chalinolobus dwyeri*
Hoary Wattled Bat	*Chalinolobus nigrogriseus*
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*
Little Bentwing-bat [1]	*Miniopterus australis*
Common Bentwing-bat [1]	*Miniopterus schreibersii*
Beccari's Freetail-bat	*Mormopteris beccarii*
Eastern Freetail-bat	*Mormopterus norfolkensis*
Eastern Tube-nosed Bat	*Nyctimene robinsoni*
Eastern Long-eared Bat	*Nyctophilus bifax*
Greater Long-eared Bat	*Nyctophilus timoriensis*
Black Flying-fox	*Pteropus alecto*
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*
Greater Broad-nosed Bat	*Scoteanax rueppellii*
Eastern Cave Bat	*Vespadelus troughtoni*

* Designates TSC Act Schedule 1 species.

[1] Maternity caves of these species are dealt with under **condition 5.2 of this licence**

Table 2: Threatened fauna species which require the implementation of Species-specific conditions:

Fauna group / Common name	Scientific name
Frogs	
(alphabetic by scientific name)	
Pouched Frog	*Assa darlingtoni* (in Dorrigo MA only)
* Green and Golden Bell Frog	*Litoria aurea*
Stuttering Frog	*Mixophyes balbus*
Fleay's Frog	*Mixophyes fleayi*
Giant Barred Frog	*Mixophyes iteratus*
Mountain Frog	*Philoria kundagungan*
Loveridge's Frog	*Philoria loveridgei*
Sphagnum Frog	*Philoria sphagnicolus*
Reptiles	
(alphabetic by scientific name)	
White-crowned Snake	*Cacophis harriettae*
Pale-headed Snake	*Hoplocephalus bitorquatus*
Birds	
(alphabetic by common name)	
Albert's Lyrebird	*Menura alberti*
Barking Owl	*Ninox connivens*
* Black-breasted Button-quail	*Turnix melanogaster*
Marbled Frogmouth	*Podargus ocellatus*
Masked Owl	*Tyto novaehollandiae*
Powerful Owl	*Ninox strenua*
* Regent Honeyeater	*Xanthomyza phrygia*
Rufous Scrub-bird	*Atrichornis rufescens*

APPENDIX B – UPPER NORTH EAST: SCHEDULE 5

Fauna group / Common name	Scientific name
Swift Parrot	*Lathamus discolor*
Non-flying mammals	
(alphabetic by common name)	
Brush-tailed Phascogale	*Phascogale tapoatafa*
* Hastings River Mouse	*Pseudomys oralis*
Koala	*Phascolarctos cinereus*
Squirrel Glider	*Petaurus norfolcensis*
Spotted-tailed Quoll	*Dasyurus maculatus*
Yellow-bellied Glider	*Petaurus australis*
Flying mammals	
(alphabetic by scientific name)	
Golden-tipped Bat	*Kerivoula papuensis*
Large-footed Myotis	*Myotis adversus*
Common Blossom-bat	*Syconycteris australis*

* designates TSC Act Schedule 1 species

Common and scientific names used are those in the *Threatened Species Conservation Act* 1995, Schedules 1 and 2.

Table 3: Threatened flora species which require the implementation of Species-specific conditions. These species occur, or are likely to occur in SFNSW estate and may be affected by forestry operations.

Acacia bynoeana	* *Hibbertia procumbens*
Acacia courtii	*Hicksbeachia pinnatifolia* – Northern and Southern Metatpopulation Units
Acacia pubescens	*Leptospermum deanei*
* *Acacia ruppii*	* *Leucopogon confertus*
* *Allocasuarina defungens*	* *Lindsaea brachypoda*
Amorphospermum whitei –Southern Metapopulation Unit	* *Lindsaea fraseri*
Angophora inopina	* *Lindsaea incisa*
Angophora robur	
Asperula asthenes	*Macrozamia johnsonii* (syn. *M. moorei*)
* *Asterolasia elegans*	* *Marsdenia longiloba*
Boronia umbellata	*Melaleuca biconvexa*
	**Melaleuca tamariscina* ssp.*irbyana*
	Melichrus hirsutus (syn. *M.* sp. A)
Bothriochloa biloba	* *Melichrus* sp. Gibberagee
* *Callitris baileyi*	*Olearia cordata*
Callitris oblonga	* *Olearia flocktoniae*
* *Calophanoides hygrophiloides*	*Parsonsia dorrigoensis*
* *Corchorus cunninghamii*	* *Phebalium glandulosum* subsp. *eglandulosum*
Corokia whiteana - Metasediments Metapopulation	* *Plectranthus nitidus*
Cryptostylis hunteriana	* *Polygala linariifolia*
* *Cynanchum elegans*	*Pomaderris brunnea*
* *Cyperus aquatilis*	* *Pomaderris queenslandica*
* *Dendrocnide moroides*	*Prostanthera askania* (syn. *P.* sp. 6 Strickland State Forest)
* *Desmodium acanthocladum*	*Prostanthera densa*
Dichanthium setosum	* *Prostanthera* sp. Somersby (syn. *P. sp. 6 junonis*)

* *Diuris disposita*	*Pterostylis cucullata* (syn. *P.* sp. D; P. sp. aff. cucullata)
* *Diuris pedunculata*	
* *Drynaria rigidula*	* *Pterostylis gibbosa*
* *Elaeocarpus sp.* Rocky Creek (syn. E. sp. Minyon)	*Pterostylis nigricans*
* *Eucalyptus fracta*	*Pultenaea campbellii* – Northern and Southern Metapopulation Units
Eucalyptus glaucina – Northern and Southern Metapopulation Units	
Eucalyptus mckieana	*Pultenaea stuartiana*
Eucalyptus rubida subsp. *barbigerorum*	* *Quassia* sp. Moonee Creek (syn. *Q.* sp. B)
Eucalyptus tetrapleura	*Rutidosis heterogama* – Inland Metapopulation Unit
Goodenia macbarronii	* *Senna acclinis*
Grevillea parviflora ssp. *parviflora*	*Sophora fraseri*
Grevillea banyabba	*Styphelia perileuca*
* *Grevillea guthrieana* - Booral and Carrai Metapopulations	*Tasmannia glaucifolia* – Southern Metapopulation Unit
* *Grevillea masonii*	*Tasmannia purpurascens*
* *Grevillea obtusiflora*	*Tetratheca glandulosa*
Grevillea quadricauda	*Tetratheca juncea*
Grevillea rhizomatosa	* *Tinospora smilacina*
Grevillea scortechinii subsp. *sarmentosa*	* *Triplarina imbricata*
Goodenia macbarronii	* *Tylophora linearis*
Hakea fraseri	* *Tylophora woollsii*
*Hakea trineura (*syn. *H.* sp. aff. *trineura)*	* *Uromyrtus australis*
* *Hedyotis galioides*	*Zieria involucrata*
* *Hibbertia hexandra* – Northern and Southern Metapopulation Units	* *Zieria lasiocaulis*
Hibbertia marginata	

* designates TSC Schedules 1 species

Table 4: Threatened flora species which require the implementation of Species-specific conditions. These species are either not currently known from SFNSW estate or are only known from non-production areas (eg. flora reserves).

* *Acacia acrionastes*	* *Fontainea oraria*
Acacia flocktoniae	*Gaultheria viridicarpa* subsp. *merinoensis*
* *Acacia macnuttiana*	*Gaultheria viridicarpa* subsp. *viridicarpa*
* *Acacia pubifolia*	* *Geijera paniculata*
Acacia pycnostachya	*Gentiana wissmannii*
* *Acalypha eremorum*	* *Gingidia montana*
* *Acronychia littoralis*	* *Grammitis stenophylla*
* *Aldrovanda vesiculosa*	* *Grevillea beadleana*
Allocasuarina simulans	*Grevillea evansiana*
* *Almaleea cambagei*	* *Grevillea mollis*
Amorphospermum whitei Northern Metapopulation Unit	*Grevillea shiressii*
* *Amyema scandens*	*Haloragis exalata* subsp. *exalata*
* *Angiopteris evecta*	*Haloragis exalata* subsp. *velutina*
**Angophora exul*	*Homoranthus lunatus*
* *Apatophyllum constablei*	*Homoranthus prolixus*
Arthraxon hispidus	* *Hypolepis elegans*
* *Arthropteris palisotii*	* *Isoglossa eranthemoides*
* *Austromyrtus fragrantissima*	* *Knoxia sumatrensis*
Baeckea sp. Pyramids (syn. *Babingtonia granitica*?)	* *Kunzea rupestris*
Baloghia marmorata	*Lasiopetalum longistamineum*

APPENDIX B – UPPER NORTH EAST: SCHEDULE 5

* *Bertya ingramii*	* *Lepidium hyssopifolium*
Bertya sp. A Cobar-Coolabah	* *Lepidium peregrinum*
* *Blumea lacera*	*Macadamia tetraphylla*
* *Boronia granitica*	*Melaleuca groveana*
Bosistoa selwynii	* *Micromelum minutum*
Bosistoa transversa	* *Monotaxis macrophylla*
Bulbophyllum globuliforme	* *Muellerina myrtifolia*
Cadellia pentastylis	*Myriophyllum implicatum*
* *Caesia parviflora* var. *minor*	*Neoastelia spectabilis*
* *Choricarpia subargentea*	* *Ochrosia moorei*
Clematis fawcettii	*Olax angulata*
Corokia whiteana Rhyolite, Metasediments and Coastal Sands Metapopulations	*Owenia cepiodora*
Corynocarpus rupestris subsp. *rupestris*	*Persicaria elatior*
Cryptocarya foetida	*Phaius australis
Darwinia biflora	* *Phaius tankervilliae*
* *Davidsonia pruriens* var. *jerseyana*	*Picris evae*
Davidsonia sp. Mullumbimby Currumbin Creek	*Pimelea venosa*
* *Diospyros mabacea*	* *Plectranthus alloplectus*
* *Diospyros major* var. *ebenus*	*Prostanthera* sp. Bundjalung (syn. *P. palustris*)
* *Diploglottis campbellii*	*Prostanthera staurophylla*
Diuris praecox	* *Pseudanthus ovalifolius*
Diuris venosa	* *Psilotum complanatum*
* *Elaeocarpus williamsianus*	* *Randia moorei*
* *Eleocharis tetraquetra*	* *Rapanea* sp. A Richmond River
* *Endiandra floydii*	*Rutidosis heterogama* – Coastal Metapopulation
Endiandra hayesii	*Sarcochilus fitzgeraldii*
Endiandra muelleri subsp. *bracteata*	*Sarcochilus hartmannii*
Eriostemon ericifolius	*Sarcochilus weinthalii*
* *Eucalyptus approximans*	*Sauropus albiflorus* subsp. *microcladus (syn Phyllanthus microcladus)*
Eucalyptus caleyi subsp. *ovendenii*	*Symplocos baeuerlenii*
Eucalyptus camfieldii	*Syzygium hodgkinsoniae*
* *Eucalyptus camphora* subsp. *relicta*	*Syzygium moorei*
Eucalyptus nicholii	*Syzygium paniculatum*
* *Eucalyptus pachycalyx* subsp. *banyabba*	* *Tarenna cameronii*
Eucalyptus parramattensis subsp. *decadens*	*Tasmannia glaucifolia* – Northern Metapopulation Unit
Eucalyptus pumila	*Thesium australe*
* *Euphrasia arguta*	*Tinospora tinosporoides*
Euphrasia bella	* *Velleia perfoliata*
* *Euphrasia collina* subsp. *muelleri*	* *Wahlenbergia scopulicola*
* *Euphrasia* sp. Tamworth (syn. *E. ruptura)*	* *Zieria floydii*
Floydia praealta	* *Zieria prostrata*
Fontainea australis	

* designates TSC Schedules 1 species

APPENDIX B – UPPER NORTH EAST: SCHEDULE 5

Table 5: Protected fauna requiring Species-specific conditions.

all raptors	*Rhinolophus megaphyllus*
Drysdalia coronoides	*Vespadelus pumilus*
Lampropholis caligula (LNE only)	*Wombat*

Table 6: Protected native plants requiring Species-specific conditions.

Cymbidium canaliculatum	*Eriostemon myoporoides* ssp. *conduplicatus*
Dipodium atropurpureum	*Gastrodia sesamoides*
Dipodium pulchellum	*Oberonia titania*
Doryanthes palmeri	

* designates TSC Schedules 1 species

AMENDMENT 2
28 April 2003
Schedule 6
replaced
Ref Appendix E

SCHEDULE 6: Matters to be addressed in assessment of proposals for new roading through High Conservation Value Old Growth Forest, Rainforest, Rare Non-commercial Forest Types and protection zones.

When applying to construct new roads or snig tracks through High Conservation Value Old Growth Forest, Rainforest, Rare Non-Commercial Forest Types and protection zones, SFNSW must provide NPWS with a report addressing the following:

(a) All options that were considered, the cost of all options, the reasons why the selected route was chosen and why the other routes were not considered feasible;

(b) The specific reasons why the road or snig track must be established;

(c) The mitigative and ameliorative measures to be applied; and

(d) Results of the field assessment which must be undertaken and must include:

i. A description of the proposed road or snig track, including dimensions of area to be affected (road footprint, run-offs etc), method of construction including any cutting and filling that may be involved, and construction of any stream crossings.

ii. An assessment and description of any threatened flora that will or is likely to be directly or indirectly affected by construction, or occurs within 50 metres of the construction area.

iii. An assessment and description of any threatened fauna that

1. will be or is likely to be directly or indirectly affected by construction,

OR

2. occurs within 100 metres of the construction area.

iv. An assessment and description of the likelihood of the road to create a barrier to movement of threatened fauna, or is otherwise likely to increase the threats to threatened fauna.

v. An assessment of any habitat features that will or are likely to be directly or indirectly affected by the construction, including but not confined to: wetlands or other waterbodies; and threatened species habitat.

vi. An assessment and description of the area affected including, but not confined to:

1. the type of High Conservation Value Old Growth Forest or Rainforest or Rare Non-Commercial Forest Types or protection zone (according to RN17);

2. a brief description of the floristics and structure of the High Conservation Value Old Growth Forest or Rainforest or Rare Non-Commercial Forest Types or protection zone;

3. a description of the total area of the High Conservation Value Old Growth Forest or Rainforest or Rare Non-Commercial Forest Types or protection zone to be directly and indirectly affected;

4. the likelihood of the road to fragment the High Conservation Value Old Growth Forest or Rainforest or Rare Non-Commercial Forest Types or protection zone patch; and

5. whether the rainforest is SEPP 26 littoral rainforest.

vii. An assessment of the likelihood of the construction increasing the presence or abundance of weeds or feral animals.

viii. An assessment of past disturbance in the proposed construction area.

SCHEDULE 7: Draft Feral and Introduced Predator Control Plan

Background and Summary

Feral and introduced animal management is a major issue for all Land Managers. Feral animals cause damage to the environment in a variety of ways. Fox predation has been formally listed as a Key Threatening Process under both Commonwealth and State legislation. There are legislative requirements to control noxious animals under State regulations. There is a wide perception in the scientific and general community that feral animals are a major threat to native wildlife.

This plan was developed in consultation with CSIRO (Peter Catling) and an expert in management of fauna at potential risk from control activity (Chris Belcher). Practicality, economics, transparency and accountability were considered in the process of developing a two-stage approach to feral animal management.

The first stage involves monitoring and control of feral animals in the context of harvest operations and the Wildlife Management Code of Practice. It makes use of a cost-effective method (using soil plots to record tracks) to monitor feral animals. When unacceptably high levels of ferals are recorded, control measures will be put in place. The second stage will be the development of a landscape approach to feral management, in conjunction with other agencies and landholders. This is used to great effect in some areas and is the preferable most practical and effective means of managing vertebrate pests.

State-wide Strategic Approach

Methods

Monitoring Predators

Soil plots, as described by Catling and Burt (1996) will be used to detect the presence of feral predators. These are strips of soft soil or sand placed across minor roads. The strips are one metre wide and run from road edge to road edge. Soil plots detect the presence of feral predators (and other animals, notably Critical Weight Range Vertebrates) through the footprints left when animals cross them. Each soil plot is visited in the early morning to achieve best results when the sun is low on the horizon and emphasises the shape of footprints with clear shadows.

At least 20 soil plots will be established in each Landscape Management Unit targeted and these will be checked daily for three days.

Controlling Predators

Bait mounding will be the primary control method used. Earth mounds approximately 40 centimetres in height are constructed and meat baits placed approximately 20 centimetres below the surface of the mounds. Mounds are monitored for take, and those visited by target species (Cats, Foxes and Dogs) are activated with 1080 poison baits.

Where the presence of native carnivores is indicated at the mounds, alternative methods of control will be employed. Soft jawed spring traps are a preferred alternative. In some instances, “Call-up and Shoot” techniques can be utilised effectively.

Landscape Stratification

Each management area will be stratified into Landscapes Management Units (LMU). There is precedent for this in the South-east Region feral management program, and in the management of Owl Habitat under the Wildlife Management Code of Practice. The development of landscape management units is described in Part B Section 3.1.2 of the Survey Design. The location of soil plots for monitoring will be determined by the plan of operations, to target recent harvesting operations, and by the results of wildlife survey and database searches, to target key threatened species locations.

Action Sequence:

Yearly Plan on SFNSW estate

1. Winter-Spring Year 1

    Review Threatened Species Surveys, Data base, and Plan of Operation

    Nominate Landscape Management Units for action

    Place Soil Plots

    Record Predator levels, CWR levels

2. Winter-Spring Year 2

    Place Soil Plots

    Record Predator levels, CWR levels

3. Analyse data for Predator Abundance.

    If no increase or decrease, stop.

    If increased levels of PA, go to 4.

4. Check Threatened Species locations and Private Property interface

    If no Threatened Species, justify stop or go to 5.

    If the Private Property interface is the epicentre of increase abundance, go to section II.

5. If there are threatened species present, check which Predator Species have increased.

    If the predators are dogs, justify actions according to dog/dingo relationship – that is, if the predators are natural populations of wild dingoes, stop. If there are "unnaturally high levels" of dingoes, or the predators are feral dogs.

6. Institute mound baiting. If takes are quolls go to 8.

    If takes are target predators, go to 7.

7. Arm mounds with 1080. Follow monitoring plan in subsequent years for both predators and CWR target species to determine efficacy.

8. If takes are quolls, determine alternative strategy – traps, shooting, stop action to maintain quolls.

Yearly Plan: All tenures.

1. Contact Neighbouring Agencies and Property Owners

2. Determine actions already underway.

3. Set up inter-agency working body according to Regional needs

4. Report results of SFNSW monitoring and control actions.

5. Negotiate, support and monitor control actions outside SFNSW tenure.

By following these decision rules for action, an effective monitor and control program can be put in place. If it is not effective, the reasons (including no action by other agencies and neighbours) for this are transparent.

SCHEDULE 8: Worked example of the large forest owl Landscape Approach

Step 1. Delineate a Planning Area of approximately 10,000 hectares +/- 50% (ie. 5,000 to 15,000).

A Planning Area of 10,000 hectares has been delineated.

Step 2. An exclusion zone encompassing a minimum of 25% of the Planning Area must be implemented using the following rules.

Based on a 10,000 hectare planning area, an exclusion zone of 2,500 hectares must be implemented.

Step 3: Of the retained 25% of the Planning Area:

- 45% (or 11.25% of the Planning Area) must be Powerful Owl habitat,
- 45% (or 11.25% of the Planning Area) must be Masked Owl habitat, and
- 10% (or 2.5% of the Planning Area) must be Barking Owl habitat.

Where there are no Barking Owl records or modelled habitat in the Planning Area, 50% must be Powerful Owl habitat and 50% must be Masked Owl habitat.

Of the retained 2,500 hectares:

1,125 hectares must be Powerful Owl habitat,

1,125 hectares must be Masked Owl habitat, and

250 hectares must be Barking Owl habitat.

Step 4: Exclusion zones for each species must be selected on the basis of the proportion of each modelled habitat class for each species occurring in the Planning Area (this excludes areas not identified as modelled habitat).

Owl species	CRA modelled habitat class	Area of CRA modelled habitat in Planning Area	Proportion of each habitat class to be in exclusion zone	Area of each habitat class to be in exclusion zone
Powerful Owl	**class 1**	**2,000 ha**	**22%** [1]	**247 ha** [2]
	class 2	**4,000 ha**	**44%**	**495 ha**
	class 3	**3,000 ha**	**34%**	**382 ha**
	total	**9,000 ha**		
Masked Owl	**class 1**	**2,000 ha**	**31%**	**349 ha**
	class 2	**3,000 ha**	**46%**	**517 ha**
	class 3	**1,500 ha**	**23%**	**259 ha**
	total	**6,500 ha**		
Barking Owl	**class 1**	**500 ha**	**50%**	**125 ha**
	class 2	**500 ha**	**50%**	**125 ha**
	total	**1,000 ha**		

[1] 2,000 / 9,000 x 100 = 22 [2] 0.22 x 1,125 = 247

Step 5: Of the exclusion zone determined in Step 2 above (2,500 ha), a minimum of 30% must be retained as exclusion areas in areas of SFNSW estate outside statutory reserves. Where existing statutory reserves comprise 25% or more of the planning unit area, then the minimum area of SFNSW estate outside of statutory reserves to be retained in exclusion zones is 10%.

Based on a 10,000 ha planning unit, of the 2,500 ha exclusion zone, 750 ha must be in SFNSW estate outside of statutory reserves; OR

Where existing statutory reserves comprise 25% or more of the planning unit area, then of the 2,500 ha exclusion zone, 250 ha must be in SFNSW estate outside of statutory reserve.

Step 6: Of the area of retained SFNSW estate outside of statutory reserves, a minimum of 30% must be retained in patches greater than 50 ha.

Based on a 10,000 ha planning unit, of the 750 ha of retained SFNSW estate outside of statutory reserves, 225 ha must be in patches greater than 50 ha; OR

Where existing statutory reserves comprise 25% or more of the planning unit area, then of the 250 ha of retained SFNSW estate outside of statutory reserves, 75 ha must be in a patch greater than 50ha.

SCHEDULE 9: Definition of Rufous Scrub-bird microhabitat

The delineation of Rufous Scrub-bird habitat is a two step process:

Step 1: At the pre-planning stage, identify areas of Rufous Scrub-bird modelled habitat classes 1, 2 and 3.

Step 2: In the field, within areas of modelled habitat search for areas of microhabitat, defined as follows:

a) Rufous Scrub-bird micro-habitat is defined as areas of rainforest and wet sclerophyll forest (eg. forest types 47 and 53) within 500 metres of rainforest. These are areas of one hectare or greater which contain extremely dense cover between two and 50 centimetres above the ground, and moderate cover between 50 and 100 centimetres above the ground. The cover may consist of living or non living plant material, or both. These areas generally have a moist ground level microclimate and abundant leaf litter.

b) In areas where there is no rainforest, Rufous Scrub-bird microhabitat is defined as areas within wet sclerophyll forest that are one hectare or greater which contain extremely dense cover between two and 50 centimetres above the ground, and moderate cover between 50 and 100 centimetres above the ground. The cover may consist of living or non living plant material, or both. These areas generally have a moist ground level microclimate and abundant leaf litter.

SCHEDULE 10: Hastings River Mouse Microhabitat model

Microhabitat model (after Smith and Quin 1997). Model 1 additive model. Model 2 substitutional model.

HASTINGS RIVER MOUSE MICROHABITAT PREDICTION

		LOW	**MOD.**	**HIGH**
	SCORE	**0**	**1**	**2**
Grass/sedge/rush cover (GSRC):	SCORE:	<10%	>9%<30%	>30%
Shelter Index (SI):	SCORE:	<17	>16	rock scarp Present
Vegetation Cover 10 to 75 cm (VC):	SCORE:	<2.6 contacts	>2.5 contacts	
Heath Cover (HC)	SCORE:	Absent	present	

Model 1	**TOTAL SCORE:**	**0,1**	**2,3,4**	**5,6**
	HABITAT SUITABILITY:	Unsuitable	moderate	high

Model 2

UNSUITABLE HABITAT:	1. GSRC score = zero, or 2. GSRC score = 1 or 2 and SI score = 0, and VC score <2.6 and HC score = O
HIGH QUALITY HABITAT	1. GSRC score = 2, and SI score = 1 or 2, and VC >2.5
MODERATE HABITAT	all other possible combinations in which GSRC score = 1 or more, and SI or VC or HC score = 1 or more

SCHEDULE 10A: Hastings River Mouse Exclusion Zone for Compartment 23 Gibraltar Range State Forest – Map

DELETED by Amend No. 4?????????

SCHEDULE 10B – HASTINGS RIVER MOUSE EXCLUSION ZONES ETC.

[Condition 6.13B]

The maps set out in this Schedule show the location of HRM exclusion zones and HRM operational zones for the purposes of condition 6.13B (Hastings River Mouse Pseudomys oralis (Special provisions for various compartments)). The maps are for guidance only. The zones are to be identified for the purpose of applying the requirements of condition 6.13B by using a CD-Rom as referred to in that condition.

SCHEDULE 11: transitional provisions

11.1 Current and proposed forestry operations

a) This licence is to apply to the conduct of all forestry operations in the Upper North East Region, as identified in the IFOA, carried out after the commencement date of this licence, except where conditions 11.1(b), 11.1 (c) and/or 11.1 (d) below apply

b) Where forestry operations have commenced before the commencement date, or will commence within one month of that date, schedule 12 will have effect for a period of three months from the commencement date. The conditions set out in schedule 12 of this licence are to be implemented as a condition of this licence for that period. At the expiration of that period all harvesting operations are to comply with conditions 1 to 8 of this licence.

c) Condition 11.1 (b) above does not apply to forestry operations that are carried out in areas identified in this licence as containing High Conservation Value Old Growth Forest, Rainforest and/or Rare Non-Commercial Forest Types as defined in this licence. Harvesting operations carried out in those areas must be conducted in accordance with condition 5 of this licence as it relates to High Conservation Value Old Growth Forest, Rainforest and Rare Non-Commercial Forest Types.

d) Where pre-logging and pre-roading surveys have been carried out before the commencement date, then Schedule 12, condition 5, prescription 32 will have effect for up to 3 months in lieu of Condition 8. Condition 8 will apply at the expiration of that period.

e) SFNSW is to provide NPWS Northern Zone with a list of all compartments date in which forestry operations commenced before the commencement date. This lists must be provided to NPWS Northern Zone within one working week of the commencement date in a hard copy and electronic format.

f) SFNSW is to provide NPWS Northern Zone with a list of all compartments date in which pre-logging and pre-roading surveys commenced before the commencement date. This lists must be provided to NPWS Northern Zone within one working week of the commencement date in a hard copy and electronic format.

11.2 Powerful Owl, Masked Owl and Barking Owl

a) This condition applies to areas of SFNSW estate which have been identified and retained in accordance with Schedule 12, condition 5, prescription 13 (d) Powerful Owl, Masked Owl and Barking Owl of this licence at the commencement date.

b) This condition only applies to retained areas recorded in an approved harvesting plan or owl landscape map.

c) Areas of SFNSW estate retained under Schedule 12, condition 5, prescription 13 (d) of this licence are to be taken to satisfy the habitat retention requirement under condition 6.9 Powerful Owl, Masked Owl and Barking Owl of this licence.

d) When areas of SFNSW estate have not been retained in accordance with Schedule 12, condition 5, Prescription 13 (d) of this licence, then the requirements of condition 6.9 of this licence must apply.

e) Condition 6.9 of this licence must be applied to all harvesting operations by 30 June 2000.

f) In meeting the requirements of condition 6.9, SFNSW must ensure that areas previously retained for Masked Owl, Powerful Owl and Barking Owl under Schedule 12, condition 5, Prescription 13 (d) are used in meeting the requirements of Condition 6.9 of this licence, except where condition 11.2 (g) below is met.

g) Where areas previously retained in meeting the requirements of Schedule 12, condition 5, Prescription 13 (d) are not used in meeting the requirements of Condition 6.9 of this licence, SFNSW must submit a revised Owl landscape approach to NPWS at least two weeks prior to the commencement of harvesting operations in compartments covered by the Owl landscape map. SFNSW must obtain the approval of NPWS prior to the commencement of harvesting operations.

(*Note: In preparing Owl Site-Based or Landscape maps, consideration of the planning area's harvesting history must be considered. Areas to be retained must, to the greatest extent possible, include areas that have:*

i. retained previously as part of a Owl Site-based or Landscape prescription; OR

ii. not been subject to recent harvesting operations.)

11.3 Connection Corridors

a) This condition applies to areas of SFNSW estate which have been retained as Connection Corridors under the provisions of Schedule 12, condition, 5 prescription 4 Connection Corridors of this licence at the commencement date.

b) This condition only applies to retained areas recorded in an approved harvesting plan.

c) Areas of SFNSW estate retained under Schedule 12, condition 5, prescription 4 of this licence are to be taken to satisfy the Ridge and Headwater Habitat retention requirement under conditions 5.8 Ridge and Headwater Habitat of this licence.

d) When areas of SFNSW estate have not been retained in accordance with Schedule 12, condition 5 Prescription 4 of this licence then the requirements of condition 5.8 of this licence must apply.

e) Condition 5.8 of this licence must be applied to all harvesting operations by 30 June 2000.

f) SFNSW must ensure that all areas previously retained as Connection Corridors for the purposes of a previous *National Parks and Wildlife Act* 1974 section 120 licence are to be retained for the purposes of condition 5.8 of this licence where those areas meet the requirements of condition 5.8.

(*Note: In preparing Ridge and Headwater Habitat maps, consideration of the planning area's harvesting history must be considered. Areas to be retained must, to the greatest extent possible, include areas that have:*

iii. retained previously as part of a Connection Corridor prescription; OR

iv. not been subject to recent harvesting operations.)

11.4 Pre-logging and pre-roading surveys for **Mixophyes fleayi, M. balbus, M. iteratus, *Golden-tipped Bat and Large-footed Myotis***

a) Condition 8 as it relates to seasonal surveys for *Mixophyes fleayi, M. balbus, M. iteratus*, Golden-tipped Bat and Large-footed Myotis commences 12 months after the commencement date.

b) Where SFNSW chooses to apply conditions referred to in condition 7 (b) of this licence where it relates to the species referred to in condition 11.4 (a) above, such conditions must be implemented until pre-logging and pre-roading surveys are conducted in accordance with this licence.

c) SFNSW must provide NPWS with a list of those compartments in which this condition is being applied by 30 June 2000. This list must be provided in written and electronic form.

SCHEDULE 12: National Parks And Wildlife Act Section 120 Licence Issued to SFNSW, September 1999.

Condition 1. Consideration of Threatened Species Issues

1.1 Threatened fauna species requiring ameliorative prescriptions

a) The threatened fauna species listed in section c) may occur in the area and are affected by forestry activities. Prescriptions 1 to 28 as they appear in condition 5 below are necessary to ameliorate the effects of forestry activities on these species. These prescriptions relate to the "General", "Species-specific" and "Existing Prescriptions" in the Conservation Protocols.

b) Some species in section c) also require additional ameliorative measures to be developed by NPWS in consultation with SFNSW. These species are indicated with a [1].

c) Species requiring the application of prescriptions 1 to 28 are indicated on the table below:

	Common Name	**Scientific Name**
Frogs:	Pouched Frog	*Assa darlingtonii*
		Crinia tinnula
	*Green and Golden Bell Frog	*Litoria aurea*
	Green-thighed Frog	*Litoria brevipalmata*
		Litoria olongburensis
		Litoria subglandulosa
		Mixophyes fleayi
		Mixophyes balbus
	Giant Barred Frog	*Mixophyes iteratus*
		Philoria kundagungan
	Loveridge's Frog	*Philoria loveridgei*
	Sphagnum Frog	*Philoria sphagnicolus*
	Red-crowned Toadlet [1]	*Pseudophyrne australis*
Reptiles:		*Coeranoscincus reticulatus*
	Stephen's Banded Snake	*Hoplocephalus stephensii*
		Underwoodisaurus sphyrurus
Birds:	Albert's Lyrebird [1]	*Menura alberti*
	Australasian Bittern	*Botaurus poiciloptilus*
	Barking Owl	*Ninox connivens*
	Black Bittern	*Dupetor flavicollis*
	Bush-Hen	*Gallinula olivacea*
	*Bush Thick-knee [1]	*Burhinus magnirostris*
	Collared Kingfisher	*Halcyon chloris*
	Comb-crested Jacana	*Irediparra gallinacea*
	Gilbert's Whistler	*Pachycephala inornata*
	Glossy Black Cockatoo	*Calyptorhynchus lathami*
	Mangrove Honeyeater	*Lichenostomus fasciogularis*
	Masked Owl	*Tyto novaehollandiae*
	Olive Whistler	*Pachycephala olivacea*
	Osprey	*Pandion haliaetus*
	Painted Honeyeater	*Grantiella picta*
	Powerful Owl	*Ninox strenua*
	Rose-crowned Fruit-dove	*Ptilinopus regina*
	Rufous Scrub-bird	*Atrichornis rufescens*
	Sooty Owl	*Tyto tenebricosa*
	Superb Fruit-dove	*Ptilinopus superbus*
	Superb Parrot	*Polytelis swainsonii*
	Swift Parrot	*Lathamus discolor*
	Turquoise Parrot	*Neophema pulchella*
	White-eared Monarch	*Monarcha leucotis*
	Wompoo Fruit-dove	*Ptilinopus magnificus*

	Yellow-eyed Cuckoo-shrike	*Coracina lineata*
Mammals:	Brush-tailed Phascogale	*Phascogale tapoatafa*
	Brush-tailed Rock Wallaby	*Petrogale penicillata*
	Common Planigale	*Planigale maculata*
	Eastern Chestnut Mouse	*Pseudomys gracilicaudatus*
	*Hastings River Mouse	*Pseudomys oralis*
	Koala	*Phascolarctos cinereus*
	Long-nosed Potoroo	*Potorous tridactylus*
	Parma Wallaby	*Macropus parma*
	Red-legged Pademelon	*Thylogale stigmatica*
	Rufous Bettong	*Aepyprymnus rufescens*
	Squirrel Glider	*Petaurus norfolcensis*
	Tiger Quoll	*Dasyurus maculatus*
	Yellow-bellied Glider	*Petaurus australis*
Bats	Beccari's Mastiff-bat	*Mormopterus beccarii*
	Common Bent-wing Bat [1]	*Miniopterus schreibersii*
	Eastern Cave Bat	*Vespadelus troughtoni*
	Eastern Little Mastiff-bat	*Mormopterus norfolkensis*
	Black Flying-fox	*Pteropus alecto*
	Great Pipistrelle	*Falsistrellus tasmaniensis*
	Greater Broad-nosed Bat	*Scoteanax rueppellii*
	Greater Long-eared Bat	*Nyctophilus timoriensis*
	Golden Tipped Bat	*Kerivoula papuensis*
	Hoary Bat	*Chalinolobus nigrogriseus*
	Large-footed Myotis	*Myotis adversus*
	Large Pied Bat	*Chalinolobus dwyeri*
Bats:	Little Bent-wing Bat [1]	*Miniopterus australis*
	Queensland Long-eared Bat	*Nyctophilus bifax*
	Yellow-bellied Sheathtail Bat	*Saccolaimus flaviventris*

* designates TSC Act Schedule 1 species

[1] designates species that also require Site-specific prescriptions

Common and scientific names used are those in the *Threatened Species Conservation Act* 1995, Schedules 1 and 2.

1.2 Threatened fauna species requiring additional ameliorative prescriptions

a) The threatened fauna species listed in section e) may occur in the area and are affected by forestry activities.

b) The species listed in section e) require the development of ameliorative prescriptions by NPWS in consultation with SFNSW. These species are those referred to in the Conservation Protocols as requiring "Site-specific" prescriptions and those species for which Species-specific Prescriptions have not been developed and agreed to as yet.

c) If any of the species listed in section e) are known to occur, or are located prior to or during specified forestry activities within a compartment or within two kilometres of a compartment (except for Red Goshawk, Eastern Quoll and Regent Honeyeater where records within five kilometres of the compartment apply), the NPWS Northern Zone Office must be informed within two working days of the occurrence being noted.

d) Once an agreed prescription is developed, NPWS will issue a licence variation to include the prescription in the relevant Harvesting Plan. This licence variation and subsequent amendments to the Harvesting Plan must be made prior to specified forestry activities commencing in the compartment.

e) Species requiring Site-specific Prescriptions to be developed are shown overleaf:

	Common Name	Scientific Name
Frogs:		* *Litoria castanea*
		Litoria piperata
		* *Litoria spenceri*
	Giant Burrowing Frog	*Heleioporous australiacus*
	Red-crowned Toadlet	*Pseudophyrne australis*
Reptiles:		*Varanus rosenbergi*
	White-crowned Snake [1]	*Cacophis harriettae*
	Pale-headed Snake [1]	*Hoplocephalus bitorquatus*
	* Broad-headed Snake [1]	*Hoplocephalus bungaroides*
Birds:	Albert's Lyrebird	*Menura alberti*
	* Black-breasted Button-quail	*Turnix melanogaster*
	* Black-throated Finch	*Poephila cincta*
	* Bush Thick-knee	*Burhinus grallarius*
	* Double-eyed Fig Parrot	*Psittaculirostris diophthalma coxeni*
	Eastern Bristle-bird	*Dasyornis brachypterus*
Birds:	Marbled Frogmouth	*Podargus ocellatus*
	* Red Goshawk	*Erythrotriorchis radiatus*
	Red-tailed Black-Cockatoo [1]	*Calyptorhynchus banksii*
	* Regent Honeyeater	*Xanthomyza phrygia*
	Square-tailed Kite [1]	*Lophoictinia isura*
Mammals:	* Black-striped Wallaby	*Macropus dorsalis*
	Broad-toothed Rat	*Mastacomys fuscus*
	* Eastern Quoll	*Dasyurus viverrinus*
	Little Bent-wing Bat	*Miniopterus australis*
	Common Bent-wing Bat	*Miniopterus schreibersii*
	Queensland Blossom Bat [1]	*Syconycteris australis*
	Queensland / Eastern Tube-nosed Bat [1]	*Nyctimene robinsoni*

* designates TSC Act Schedule 1 species

[1] Designates species for which no prescription has been developed to date and which will require an agreed prescription to be developed by NPWS and SFNSW.

Common and scientific names used are those in the *Threatened Species Conservation Act* 1995, Schedules 1 and 2.

1.3 Threatened flora species requiring prescriptions

a) The threatened flora species listed in section b) may occur in the area and are affected by forestry activities. Prescriptions 29 to 31 as they appear in condition 5 below are necessary to ameliorate the effects of forestry activities on these species.

b) Threatened flora species requiring prescriptions are shown below:

Scientific Name	Scientific Name
Acacia bynoeana	*Macrozamia johnsonii*
Acacia courtii	*Marsdenia longiloba*
Acacia georgensis	*Melaleuca groveana*
Acacia ruppii	*Melichrus hirsutus*
Amorphospermum whitei	*Ochrosia moorei*
Angophora robur	*Olearia flocktoniae*
Arthraxon hispidus	*Parsonsia dorrigoensis*
Boronia umbellata	*Phyllota humifusa*
Bothriochloa biloba	*Plectranthus nitidus*
Caesia parviflora var *minor*	*Pomaderris brunnea*
Corchorus cunninghamii	*Pomaderris parrisiae*
Corokia whiteana	*Prostanthera cryptandroides*
Correa baeuerlenii	*Prostanthera* species 6
Corybas undulatus	*Pterostylis* species D

Continued:

Cryptostylis hunteriana
Cynanchum elegans
Diuris tricolor
Diuris venosa
Elaeocarpus species A
Endiandra hayesii
Eucalyptus glaucina
Eucalyptus kartzoffiana
Eucalyptus nicholli
Eucalyptus parramattensis subsp. *decadens*
Eucalyptus parvula
Eucalyptus tetrapleura
Floydia praealta
Grevillea beadleana
Grevillea masonii
Hakea trineura
Hibbertia hexandra
Hibbertia marginata
Hicksbeachia pinnatifolia
Leptospermum sejunctum
Lindsaea incisa
Macadamia tetraphylla
Pultenaea campbellii
Quassia species B
Randia moorei
Restio longipes
Sarcochilus fitzgeraldii
Sarcochilus hartmanii
Sarcochilus weinthallii
Senna acclinis
Sophora fraseri
Styphelia perileuca
Symplocos baeuerlenii
Syzygium hodgkinsoniae
Syzygium moorei
Tasmannia purpurascens
Tetratheca glandulosa
Tetratheca juncea
Thesium australe
Triplariana nowraensis (syn. *Baeckea camphorata*)
Tylophora woollsii
Uromyrtus australis
Zieria floydii

Condition 2. Harvest Planning

a) Harvesting Plans must include the following:

i. A list of threatened species occurring within the compartment and within five kilometres of the compartment boundary that were recorded during pre-logging and pre-roading surveys, listed in NPWS Atlas data and listed in SFNSW records;

ii. Definitions as they appear in condition 4 of this licence variation;

iii. Prescriptions 1 to 12 as they appear in condition 5 below;

iv. Those Species-specific Prescriptions 13 to 31 as they appear in condition 5 below that are relevant to the compartment. (Species-specific Prescriptions that are not relevant to the compartment must not be included in the Harvesting Plan);

v. Where relevant, those prescriptions for species listed in condition 1.2 approved in writing by NPWS Northern Zone office.;

vi. Those prescriptions and Harvesting Plan Operation Map amendments triggered by the results of the Pre-logging and pre-roading Surveys in Prescription 32.

vii. The Harvesting Plan Map must present, as clearly as possible at the standard scale used, all threatened species records (database search records, SFNSW records and new survey records) and threatened fauna features requiring prescriptions. The Map must also indicate the management actions for each, eg. buffer zones must be indicated.

b) All the requirements in condition 2 a) above must be included in the Harvesting Plan prior to specified forestry activities commencing in the compartment.

Condition 3. Reporting and Information Requirements

SFNSW must provide the NPWS Northern Zone Office with:

a) Harvesting Plans, approved by the relevant SFNSW Regional Manager, as requested by NPWS Northern Zone office within ten days of request.

b) A list of compartments in which SFNSW has been operating in the previous month and is proposed to be operating in the next month must be provided on the first day of each month or the next working

day. This list must detail the following: SFNSW region; state forest name; compartment number; date operations commenced (day/ month/ year); date operations finished (day/ month/ year); date operations proposed to commence; whether operations are current. This list must be provided by SFNSW Head Office in both digital and hard copy format. Where available, maps showing the 80% of third order streams within each SFNSW Management Area which have been designated a 40 metres buffer as per the requirements of Prescription 3 part a).

c) Where available, maps showing the location of connection corridors within each SFNSW Management Area as per Prescription 4.

d) Maps showing retained Barking Owl, Powerful Owl, Masked Owl, Brush-tailed Phascogale, Squirrel Glider and Rufous Scrub-bird habitat, where relevant, must be provided at least ten days prior to the commencement of specified forestry activities in the compartment.

e) Threatened species pre-logging and pre-roading survey reports must be provided to NPWS Northern prior to the day of commencement of specified forestry operations in the compartment.

f) Wildlife records suitable for NPWS Atlas purposes for all threatened species recorded on SFNSW estate, whether in a standard survey, incidentally, or subsequent to the Pre-logging and pre-roading Survey Report must be forwarded by agreed electronic means to NPWS Head Office GIS Unit.

Condition 4. Definitions

Specified forestry activities: Timber harvesting (including all forms of silviculture), construction and operation of log dumps, collection of firewood, cutting of posts, gravel extraction, harvesting of tea tree oil, road construction (including tracks, fire trails and snig tracks), prescribed burning that is not undertaken in accordance with the provisions of the *Rural Fires Act* 1997, and grazing that is not undertaken in accordance with the provisions of the *Rural Fires Act* 1997 (to the extent controlled by SFNSW).

Critical Weight Range Vertebrates (CWRV): In this licence variation, CWRV refers to the following threatened species: Albert's Lyrebird, Bush Hen, Bush Thick-knee, Rufous Scrub-bird, Eastern Bristlebird, Black-striped Wallaby, Brush-tailed Phascogale, Common Planigale, Tiger Quoll, Rufous Bettong, Long-nosed Potoroo, Long-footed Potoroo, Parma Wallaby, Red-legged Pademelon, Brush-tailed Rock Wallaby and Hastings River Mouse.

Net logging area: The gross area less Preferred Management Priority exclusion zones, riparian buffers and connection corridors, rainforest protocol exclusions, old growth forest protocol exclusions and rare non-commercial forest type exclusions.

Prescribed burning: Any burning in SFNSW estate deliberately undertaken according to prescribed procedures pursuant to the *Rural Fires Act* 1979.

SEPP 14: State Environment Planning Policy No. 14 - Wetlands

Streams: Streams as shown on the relevant topographic map as published by the Central Mapping Authority at a scale of 1:25 000. A first order stream is defined as that part of a stream between its point of origin and the first junction with another stream, whereupon it becomes a second or higher order stream. A third order stream commences at the junction of two second order streams.

Conservation Protocols: The document titled “Conservation Protocols for timber harvesting on SFNSW estates for the duration of the IFA decision” (NPWS & SFNSW 29 November 1996).

BOGMP: The Broad Old Growth Mapping Project (NPWS & SFNSW 1996)

Condition 5. Prescriptions

The carrying out of specified forestry activities must comply with the prescriptions agreed to between the NPWS and SFNSW, as outlined in the prescriptions below. SFNSW must incorporate the relevant prescriptions into the Harvesting Plans for areas covered by this licence and must ensure that these prescriptions are implemented.

Prescription 1. Tree Retention

The following prescription must be applied for those compartments that lie within the non-regrowth zone as shown on Map 1 attached to this licence variation.

a) Non-regrowth Zone Hollow-bearing Tree Retention

i. A minimum of ten hollow-bearing trees must be retained per two hectares. Where this density is not available, ten trees must be selected from trees with diameters within the largest 30% of the stand.

ii. Retained, hollow-bearing trees must be selected from trees with diameters within the largest 30% of the stand and be live trees with good crown development.

iii. Retained hollow-bearing trees should represent the range of species that occurs in the area.

iv. Trees retained outside the net logging area (see condition 10 Definitions of this letter) must not be counted as hollow-bearing trees.

v. Hollow-bearing trees must be scattered throughout the net logging area.

vi. Hollow-bearing trees must be marked for retention.

b) Non-regrowth Zone Recruitment Tree Retention

i. A minimum of ten recruitment trees must be retained per two hectares.

ii. Retained recruitment trees must show potential for developing into hollow-bearing trees with good crown development. Trees in the mature and intermediate growth stages should be retained as recruitment trees.

iii. Retained recruitment trees should represent the range of species that occurs in the area.

iv. Trees retained outside the net logging area must not be counted as recruitment trees.

v. Recruitment trees must be scattered throughout the net logging area.

vi. Recruitment trees must be marked for retention.

The following prescription must be applied for those compartments that lie within the regrowth zone as shown on Map 1 attached to this licence variation.

c) Regrowth Zone Hollow-bearing Tree Retention

i. A minimum of ten-hollow bearing trees must be retained per two hectares. Where this density is not available then those hollow-bearing trees present must be retained.

ii. Retained, hollow-bearing trees must be selected from the trees with diameters within the largest 30% of the stand and be live trees with good crown development.

iii. Retained hollow-bearing trees should represent the range of species that occurs in the area.

iv. Trees retained outside the net logging area must not be counted as hollowing-bearing trees.

v. Hollow-bearing trees must be scattered throughout the net logging area.

vi. Hollow-bearing trees must be marked for retention.

d) Regrowth Zone Recruitment Tree Retention

vii. For each hollow-bearing tree retained as part of the Regrowth Zone Hollow-bearing Tree Retention prescription above, a recruitment tree must be retained.

viii. Retained recruitment trees must show potential for developing into hollow-bearing trees with crown development. Trees in the mature and intermediate growth stages should be retained as recruitment trees.

ix. Retained recruitment trees should represent the range of species that occurs in the area.

x. Trees retained outside the net logging area must not be counted as recruitment trees.

xi. Recruitment trees must be scattered throughout the net logging area.

xii. Recruitment trees must be marked for retention.

The following prescriptions must be applied in both the regrowth and non-regrowth zones:

e) Protection of hollow bearing trees, recruitment trees and dead stags

i. Specified forestry activities and post-logging burning must aim to minimise damage to hollow-bearing trees, recruitment trees and dead stags. The potential for damage should be minimised by techniques of directional felling. Felled heads must be flattened or removed from five metres of stems retained to meet this prescription.

f) Dead stag retention

ii. Dead stags must be retained in areas outside the net harvesting area, within visual protection strips, and elsewhere where it is safe to do so.

iii. Dead stags must not be counted as hollow-bearing trees or recruitment trees.

Prescription 2. Significant Food Resources

a) Stands where *Allocasuarina* spp. dominate the canopy should be protected from specified forestry activities. Where more than 30 crushed cones have been found beneath individuals of *Allocasuarina* spp., indicating intensive use by the Glossy Black Cockatoo, the tree must be retained.

b) At least four mature (>40 centimetres dbh) winter-flowering eucalypt species per two hectares must be retained where they occur. Where retained hollow-bearing or recruitment trees meet these requirements, the hollow-bearing and recruitment trees can be counted as food trees.

c) Damage to mature banksias and *Xanthorrhoea* spp. should be avoided during forestry operations.

d) All trees with "V-notch" incisions or other incisions made by Yellow-bellied Gliders must be retained. Where retained hollow-bearing or recruitment trees meet these requirements, the hollow-bearing and recruitment trees can be counted as food trees.

e) Where harvesting operations will impact upon retained trees referred to in parts a), b) and d) they must be marked for retention.

f) Specified forestry activities and post-logging burning must aim to minimise damage to retained trees referred to in Prescription 2 a) to e) above. The potential for damage should be minimised by techniques of directional felling. Felled heads must be flattened or removed from five metres of stems retained to meet this prescription.

Prescription 3. Riparian Buffers

a) Riparian buffers must be at least ten metres wide on each side of all first order streams, and at least 20 metres wide on each side of all second order streams. For at least 80% of third and higher order streams in a Management Area, riparian buffers must be at least 40 metres wide on each side of the stream. The remaining 20% must have a buffer of 20 metres or greater on each side of the stream.

b) These buffers must be mapped on the Harvesting Plan Operational Map and clearly recorded in Harvesting Plans. The buffer widths must be clearly indicated on the Harvesting Plan Operational Map.

c) Specified forestry activities, with the exception of road construction and road maintenance where there is no other practical means of access, must be excluded from riparian buffers. Road construction and road maintenance through riparian buffers should avoid sites where threatened species have been recorded.

d) All practical precautions should be taken to avoid felling trees into riparian buffer zones.

Prescription 4. Connection corridors

a) Each 500 hectares of SFNSW estate must include a minimum of two connection corridors at least 40 metres wide connecting second order streams, or one connection corridor at least 80 metres wide

connecting third order streams, or a combination of the two. The option is to be chosen by SFNSW. These connection corridors should not be cut by roads if possible

b) Connection corridors must establish links between different drainage systems. Connection corridors should connect the relevant second or third order stream via the associated lower order stream, however, areas of identified Old Growth Forest, Rare Forest types and Rainforest may be used as the basis of the connection corridor.

c) Specified forestry activities must be excluded from connection corridors, with the exception of road construction and road maintenance where there is no other practical means of access.

d) All practical precautions should be taken to avoid felling trees into these corridors.

e) Connection corridors, and their widths, relevant to the compartment (ie. for the 500 hectares relating to the compartment being planned) must be mapped and clearly recorded in the Harvesting Plan Operational Map. Connection corridors should also be mapped on the 1:25,000 topographic map sheets and archived by SFNSW.

Prescription 5. Wetlands

a) Wetlands are defined as areas that form a shallow waterbody when inundated cyclically, intermittently or permanently with fresh, brackish or salt water, and where the inundation determines the type and productivity of the soils and the plant and animal communities.

b) A buffer zone at least ten metres wide must be established around all wetlands and swamps more than 0.1 hectares and less than 0.5 hectares surface area.

c) A buffer zone at least 40 metres wide must be established around all wetlands and swamps greater that 0.5 hectares surface area and all SEPP 14 wetlands.

d) The buffer zone must be measured from the outer edge of the vegetation communities dominated by wetland species.

e) Specified forestry activities must be excluded from wetlands and wetland buffer zones. All precautions should be taken to avoid felling trees into wetland buffer zone.

f) Wetlands and wetland buffer zones must be mapped and clearly recorded in Harvesting Plans. Where the scale of the Harvesting Plan Operational Map precludes accurate mapping of the boundary of wetlands, the location of the wetland must be clearly indicated on the Harvesting Plan Operational Map.

Prescription 6. Heath

a) Heath is defined as areas dominated by woody shrubs generally less than 2m tall at maturity, with xeromorphic leaves.

b) A buffer zone at least 20 metres wide must be established around all heath more than 0.2 hectares and less than 0.5 hectares surface area.

c) A buffer zone at least 40 metres wide must be established around all heath greater than 0.5 hectares surface area.

d) Specified forestry activities must be excluded from heath and heath buffer zones. All precautions should be taken to avoid felling trees into heath buffer zones.

e) Heath and heath buffer zones must be mapped and clearly recorded in Harvesting Plans. Where the scale of the Harvesting Plan Operational Map precludes accurate mapping of the boundary of heath, the location of the heath must be clearly indicated on the Harvesting Plan Operational Map.

Prescription 7. Rocky Outcrops

a) Rocky outcrops are defined as areas characterised by a high proportion of exposed rock or boulders relative to the surrounding area, OR, areas with skeletal soils, supporting heath or shrub communities (sometimes with occasional emergent trees). These sites can occur where the geology varies from the surrounding area (eg. rhyolite outcrops).

b) A buffer zone at least 20 metres wide must be established around all rocky outcrops more than 0.1 hectares and less than 0.5 hectares surface area.

c) A buffer zone at least 40 metres wide must be established around all rocky outcrops greater than 0.5 hectares surface area.

d) Specified forestry activities must be excluded from within rocky outcrops and rocky outcrop buffer zones. All precautions should be taken to avoid felling trees into rocky outcrop buffer zones.

e) Rocky outcrops and their buffer zones must be mapped and clearly recorded in Harvesting Plans. Where the scale of the Harvesting Plan Operational Map precludes accurate mapping of the boundary of rocky outcrops, the location of the rocky outcrop must be clearly indicated on the Harvesting Plan Operational Map.

Prescription 8. Caves, tunnels and disused mineshafts

a) All caves, tunnels and disused mineshafts (with the exclusion of open pits of less than three metres in depth) must be protected by a buffer zone at least 50 metres wide. Where the NPWS is satisfied that adequate surveys for threatened cave-dependent bats have been undertaken and no Schedule 1 or 2 cave-dependant bats or evidence of Schedule 1 or 2 cave-dependant bats have been recorded, these buffer zones may be reduced to ten metres radius. Specified forestry activities must be excluded from these buffer zones.

b) All known threatened microchiropteran bat maternity and hibernation sites must be protected by a 50 metres radius buffer zone. Specified forestry activities must not be conducted within this buffer zone. Within 50 to 100 metres of the site a maximum of 50% canopy reduction can occur.

c) Caves, tunnels and disused mineshafts and their buffer zones must be mapped and clearly recorded in Harvesting Plans. Where the scale of the Harvesting Plan Operational Map precludes accurate mapping of these features, the location of the feature must be clearly indicated on the Harvesting Plan Operational Map.

Prescription 9. Burning

When fulfilling their responsibilities under the *Rural Fires Act* 1997, SFNSW should take account of the following principles.

a) Prescribed burning regimes should take account of wildfire history and reflect the ecological requirements of any threatened species, or their habitat, known or likely to occur in the area. Burning should be varied by season, intensity and interval.

b) Prescribed burning should be conducted in a manner which promotes and maintains an understorey mosaic which includes significant areas of dense understorey vegetation, particularly within the habitat of CWRV vertebrates.

c) In areas where intervals between fires are less than five years, prescribed burning should be conducted in a manner that minimises the impact on understorey vegetation and large fallen logs (>40 centimetres dbh and five metres in length).

Prescription 10. Pre-logging site inspections

a) Persons conducting pre-logging and pre-roading site inspections must search for and record the following threatened species habitat features:

   i. nest, den and roost sites (especially raptor and owl nests and roosts, and nests and dens of threatened hollow-dependent species);

   ii. owl pellets, distinctive scats (eg. Tiger Quoll, Koala and Brush-tailed Rock Wallaby scats), a sample of predator scats and distinctive tracks (such as Tiger Quoll);

   iii. latrine and den sites of the Tiger Quoll;

   iv. crushed cones beneath *Allocasuarina* spp.;

   v. Yellow-bellied Glider “v-notch” trees and trees with other incisions made by Yellow-bellied Gliders;

   vi. skeletal remains;

vii. caves, tunnels and disused mineshafts;

viii. diggings made by potoroos and bandicoots.

b) Records of these features must be provided to the relevant NPWS Zone Office within ten working days of the completion of the survey reports.

Prescription 11. Ground Habitat Protection

a) SFNSW should take reasonable measures to protect ground habitat (understorey, ground cover, large logs on the forest floor) from specified forestry activities.

Prescription 12. Other conditions

a) Rural Fires Act

Notwithstanding any of the above conditions, SFNSW may carry out activities necessary for its compliance with the provisions of the *Rural Fires Act* 1997.

b) Notification

Where any of the conditions of this licence requires a matter to be notified to the NPWS, approved by the NPWS, or some other action by the NPWS, then NPWS means the Manager of the NPWS Northern Zone or his delegate.

c) Cumulative effect

In the event that the cumulative effect of the Prescriptions of this licence variation leads to more than a 20% reduction in the net logging area in, or significantly compromises the silvicultural objective for a compartment, SFNSW may seek a review of the Prescriptions. The NPWS must consult with the relevant Harvesting Advisory Board, as necessary, prior to completion of any such review.

Prescription 13. Powerful Owl, Masked Owl and Barking Owl

Where there is a record of a Powerful Owl, Masked Owl and / or Barking Owl (observation, call detection site, roost site or nest site) in the compartment or within two kilometres of the compartment boundary the following must apply:

a) Pre-logging surveys for roost and nest sites along gully lines and heads of gullies must be conducted in the net logging area and 50 metres beyond the boundary of the net logging area.

b) Specified forestry activities must be excluded from within a 50 metres radius of a Powerful Owl, Masked Owl, Barking Owl or nest site, and from within 30 metres of a permanent roost site (ie. a roost that shows evidence of more than one visit/use) unless authorised in writing by NPWS Northern Zone office.

c) The location of nest or roost sites and corresponding buffers must be indicated on Harvesting Plan Operational Maps.

d) Potential habitat must be retained as follows:

i. 300 hectares of potential habitat must be retained within a two kilometres radius of a record (ie. an observation, call detection site, roost or nest site location). In applying this prescription SFNSW must use the attached guideline (Attachment A), OR

ii. as an alternative approach to the application of the record based prescription described in Prescription 13 i), SFNSW may apply a landscape approach as described in the attached guideline (Attachment B).

e) Areas of potential habitat retained to meet this prescription must be identified and mapped on the Harvesting Plan Operational Map as excluded from specified forestry activities.

f) Specified forestry activities must be excluded from potential habitat retained under Prescription 13 d) above.

g) Where information indicates that an abundance of more than one Greater Glider per hectare exists within two kilometres of a Powerful Owl record, eight habitat trees per hectare should be retained within the net logging area.

Prescription 14. Sooty Owl

Where a record of a Sooty Owl exists in the compartment or within two kilometres of the compartment boundary, the following must apply:

a) Pre-logging surveys for roost and nest sites along gully lines and heads of gullies must be conducted within the net logging are or areas beyond 50 metres of the boundary of the net logging area.

b) Specified forestry activities must be excluded from within a 50 metres radius of a Sooty Owl nest site, and from within a 30 metres radius of a permanent roost site (ie. a roost that shows evidence of more than one visit/use) unless authorised in writing by NPWS Northern Zone.

c) The location of nest or roost sites and corresponding buffers must be indicated on Harvesting Plan Operational Maps.

Prescription 15. Squirrel Glider

Where there is a record of a Squirrel Glider in the compartment or within 400 metres of the compartment boundary the following must apply:

a) Specified forestry activities must be excluded from an eight hectare area centred on Squirrel Glider records. This eight hectare area should cover gully, midslope and ridgetop areas where possible.

b) Areas of habitat retained to meet this prescription must be identified and mapped on the Harvesting Plan Operational Map as excluded from specified forestry activities.

c) When ten of these areas, separated by two kilometres or more, are retained over a two year period in any one SFNSW Management Area, SFNSW may apply to the NPWS for a review of this prescription.

Prescription 16. Yellow-bellied Glider

Where there is a record of a Yellow-bellied Glider in the compartment or within 100 metres of the compartment boundary, the following must apply:

a) Persons conducting pre-logging and pre-roading surveys and site inspections must search for Yellow-bellied Glider sap feed trees (ie. “v-notch” trees and trees with other incisions made by Yellow-bellied Glider).

b) All Yellow-bellied Glider sap feed trees must be retained. Within a 100 metres radius of retained sap feed trees and records of Yellow-bellied Glider, 15 additional feed trees must be retained. The additional retained feed trees should be of the same species as the identified sap feed trees, or trees that shed their bark in long strips, eg. species from the Blue, Flooded, Grey, Red and White Gum groups. The retained feed trees must be >30 centimetres dbh where available. Where retained hollow-bearing or recruitment trees meet these requirements, the hollow-bearing or recruitment trees can be counted as feed trees.

c) A 50 metres radius buffer must be established around all Yellow-bellied Glider den sites. Specified forestry activities must be excluded from this buffer.

d) The location of all known records and den sites (including those located during harvesting operations) must be indicated on the Harvesting Plan Operational Map.

Prescription 17. Critical Weight Range Vertebrates (CWRV)

Where there is a record of a CWRV, as defined in condition 4, in the compartment or within two kilometres of the compartment boundary (or for Tiger Quoll within five kilometres) the following must apply:

a) A 20 metres buffer must be established around all areas of rainforest Category A and Category B (as defined in Prescription 33) within the compartment. Machinery must not enter this buffer. Trees may

be felled out of and into the buffer. Trees must not be felled out of or into the rainforest. (This prescription does not diminish the conditions applied under Prescription 33.)

b) Commercial and private firewood licences should specify that fallen hollow logs over 40 centimetres diameter should not be removed.

c) Feral predator surveys should be conducted after harvesting operations using day time and / or nocturnal survey techniques. Species-specific control measures should be undertaken to remove feral predators as required and reasonable, using the results of the surveys to justify the action taken.

d) Results of feral predator surveys must be provided to the NPWS Northern Zone office.

e) The area covered by fuel reduction burns should not exceed 75% of the net logging area in any one compartment.

f) Grazing regimes should aim to minimise adverse impacts on CWRV species.

g) In addition to the above, the following species-specific conditions must be applied:

Bush Thick-knee

a) A 20 metres radius buffer must be established around all Bush Thick-knee nest sites. Specified forestry activities must be excluded from this buffer. The location of nest sites and buffers must be indicated on the Harvesting Plan Operational Map.

Albert's Lyrebird

a) A ten metres radius buffer must be established around all Albert's Lyrebird nest sites. Specified forestry activities must be excluded from this buffer. The location of nest sites and buffers must be indicated on the Harvesting Plan Operational Map.

Tiger Quoll

a) Where there is a record (observation, latrine, den site, hair analysis) of Tiger Quoll in the compartment or within five kilometres of the compartment boundary the exclusion zones listed below must be established. Placement of these exclusion zones should take into account the location of Tiger Quoll records.

   i. maternal den sites exclusion zone: 12 hectare exclusion with link to riparian buffers.

   ii. permanent den sites exclusion zone: 3.5 hectare exclusion with link to riparian buffers.

   iii. latrine sites exclusion zone: 12 hectare exclusion.

b) The location of these exclusion zones must be mapped on the Harvesting Plan Operational Map.

c) Specified forestry activities must not be conducted within exclusion zones established under a) above.

Long-nosed Potoroo

a) Where there is a record of Long-nosed Potoroo in the compartment or within two kilometres of the compartment boundary, harvesting and burning must be excluded from a five metres buffer around six trees per hectare. These six trees can include trees retained under Prescriptions 1 or 2.

Brush-tailed Phascogale

Where there is a record of a Brush-tailed Phascogale in the compartment or within three kilometres of the compartment boundary the following prescription must apply:

a) 50 hectares of potential habitat must be retained within a three kilometres radius of a Brush-tailed Phascogale record. Potential habitat must be retained as described in the attached guidelines (Attachment C).

b) Retained potential habitat must be on mid-slope or ridge-top areas. Retained potential habitat can include areas of identified old growth forest where this occurs on mid-slope or ridge-top areas.

c) Areas of potential habitat retained to meet this prescription must be identified and mapped in the harvesting plan as excluded from specified forestry activities.

d) When ten of these areas, separated by three kilometres or more, are retained over a two year period in any one SFNSW Management Area, SFNSW may apply to the NPWS for a review of this prescription.

Prescription 18. Threatened Frogs

The following general frog protection measures must be applied throughout the net logging area within two kilometres of a record of a threatened frog.

a) A ten metres buffer must be established around all ponds and dams (as separate from streams and wetlands detailed in other prescriptions). All practical precautions should be taken to avoid felling trees into this buffer. Machinery must not enter this buffer.

b) Grazing and associated burning should be excluded from swamps and ephemeral wetlands.

c) Any burning should be conducted in a manner which precludes its encroachment into any buffer zones established under this condition; or in a manner consistent with continued wetland management.

d) Where more than ten male threatened frogs per hectare are detected, stream crossings should be bridged if possible. This principle is to be applied within 500 metres of the perimeter of the concentration of frogs.

e) In addition to the above the following species-specific prescriptions must be applied where specified.

Pseudophyrne australis

a) Where there is a record of this species in the compartment or within two kilometres of the compartment boundary the NPWS must be notified to develop a Site-specific prescription.

b) Sandstone habitat should be protected from exploitation by bush-rock collectors.

Mixophyes fleayi

a) Where there is a record of this species in the compartment or within 200 metres of the compartment boundary a 40 metres wide buffer must be established on both sides of the stream extending 200 metres upstream and 200 metres downstream of the record.

b) Specified forestry activities must be excluded from this buffer. The buffer must be mapped on the Harvesting Plan Operational Map.

Mixophyes iteratus* and *Mixophyes balbus

a) Where there is a record of this species in a compartment on a first or second order stream, a 30 metres wide buffer must be established on both sides of the stream that extends 200 metres upstream and 200 metres downstream of the record.

b) Where there is a record of this species in a compartment on a third or greater order stream, a 40 metres wide buffer must be established on both sides of the stream that extends 200 metres upstream and 200 metres downstream of the record.

c) Specified forestry activities must be excluded from this buffer. The buffer must be mapped on the Harvesting Plan Operational Map.

Philoria spp.

a) Where there is a record of *Philoria* spp. within the compartment in a riparian buffer zone (established under Prescription 3) along a first or second order stream, this stream should be used to locate the connection corridors established under Prescription 4. The Harvesting Plan must note where this occurs.

b) Where additional records of these species occur on other streams or the record is outside of a riparian buffer zone, or both, a 50 metres radius buffer must be established around the record. Specified forestry activities must be excluded from this buffer. The buffer must be mapped on the Harvesting Plan Operational Map.

Litoria aurea

a) Where there is a record of this species in the compartment or within 500 metres of the compartment boundary, a five hectare buffer must be established around any waterbody where this species has been recorded. Specified forestry activities must be excluded from this buffer. This buffer must be mapped on the Harvesting Plan Operational Map.

b) This prescription applies pending finalisation of the *Litoria aurea* species recovery plan.

Litoria brevipalmata

a) Where there is a record of this species in the compartment or within 500 metres of the compartment boundary, a five hectare buffer must be established around the record of this species. Specified forestry activities must be excluded from this buffer. This buffer must be mapped on the Harvesting Plan Operational Map.

b) When ten records of either *Litoria aurea* or *Litoria brevipalmata* are accumulated in a SFNSW Management Area, SFNSW may apply to the NPWS for a review of the prescription for the relevant species for that Management Area. As a guide, records that are greater than two kilometres apart and accumulated over a two year period would be considered sufficient to initiate a review.

Prescription 19. Threatened Bats

Where there is a record of a threatened bat in the compartment or within five kilometres of the compartment boundary the following must apply:

a) If threatened fruit-bats are detected during pre-harvest inspections, the full extent of the roosting camp must be identified on the Harvesting Plan Operational Map.

b) Likely multiple microchiropteran bat roost trees should be inspected prior to operations commencing within 100 metres of such trees. Likely roost trees are dead stags greater than 100 centimetres dbh; or large trees with accessible base hollows.

c) Post-logging burning should plan for no more than 75% coverage of the harvesting area in areas where threatened bats have been detected.

d) In addition to the above the following species-specific prescriptions must be applied where specified:

***Pteropus alecto* Black Flying-fox**

Where roosting camps containing Black Flying-fox occur the following must apply:

a) A 50 metres radius buffer must be established around roosting camps containing the Black Flying-fox. Specified forestry activities must be excluded from this buffer.

b) The locations of Black Flying-fox camps and their buffers must be clearly mapped on the Harvesting Plan Operational Map and recorded in the Harvesting Plan.

Saccolaimus flaviventris, Mormopterus beccarii, Mormopterus norfolkensis, Scoteanax rueppellii, Chalinolobus nigrogriseus, Falsistrellus tasmaniensis

a) A 50 metres radius buffer must be established around roost sites harbouring more than three individuals of these species. Specified forestry activities must be excluded from these buffers.

b) These buffers must be mapped on the Harvesting Plan Operational Map.

Nyctophilus bifax* and *Nyctophilus timoriensis

a) A 50 metres radius buffer must be established around roost sites harbouring an individual of these species. Specified forestry activities must be excluded from these buffers.

b) These buffers must be mapped on the Harvesting Plan Operational Map.

Chalinolobus dwyeri* and *Vespadelus troughtoni

a) A 50 metres wide buffer must be established around entries to known major subterranean roosting sites of these species. Specified forestry activities must be excluded from these buffers.

b) These buffers must be mapped on the Harvesting Plan Operational Map.

***Kerivoula papuensis* Gold-tipped Bat**

Where this species has been recorded within a compartment or within 200 metres of a compartment boundary, the following must apply:

a) A 40 metres wide buffer must be established on both sides of streams for 200 metres upstream and 200 metres downstream of the stream closest to the record of the species. Specified forestry activities must be excluded from these buffers.

b) These buffers must be mapped on the Harvesting Plan Operational Map.

Myotis adversus

Where this species has been recorded within a compartment, the following must apply:

a) A 40 metres wide buffer must be established on both sides of all permanent streams, and all other natural water bodies used by this species, within that compartment.

b) These buffers must be mapped on the Harvesting Plan Operational Map.

Miniopterus australis, Miniopterus schreibersii, Chalinolobus dwyeri, Vespadelus troughtoni

Where there is a record of one of these species in the compartment or within five kilometres of the compartment boundary, the following must apply:

a) SFNSW and the NPWS must develop a management strategy for forests around known maternity and hibernation sites of these species.

b) Where ten roost exclusion sites for a particular threatened bat species, separated by two kilometres or more are accumulated within a two year period, SFNSW can apply to the NPWS for review of this prescription.

Prescription 20. Olive Whistler

a) Where there is a record of Olive Whistler within a compartment, a 20 metres buffer must be established around all areas of rainforest Category A or Category B (as defined in Prescription 33). Machinery must not enter this buffer. Trees may be felled out of and into the buffer. Trees must not be felled out of or into the rainforest. (This prescription does not diminish the conditions applied under Prescription 33.)

b) These buffers must be mapped on the Harvesting Plan Operational Map.

Prescription 21. Glossy Black Cockatoo

Where there is a record of this species within a compartment or within two kilometres of a compartment boundary, the following must apply:

a) A 50 metres radius buffer must be established around all Glossy Black Cockatoo nest sites. Specified forestry activities must be excluded from this buffer.

b) These buffers must be mapped on the Harvesting Plan Operational Map.

c) When ten Glossy Black Cockatoo nest buffers are retained over a two year period in any one SFNSW Management Area, SFNSW may apply to the NPWS for a review of this prescription.

Prescription 22. Gilberts Whistler

a) Where there is a record of this species in a compartment or within 200 metres of the compartment boundary, specified forestry activities must be excluded from a four hectare block around territories of this species.

b) These exclusion zones must be mapped on the Harvesting Plan Operational Map.

Prescription 23. Turquoise Parrot

a) A 20 metres radius buffer must be established around all Turquoise Parrot nest sites. Specified forestry activities must be excluded from this buffer. The buffer must be mapped on the Harvesting Plan Operational Map.

Prescription 24. Swift Parrot

a) Where this species is detected in a compartment, harvesting must be temporarily excluded from flowering eucalypts. The Harvesting Plan must indicate which areas are temporarily excluded from harvesting.

Prescription 25a. Koala Prescription for North Coast Forest Types

This prescription applies north of Sydney to the following forest types listed in Research Note 17:

- Rainforest Group
- Maritime, Blackbutt, Sydney Blue Gum and Spotted Gum Leagues
- Grey Gum - Grey Ironbark, Grey Box-Ironbark and Red Gum Leagues
- Eucalypt Plantations

Planning

At the beginning of the harvest planning process, locally compiled records will be consulted to determine if there is a reliable record of a Koala within two kilometres of the boundary of the logging compartment boundary. Due recognition will be taken of local and historical knowledge with regard to koala distribution. If a record exists as described, or consideration of historical and local knowledge (including suitability of habitat) indicates that koalas are likely to occur, a methodical survey for koala or signs of koala presence will be undertaken during inspections of the proposed logging area prior to compiling the harvesting plan.

Community dialogue about Koalas should be initiated and maintained at an early stage. This need not be high profile and time consuming, but as a minimum should include contact and exchange of information with neighbours, and local animal welfare and conservation groups. Many interest groups, and the general public, have a knowledge of Koala populations in their area. In some situations, animal care groups may be notified in case of accidental injury to a Koala.

The following procedures will be applied to EUCALYPT PLANTATIONS on State forest lands ONLY where there are more than twenty stems per hectare of primary browse species (greater than fifteen centimetres dbhob).

The first step in planning the Koala survey will be to review a forest type map (where available) and other habitat assessments of the logging area to: i) to determine and document which forest types to select as priorities for sampling, and ii) to decide which forest types may carry these species, or are used locally by Koalas. The planning documents will be available on request.

Survey Method

The survey will proceed according to the following guidelines:

- A walk transect of the logging area will be done to sample a representative and well distributed cross section of the area at a minimum rate of one kilometre for each 100 hectares of the logging area. The transect may contain infrequent bends and may be broken into segments. The transect may cross small patches or narrow linear strips of non-logging area or unlikely habitat but larger area blocks (>10 hectares) that will not be logged will be excluded from sampling.
- During the walk transect, the area beneath trees within 20 metres of the transect will be searched for dung at a rate of ***FIVE*** trees (if available) on each ***FIFTY*** metres segment of the transect.
- Primary browse species, preferably larger than 15 centimetres dbhob with an average of more than 50 centimetres dbhob, will be targeted for dung searches. Secondary and then other species will be used in that priority to make up the numbers per ***FIFTY*** metres of transect. (When choosing trees to be sampled, those with interlocking crowns should be avoided wherever possible).
- If trees as defined above are not available, those tree species and size classes which are present will be sampled.
- Indicative primary browse species for the Coastal zone are: tallowwood, grey gum, forest red gum, and swamp mahogany. Most other eucalypts, plus larger Casuarinaceae and broadleaf paperbark are commonly considered secondary browse species. Brushbox, turpentine, apple, and bloodwood can be considered incidental browse.
- A search of ***ONE*** minute per tree, within two metres concentrated around the base of the tree, will comprise the basic search unit. A scan of the area below the crown of the tree should also be done on the way to the tree.
- Scats will be left *in situ*, other than small samples taken for identification or other analyses.
- Fire events on the compartment within the past year will be recorded.
- Sampling should not be undertaken within one month following fire events.

Recording Results

- The results of this survey will be recorded on the standard format data forms. (See "Reporting" section for further requirements).
- The actual transect route taken will be accurately recorded on a map and justification given for the route taken.

- The locality of apparent runway trees found, and any Koala found (with special annotation for mother Koala with young), shall be accurately recorded on the same map.
- The number of scats beneath each tree does not need to be counted or recorded except where there is a very high number (ie close to 20) or they are of distinctly different sizes.
- The approximate locality of any transect section having ***THREE*** trees with Koala dung pellets out of any ten consecutive trees searched will be shown on this map as a transect section showing high use by Koala.
- "High use areas" in subsequent intensive walk surveys will be identified by this same criterion - ie. areas with Koala dung pellets under ***THREE*** out of any ten consecutive trees searched.
- Subsequent intensive surveys by walk transect will be done to (i) map the extent of high use areas indicated by high use sections of transect and (ii) to determine the importance of areas adjacent to reported runway trees or mother Koalas (where these areas are not associated with high dung pellet counts).

STAR Methodology

- Walk transects will consist of six additional radiating transects to determine the high use area, sampled at the same rate as above, with primary and then secondary browse species as targets for tree searches. These will start in the centre of the high use area on the original transect. Two of these will be established perpendicular to the original. The remaining four additional transects will be done on the diagonal between the perpendicular and the original transects. These transects will thus form a STAR pattern. These transects shall be carried out for at least 100 metres beyond any delineation of the high use area. Where the person undertaking the transects is satisfied that Koala habitat is present they may choose to forego the interior parts of the additional transects and commence survey near what they consider to be the edge of the high use area.
- Intermediate use compartments will be defined as compartments in the dot point following and compartments which have Koala dung under two out of ten trees in any one 100 metres segment.
- Where high use by Koalas is identified on a transect by only three to four trees with dung and where the subsequent radiating six transects fail to show high use, this area will not be mapped to the Harvesting Plan as a high use Koala area, but defined as an intermediate use area.
- The high use area boundary will be checked by inspection around the perimeter defined by the points above. The results of this inspection will be recorded as a concise narrative on the data sheet and mapped to the Harvesting Plan. Any data collected will be clearly reported on the data sheets.
- Where high usage is detected near the boundary (within 50 metres) of the proposed logging area, minor but appropriate and indicative sampling of relevant adjacent habitat - up to 100 metres into adjacent State Forest or National Park - will supplement the walk transect. This sampling will consist of inspection for Koalas, Koala dung and Koala habitat.
- Where this situation occurs adjacent to private lands a comment is required on the survey record and any associated report as to whether suitable Koala habitat, and possible Koala populations, extends into that land.
- Concise notes about adjacent habitat will be made on the data form, where relevant.
- Areas identified on forest type maps larger than about ten hectares of forest types that carry primary browse species that were not sampled by transect shall be inspected for koala evidence and results recorded as concise narrative on the data sheet. Information which should be used to identify these areas include Research Note 17 and local knowledge.

At the harvest planning stage, reserves, exclusions, and retention rates for high use and intermediate use areas will be planned and designed according to the following section.

Reserves and Exclusions

Special conditions for this species:

Individual Koalas will be protected from tree felling operations wherever detected. A tree containing a Koala will not be felled or damaged while the Koala is known to be in the tree.

Detection of a Koala will trigger actions listed below (see Operations).

Logging will be excluded from within fifty metres of high use areas. This will be documented and mapped in the Harvesting Plan.

In intermediate use areas, the following prescriptions apply:

1. Ten primary browse trees (or secondary browse species if primary are unavailable)will be retained per hectare in the compartment. These may include habitat trees if they meet the browse requirements.

2. Gap creation for silvicultural purposes will not take place in preferred forest types.

Where a high use area is identified in a eucalypt plantation, specific management of the area will be negotiated with NPWS.

Particular to this compartment:

Other reserves and exclusions will be planned by the District at this harvest planning stage. See box concerning plantations.

Extra measures required:

Proactive dialogue with contractors will be essential to ensure knowledge and attitude is compatible with compliance with this prescription. This should be initiated during the pre-logging joint inspection stage when going into known Koala areas.

Retained Habitat

Special conditions for this species:

Isolated individual trees with more than twenty Koala dung pellets beneath shall be marked and retained undamaged by logging, and logging debris shall be removed at least ten metres from their base.

Particular to this compartment:

To be completed by District at Harvest Plan compilation.

Extra measures required:

Near koala high use areas, primary and secondary browse trees will be retained as habitat trees where available.

Operations

Compartment Marking:

Exclusion zones will be marked to clearly exclude logging from those areas of compartments with positive Koala records and where survey results show high use. If koalas are encountered during this phase of operations the prescriptions set in harvesting (below) will be followed.

Trees to be retained in intermediate use areas will be clearly marked for retention.

During tree marking, primary browse trees should be briefly scanned for Koalas and Koala pellets (see next section for description of required action if a koala is detected).

Harvesting:

Continued dialogue with contractors is needed to ensure knowledge and attitude is compatible with compliance with this prescription on all compartments. A planned and documented process for inspection of operations will be required in those compartments with exclusion zones for the protection of Koala habitat.

If a Koala is observed during marking or logging (in an area that has not previously been found to be a high use area), numerous dung pellets (more than twenty below a tree) are found, or where less than twenty pellets of two markedly disparate sizes (medium plus about half sized) are found the following procedure will be followed:

- Walk transects will be initiated consisting of eight transects in the cardinal and sub-cardinal directions, and centred on the observation, to determine the extent of any high use area that may occur. The sampling will be at the same rate as the transect method described previously, with primary and then secondary browse species as targets for dung searches. These transects shall be carried out for at least 100 metres beyond any delineation of a high use area. Where the person undertaking the transects is satisfied that Koala habitat is present they may choose to forego the

interior parts of the transects and commence survey near what they consider to be the edge of the high use area.

- Any high use area boundary found will be checked by inspection around the perimeter defined by the transects. The results of this inspection will be recorded as a concise narrative on the data sheet and mapped to an Amendment to the Harvesting Plan.
- The results and maps will be promptly forwarded to NPWS (see Reporting Section).

All tree felling will immediately and subsequently be excluded from within fifty metres of a high use area, or modified within intermediate use areas.

Post-log Burning (associated with this operation):

As far as practicable post logging fire is to be kept out of the area reserved from logging for the protection of Koala habitat.

Monitoring:

Koala monitoring will be conducted as part of the general monitoring procedures planned by SFNSW. Compartment monitoring may be advantageous to Districts for future planning in areas that have positive Koala records and prior management.

At the initial stage the state wide monitoring of Koala populations will require a comprehensive compilation of the location and extent of high use areas. The monitoring program will be designed to give information on the effectiveness of these prescriptions in meeting their objectives.

The survey methodology for detecting Koalas and determining high use areas (contained in these prescriptions) may be reviewed in the light of findings from the monitoring program.

Reporting:

"Hard copy" of all survey results (including Amendments to Harvesting Plans) will be archived by the District on the compartment history. All Koala sightings will be incorporated into SFNSW database with subsequent prompt transfer to NPWS. Survey records (including Amendments to Harvesting Plans) will be reported in the same manner.

Maps will accompany survey results in relevant communications in either digital format (GIS) or as a clear paper copy. This will include the actual transect route taken, accurately recorded on a map. The locality of relevant Koala or Koala sign (including that of relevant adjacent areas) will be recorded on the same map. (Positive and negative results are both important.)

OR

USE THE PRESCRIPTION BELOW FOR FOREST TYPES NOT COVERED BY COASTAL KOALA PRESCRIPTION IN EVERY MANAGEMENT AREA EXCEPT GLOUCESTER-(SEE SEPARATE PRESCRIPTION FOLLOWING FOR THIS MA)

Prescription 25b. Koala (for Forest Types not covered by the coastal Koala prescription)

(a) If a past record of a Koala is accurately known or if evidence of regular koala activity is detected prior to or during forestry operations, operations will be excluded from within 100 metres of the location of the record or the location of the evidence of activity until the assessment in paragraph (b) below has been undertaken.

(b) The extent of habitat use and preferred food trees within the 100 metres radius area referred to in Prescription 25b (a) above shall be assessed using the modified asterisk technique. Prescription 25b (c), (d) or (e) below will then apply, as appropriate to the outcome of that assessment.

(c) If no further evidence of regular Koala activity is found, forestry operations may resume but a minimum of five Koala food trees must be retained within the 100 metres radius area referred to in (a) condition 25b. If a Koala was recorded in a preferred food tree, that tree must be included among the retained trees.

(d) If regular Koala activity is detected but less than 20% of trees examined have Koala faecal pellets underneath and no further Koalas are observed, limited forestry operations may resume under the following conditions:

(i) all trees with evidence of regular Koala activity shall be retained;

(ii) a minimum of 15 Koala food trees per hectare shall be retained within the 100 metres radius area referred to in Prescription 25b (a) above;

(iii) if the density of Koala food trees per hectare does not permit the above specified number of trees to be retained, all existing Koala food trees shall be retained.

(e) If regular Koala activity is detected and more than one koala is observed or more than 20% of trees examined have Koala faecal pellets underneath, forestry operations (which includes, to the fullest extent practicable, prescribed burning) shall be excluded from the 100 metres radius area referred to in Prescription 25b (a) above and the Manager Threatened Species, Northern Zone notified.

For the purposes of Prescription 25b (a) to (e) above, Koala food trees shall be leafy, with broad crowns and represent the range of sizes greater than 40 centimetres dbh present and be selected with preference to Tallowwood *Eucalyptus microcorys*, Small-fruited Grey Gum *E. propinqua*, Grey Gum *(E. bitubinata* **if north of Liverpool Range** *E. punctata* **if south of Liverpool Range - delete which is not applicable)**, Large fruited Grey Gum *E coraliculata*, Forest Red Gum *E. tereticornis,* and Sydney Blue Gum *E. saligna*. If these species are not present in adequate numbers, food trees should be selected from the following species:- Blackbutt *E. pilularis*, Flooded Gum *E. grandis*, White Mahogany *E. acmenoides* and Red Mahogany *E. resinifera.* Koala food trees retained pursuant to this condition may be counted as habitat trees or habitat recruitment trees for the purposes of other conditions.

For the purposes of Prescription 25b (a) to (e) above, regular Koala activity is indicated by the presence of Koala faecal pellets beneath trees or by characteristic claw scratch marks on the trunks of trees.

USE THE PRESCRIPTION BELOW FOR FOREST TYPES NOT COVERED BY COASTAL KOALA PRESCRIPTION IN GLOUCESTER MANAGEMENT AREA ONLY

Prescription 25c. Koala (for Forest Types not covered by the coastal Koala prescription)

a) If a past record of a Koala is accurately known or if evidence of regular Koala activity is detected prior to or during forestry operations, operations will be excluded from within 100 metres of the location of the record or the location of the evidence of activity until the assessment in paragraph (b) below has been undertaken.

b) The extent of habitat use and preferred food trees within the 100 metres radius area referred to in Prescription 25c (a) above shall be assessed using the modified asterisk technique. Prescription 25c (c), (d) or (e) below will then apply, as appropriate to the outcome of that assessment.

c) If no further evidence of regular Koala activity is found, forestry operations may resume but a minimum of five Koala food trees must be retained within the 100 metres radius area referred to in Prescription 25c (a) above. If a Koala was recorded in a preferred food tree, that tree must be included among the retained trees.

d) If regular Koala activity is detected but less than 20% of trees examined have Koala faecal pellets underneath and no further Koalas are observed, limited forestry operations may resume under the following conditions:

   i. trees with evidence of regular Koala activity shall be retained;

   ii. a minimum of 15 Koala food trees per hectare shall be retained within the 100 metres radius area referred to in Prescription 25c (a) above; and

   iii. if the density of Koala food trees per hectare does not permit the above specified number of trees to be retained, all existing Koala food trees shall be retained.

e) If regular Koala activity is detected and more than one Koala is observed or more than 20% of trees examined have Koala faecal pellets underneath, forestry operations, including post-harvest and hazard

reduction burning, shall be excluded from the 100 metres radius area referred to in Prescription 25c (a) above and the Manager Threatened Species, Northern Zone notified.

For the purposes of (a) to (e) above, Koala food trees shall be leafy, with broad crowns and represent the range of sizes greater than 40 centimetres dbh present and be selected with preference to Manna Gum *Eucalyptus viminalis*, Messmate *E. obliqua*, Snow Gum *E pauciflora*, Mountain Gum *E. dalrympleana*, Sydney Blue Gum *E. saligna*, and New England Blackbutt *E andrewsii.* Koala food trees retained pursuant to this condition may be counted as habitat trees or habitat recruitment trees for the purposes of other conditions.

For the purposes of (a) to (e) above, regular Koala activity is indicated by the presence of Koala faecal pellets beneath trees or by characteristic claw scratch marks on the trunks of trees.

Prescription 26. Rufous Scrub-bird

a) An exclusion zone of 300 metres radius must be established around any confirmed Rufous Scrub-bird habitat. Specified forestry activities must not be conducted within this exclusion zone. In determining confirmed Rufous Scrub-bird habitat the guidelines detailed in Attachment D must be followed.

b) Within two kilometres of a Rufous Scrub-bird record, rainforest must be buffered with a 20 metres machinery exclusion zone. Trees may be felled out of or into the buffer, but must not be felled within or into the rainforest.

c) Fuel reduction burning should be limited to less than 75% of the compartment.

Prescription 27. Hastings River Mouse

This prescription applies to the Tenterfield and Dorrigo Forest Management Areas, and to those areas of the Casino, Grafton, Kempsey/Wauchope and Mount Royal Management Areas which contain forest, are above 400 metres elevation and have topographical and vegetation characteristics outlined in NPWS (1993) *Interim Hastings River Mouse Identification Guide* and Read (1993) "Prescriptions for the identification of habitats of the Hastings River Mouse *Pseudomys oralis* (Rodentia: Muridae)". *For. Comm. NSW Tech. Pap. No. 58.*

For areas of habitat assessed as "low quality" (L1 to M2) the following prescription must be applied.

a) A 20 metres buffer must be established around all sedge areas within the compartment. Specified forestry activities must be excluded from these buffers. Buffers must be mapped on the Harvesting Plan Operational Map.

For areas of habitat assessed as "moderate / high quality" (M3 to H5) the following prescription must be applied.

b) Specified forestry activities must be excluded from all areas within 100 metres of areas identified as High Quality Habitat. These areas must be mapped on the Harvesting Plan Operational Map.

Where there is a known record of Hastings River Mouse within the compartment or within 800 metres of the boundary of the compartment, the following prescription must be applied.

c) Specified forestry activities must be excluded within an 800 metres radius of a Hastings River Mouse record. These areas must be mapped on the Harvesting Plan Operational Map.

Prescription 28. Osprey

a) If an osprey nest is encountered during pre-logging site inspections or specified forestry operations, the nest must be protected by a 100 metres radius exclusion zone around the site. Specified forestry activities must not be conducted within this exclusion zone.

Prescription 29: Threatened flora prescription A

Where there is a record of one or more of the species listed in part d) of this prescription in the compartment or within ten metres of the compartment boundary the following must apply:

a) Buffers of ten metres radius must be established around 50% of individuals of these species. Specified forestry activities must be excluded from these buffers. All practical precautions should be taken to avoid felling trees into these buffers.

b) Around buffers established in a), an additional ten metres wide modified harvesting zone must be established. Within this zone, at least 50% of the canopy must be retained. As far as possible, this canopy must be evenly spaced.

c) These buffers must be mapped on the Harvesting Plan Operational Map.

d) The species covered by this prescription are *Amorphospermum whitei*, *Eucalyptus glaucina*, *Eucalyptus tetrapleura* and *Tetratheca juncea*

Prescription 30: Threatened plant prescription B

Where there is a record of one or more of the species listed in part b) of this prescription in the compartment the following must apply:

a) Damage to plants caused by specified forestry activities must be avoided. No buffer is required. The location of these species must be mapped on the Harvesting Plan Operational Map.

b) The species covered by this prescription are:

Acacia courtii
Acacia georgensis
Acacia ruppii
Corchorus cunninghamii
Corokia whiteana
Hakea trineura
Hibbertia hexandra
Olearia flocktoniae
Pomaderris brunnea
Pomaderris parrisiae
Prostanthera species 6
Sophora fraseri
Tasmannia purpurascens
Tetratheca glandulosa

Prescription 31: Threatened plant prescription C

Where there is a record of one or more of the species listed in part d) of this prescription in the compartment or within ten metres of the compartment boundary the following must apply:

a) Buffers of ten metres radius must be established around all individuals of these species. Specified forestry activities must be excluded from these buffers. All practical precautions should be taken to avoid felling trees into these buffers.

b) Around buffers established in a), an additional ten metres wide modified harvesting zone must be established. Within this zone, at least 50% of the canopy must be retained. As far as possible, this canopy must be evenly spaced.

c) These buffers must be mapped on the Harvesting Plan Operational Map.

d) The species covered by this prescription are:

Acacia bynoeana
Angophora robur
Arthraxon hispidus
Boronia umbellata
Bothriochloa biloba
Caesia parviflora var *minor*
Correa baeuerlenii
Corybas undulatus
Cryptostylis hunteriana
Cynanchum elegans
Diuris tricolor
Diuris venosa
Elaeocarpus species A
Endiandra hayesii
Eucalyptus kartzoffiana
Eucalyptus nicholli
Eucalyptus parramattensis subsp. *decadens*
Marsdenia longiloba
Melaleuca groveana
Melichrus hirsutus
Ochrosia moorei
Parsonsia dorrigoensis
Phyllota humifusa
Plectranthus nitidus
Prostanthera cryptandroides
Pterostylis species D
Pultenaea campbellii
Quassia species B
Randia moorei
Restio longipes
Sarcochilus fitzgeraldii
Sarcochilus hartmanii
Sarcochilus weinthallii
Senna acclinis

Eucalyptus parvula
Floydia praealta
Grevillea beadleana
Grevillea masonii
Hibbertia marginata
Hicksbeachia pinnatifolia
Leptospermum sejunctum
Lindsaea incisa
Macadamia tetraphylla
Macrozamia johnsonii
Styphelia perileuca
Symplocos baeuerlenii
Syzygium hodgkinsoniae
Syzygium moorei
Thesium australe
Triplariana nowraensis (syn. *Baeckea camphorata*)
Tylophora woollsii
Uromyrtus australis
Zieria floydii

Prescription 32. Pre-logging and pre-roading surveys

Specified forestry activities must not be undertaken in any compartment unless the following pre-logging and pre-roading surveys have been conducted. This condition applies to compartments currently licensed by NPWS, continuing operations and operations not yet commenced.

1 Introduction

As specified in the Threatened Species Protocol (TSP) of November 1996, pre-logging and pre-roading surveys are required for certain threatened species. Threatened flora and fauna requiring surveys are listed in Appendices 1 and 2 of this licence variation respectively. These species are those that require Species-specific Prescriptions or Site-specific Prescriptions under the Threatened Species Protocol. The surveys set out below are designed to specifically target these species.

SFNSW may decide to invoke a particular prescription for a species rather than conducting surveys for species. However there are only limited circumstances where this will be possible as most prescriptions are triggered by a record.

1.1 Principles of survey design

- To provide information in order for managers to maintain and enhance local viable populations of threatened species within timber production forests for the duration of the IAP.
- Surveys are to have regard to cost-effectiveness and take account of currently used methods.
- To provide enough information to allow a justified decision with regard to the dual objectives of the Government Forestry Policy.

1.2 Objectives

- To provide a trigger to apply species prescriptions.
- To conduct surveys in a co-ordinated, systematic and efficient manner which ensures a standardised approach across SFNSW Regions.
- To set minimum standards for survey techniques and effort.
- To set minimum standards for documentation of survey techniques and effort.
- To provide information on core / micro habitat requirements and distribution of threatened species.
- To establish a survey methodology which is credible, repeatable and transparent.
- To establish survey methods for flora and fauna which are able to be integrated with surveys for timber, soil, cultural heritage sites and other forest values.

2 Survey requirements

2.1 Surveyor experience

a) In order to conduct credible, efficient pre-logging and pre-roading flora and fauna surveys the surveyor must be suitably experienced and trained in the appropriate field. Suitable experience and training is defined as:

i. Experience with flora / fauna survey work.

ii. Extensive experience with identification of flora / fauna species. In particular, surveyors must be able to identify the threatened species listed in Appendices 1 and/or 2 of this condition relevant to the region, as well as similar species that those listed may be confused with. Surveyors must also be familiar with the types of habitat in which these species occur (see Appendices 1 and 2 of this condition).

iii. Familiarisation with herbarium / museum specimens of threatened taxa listed in Appendices 1 and/or 2 for the region being surveyed, if not already familiar. SFNSW Regions should establish their own herbarium or have ready access to a herbarium which includes at least the species listed in Appendix 1 of this condition which occur in their area, and those species that can be confused with those listed in Appendix 1 of this condition. The National Herbarium of NSW should be consulted on what information to record with each specimen.

iv. Tertiary botanical / fauna or ecological qualifications are preferable but not essential if the above criteria are met.

2.2 Survey documentation and reporting

a) Survey results must be documented as per the following:

i. A pre-logging / pre-roading flora and fauna Survey Report must be prepared. The report must include the information set out in all of the "Data to Record" sections below.

ii. All raw data sheets must be included in the Survey Report.

iii. The Survey Report must also provide, for each methodology employed, the surveyor's name and an explanation of the way in which surveyor(s) meet the experience criteria specified in Section 2.2. Once this information has been supplied on a particular person it need not be supplied again.

iv. The Survey Report must document all details of previous reliable surveys as specified in section 2.4.2 part e) of this prescription.

v. The Survey Report must be forwarded to the NPWS Northern Zone prior to the day of commencement of specified forestry activities in the compartment.

vi. Please note, all survey durations are to be interpreted as time net of travel, that is, not including travel times to and from the survey area.

2.3 Known and potential habitat

a) Pre-logging and pre-roading surveys must be conducted in known or potential habitat in the net logging area (as defined in condition 4), and in areas 50 metres beyond the boundary of the net logging area, for the species listed in Appendices 1 and 2 of this condition. Appendices 1 and 2 of this condition also provide information on species' distribution and habitat requirements. As new information on a species' biology, distribution or habitats comes to light, such as through the surveys described here, these descriptions may be modified by NPWS to reflect this.

2.3.1 Flora

a) Known or potential habitat for the purposes of flora survey is defined as a combination of:

i. Distribution, and

ii. High probability habitat.

b) These are detailed in Appendix 1 of this licence variation. This broad definition is required to trigger surveys due to the paucity of distributional and habitat information for threatened plant species. The definition is therefore to be used as a guide to trigger survey for particular species.

c) Additional habitat details have been provided in Appendix 1 where known, but this information must not be used to define suitable habitat for survey, only as a guide to known habitats. This is because many threatened species may be recorded outside known distributional ranges or habitat types.

2.3.2 Fauna

a) "Known habitat" for the purposes of fauna survey is defined as the area within a two kilometres radius of a record (except for Tiger Quoll and microchiropteran bats where the area within a five kilometres radius of a record constitutes known occurrence).

b) "Potential habitat" for the purposes of pre-logging fauna survey is defined as a combination of broader-scale to finer-scale habitat components as detailed in Appendix 2 of this licence variation. Different information sources that are to be utilised when determining what constitutes "potential habitat" for any particular fauna species, include:

   i. Geographical distribution (use maps in standard, current fauna texts or consult with the Australian Museum).

   ii. Interim Assessment Process expert fauna panel predicted distribution maps (see Table 1 in Appendix 2 of this condition for species with models). Where a model is not available use geographical distribution.

   iii. Published scientific material.

   iv. Macrohabitat definition.

   v. Microhabitat definition.

c) In defining potential habitat for a species the following must apply:

   i. For species where IAP expert fauna panel predicted distribution maps are available:

      If the compartment lies within the geographic distribution of the species, AND the compartment contains potential habitat as defined by the IAP expert fauna panel, then pre-logging / pre-roading surveys, as described in this prescription must be conducted for that species. However, if the compartment does not contain areas of microhabitat as defined in Appendix 2 of this licence variation, pre-logging / pre-roading surveys are not required

   ii. For species where no IAP expert fauna panel predicted distribution maps are available:

      If the compartment lies within the geographic distribution of the species, AND the compartment contains any potential macrohabitat as defined in Appendix 2 of this licence variation, then pre-logging / pre-roading surveys, as described in section 2.4 of this licence variation must be conducted for that species.

d) Pre-logging / pre-roading survey effort must focus on areas of microhabitat (as defined in Appendix 2 of this condition) where they occur. Information on microhabitat and macrohabitat requirements of species can also be gleaned from published scientific material when assessing the presence of potential habitat in a compartment.

e) Notwithstanding the above, if previous reliable surveys within two kilometres or five kilometres (as appropriate to the species) have recorded the species then surveys within the compartment are required for that species. If previous reliable surveys within two kilometres or five kilometres (as appropriate to the species) have not recorded the species, surveys are not required for that species. Reliable survey is defined as being survey equal to or better than the survey requirements set out in this condition with respect to survey methodology, sampling intensity, sample placement and distribution, season of survey and weather conditions. SFNSW must document all such previous reliable surveys used in place of conducting surveys in the Survey Report. This documentation must also include the following details on the previous survey: survey methodology, sampling intensity, sample placement and distribution, season of survey and weather conditions.

f) Where no previous reliable surveys have been conducted, surveys must be conducted within the compartment.

2.4 Desktop review of compartment(s):

a) The desktop review of compartments for which Harvesting Plans are being prepared must involve collation of the following information:

Data to Record*:*

a) Date of review.

b) Management Area, State Forest name, compartment number.

c) Name of person(s) conducting review.

d) Results of a database search for threatened flora and fauna records within five kilometres of the compartment boundary. The most up to date NPWS database must be used and its date given.

e) Results of a check of SFNSW records for threatened species recorded within five kilometres of the compartment boundary and any other records readily available.

f) A summary of those threatened species records collated in parts iv. and v. above, including species name, location (AMG), date of record, type of record (eg. observed, heard, road kill, hair analysis), observers name, and source of record, where this information is available.

2.5 Incidental Threatened Flora and Fauna Records

a) All incidental records of threatened flora and fauna subsequent to the desk top review must be recorded are included in the Survey Report.

Data to Record:

a) Species name.

b) AMG to within 100 metres.

c) State Forest and compartment number that species recorded in.

d) Date recorded.

e) Recorder's name.

2.6 Pre-logging and Pre-roading Compartment Traverse

a) The purpose of the Compartment Traverse is to search for threatened flora species and certain threatened fauna features within the net logging area (as defined in condition 4) and in areas 50 metres beyond of the boundary of the net logging area.

b) The threatened flora component of this survey must be conducted by a suitably experienced person as described in Section 2.2 of this prescription. Species that are unfamiliar to the surveyor must be collected and identified or verified by a relevant herbarium.

c) The threatened fauna features component of this survey must be conducted by a person with suitable training in the identification of these features.

d) ***Desktop component***

i) Examine air photographs and forest type maps of a suitable scale (minimum of 1:25,000) to define broad habitat types and forest types within the compartment.

ii) Mark on a 1:25,000 forest type map the proposed route traversing the full range of habitats, forest types and environmental gradients within the compartment(s).

iii) For each 200 hectares of net logging area, a minimum four kilometres traverse must be planned within which targeted sampling must be conducted as specified below in part e).

e) ***Field Methodology:***

Threatened flora component

i. For the threatened flora component of the Compartment Traverse, a “random meander” search (Cropper 1993) must be conducted along the proposed route identified in the desktop

component above. The traverse should be conducted within the net logging area and in areas 50 metres beyond the boundary of the net logging area.

ii. A minimum of six hours per 200 hectares of flora survey must be conducted along the traverse. Threatened flora species requiring species-specific prescriptions (listed in Appendix 1 of this licence variation) within known or potential habitat must be searched for continuously along the traverse.

iii. If habitats not previously identified in the desktop component are encountered while sampling along the pre-determined traverse, a proportion of the sampling time should be used to sample these habitats.

iv. The timing of the threatened flora surveys should take into account flowering periods of the threatened flora species being surveyed (this is particularly relevant to orchids and annual species). Data on known flowering periods of cryptic species is included in Appendix 1 of this licence variation.

v. Where individuals or populations of threatened plants requiring prescriptions are found, the individual or population boundary must be flagged (eg. with flagging tape) by the person conducting the flora survey. The location of the individual or population must also be marked on the Harvesting Plan map to assist the Supervising Forest Officer in finding the flagged plant(s) during compartment mark up.

Threatened fauna features component

i. For the threatened fauna features component of the Compartment Traverse, a minimum four hours per 200 hectares must be spent searching for the following features continuously along the proposed route identified in the desktop component above:

- Owl nest and roost sites.
- Owl pellets.
- Threatened hollow-dependent fauna nests and dens (eg. Yellow-bellied Glider, Squirrel Glider, Brush-tailed Phascogale, Glossy Black Cockatoo).
- Yellow-bellied Glider “v-notch” trees and trees with other incisions made by this Glider.
- Raptor nests and roosts (eg. Red Goshawk, Square-tailed Kite).
- Caves, mines and disused mineshafts (for further targeted survey work).
- Distinctive scats (eg. Tiger Quoll, Koala and Brush-tailed Rock Wallaby).
- Latrine and den sites of the Tiger Quoll.
- Potential Long-nosed Potoroo diggings.
- Permanent soaks and seepages (for further targeted survey work).
- Suitable *Varanus rosenbergi* microhabitat (inspection of burrows and underneath rocks and fallen logs) when in potential habitat within their geographic range.

ii) If habitats not previously identified in the desktop component are encountered while sampling along the pre-determined traverse, a proportion of the sampling time should be used to sample these habitats.

iii) Where threatened fauna features are found, these features are to be appropriately flagged in the field by the person conducting the survey. The location of the feature must also be marked on the Harvesting Plan map to assist the Supervising Forest Officer in finding the flagged feature(s) during compartment mark up.

f) ***Data to Record:***

i. Management Area, State Forest name, compartment number(s).

ii. Date of survey.

iii. The route traversed during survey clearly marked on 1:25,000 forest type map.

iv. Length of compartment traverse.

v. Time spent conducting each component of the field methodology, ie. flora and fauna.

vi. Threatened flora taxa recorded and the number of individuals of each (indicate whether count or estimate).

vii. AMG (to a minimum of 100 metres) of threatened flora records and threatened fauna features recorded.

viii. Locality description (name and distance from nearest road, creek, etc) of threatened flora records.

ix. Locality of threatened flora and threatened fauna features marked on a 1:25,000 forest type map.

2.7 Pre-logging and Pre-roading Targeted Fauna Surveys

a) Pre-logging and pre-roading targeted fauna surveys are required for threatened fauna requiring species-specific or site-specific prescriptions. All Targeted Fauna Surveys must be conducted within known or potential habitat (as defined in section 2.4 of this prescription) in the net logging area and areas beyond 50 metres of the boundary of the net logging area.

b) The Targeted Fauna Survey requirements are based on a minimum survey effort for a standard 200 hectares of net logging area. Table 1 of this licence variation summarises which survey methods will need to be employed for each threatened species requiring Species-specific Prescriptions or Site-specific Prescriptions.

c) Any variations to the requirements set out below for Targeted Fauna Surveys must be approved in writing by NPWS Northern Zone Threatened Species Manager.

d) ***Data to Record***

for each fauna survey technique/method used the following information is to be recorded:

i. Management Area, State Forest name, compartment number.

ii. Type of survey (including details of methodology used).

iii. Date of survey.

iv. Survey location AMG to nearest 100 metres.

v. Locality description (name and distance from nearest road, track, creek, etc).

vi. Survey point or transect clearly marked on 1:25,000 forest type map.

vii. Survey start time and finish time.

viii. Threatened species being targeted.

ix. Threatened species recorded.

x. Record observation type, ie. species heard, observed, scat record, track, hair, ultrasonic detection etc. Where bat ultrasonic detection, scat or hair record, the reliability of the record is to be provided also. Name of person conducting hair or bat ultrasonic analysis.

xi. For playback surveys: list species played.

xii. For trapping surveys: baits used in any traps.

xiii. For riparian and non-riparian frog surveys: mark on map and record time spent at each site surveyed.

xiv. For each day or night of survey, on arriving at the survey location the following is to be recorded:

- Temperature (degrees Celsius).
- Wind: 0 = calm; 1 = light, leaves rustle; 2 = moderate, moves branches; 3 = strong, impedes progress.
- Rain: 0 = rain during survey; 1 = evidence of rain in last 24 hours; 2 = no evidence of rain in last 24 hours.
- Night light: 1 = very dark, no moon + cloud; 2 = dark; quarter moon or moon with heavy cloud; 3 = detail seen, moon and clear sky; 4 = bright, half moon or more and no cloud.
- Date and time these measurement made.

Spotlight Survey

a) Spotlight surveys should target the following species: Brush-tailed Phascogale, Black-striped Wallaby, Brush-tailed Rock Wallaby, Long-nosed Potoroo, Parma Wallaby, Red-legged Pademelon, Rufous Bettong, Squirrel Glider, Yellow-bellied Glider, Greater Glider, Tiger Quoll, Marbled Frogmouth, Barking Owl, Powerful Owl, Sooty Owl and Masked Owl.

b) Spotlight surveys may be conducted in conjunction with call playback, and must be conducted as follows:

- 1 x two kilometres transect (or two x one kilometre transects) per 200 hectares of net logging area.
- This / these transects must be spotlighted twice on two separate nights. On one night, the spotlighting transect(s) can be conducted from a vehicle. On the other night, the transect(s) must be spotlighted on foot. Preferably both transects should be done on foot.
- During vehicle spotlight, vehicle speed must not exceed five kilometres/hour. Vehicle spotlight must be a minimum one hour duration per 200 hectares.
- During walk spotlight, observers must walk at approximately one kilometre/hour. Walk spotlight must be a minimum one hour duration per 200 hectares.
- Survey must involve two observers using 100 watt spotlights for vehicle spotlight and 50 watt spotlights for walk spotlight.
- Windy, cold and rainy conditions to be avoided.
- Records of Tiger Quolls will trigger surveys for den, maternal den and latrine sites.
- Walking spotlight survey transects can be established along roads/tracks or, if potential habitat exists away from roads, SFNSW can opt to establish an off-road survey.

Nocturnal Call Playback

a) Nocturnal call playback is used to target the following species: Barking Owl, Masked Owl, Powerful Owl, Sooty Owl, Marbled Frogmouth, Squirrel Glider and Yellow-bellied Glider. SFNSW can choose to play Bush Thick-knee calls where appropriate but this does not limit the requirements under the *Diurnal Bird* survey section below.

b) Nocturnal call playback surveys must be conducted as follows:

- Two call playback sites per 200 hectares of net logging area. Playback sites must be more than one kilometre apart. The location of the playback sites should optimise response.
- As a minimum the following calls must be played: Powerful Owl, Sooty Owl and Masked Owl. The following calls must be played where potential habitat exists for the species: Barking Owl, Yellow-bellied Glider, Squirrel Glider and Marbled Frogmouth.
- At each call playback site, an initial listening period of ten minutes should be undertaken, then each call must be played for five minutes followed by at least a two minute listening period. After the last call at least ten minutes must be spent listening. Calls must be played from a good quality walkman and amplified through a nine volt megaphone.
- The playback session must be conducted twice, on two separate nights. Where a species is recorded on the first night of survey, it is not a requirement of the pre-logging / pre-roading surveys that the call of this species be played again on the second night of survey.
- Windy and rainy conditions are to be avoided.
- Where 1 x two kilometres transect is established for spotlighting, call playback can be conducted at the beginning and end of each two kilometres transect. Where two x one kilometre transects are established for spotlighting, call playback can be conducted at the beginning or end of each one kilometre transect.
- Survey season: Owl surveys are best conducted between April and September. All other species are best surveyed for in Spring-Summer.

Table 1: Survey requirements for threatened fauna.

Species Name	Spot light	Call Play back	Hair tubes	Scat & track	Riparian frog	Non-riparian frog	Micro bat roost	Elliott traps	Species specific
Amphibians									
Helioporous australiacus					X	X			X
Litoria aurea									X
Litoria brevipalmata									X
Litoria castanea									X
Litoria piperata					X				

Species Name	Spot light	Call Play back	Hair tubes	Scat & track	Riparian frog	Non-riparian frog	Micro bat roost search	Elliott traps	Species specific
Litoria spenceri					X				
Mixophyes fleayi					X				
Mixophyes iteratus					X				
Mixophyes balbus					X				
Philoria kundagungan					X [1]	X			
Philoria loveridgei					X [1]	X			
Philoria sphagnicolus					X [1]	X			
Pseudophryne australis					X	X			
Pseudophryne corroboree					X				
Reptiles									
Varanus rosenbergi									X
Flying Mammals									
Beccari's Mastiff Bat *Mormopterus beccarii*							X		
Black Flying Fox *Pteropus alecto*							X		
Common Bent-wing Bat *Miniopterus schreibersii*							X		
Eastern Little Mastiff Bat *Mormopterus norfolkensis*							X		
Golden-tipped Bat *Kerivoula papuensis*									X
Great Pipistrelle *Falsistrellus tasmaniensis*							X		
Greater Broad-nosed Bat *Scoteanax rueppellii*							X		
Greater Long-eared Bat *Nyctophilus gouldii*							X		
Hoary Bat *Chalinolobus nigrogriseus*							X		
Large Pied Bat *C. dwyeri*							X		
Large-footed Myotis *Myotis adversus*							X		X
Little Bent-wing Bat *Miniopterus australis*							X		
Queensland Long-eared Bat *Nyctophilus bifax*							X		
Yellow-bellied Sheath-tailed Bat *Saccolaimus flaviventris*							X		
Vespadelus troughtoni							X		
Vespadelus baverstocki							X		
Non-flying Mammals									
Black-stripped Wallaby	X			X					
Broad-toothed Rat								X	
Brush-tailed Phascogale	X		X	X					
Brush-tailed Rock Wallaby	X			X					
Eastern Quoll			X	X					
Hastings River Mouse								X	X
Koala				X					
Long-footed Potoroo	X		X	X					
Long-nosed Potoroo	X		X	X					
Parma Wallaby	X			X					
Red-legged Pademelon	X			X					
Rufous Bettong	X			X					
Smoky Mouse								X	X
Southern Brown Bandicoot			X	X					
Squirrel Glider	X	X							
Tiger Quoll	X		X	X					
Yellow-bellied Glider	X	X							
Birds									
Barking Owl	X	X							
Marbled Frogmouth	X	X							
Masked Owl	X	X							
Powerful Owl	X	X							
Sooty Owl	X	X							
Black-breasted Button-quail		X							X
Black-throated Finch									DB [2]
Bush Thick-knee		X							X
Double-eyed Fig Parrot									X
Eastern Bristlebird									X

Gilbert's Whistler	DB
Glossy Black Cockatoo	X
Olive Whistler	X
Pink Robin	DB
Red Goshawk	DB
Regent Honeyeater	DB
Superb Parrot	DB
Swift Parrot	DB
Turquoise Parrot	DB

[1] riparian surveys in wet sclerophyll forest only

[2] DB = general diurnal bird survey

Hairtubes

a) Hairtubes are used to target the following species: Brush-tailed Phascogale, Eastern Quoll, Long-nosed Potoroo and Tiger Quoll.

b) Hairtube surveys must be conducted as follows:

- 20 hairtubes must be set along two x one kilometre transects per 200 hectares of net logging area.
- One transect must run along or near gully lines and the other along the midslope. Transects must run along the contour and focus on areas of potential habitat for the species being targeted.
- Along each one kilometre transect, ten hairtubes must be set approximately 100 metres apart.
- Hairtubes must be baited alternately with a meat bait and a suitable 'vegetarian' bait.
- Records of Tiger Quolls will trigger a targeted survey for den, maternal den and latrine sites.

c) Collection and analysis:

- All hairtubes must remain set for ten nights. During collection of hair samples, any tapes with hairs attached should be removed on site to avoid contamination. All hair samples must be forwarded for identification to a person suitably experienced in hair analysis.
- A result of 'definite' or 'probable' must be counted as a record where it refers to a threatened species listed on Schedule 1 of the *Threatened Species Conservation Act* 1995 (TSC Act). A result of 'definite' must be counted as a record where it refers to a threatened species listed on Schedule 2 of the TSC Act.

Scat and track survey

a) Scat and track surveys are used to target the following species: Black-striped Wallaby, Brush-tailed Rock Wallaby, Brush-tailed Phascogale, Rufous Bettong, Long-nosed Potoroo, Parma Wallaby, Red-legged Pademelon and Tiger Quoll.

b) Scat and track surveys must be conducted as follows:

- One x one kilometre road transect per 200 hectares of net logging area.
- Scat and track survey must consist of a slow walk along one kilometre road transect.
- One or two people should walk slowly along the edge of the road looking for scats in open areas, under bushes and on large logs by the side of the road. Observers must also look for fresh tracks along the road.
- All predator scats must be collected for analysis. Scats must be forwarded for identification to a person suitably experienced in scat analysis. Identification results of 'definite' or 'probable' must be counted as a record where it refers to a threatened species listed on Schedule 1 of the TSC Act. A result of 'definite' must be counted as a record where it refers to a threatened species listed on Schedule 2 of the TSC Act.
- If surveyors are unsure of identification of non-predator scats, these scats must be sent to a suitably experienced person for verification.

- Distinctive, readily identifiable tracks (eg. of Tiger Quoll) should be able to be identified by field staff using standard texts.

Frog surveys

It would be most effective to undertake a local to regional scale frog survey at the most appropriate time of year and under the best weather conditions. Such a survey could cover breeding sites within or immediately adjacent to compartments scheduled to be logged over the following year.

Riparian frog survey

a) Riparian frog surveys are used to target the following species: *Heleioporous australiacus*, *Pseudophyrne australis*, *Mixophyes fleayi*, *Mixophyes iteratus*, *Mixophyes balbus*, *Philoria* species (in wet sclerophyll), *Litoria piperata* and *Litoria spenceri*.

b) Riparian frog surveys must be conducted as follows:

- Surveys must be a minimum of 1 person hour duration per 200 hectares of net logging area. If more than one stream is surveyed, a minimum of ten minutes must be spent at each separate site.
- Three call playback sessions must be conducted per one hour search. After an initial two minute listening period, calls of threatened frog species likely to occur in the search area must be played for two minutes followed by a minimum 5 minutes listening period. When an observer is unsure of a species' identification, the call responses should be taped to allow verification by a suitably experienced frog expert.
- Surveys must be conducted twice, on two separate nights.
- Surveys must not be conducted in cold, windy conditions. All attempts should be made to survey just after rain, during very light showers, or when showers are intermittent.
- Surveys to focus on searching in macrohabitat and microhabitat.
- For *Litoria piperata*, surveys should be repeated during the day with particular attention taken to search rocks and debris by the creeks and vegetation overhanging the creeks (search should be conducted so as to not result in damage to habitat).
- Survey season: *Litoria piperata*: summer. *Litoria spenceri*: summer. *Mixophyes fleayi* and *M. balbus*: September to March. *Mixophyes iteratus*: October to February. *Philoria* species: spring to early summer (best in spring), no later than December. *Pseudophyrne australis*: spring - summer after rain.

Non-riparian frog search

a) Non-riparian frog surveys are used to target the following species: *Heleioporous australiacus*, *Pseudophyrne australis*, *Philoria* species.

b) Non-riparian frog surveys must be conducted as follows:

- Surveys must adequately search soaks, seepages and bogs within the net logging area. Where soaks, seepages or bogs occur, a minimum of 30 minutes to a maximum of two hours per 200 hectares of net logging area depending on the number and extent of soaks, seepages and bogs. A minimum of ten minutes must be spent at each separate soak, seepage or bog.
- Surveys for *Philoria* species must be conducted either in the late afternoon or very early morning.
- Call playback must consist of two minutes call playback followed by five minutes listening. This should be conducted at each soak, seepage or bog. When an observer is unsure of a species' identification, the call responses should be taped to allow verification by a suitably experienced frog expert.
- Surveys must not be conducted in cold, windy conditions. All attempts should be made to survey just after rain, during very light showers, or when showers are intermittent.
- Survey Season: *Philoria* spp: spring to early summer (best in spring), no later than December. *Pseudophryne australis*: spring - summer after rain.

***Litoria aurea* and *Litoria castanea* survey**

a) The following survey methodology is provided as a guide. Any variation to this survey technique must be clearly documented in the survey report.

- Permanent swamps or ponds of greater than 1ha surface area must be surveyed for a minimum of one hour, both day and night. For large swamps or ponds, survey effort should be proportional to this effort. For smaller swamps and ponds a minimum of 30 minutes survey must be undertaken both day and night.
- Night survey must be conducted twice on two non-consecutive nights.
- Call playback must be conducted at 50-100 metres intervals around swamp / pond perimeter with call played for two minutes followed by a five minute listening period. When an observer is unsure of a species' identification, the call responses should be taped to allow verification by a suitably experienced frog expert.
- Surveys must not be conducted in cold, windy conditions. All attempts should be made to survey immediately prior to significant rainfall, just after rain, during very light showers, or when showers are intermittent.
- Survey Season for *Litoria aurea* is September to February.

***Litoria brevipalmata* survey**

a) Surveys for *Litoria brevipalmata* must be conducted as follows:

- For every 1ha surface area of temporarily flooded areas or ponds, a minimum of one hour survey must be conducted. For smaller swamps and ponds a minimum of 30 minutes survey must be conducted.
- Searches must concentrate on emergent vegetation in ponds and temporarily flooded areas.
- Surveyor must stop every 50-100 metres along the boundary of the flooded area or pond and listen for five minutes, then use playback for a minimum of two minutes followed by a further listening period of five minutes. When an observer is unsure of a species' identification, the call responses should be taped to allow verification by a suitably experienced frog expert.
- Surveys must be conducted on at least two nights when weather conditions are most appropriate. All attempts should be made to survey just after (up to two days after) very heavy rains.
- Surveys must not be conducted in cold, windy conditions. Surveys are best conducted on warm, still nights.
- Survey season: September to January.

***Heleioporus australiacus* survey**

a) Surveys for *Heleioporus australiacus* must be conducted as follows:

- A road-based night survey must be conducted for *Heleioporus australiacus*.
- A minimum of two kilometres of road-based survey per 200 hectares of net logging area must be conducted.
- Surveyor must drive along roads in or adjacent to compartments at a speed of <1-15 kilometres/ hour.
- Call playback must be conducted at three points along the road survey. Species call must be played for three minutes followed by a ten minute listening period. When an observer is unsure of a species' identification, the call responses should be taped to allow verification by a suitably experienced frog expert.
- Surveys are best conducted on warm, still nights during rain.
- Survey season: spring and autumn (very wet and warm conditions needed).

Microchiropteran bat surveys

Microchiropteran bat cave, tunnel and disused mineshaft roost surveys

a) Surveys for microchiropteran bat caves, tunnels and disused mineshaft roost sites must be conducted as follow:

- All caves, mines and disused mineshafts (except open pits of less than three metres in depth) must be surveyed. A cave is defined as a hollow in the earth especially one opening more or less horizontally into a hill, mountain etc.
- Surveys must consist of an ultrasonic call recording of 30 minutes duration conducted at dusk. Call detection units must be placed at the entrances of likely cave roosts that lie within the net logging area or in areas beyond 50 metres of the boundary of the net logging area.

OR

- A person experienced in bat survey work may physically inspect any potential cave roost sites. The first option is the most preferred as bats can be critically affected if roost sites are disturbed at inappropriate times of the year. For this reason, a person with extensive knowledge and experience with bat survey work is essential if this option is chosen.
- Windy, cold and rainy weather conditions must be avoided.
- If a call analysis is undertaken, results of 'definite' and 'probable' will count as records, while 'possible' results will be discounted.
- Survey season: October to late March

Golden-tipped Bat *Kerivoula papuensis* and Large-footed Myotis *Myotis adversus*

a) Surveys for *Kerivoula papuensis* and *Myotis adversus* must be conducted as follows:

- Two harp traps per 200 hectares of net logging area both set for a minimum of two consecutive nights (ie. four trap nights).
- Harp traps must be set well before dusk.
- Harp traps must be set in potential *Kerivoula papuensis* or *Myotis adversus* habitat across creeks, pools and other appropriate flyways close to streams to increase the chance of trap success. Supplementary screening should be used where necessary.
- In potential *Myotis adversus* habitat, a bat detection recording must be conducted for 30 minutes commencing at dusk. Anabat surveys should focus on large permanent bodies of water.
- Windy, cold and rainy weather conditions must be avoided.

Small mammal survey

Broad-toothed Rat

a) Surveys for the Broad-toothed Rat must be conducted as follows:

- 75 Elliott traps baited with peanut butter mix, spaced at ten metres intervals, running through potential habitat.
- Traps to be set for four nights.

Diurnal birds

Bush Thick-knee

a) Surveys for the Bush Thick-knee must be conducted as follows:

- Call playback must be conducted at 500 metres intervals within areas of potential habitat during the breeding season (July to January). Calls must be played for a minimum five minutes followed by a ten minute listening period.
- Call playback must be conducted at dusk and concentrated within the net logging area.
- Playback survey must be combined with a slow walk to flush the birds.

- Nest searches must be conducted in conjunction with playback walk.
- Survey season: July to January.

Olive Whistler

a) Surveys for the Olive Whistler must be conducted as follows:

- Call playback must be conducted in potential habitat within the net logging area, and within areas beyond 50 metres of the boundary of the net logging area, during the breeding season - September to January.
- Call playback must be conducted for a minimum of five minutes followed by a ten minute listening period.
- Call playback survey must be conducted twice on at least two non-consecutive days.
- Survey season: September to January.

Black-breasted Button-quail

a) Surveys for the Black-breasted Button-quail must be conducted as follows:

- Surveys for Black-breasted Button-quail must be conducted in potential habitat within the net logging area, and in areas beyond 50 metres of the boundary of the net logging area.
- Searches must be conducted for characteristic pivot feeding marks (platelets) for a minimum one hour per ten hectares of potential habitat. Individual birds scrape the litter with their feet alternately in a circular motion leaving, in most instances, a neatly inscribed circle or saucer-shape of exposed soil. The presence of feeding marks suggests the presence of Black-breasted Button-quail and / or Painted Button-quail.
- Where pivot feeding marks are located, further target survey and call playback must be conducted to determine the presence of Black-breasted Button-quail. Call playback surveys must consist of two minutes call followed by five minutes of listening. Both adult female "booming" and "bubbling" calls must be played. Both calls must be played three times each.
- Targeted surveys for individuals must be conducted in conjunction with call playback for a minimum of one hour for every ten hectares of potential habitat.

Double-eyed Fig Parrot

a) Surveys for the Double-eyed Fig Parrot must be conducted as follows:

- Surveys must be conducted in potential habitat within the net logging area and in areas 50 metres beyond the boundary of the net logging area. The Double-eyed Fig Parrot Recovery Team has developed advanced methods to survey for Double-eyed Fig Parrot individual and nests. Survey methodology must be sought from the Recovery Team.

Eastern Bristlebird

a) Surveys for the Eastern Bristlebird must be conducted as follows:

- Call playback techniques in potential habitat within the net logging area and in areas 50 metres beyond the boundary of the net logging area. Calls must be played for five minutes followed by a ten minute listening period.
- Target survey of species must be conducted in conjunction with call playback and be a minimum 30 minutes.
- Care should be taken to avoid playing calls too frequently or too loud during the breeding season.
- Each potential site should be surveyed a number of times as birds may not be detected in the first survey.

Other Diurnal Birds

a) Surveys for other threatened diurnal birds requiring species-specific or site-specific prescriptions must be conducted as follows:

b) A minimum of one hour per 200 hectares must be spent specifically searching for the following species in the early morning: Red Goshawk, Regent Honeyeater, Pink Robin, Superb Parrot, Turquoise Parrot, Swift Parrot, Gilbert's Whistler and Black-throated Finch.

c) The following species-specific surveys must be conducted:

i. Red Goshawk: Particular attention must be given to the identification of nests in riparian forest in floodplain areas. Survey season: August to December, during the nesting season.

ii. Regent Honeyeater: Surveys must be conducted where recent (ie. records with five years) records exist within five kilometres of the compartment boundary. Surveys must focus on any permanent water bodies, dams, flowering eucalypts. Call playback must also to be conducted for this species in areas of potential habitat.

iii. Superb Parrot: Surveys for nests must be conducted and must concentrate on mature trees up to 300 metres from water. A nest tree can be identified by a pair of birds seen entering a hollow, a male seen to enter a hollow alone, or a male observed feeding a female at a hollow entrance. Surveys should concentrate on searching winter flowering eucalypts and other species. Survey season: September to December, the breeding season.

iv. Turquoise Parrot and Swift Parrot: Surveys should concentrate on searching winter flowering eucalypts and other species. Particular attention must be paid to searching for nests of the Turquoise Parrot which are seldom more than a metres above the ground in hollows in small trees, dead eucalypts or in holes or stumps, or logs lying on the ground. Swift Parrot surveys are best conducted during winter months. Survey season: August to December, the breeding season.

v. Black-throated Finch: In dry seasons or during droughts, extra effort should be employed surveying around permanent water holes.

vi. Gilbert's Whistler: Call playback in the breeding season should be employed for this species.

Reptile survey methods

Varanus rosenbergi survey

a) Additional to the measures required in the threatened fauna features component of the transect survey and section 2.9 of this prescription, the principles to be followed to optimise detection of this species are:

- SFNSW staff conducting harvest planning and general operations within the geographic distribution of *Varanus rosenbergi* should be familiarised with the species key identification features.
- SFNSW staff should examine road kill goannas within the distribution of this species.

2.8 Features to be searched for during pre-logging compartment mark up

a) The following features require application of a prescription under the broad area licence variation. These features must be searched for and marked in the field, where appropriate, by the Marking Foreman / Supervising Forestry Officer prior to the commencement of harvesting operations. Compartment mark-up must be conducted at least 100 metres in advance of logging operations. The Supervising Forest Officer must receive specific training in the identification of any features unfamiliar to her/him.

b) The following features must be searches for during pre-logging compartment mark-up:

i. *Allocasuarina* spp. with >30 crushed *Allocasuarina* spp. seed cones beneath.
ii. Owl nest and roost sites.
iii. Owl pellets.
iv. Threatened hollow-dependent fauna nests and dens (eg. Yellow-bellied Glider, Squirrel Glider, Brush-tailed Phascogale, Glossy Black Cockatoo).
v. Raptor nests and roosts (eg. Red Goshawk and Square-tailed Kite).
vi. Nests of Glossy Black-cockatoo, Albert's Lyrebird and Bush Thick-knee.
vii. Latrine and den sites of the Tiger Quoll.

viii. Yellow-bellied Glider "V-notch" trees and trees with other incisions made by Yellow-bellied Gliders.

ix. Distinctive, readily identifiable tracks (eg. Tiger Quoll).

x. Distinctive scats (eg. Tiger Quoll, Koala and Brush-tailed Rock Wallaby scats).

xi. Caves, tunnels and disused mineshafts (except open pits of less than three metres depth).

xii. Accessible basal hollows in likely bat roost trees (>100 centimetres dbh dead stags or large trees with accessible base hollow) should be inspected prior to operations commencing within 100 metres of such trees. Supervising Forest Officer should look (and smell) for the presence of bat droppings inside the base of the tree.

xiii. Permanent soaks and seepages.

xiv. Roosting camps of the Black Flying-fox (most often found roosting with Grey-headed Flying-foxes).

xv. Threatened flora and fauna species requiring species-specific or site-specific prescriptions.

c) It is considered that marking prior to harvesting is adequate for these features as they invoke small area specific prescriptions. However, threatened flora and fauna species requiring Species-specific or Site-specific Prescriptions must also be recorded where found and the appropriate prescription applied.

Attachment A: Guidelines for the application of the record based large forest owl prescription

The Threatened Species Protocols requires that "where available 300 hectares of potential habitat must be retained within a two kilometres radius"....of a record of Powerful, Masked or Barking Owl.

These guidelines seek to outline a process for implementing the measures for the Barking, Powerful and Masked Owls in a consistent manner. They provide more detail on how to interpret the threatened species protocols and provide details of potential habitat.

Where information indicates that an abundance of more than one Greater Glider per hectare exists within two kilometres of a Powerful Owl record, eight habitat trees per hectare should be retained within the net logging area.

Identification of owl sites

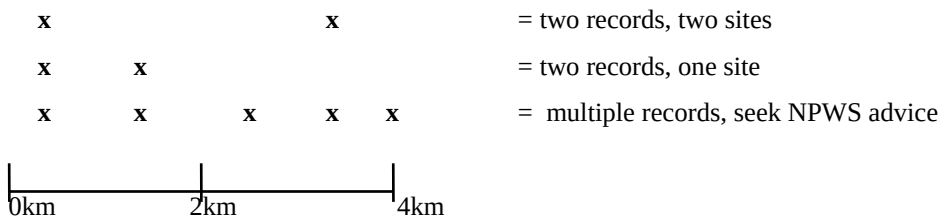
For the purpose of this guideline a **record** is an observation, call detection site, roost site or nest site of a large forest owl There can be a number of records at a number of different locations or a number of records at the same location.

Whilst not written into the protocol the intent was that where two or more **records** are within two kilometres of each other then they can be considered one **site** (see Figure 1). The orientation of the two kilometres radius circle should be centred around the records.

Where there is a line of records consecutively less than two kilometres apart but collective spreading over two kilometres then advice from NPWS should be sought as to how to apply the protocol. It is likely that this will be dealt with on a case by case basis.

If there are multiple records greater than two kilometres apart, that is a number of sites, then 300 hectares will need to be found within two kilometres of each site (see Figure 1).

Figure 1: Determining the number of records and sites.



x = location of Masked or Powerful Owl record

If an owl record is within two kilometres of private property, then the 1200 hectares (two kilometres radius) planning area must be located on SFNSW estate or other crown lands.

Identification of habitat

Potential habitat is defined as IAP mapped modelled habitat, candidate old growth forest and forest types as per Table 1 below. The IAP models comprise forest types by broad growth stage classes (regrowth, mature and senescing). The mapped modelled habitat represents the best predicted habitat on a regional scale. Where possible, and given other constraints (such as timber availability), the mapped habitat should be used in the first instance, then the candidate old growth forest and then forest types.

Candidate Old Growth: The IAP models predict mature and senescing growth stages as having high habitat value for these owls. Candidate Old Growth (COG) forest is derived from growth stage data indicating that senescing or late mature trees comprise a significant proportion of the canopy, which is structurally the more desirable as owl habitat. Areas of candidate old growth (COG) forest can be used to make up potential habitat. In addition, Category C rainforest can be considered potential habitat for Powerful Owl.

NOTE: COG does not need to pass the stump count test for identified Old Growth Forest to be considered suitable owl habitat.

Forest Types: The IAP models predict that particular forest types have low to high habitat value (Table 1). When using forest types to make up potential first preference should be for those forest types with high, then medium and lastly low predicted habitat value, where practicable.

APPENDIX B – UPPER NORTH EAST: SCHEDULE 12

Table 1: Predicted owl habitat value of forest types

	high	medium	low
Powerful Owl	122, 103, 140, 141, 142, 159, 160, 161, 167, 103 etc.	36, 37, 39, 42, 45, 46, 47, 48, 49, 51, 52, 53, 56, 60, 61, 62, 64, 70, 71, 72, 74, 76, 81, 82, 83, 84, 85, 92, 93, 97, 131, 150, 151, 152, 153, 154, 155, 158, 162, 163, 167, 168, 164, 170.	38, 40, 41, 97, 117, 119, 126, 130, 171, 175, 176, 177, 180, 182, 203, 204, 213.
Masked Owl	37, 39, 56, 61, 62, 64, 70, 71, 72, 74, 76, 81, 82, 83, 84, 85, 92, 93, 122, 167, (140, 141, 142, 159, 160, 161, 103, etc)	38, 41, 40, 97, 117, 119, 126, 130, 97, 163, 171, 175, 176, 177, 180, 182, 203, 204, 213.	36, 42, 45, 46, 47, 48, 49, 51, 52, 53, 60, 131, 150, 151, 152, 153, 154, 155, 158, 162, 163, 164, 167, 168, 170.
Barking Owl	37, 38, 39, 41, 70, 71, 72, 74, 76, 82, 83, 84, 92, 93	-	40, 61, 62, 64, 97, 117, 119, 126, 130

Delineation of habitat patches

When delineating patches of habitat

- identified patches do not need to be confined to the compartment(s) being planned, patches are to be sourced within two kilometres of the record (site) or in the immediate 1200 hectares surrounding the record. This may include compartments not being planned to be logged as long as they contain potential habitat.
- identified patches can be sourced from existing reserves: National Parks, Nature Reserves and Flora Reserves, as long as it is identified as potential habitat; or from exclusion zones, riparian buffers, identified old growth, rainforest (where applicable), steep slopes and other features excluded from the net harvesting area.
- otherwise the potential habitat must be found within the harvesting area being planned. Preference should be given to using the mapped habitat, then candidate old growth and then predicted high and medium forest types listed in table 1. Use of the low habitat value forest types, as per Table 1 should be justified.
- Potential owl habitat can only be sourced from public land, it cannot be sourced from private land.

Attachment B: Guidelines for the application of a landscape approach to the large forest owl prescription.

The objective of the landscape approach are:

- To cater for the conservation of the Barking, Masked and Powerful Owls throughout public land;
- To develop planning system that caters for large forest owls prior to compartment planning;
- To give certainty to the Harvest Planning system; and
- To minimise conflicts between meeting conservation and resource objectives and commitments.

In designing a landscape plan the following **design principles** are to be followed:

- Retained suitable habitat is to be dispersed through the landscape;
- Some large patches of habitat should be retained;
- The Planning Area should be about 10,000 hectares in size ± 50% (5,000-15,000 hectares);
- The plan applies to Crown Land only, particularly SFNSW estate and National Parks and reserves.
- As a general rule the landscape approach will be introduced for the larger forest areas. Small scattered forest areas can be amalgamated for the application of the landscape approach or the record based prescription can be applied.

The following **design rules** are to be followed:

1. A minimum area of 25% of suitable habitat must be retained across the planning area. Suitable habitat does not include large areas of wetland, heath, non-forest areas or non-riparian rainforest. Suitable habitat includes all other forest areas. Non-suitable habitat is to be excluded from the gross area when making the calculations.
2. Of the 25% of retained habitat, a minimum of 30% (or 7.5% of the planning area) must be production forest areas (eg. statutory reserves)
3. If the area of statutory reserves is greater than 25% of the total planning area then the area to be retained in the production forest, in 2, will be capped at a maximum of 12.5% of the production forest.
4. The area in production forest can include PMP exclusions, riparian buffers, EPA exclusions and other Conservation Protocol exclusions (such as Old Growth).
5. Of the retained habitat in the production forest 30% should be patches of reasonable sizes (50-100 hectares).
6. A minimum of 25% of the IAP modelled mapped owl habitat should be retained. This 25% can be sourced in statutory reserves. This IAP modelled mapped habitat has been provided to SFNSW.

Attachment C: Guidelines for identification of potential habitat for Brush-tailed Phascogale

The Threatened Species Protocols requires that "within three kilometres of a Brush-tailed Phascogale record, 50 hectares of potential habitat should be reserved along midslopes and ridges."

These guidelines seek to outline a process for implementing the measures for identifying potential habitat for the Brush-tailed Phascogale in a consistent manner. They provide more detail on how to interpret the Threatened Species Protocols and provide details of the elements comprising potential habitat.

If a record is within three kilometres of private property, then the 2800 hectares planning area must be located entirely on SFNSW estate or other crown lands.

Identification of habitat

Potential habitat is defined as IAP mapped modelled habitat, and mid-slope or ridge-top areas where identified old growth forest and forest types as per Table 1 below occur. The IAP models comprise forest types by broad growth stage classes(regrowth, mature and old growth). The mapped modelled habitat represents the best predicted habitat on a regional scale. Where possible, and given other constraints (such as timber availability), the mapped habitat should be used in the first instance, then the old growth forest and then forest types.

Old Growth: The IAP models predict the old growth stage as having high habitat value for this species. Old Growth forest is derived from growth stage data indicating that senescing trees comprise a significant proportion of the canopy, which is structurally the more desirable as Brush-tailed Phascogale habitat. Areas of old growth forest can be used to make up potential habitat.

Forest Types: The IAP models predict that particular forest types have low to high habitat value (Table 1). When using forest types to make up potential first preference should be for those forest types with high, then medium and lastly low predicted habitat value, where practicable.

Table 1: Predicted Brush-tailed Phascogale habitat value of specific forest types

high	medium	low
37, 39, 56, 61, 62, 64, 70, 71, 72, 74, 76, 81, 82, 83, 84, 85, 92, 93	30, 31, 38, 40, 41, 97, 117, 119, 126, 130	42, 45, 46, 47, 48, 49

Delineation of potential habitat patches

When delineating patches of potential habitat the following should be noted:

- Identified patches do not need to be confined to the compartment(s) being planned, patches are to be sourced within three kilometres of the record (site) or in the immediate 2800 hectares surrounding the record. This includes compartments not being planned to be logged, providing they contain potential habitat.
- Identified patches of potential habitat can be sourced from existing reserves: National Parks, Nature Reserves and Flora Reserves, providing it is identified as potential habitat; or from exclusion zones, riparian buffers, identified old growth, rainforest (where applicable), steep slopes and other features excluded from the net harvesting area.
- Otherwise, the potential habitat must be found within the harvesting area being planned. Preference should be given to using the mapped habitat, then identified old growth and then predicted high and medium forest types listed in Table 1. Use of the low habitat value forest types, as per Table 1, should be justified.

Potential Brush-tailed Phascogale habitat can only be sourced from public land, it cannot be sourced from private land.

Attachment D: Guidelines for the identification of Rufous Scrub-bird Habitat

Rufous Scrub-birds are known to occur in rainforest and wet sclerophyll forest at higher elevations. There are considered to be five major habitat refuges: Barrington Tops, Werrikimbe-Mt Boss, New England-Killiekrankie Mountain, Gibraltar Range and Border Range (NSW NPWS 1994).

a) Potential Rufous Scrub-bird habitat is defined as areas of rainforest and wet sclerophyll forest (eg. forest types 47 and 53) within 500 metres of rainforest. These are areas of one hectare or greater and contain extremely dense cover between two and 50 centimetres above the ground and moderate cover between 50 and 100 centimetres above the ground. The cover may consist of both living and non living plant material. These areas generally have a moist ground level microclimate and abundant leaf litter.

b) In areas where there is no rainforest potential Rufous Scrub-bird habitat is defined as areas within wet sclerophyll forest that are of one hectare or greater and contain extremely dense cover between two and 50 centimetres above the ground and moderate cover between 50 and 100 centimetres above the ground. The cover may consist of both living and non living plant material. These areas generally have a moist ground level microclimate and abundant leaf litter.

c) Targeted pre-logging surveys must be conducted for the Rufous Scrub-bird in potential habitat as defined in above.

d) Targeted pre-logging surveys must consist of:

i. General listening for 20 minutes for Rufous Scrub-bird calls near the wet sclerophyll / rainforest ecotone.

ii. Playing of taped calls within the centre of the potential habitat patches for ten minutes with a subsequent ten minute listening period per patch.

iii. Three separate surveys must be undertaken over a four to six week period during the August-February period in the early morning or late afternoon.

iv. Surveys will apply to the net harvesting area only.

v. Surveys must be conducted by a suitably experienced person.

References:

NSW NPWS (1994) **Fauna of north-east NSW forests.** North East Forests Biodiversity Study Report No. 3, unpublished report, NSW National Parks and Wildlife Service.

Appendix 1: Potential habitat of threatened flora listed in the Conservation Protocols

Note - refer to Section 1.5.1 for a definition of potential habitat.

Species	Schedule	Prescription

Acacia bynoena 2 C

Distribution: Hazelbrook to Bell & Wheelbarrow Ridge. eg. Lower Portland, West of French's Forest, Berrima & Mittagong.
High probability habitat: Heath, dry sclerophyll forest & woodland.
Additional known habitat details: Has been recorded with *Kunzea ambigua, K. capitata, Acacia occicedrus, A. myrtifolia, Eucalyptus gummifera, E. haemostoma, E. parramatensis, E. sclerophylla, Leptospermum flavescens, Angophora bakeri, Banksia serratifolia, Angophora hispida*. Recorded on laterite flats.

Acacia courtii 2 B

Distribution: Between Wingham & Wauchope. eg. Middle Brother SF & North Brother Mountain.
High probability habitat: Dry sclerophyll forest.
Additional known habitat details: On north to west facing slopes on shallow soils over microgranite, between 40-300 metres alt.

Acacia georgensis 2 B

Distribution: Dr George Mountain & Kianniny Bay.
High probability habitat: Shrub communities & woodland.
Additional known habitat details: Skeletal soils on rhyolite & granite. Associated species include *Eucalyptus tereticornis, E. spectatrix, Kunzea ambigua, Eriostemon myoporoides, Melaleuca armillaris.*

Acacia ruppii 1 B

Distribution: Restricted to the Coaldale area near Grafton. eg. proposed Fortis Ck NP, Banyabba SF
High probability habitat: Dry sclerophyll forest & shrubland,
Additional known habitat details: Sandy soils over sandstone. Recorded from & on disturbed roadside sites between 50-150 metres alt. Often in Angophora/Bloodwood/Scribbly Gum forest. Flowers July-Sept.

Amorphospermum whitei 2 A

Distribution: North from Upper Macleay River
High probability habitat: Rainforest & wet sclerophyll forest.
Additional known habitat details: Littoral & warm temperate rainforest.

Angophora robur 2 C

Distribution: From north-west of Coffs Harbour to north-west of Grafton. eg. Fortis Ck SF, Sherwood NR, Waihou NR.
High probability habitat: Dry sclerophyll forest.
Additional known habitat details: Low site quality dry sclerophyll forest. Restricted to sandy soils on sandstone. Associated with other rough-barked apples, various stringybarks and bloodwoods. Restricted but locally frequent in the Glenreagh-Coaldale sandstone belt.

Arthraxon hispidus 2 C

Distribution: North from the Gibraltar Ra. eg. Gibraltar Range SF
High probability habitat: In rainforest, eucalypt forest & woodland.
Additional known habitat details: Flowers summer - autumn.

Boronia umbellata 2 C

Distribution: Coffs Harbour district. eg. Bagawa, Conglomerate & Lower Bucca SFs, Madmans Ck FR
High probability habitat: Wet sclerophyll forest.
Additional known habitat details: In tall open forest, adjacent to creek lines and sheltered positions, comprising of *Eucalyptus acmenoides, E. siderophloia, E. microcorys* and *E. propinqua* (FT 60).

Bothriochloa biloba 2 C

Distribution: From the Darling Downs south along the western slopes, northern tablelands & the Hunter Valley. eg. Ewingar SF.
High probability habitat: In grassy woodland
Additional known habitat details: On poorer soils. Recorded from euchrozem soil on cleared roadsides; brown clay & black soil. Flowers summer.

Caesia parviflora* var *minor 1 C

Distribution: South from Corindi.
High probability habitat: Heath, woodland, dry sclerophyll forest
Additional known habitat details: Sandstone substrates. Flowers spring - summer.

Corchorus cunninghamii 1 B

Distribution: North of Lismore. Chiefly collected in the Lismore district last century. eg. Toonumbar SF.
High probability habitat: Margins of rainforest & wet sclerophyll forest.
Additional known habitat details: Generally grows in narrow ecotone between closed forest & open forest. Favours hill crests or upper slopes, shallow, well-drained soils & south to south-east aspects. Also known from wet sclerophyll forest dominated by Ironbark, Brush Box & Grey Gum.

Corokia whiteana 2 B

Distribution: North from Lismore. eg. Big Scrub FR, Nightcap NP, Whian Whian, Nullum SFs, Hogans Scrub, Billinudgel NR
High probability habitat: Warm temperate rainforest & wet sclerophyll forest.
Additional known habitat details: On poorer soils. Commonly in ecotones between wet sclerophyll forest & coachwood warm temperate rainforest from 10-800 metres alt., usually on rhyolite, rarely on basalt. Also in sclerophyll forest on coastal sands.

Correa baeuerlenii 2 C

Distribution: Coastal ranges from the Clyde River to near Tathra.
High probability habitat: Wet sclerophyll forests & margins of rainforest.
Additional known habitat details: Usually adjacent to creeks. Flowers spring & sporadically at other times.

Cryptostylis hunteriana 2 C

Distribution: South from the Gibraltar Range, chiefly in coastal districts eg. Riamukka SF, Gibraltar Range NP
High probability habitat: Swamp-heath.
Additional known habitat details: On sandy soils in small, localised colonies most often on the flat plains close to the coast. Also known from some mountainous areas growing in moist depressions and swampy habitats. Recorded on granite & sandstone. Flowers Dec - Feb.

Cynanchum elegans 1 C

Distribution: Gloucester district, Newcastle, Illawarra area & inland to Mt Dangar. Scattered sites along the central coast & lower north coast areas extending inland to the Hunter Valley. eg. Delicate Nobby, Fairfield, Camels Hump NR, Woko NP.
High probability habitat: Dry & subtropical rainforest & sclerophyll forest
Additional known habitat details: On clays or clay loams & in scrub or woodland on steep basalt scree slopes. Recorded in Spotted Gum forest 0-200 metres alt.

Diuris tricolor 2 C

Distribution: Widespread
High probability habitat: In sclerophyll forest among grass.
Additional known habitat details: Often with *Callitris*. Flowers Sept - Nov.

Diurus venosa 2 C

Distribution: Barrington Tops, Brackendale & New England NP.eg. Barrington Tops SF, Barrington Tops NP, north of Riamukka SF (Brackendale), New England NP.
High probability habitat: Grassy understorey of eucalypt woodland or in grasslands or herbfields.
Additional known habitat details: In moist areas at altitudes > 1100 metres on dark humic loam or basalt soil. Associated species include *E. pauciflora*. Recorded from margins of high altitude swamps. Flowers Nov - Jan.

***Elaeocarpus* sp A ("Minyon")** 1 C

Distribution: Nightcap & Koonyum Ranges. eg. Whian Whian SF, Nullum SF, Snows Gully NR
High probability habitat: Subtropical & warm temperate rainforest & wet sclerophyll forest.
Additional known habitat details: On deep brown podzolics formed on rhyolite and basalt-rhyolite mix.

Endiandra hayesii 2 C

Distribution: North from the Richmond River. eg. Big Scrub FR, Broken Head FR, Minyon Falls FR, Nightcap NP, Snows Gully FR, Mebbin, Mooball, Nullum, Whian Whian & Wollumbin SFs.
High probability habitat: Subtropical & littoral rainforest, & wet sclerophyll forest.
Additional known habitat details: Sedimentary soils & alluvium in cool, moist, sheltered valleys.

Eucalyptus glaucina 2 A

Distribution: Near Casino & from Broke to Taree. eg. Selection Flat FR, Uffington SF.
High probability habitat: Grassy woodland.
Additional known habitat details: Deep, moderately fertile soils, well watered areas.

Eucalyptus kartzoffiana 2 C

Distribution: Araluen to Bendethera. Deua NP.
High probability habitat: Wet & dry sclerophyll forest, often in gullies & creek lines.
Additional known habitat details: Associated with *Eucalyptus viminalis, E. radiata, E. maidenii* & *Casuarina cunninghamiana.*

Eucalyptus nicholii 2 C

Distribution: Niangala to Glen Innes, particularly in the area from Walcha to Glen Innes & east thereof. eg. Styx River SF, Nicholii FR, Hyland SF, Donnybrook SF, Oxley Wild Rivers NP
High probability habitat: In grassy or sclerophyll woodland.
Additional known habitat details: Shallow relatively infertile soils on shales & slates. Scattered distribution on rocky ridges especially of porphyry and granite; absent from high, wet granite country in the eastern part of the Northern Tablelands.

Eucalyptus parramatensis* ssp *decadens 2 C

Distribution: Tomago to Kurri Kurri & Williamstown.
High probability habitat: In dry sclerophyll woodland.
Additional known habitat details: On infertile sandy soils in low-lying, often swampy sites. Associated trees include *Angophora bakeri, Eucalyptus signata* & *E. globoidea*.

Eucalyptus parvula 2 C

Distribution: Big Badja to Nunnock Swamp FR. eg. Kybean, Brown Mountain, Nunnock Swamp FR.
High probability habitat: Tussock grassland, wet flats & swamp surrounded by dry sclerophyll woodland.
Additional known habitat details: Associated with *Eucalyptus stellulata, E. viminalis, E. rubida & E. pauciflora*.

Eucalyptus tetrapleura 2 C

Distribution: South of Casino. eg. Glenugie Peak FR, Wells Crossing FR.
High probability habitat: Dry & wet sclerophyll forest.
Additional known habitat details: Moderately fertile soil, often in lower areas.

Floydia praealta 2 C

Distribution: North from the Richmond River eg. Boatharbour NR, Broken Hd NR, Johnstons Scrub NR, Limpinwood NR, Mt Warning NP, Nightcap NP, Numinbah NP, Victoria Park NR. Whian Whian & Wollumbin SFs.
High probability habitat: Rainforest.
Additional known habitat details: Chiefly riverine and subtropical rainforest.

Grevillea beadleana 1 C

Distribution: From the Apsley River to the Guy Fawkes River, also near Grafton. eg. Guy Fawkes River NP, Aspley River, Moona Plains, Shannon Ck (Coutts Crossing).
High probability habitat: Dry sclerophyll forest.
Additional known habitat details: Grows among siliceous granitic outcrops (bluffs, creeks) yielding low nutrient, acidic, well-drained soils. Granite scarps & exposures, cliff edges, dry sclerophyll forest. Also on sandstone.

Grevillea masonii 1 C

Distribution: Known only from a few localities near Grafton.
High probability habitat: Woodland.
Additional known habitat details: Disturbed road verges & cultivated or grazed pasture at low elevations in what was formerly open eucalypt woodland. Grows in gravelly loams.

Hakea trineura 2 B

Distribution: From Lansdowne to Wauchope eg. Lansdowne SF.
High probability habitat: Sclerophyll forest.
Additional known habitat details: Restricted to the near coastal ranges above 230 metres alt.

Hibbertia hexandra 1 B

Distribution: North from Lismore, also collected from near Wauchope. eg. Nightcap NP, Whian Whian, Mt Boss SFs

High probability habitat: Heath, open forest or rainforest.

Additional known habitat details: In ranges around Mt Warning.

Hibbertia marginata 2 C

Distribution: Southern Richmond Range.
High probability habitat: Dry sclerophyll forest.
Additional known habitat details: Grassy forest on sandstone. Flowers spring.

Hicksbeachia pinnatifolia 2 C

Distribution: From the Nambucca Valley to south-east Qld. eg. Never Never & Whian Whian SFs Nightcap NP, Big Scrub area.
High probability habitat: Rainforest & moist open forest.
Additional known habitat details: Subtropical rainforest on basaltic derived soils. Also moist open forest & regrowth rainforest.

Leptospermum sejunctum not listed C

Distribution: Nowra area.
High probability habitat: Dry sclerophyll forest & woodland.
Additional known habitat details: Seepage areas. Sandstone substrate. Associated species include *Eucalyptus maculata, E. gummifera, E. punctata, E. imitans* & *Kunzea ambigua*.

Lindsaea incisa 1 C

Distribution: Between Grafton & Corindi
High probability habitat: Sclerophyll forest.
Additional known habitat details: Damp sandy places, open forest.

Macadamia tetraphylla 2 C

Distribution: Chiefly in the Richmond & Tweed Rivers extending into the Numinbah Valley & Coomera River, Qld. eg. Goonengerry and Whian Whian SF Davis Scrub NR, Limpinwood NR, Minyon Falls FR, Mt Warning NP, Nightcap NP, Numinbah NR, Victoria Park NR.
High probability habitat: Rainforest.
Additional known habitat details: Subtropical rainforest near the coast.

Macrozamia johnsonii 1 C

Distribution: North from the Clarence River Valley. eg. Chaelundi & Dalmorton SFs, Chandlers Ck FR, Chaelundi NP.
High probability habitat: Wet sclerophyll forest & the margins of rainforest.
Additional known habitat details: Mostly in foothills of ranges in tall wet sclerophyll forest & margins of rainforest, generally on steep slopes.

Marsdenia longiloba 1 C

Distribution: From the Hastings River to south-east Qld. eg. Billilimbra, Edinburgh Castle & Mt Boss SFs.
High probability habitat: Wet sclerophyll forest.
Additional known habitat details: Usually occurs in lowland wet sclerophyll forest, in ecotones between rainforest & wet sclerophyll forest, & sometimes in areas with rock outcrops. Also in subtropical rainforest & warm temperate rainforest, mostly below 200 metres alt.

Melaleuca groveana 2 C

Distribution: North from Pt Stephens. eg. Broken Bago, Doyles R., Way Way & Wild Cattle Ck SFs, Six-B FR, Tomaree NP, Yengo NP, Pokolbin SF, Corrabare SF.
High probability habitat: Heath.
Additional known habitat details: Also recorded from dry woodlands. Often in exposed sites, restricted to higher areas, coastal districts. Associated species include *Eucalyptus punctata, E. sparsifolia* & *E. crebra*.

Melichrus hirsutus 1 C

Distribution: North of Glenreagh to north of Grafton eg. Kremnos Ck, Black Swamp Ck, west of Kremnos Ck, Shannon Ck VCL, Banyabba NR, Wombat Ck, north of Copmanhurst.
High probability habitat: Dry sclerophyll forest.

Additional known habitat details: On sandstone at low altitudes (20-150 metres) in sandy soils including both grey-brown podsolics & lithosols with conspicuous sandstone outcrops. Mean annual rainfall c. 1200-1300 millimetres. Also in dry sclerophyll forest with well-developed shrub layer of many species. Flowers March – August

Ochrosia moorei 1 C

Distribution: North from the Richmond River. eg. Whian Whian & Wollumbin SFs, Big Scrub FR, Boatharbour NR, Numinbah NR, Victoria Park NR.
High probability habitat: Riverine & subtropical rainforest & ecotones.
Additional known habitat details: On deep heavy alluvial soil, usually on basalt, & often near creeks. Associated species include *Aphananthe philipinensis, Capparis arborea, Planchonella australis, Ficus* species Sporadic flowering.

Olearia flocktoniae 1 B

Distribution: From Brooklana - Marengo north of the Dorrigo Plateau. eg. Brooklana, Ellis, Hyland, Marengo, Wild Cattle Ck SFs, Dorrigo NP, Mt Hyland NR.
High probability habitat: Wet sclerophyll forest & warm temperate rainforest.
Additional known habitat details: Pioneer species of recently disturbed areas on sedimentary & granitic substrates. Flowers Feb - March.

***Parsonsia* species B *(=dorrigoensis*)** 2 C

Distribution: From the Bellinger River to Woolgoolga. eg. Dorrigo NP, New England NP
High probability habitat: In subtropical and warm-temperate rainforest and sclerophyll forest
Additional known habitat details: Found in subtropical & warm temperate rainforests, especially in more open parts & on rainforest margins, & in wet sclerophyll forests on brown clays overlying metasediments. Associated species include *Lophostemon confertus, Eucalyptus campanulata, E. microcorys, E. pilularis, E. saligna, Schizomeria ovata, Acmena smithii, Trochocarpa laurina, Callicoma serratifolia.*

Phyllota humifusa 2 C

Distribution: From Jellor (west of Mittagong) to Penrose (Bundanoon area). eg. Penrose SF.
High probability habitat: Dry sclerophyll forest & woodland with heathy understorey.
Additional known habitat details: Deep sandy soil. Associated species include *Eucalyptus mannifera, E. sclerophylla, E. radiata.*

Plectranthus nitidus 1 C

Distribution: North from Hortons Ck. eg. Terania Ck, Mt Neville NR.
High probability habitat*:* Cliffs.
Additional known habitat details: Rocky cliffs in rainforest.

Pomaderris brunnea 2 B

Distribution: From Tantawangalo SF to south of Walcha. eg. Picton area, upper Cordeaux Dam, Wollemi NP, Menangle, Nepean River, Tantawangalo SF, Tuggolo SF.
High probability habitat: Woodland & open forest.
Additional known habitat details: On river bank, intermediate between Silvertop Stringybark & New England Blackbutt.

Pomaderris parrisiae 2 B

Distribution: From Cobargo to Eden.
High probability habitat: Wet sclerophyll forest.
Additional known habitat details: Sometimes on margins of rainforest.

Prostanthera cryptandroides 2 C

Distribution: From Lithgow to Sandy Hollow. eg. Blue Mountains & Wollemi NP.
High probability habitat: Sclerophyll forest.
Additional known habitat details: Often in rocky sites, at the bases of sandstone boulders.

***Prostanthera sp.* 6** 2 B

Distribution: Ourimbah to Narara area. eg. Strickland SF
High probability habitat: Sclerophyll forest.
Additional known habitat details: On ridges in or adjacent to rainforest.

***Pterostylis* sp D** 2 C

Distribution: Possibly restricted to Barrington Tops.
High probability habitat: Montane forest.
Additional known habitat details: Moist sheltered slopes in montane forest. Flowers October. Flowers Aug - Oct.

Pultenaea campbellii 2 C

Distribution: From Glen Innes District to Nundle. eg. Hanging Rock, Warra SFs.
High probability habitat: Dry sclerophyll forest

Additional known habitat details: Recorded on light gravelly soil above 600 metres alt.

***Quassia* species B (sp.1 Mooney Ck)** 1 C

Distribution: From Moonee area north of Coffs Harbour to north-east of Grafton. eg. McRaes Knob; Pine Brush, Flaggy Ck area, north-west of Glenreagh, Conglomerate, Kangaroo River, Orara East & Wedding Bells SFs
High probability habitat: Wet sclerophyll forest.
Additional known habitat details Tall open forest & disturbed wet sclerophyll forest on clay soil over metasediments. Mean annual rainfall is c. 1500 millimetres. Alt from 5-500 metres.

Randia moorei 1 C

Distribution: North from Broken Head. eg. Brunswick Heads NR, Broken Hd NR, Stotts Is NR
High probability habitat: Rainforest.
Additional known habitat details: Subtropical, riverine & littoral rainforest in deep alluvial soils over basalt or shales or slates. Alt. to 500 metres.

Restio longipes 2 C

Distribution: From the Budawangs to the Blue Mountains. eg. Blue Mountains NP, Kanangra Boyd NP, Stingray Swamp FR, Budawang NP.
High probability habitat: Swamps or depressions in heath or dry sclerophyll forest.
Additional known habitat details: Sandy alluvium.

Sarcochilus fitzgeraldii 2 C

Distribution: Scattered distribution north from the Macleay River. eg. Dorrigo NP, Limpinwood NR, Mt Warning NP.
High probability habitat: Subtropical rainforest & brushbox forest.
Additional known habitat details: Often near streams, alt. between 500-700 metres. Flowers Oct - Nov.

Sarcochilus hartmannii 2 C

Distribution: Scattered northwards from near the Bellinger River. eg. Mt Warning NP, Nightcap NP.
High probability habitat: On rocks & rockfaces or the base of trees or cycads.
Additional known habitat details: In shallow humus on rocks, often occurring on exposed escarpments, from 500-100 metres alt. Substrates include basalt & greywacke. On boulders, cliff faces & escarpments, usually in quite exposed locations. Flowers Oct - Nov.

Sarcochilus weinthalii 2 C

Distribution: On coastal ranges north from the Richmond River.
High probability habitat: Rainforest or rainforest edge.
Additional known habitat details: On trees in dry rainforest between 400-700 metres alt, often at edges of clearings. Recorded on *Heritiera actinophylla*. Flowers Aug - Oct.

Senna acclinis 1 C

Distribution: North from Balgownie (Wollongong area). eg. Oxley Wild Rivers NP, Toonumbar NP, Cape Hawke, Richmond Range SF, Hallidays Point.
High probability habitat: Rainforest & wet sclerophyll forest.
Additional known habitat details: Littoral & subtropical rainforest, wet sclerophyll (*Eucalyptus grandis)* forest.

Sophora fraseri 2 B

Distribution: North from Casino district. eg. Toonumbar SF.
High probability habitat: Rainforest & wet & dry sclerophyll forest.
Additional known habitat details: In moist situations, often in or near subtropical & dry rainforest. Has been recorded from Eucalypt-Brushbox forest on ridge, & in mixed tall forest of Ironbark & Brushbox on a steep south facing slope on loam.

Styphelia perileuca 2 C

Distribution: Snowy Range & Round Mountain on the northern tablelands. eg. Cathedral Rock NP, New England NP.
High probability habitat: Sclerophyll forest.
Additional known habitat details: In open eucalypt forests (with *Eucalyptus dalrympleana, E. youmanii, E. radiata*) on broad ridges & gentle slopes at 1250-1500 metres alt. In dry sclerophyll forest on sandy soil or light brown sandy loam over granite. One record from heath on trachyte.

Symplocos baeuerlenii 2 C

Distribution: North from the Nightcap Range. eg. Boomerang Falls FR, Mt Warning NP, Nightcap NP, Numinbah NR.
High probability habitat: Rainforest & rainforest with a *Eucalyptus* species & *Lophostemon* overstorey.
Additional known habitat details: On rhyolite-derived clay soils & clays derived from metasediments in warm temperate rainforest & subtropical rainforest between 100-1000 metres alt. Associated species include *Cryptocarya erythroxylon, Sloanea woollsii, Ceratopetalum apetalum,* & *Callicoma serratifolia*.

Syzygium hodgkinsoniae 2 C

Distribution: North from the Richmond River. eg. Big Scrub FR, Boomerang Falls FR, Brunswick Hds NR, Inner Pocket NR, Limpinwood NR, Minyon Falls FR, Mt Warning NP, Nightcap NP, Numinbah NR.
High probability habitat: Rainforest & rainforest with *Lophostemon* overstorey.
Additional known habitat details:
Subtropical or gallery rainforest on rich alluvial soils.

Syzygium moorei 2 C

Distribution: North from the Richmond River. eg. Brunswick Heads NR, Stotts Is NR, Binna Burra; Mullumbimby.
High probability habitat: Rainforest.
Additional known habitat details: Riverine & gully rainforests at low altitude.

Tasmannia purpurascens 2 B

Distribution: Barrington Tops to Ben Halls Gap. eg. Barrington Tops NP, Gloucester River, Stewarts Brook & Ben Halls Gap SF.
High probability habitat: Wet sclerophyll forest & rainforest.
Additional known habitat details: In tall wet sclerophyll forest, subalpine woodland, & the ecotone between cool temperate rainforest & tall forest, between 1200-1600 metres alt. Sometimes occurs beside swamps or creeks. Recorded growing on chocolate brown kraznozem on basalt.

Tetratheca glandulosa 2 B

Distribution: North of Port Jackson. eg. Mangrove Mountain, Glenorie, Pennant Hills, Duffys Forest, McPherson SF, Yengo NP, Dharug NP, Ku-ring-gai NP.
High probability habitat: Dry woodland.
Additional known habitat details: Associated species include *Angophora bakeri, Eucalyptus gummifera, E. capitellata, Banksia serrata*. On ironstone gravel & shale.

Tetratheca juncea 2 A

Distribution: Bulahdelah to Lake Macquarie. Old records from Botany Bay & Port Jackson. eg. Awabakal NR, Glenrock SRA, Munmorah SRA, Lake Macquarie area, Bulahdelah SF, Walleroo SF, Awaba SF, Heaton SF.
High probability habitat: Heath & open dry sclerophyll forest.
Additional known habitat details: Sandy swampy areas, neutral clay soils, upper parts of ridges, southerly aspect. Associated species include *Angophora costata, E. capitellata, E. haemostoma*. Flowers Sept - Nov.

Thesium australe 2 C

Distribution: From Cabramurra to Queensland border. eg. Crowdy Bay NP, Hat Head NP, Kattang NR, Michelago & Cabramurra.
High probability habitat: Grassland or woodland.
Additional known habitat details: Wide range of substrates. Associated species include *Themeda triandra, Poa sieberiana, Eucalyptus rossii, E. blakelyi, E. mannifera, E. pauciflora.* Often in damp sites. Flowers spring - summer.

Triplariana nowraensis 1 C

Distribution: Nowra to Tomerong.
High probability habitat: Dry sclerophyll forest with a heathy understorey.
Additional known habitat details

Tylophora woollsii 1 C

Distribution: Clouds Creek area near Dorrigo.
High probability habitat: Wet sclerophyll forest.
Additional known habitat details: Recorded from brown clay over metasediments in wet sclerophyll forest between 10-750 metres alt. Flowers Jan - Feb.

Uromyrtus australis 1 C

Distribution: Nightcap Range. eg. Big Scrub FR, Nightcap NP, Rocky Ck, Whian Whian & Nullum SFs.
High probability habitat: Rainforest & wet sclerophyll forest.

Additional known habitat details: Recorded from warm temperate rainforest on shallow yellow soil over rhyolite in high rainfall areas from 400-770 metres alt. Often associated with *Ceratopetalum apetalum.* Also in warm temperate rainforest/wet sclerophyll forest ecotone.

***Zieria floydii* ms** 1 C

Distribution: Known only from the Guy Fawkes area. eg. Guy Fawkes River NP.
High probability habitat: Rainforest & dry sclerophyll forest with a possible record from wet sclerophyll forest.
Additional known habitat details: On the fringe of rainforest in hilly country.

Appendix 2: Potential habitat for threatened fauna listed in the Conservation Protocols

Introduction

Known habitat for the purposes of pre-logging fauna survey is defined as areas where there is a record of the species within two kilometres (except for Tiger Quoll and microchiropteran bats where the area within five kilometres of a record constitutes known habitat).

Potential habitat for the purposes of pre-logging fauna survey is defined as a combination of broader-scale to finer-scale habitat components as detailed in Appendix 2 of this document. Different information sources that are to be utilised when determining what constitutes "potential habitat" for any particular fauna species, including:

1. Geographic distribution (use maps in standard, current fauna texts or consult with the Australian Museum).
2. Interim Assessment Process expert fauna panel predicted distribution maps (see Table 1 below for species with models). Where model is not available use geographic distribution.
3. Macrohabitat definition.
4. Microhabitat definition.

A series of steps must be worked through when identifying the presence of potential habitat of a particular species within any one compartment. These steps work from the broader-area, distribution level down to the finer-scale, microhabitat definition. Each of the following steps needs to be worked through for each species listed in Appendix 2.

Step 1. Does the compartment lie within the geographic distribution of the species?

Step 2. Does the compartment contain any potential habitat as defined by the IAP expert fauna panel predicted distribution map OR where no IAP map is available does the compartment contain any potential macrohabitat habitat as defined in Appendix 2?

If Step 1 and 2 were answered yes, then pre-logging / pre-roading surveys are required for that species.

Step 3. Active searches should be concentrated, as far as operationally practical, within areas of suitable microhabitat.

Table 1: Threatened Fauna Species with IAP models

	Northern		**Central**		**Southern**		**Tumut**	
SPECIES	**Model**	**Maps**	**Model**	**Maps**	**Model**	**Maps**	**Model**	**Maps**
THREATENED FROGS								
Litoria brevipalmata	yes	yes	yes	yes (crude)				
Mixophyes balbus	yes	yes	yes	yes	yes	yes	yes	no
Mixophyes iteratus	yes	yes	yes	no				
Philoria kundagungan	yes	yes	no	no				
Philoria loveridgei	yes	yes	no	no				
Philoria sphagnicolus	yes	yes	no	no				
FLYING MAMMALS								
Black Flying-fox	yes	yes	no	no				
Common Bent-wing Bat *Miniopterus schreibersii*	yes	yes	no	no				

APPENDIX B – UPPER NORTH EAST: SCHEDULE 12

	Northern		Central		Southern		Tumut	
SPECIES	**Model**	**Maps**	**Model**	**Maps**	**Model**	**Maps**	**Model**	**Maps**
FLYING MAMMALS								
Golden Tipped Bat *Kerivoula papuensis*	yes	yes	no	no	yes	yes	yes	no
Great Pipistrelle *Falsistrellus tasmaniensis*	yes	yes	no	no				
Hoary Bat *Chalinolobus nigrogriseus*	yes	yes	no	no				
Little Bent-wing Bat *Miniopterus australis*	yes	yes	no	no				
Queensland Long-eared Bat *Nyctophilus bifax*	yes	yes	no	no				
NON-FLYING MAMMALS								
Brush-tailed Phascogale	yes	yes	no	no	yes	yes	yes	yes
Brush-tailed Rock Wallaby	yes	yes	no	no				
Long-nosed Potoroo	yes	yes	yes	no	yes	yes	yes	no
Long-footed Potoroo	na		no	no				
Parma Wallaby	yes	yes	yes	yes				
Red-legged Pademelon	yes	yes	no	no				
Rufous Bettong	yes	yes	no	no				
Southern Brown Bandicoot	na				yes	yes	yes	yes
Squirrel Glider	yes	yes	yes	yes	yes	yes	yes	yes
Tiger Quoll	yes	yes	yes	yes	yes	yes	yes	yes
Yellow-bellied Glider	yes	yes	yes	yes	yes	yes	yes	yes
NOCTURNAL BIRDS								
Marbled Frogmouth	yes	yes						
Powerful Owl	yes	yes	yes	yes	yes	yes	yes	yes
Sooty Owl	yes	yes	yes	yes	yes	yes	yes	no
Masked Owl	yes	yes	yes	yes	yes	yes	no	no
DIURNAL BIRDS								
Albert's Lyrebird	yes	yes	no	no				
Black-breasted Button-quail	yes	yes						
Bush Thick-knee	yes	yes	no	no				
Double-eyed Fig Parrot	yes	yes						
Glossy Black Cockatoo	no		no	no	yes	yes	yes	no
Olive Whistler	no	yes	no	no			yes	yes
Pink Robin			no	no			yes	yes
Regent Honeyeater					yes	yes	yes	Yes
Superb Parrot	no		no	no			yes	no
Swift Parrot	yes	yes	yes	no				
ADDITIONAL SPECIES								
Hoplocephalus bungaroides			yes	yes				
Hastings River Mouse	yes	yes	no	no				
Koala					yes	yes	yes	yes
Rufous Scrub-bird	yes	yes						
Queensland Tube-nosed Bat	yes	yes	no	no				
Queensland Blossom Bat	yes	yes	no	no				

Potential Habitat Descriptions

Species ***Schedule***

(i) Amphibians

Corroboree Frog ***Pseudophryne corroboree*** ***2***

Distribution: Australian Alps and Brindabella Ranges in southern NSW.
Macrohabitat: Montane and sub-alpine sclerophyll forests and woodlands, heath and grasslands >900 metres asl. Microhabitat: Breeding habitat is small, semi-permanent shallow pools, bogs and seepages. Also found under logs and vegetation besides creeks. Calls from with burrows, especially in sphagnum bogs.

Giant Burrowing Frog ***Heleioporus australiacus*** ***2***

Distribution: Coast and ranges from the central coast of NSW to eastern Victoria.
Macrohabitat: Found in very variable sites, and can be found on the forest floor at quite a distance from water. Mostly restricted to Hawkesbury sandstone areas.
Microhabitat: Typically around sandy creek banks. Lives in and calls from burrows of small creeks. Breeds adjacent to non-perennial stream beds in poorly drained areas.

Green and Golden Bell Frog ***Litoria aurea*** ***1***

Distribution: From Byron Bay along the east coast of NSW, to the Australian Capital Territory, and into east Gippsland, Victoria. Confined to narrow coastal strip (within 20-30 kilometres of coast).
Macrohabitat: No association with any particular forest type. Found in shallow, still or slow-moving water (both ephemeral and permanent), with a sand substrate and emergent vegetation, especially bullrushes. Often found in situations with a sunny aspect.
Microhabitat: Shelters under ground debris. Basks during daytime on emergent vegetation or near edge of water and is also active at night.

Green-thighed Frog ***Litoria brevipalmata*** ***2***

Distribution: From the Conondale Ranges in south-east Queensland down the NSW coast to Gosford.
Macrohabitat: Ephemeral pools, semi-permanent ponds and flooded grassy areas in or near wet sclerophyll forest, rainforest, riparian areas and *Melaleuca* swamps, however, some breeding records from dry sclerophyll forests.
Microhabitat: Forages in riparian habitats in leaf litter. Calls made from around pools, ephemeral streams and ditches.

Mixophyes fleayi, Mixophyes balbus **and** ***Mixophyes iteratus*** ***2***

Distribution:
Mixophyes fleayi: Mid to high elevations from the Conondale Range in south-east Queensland to the Upper Richmond River
Mixophyes balbus: Mid to high elevations from south of the Richmond River in far northern NSW, along the coastal catchments of NSW, and East Gippsland in Victoria.
Mixophyes iteratus: From south-east Queensland through eastern NSW to Narooma.
Macrohabitat: Rainforest and wet sclerophyll forest, with moist leaf litter, usually close to permanent running water. Disperses along forest floor during moist conditions and may be found some distance from permanent water, eg. ridge tops. *Mixophyes iteratus* is more prevalent at lower altitudes and in larger streams than its congeners, although has been recorded up to 1000 metres asl.
Microhabitat: Usually calls on, or under, the leaf litter along streambanks. *M. balbus* often call from rocks in rapidly flowing sections of streams.

New England Swamp Frog ***Litoria castanea*** ***1***

Distribution: The upper reaches of the Clarence, Macleay and Gwydir valleys.
Macrohabitat: Permanent ponds, dams, still backwaters of rivers, typically where beds of tall reeds occur, but also overhanging grassy banks where reeds are absent.
Microhabitat: Shelters under ground debris and fallen timber. Calls while floating in the water.

Peppered Frog ***Litoria piperata*** ***2***

Distribution: From the upper reaches of the Clarence and Macleay River valleys.
Macrohabitat: Known records are from dry sclerophyll forest >1000 metres asl, in close proximity to fast flowing streams. Also known from woodland areas with limited understorey of shrubby plants, especially where tea trees predominate along the creekline.
Microhabitat: Shelters in vegetation and under ground debris and fallen timber besides ponds and streams.

Philoria kundagungan*, *Philoria loveridgei* and *Philoria sphagnicolus ***2***

Distribution:
Philoria kundagungan: Washpool - Gibraltar Range and Urbenville areas, and Cunningham's Gap and Emu Creek in Queensland.
Philoria loveridgei: Murwillumbah to Urbenville area.
Philoria sphagnicolus: Dorrigo, Werrikimbe and Comboyne areas.
Macrohabitat: Rainforest and wet sclerophyll at mid to high altitudes. *Philoria loveridgei* is known from elevations as low as 240 metres asl. *Philoria sphagnicolus* has been recorded from altitudes 350-1 350 metres asl. In areas of high rainfall can occur some distance from streams in areas of impeded drainage.
Microhabitat: Occurs in saturated leaf-litter and mud in soaks, small creek beds, gully headwaters (ie. 1st and 2nd order streams). Calls from with burrows up to 15 centimetres deep. Surveys for *Philoria* species are best conducted in the late afternoon or very early morning, after rainfall and when leaf litter is moist.

Red-crowned Toadlet ***Pseudophryne australis*** ***2***

Distribution: Hawkesbury Sandstone country within 160 kilometres of Sydney.
Macrohabitat: Variety of habitats.
Microhabitat: Temporary creeks, gutters and soaks. Often found under rocks and logs. Recorded breeding in damp leaf litter and from the edge of dams. Calls made on the ground and from burrows.

Spotted Tree Frog ***Litoria spenceri*** ***1***

Distribution: Australian alps region and eastern Victoria.
Macrohabitat: Usually recorded in, or beside, fast-flowing rocky streams in wet and dry sclerophyll at altitudes above 300 metres.
Microhabitat: Often found among boulders and debris. Calls made from the ground or low vegetation.

(ii) Reptiles

Heath Monitor ***Varanus rosenbergi*** ***2***

Distribution: Two disjunct populations in the Sydney and Canberra regions.
Macrohabitat: Coastal heaths, humid woodlands, wet and dry sclerophyll forest, usually with a sandy substrate.
Microhabitat: Often lives under logs or rocks or in burrows. Terrestrial and diurnal.

(iii) Birds

Albert's Lyrebird ***Menura alberti*** ***2***

Distribution: Very restricted range, from the Lower Richmond valley, NSW to the Mistake Mountains and Mount Tamborine in south Queensland. There are unconfirmed reports of its occurrence further north in the Blackwall and Conondale Ranges.
Macrohabitat: Sub-tropical, warm temperate and cool-temperate rainforest and wet sclerophyll forest with dense vegetation, ground litter, logs and vines.
Microhabitat: Ground litter, vines, tall trees and ground logs or large boulders are critical habitat elements.

Black-breasted Button -quail ***Turnix melanogaster*** ***1***

Distribution: Patchily distributed in coastal and sub-coastal areas in south-east Queensland and far north-east NSW. In NSW it has been recorded in the Urbenville and Murwillumbah areas.
Macrohabitat: Occurs in dry rainforest, dry sclerophyll forest, regenerating vine forest dominated by eucalypts and the margins of sub-tropical rainforests, typically at elevations of 200-700 metres asl.
Microhabitat: Favours the edge of the forest, in small grassy clearings, or in tangled vines with thick cover. A dense canopy layer and dense ground cover are critical, with a layer of moist leaf litter present.

Black-throated Finch ***Poephila cincta*** ***1***

Distribution: Far northern inland NSW on the north-west slopes and plains.
Macrohabitat: Woodland savannah, open forested grasslands and riparian vegetation.
Microhabitat: Sparse eucalypt or paperbark canopy.

Bush Thick-knee ***Burhinus grallarius*** ***1***

Distribution: Widespread distribution in woodland habitats throughout Australia. Recent records from the coast and ranges of far northern NSW.
Macrohabitat: Dry, grassy open forest, woodland and forest edges. Usually found on flat terrain at low elevations.
Microhabitat: A nocturnal species, it usually lies hidden during the day. Forages in areas containing native grasses, with abundant leaf litter, fallen timber and logs are suitable habitat. The nest is a small scrape on bare ground, often near a bush or tree, or beside fallen limb.

Double-eyed Fig Parrot ***Psittaculirostris diopthalma coxeni*** ***1***

Distribution: Recorded from the Maryborough - Gympie district in Queensland to the Macleay River on the NSW mid north coast. In NSW, the species is found in the Urbenville and Murwillumbah, and has been recorded in the Tweed, Brunswick, Richmond and Clarence valleys.
Macrohabitat: Lowland sub-tropical rainforest and dry rainforest, from sea level to 900 metres asl.
Microhabitat: Areas where fig trees predominate.

Eastern Bristle-bird ***Dasyornis brachypterus*** ***2***

Distribution: Restricted to coastal south-east Australia, from the Conondale Range in south-east Queensland to eastern Victoria. There is a major geographic separation of 750 kilometres between populations in Border and Nightcap ranges in far northern NSW and near Kiama and Jervis Bay in south-east NSW.
Macrohabitat: In NE NSW it occupies a variety of heath or tussock grass habitats, usually on the boundary of woodland or forest.
Microhabitat: In NE NSW optimum habitat appears to be eucalypt forest with sorghum tussock grass understorey and high litter levels. Most territories are close to a rainforest refuge, with a number of fallen logs and a creek or gully. Calls mainly at dusk and dawn.

Gilbert's Whistler ***Pachycephala inornata*** ***2***

Distribution: Mostly west of the Great Dividing Range. West of the Darling, around Yathong and Round Hill Nature Reserves, between Dareton and Buronga and around Abbots Tank Rd. Also along the Murray River and extending east into the heather upper reaches of the Lachlan River.
Macrohabitat: Open eucalypt and mallee woodland. Preferred habitat appears to be mallee, often in association with spinifex, although is also uses shrubby mulga or taller eucalypt woodlands, Belah, riverine Black Box and Lignum.Recorded in Bimblebox / Pine or ironbark / pine woodlands where associated with a shrubby understorey.
Microhabitat: Occurs where mixed shrubs (especially *Melaleuca*) occur in dense stands.

Glossy Black Cockatoo ***Calyptorhynchus lathami*** ***2***

Distribution: Patchy distribution in a wide coastal band from Eungella, eastern Queensland, to Orbost, Victoria. In NSW it is found on the coast, tablelands and as far west as the Riverina and the Pilliga Scrub.
Macrohabitat: Occurs in a range of forest types with a canopy or understorey that includes *Allocasuarina* spp, which are its food source.
Microhabitat: The presence of *Allocasuarina* spp is an indicator of likely habitat. (*A. torulosa* and *A. littoralis* in NE NSW; *A. littoralis* in SE NSW.) Chewed cones beneath trees indicate the presence of the species in an area. Large, mature hollow-bearing trees are required for nesting.

Marbled Frogmouth ***Podargus ocellatus*** ***2***

Distribution: A very restricted range in the northern rivers of NSW and has been recorded from the Tweed, Brunswick, Richmond and Clarence valleys.
Macrohabitat: Associated with subtropical rainforest and wet sclerophyll forest with a well developed rainforest understorey, primarily at mid to low elevations.
Microhabitat: Usually found near gullies and creeks (particularly with stands of Bangalow Palms) as riparian vegetation is used for roosting and foraging, with adjacent forest also used for foraging. Extends upslope to ridges where mesic understorey present.

Masked Owl ***Tyto novaehollandiae*** ***2***

Distribution: Found south from Cooktown, Queensland to the Pilbara region in Western Australia. Found sporadically along the coast and tablelands of NSW.
Macrohabitat: Found in a wide range of forest types, including wet and dry sclerophyll and rainforest. Thought to prefer drier forests and woodlands in flat or undulating country, however, may favour inclusion of moist forested areas within. Prefers a mosaic of sparse and dense ground cover. Often roosts in rainforest gullies. Found across the range of topographic sequences.
Microhabitat: Forages in areas with an open understorey, feeding mainly on small and medium-sized terrestrial mammals, and occasionally small arboreal mammals. Roost and nest trees are typically mature eucalypts bearing large hollows, although there are a number of records of the species roosting in dense vegetation. Nests have been located in both live and dead eucalypts.

Olive Whistler ***Pachycephala olivacea*** ***2***

Distribution: Queensland to South Australia, and occurs across the altitudinal range from coastal to alpine areas. In NSW, found north of the Hunter River, NSW, extending just into the Lamington Plateau in far south-east Queensland. There are isolated populations in the Macpherson Range, New England NP, Mt. Boss and Barrington Tops areas, and possibly in the Gibraltar Range and Walcha-Nundle areas.
Macrohabitat: In NE NSW, cool temperate rainforest and cool, moist sclerophyll forest at elevations of >=800 metres asl. Also recorded in warm temperate and sub tropical rainforests. South of Sydney, the species inhabits rainforest, moist eucalypt forest, coastal, moist thickets and mountain scrubs.
Microhabitat: Areas with a dense, moist understorey,

Pink Robin ***Petroica rodinogaster*** ***2***

Distribution: Tasmania, eastern Victoria, NSW and the ACT. The population in NSW is confined to a relatively small area occurring primarily in the far south coast and ranges.
Macrohabitat: Cool temperate and warm temperate rainforest and their ecotones, montane moist and wet sclerophyll forests. Found at all altitudes. Shows a preference for mature forest structure, but has been found in younger moist forests and in drier forests during the cooler months.
Microhabitat: Ecotones may be important.

Powerful Owl ***Ninox strenua*** ***2***

Distribution: Found in the coastal areas and adjacent ranges of eastern Australia from the Victoria/South Australia border to Eungella in south-east Queensland. In NSW it is distributed throughout the length of the Great Dividing Range and also occurs on the western slopes.
Macrohabitat: Occurs in a range of vegetation types from woodland and open forest to rainforest. In NSW most commonly occurs in tall, wet or dry sclerophyll forests.
Microhabitat: Often found roosting in *Exocarpus* and rainforest gullies, or *Allocasuarina* groves, in stands with a dense canopy. It may utilise the drier portions of its home range for foraging. In forests, nest trees have been most commonly located at the head or sides of gullies. A large proportion of the diet is comprised of arboreal mammals.

Red Goshawk ***Erythrotriorchis radiatus*** ***1***

Distribution: Restricted to coastal and sub-coastal regions in northern and north-east Australia. Its range extends from the Kimberley's in Western Australia across the north-east coast to NSW. It is sparsely distributed in NSW from the Queensland border to the Hunter Valley. Most recent records are north of Nambucca Heads.
Macrohabitat: Coastal and sub-coastal regions at elevations from sea level to 1000 metres, but principally recorded from low elevations. It occurs in coastal and tropical savannahs, woodlands, open forests, gallery forests along watercourses, wetlands and the edge of rainforests.
Microhabitat: Tall trees within one kilometre of water are critical for nesting. Nests consist of sticks, twigs and green leaves in vertical or horizontal fork at least five metres above the ground.

Regent Honeyeater ***Xanthomyza phrygia*** ***1***

Distribution: Mainly in dry open-forest and woodland in areas of low to moderate relief on the inland slopes of the Great Dividing Range. The species also visits coastal southern areas and the north coast and tablelands.
Macrohabitat: Woodland to open forests <= 1000 metres asl. Box ironbark open forest and woodland communities.
Microhabitat: Important tree species are: in Mugga Ironbark *Eucalyptus sideroxylon*, White Box *E. albens*, Yellow Box *E. melliodora*, Yellow Gum *E. leucoxylon* and Blakely's Red Gum *E. blakelyi*, they are also known to feed on the flowers of mistletoe growing on River She-Oak *Allocasuarina cunninghamiana.* On the

central coast NSW they are known to feed on Swamp Mahogany *E. robusta* and Coastal Banskia *Banksia integrifolia*. In north-east NSW they are known to feed on Grey and Silverleaved Ironbarks *E. siderophloia* and *melanophloia*, and Spotted Gum *Corymbia maculata* et al.

Sooty Owl ***Tyto tenebricosa*** ***2***

Distribution: Coastal south-east Australia from the Conondale Range in south-east Queensland to eastern Victoria. Found throughout coastal NSW, generally east of the Great Dividing range.
Macrohabitat: Regarded as a specialist inhabitant of rainforest and tall open forest, however it is occasionally recorded foraging in adjacent dry sclerophyll forests. Roosts by day in dense gully vegetation such as rainforest, although the species will also roost in tree hollows, caves and rock overhangs. Requires large, hollow-bearing trees for nesting.
Microhabitat: Forages mostly in areas with a moist understorey, feeding predominantly on small arboreal mammals and terrestrial mammals. Nests in hollows of large eucalypts and rainforest trees, typically in the range of 125-160 centimetres dbh.

Superb Parrot ***Polytelis swainsonii*** ***2***

Distribution: Limited to northern Victoria and southern and western NSW as far north as Narrabri. Migrates to north-central NSW in autumn and winter. Found in the south-west all year round; and in central-north western mainly during winter. It also occurs on the south-west slopes of the Great Divide mainly in summer.
Macrohabitat: Woodland, riparian forests. Box woodlands are used for foraging.
Microhabitat: Nesting occurs in large, mature hollow-bearing trees, usually close to water.

Swift Parrot ***Lathamus discolor*** ***2***

Distribution: Tasmania, Victoria, New South Wales and south-east Queensland. In NSW it occurs along the Victorian border and extends up the coast and ranges to the Queensland border. It is found at elevations from sea level to 1000 metres asl near Tenterfield.
Macrohabitat: Dry sclerophyll lowland forests.
Microhabitat: Areas containing winter flowering species, particularly Boxes, Ironbarks and *Banksia integrifolia*. Relies on mature, hollow-bearing trees for nesting (Tasmania only).

Turquoise Parrot ***Neophema pulchella*** ***2***

Distribution: Principally in NSW, with the southern part of its range intruding into north-east Victoria and into the granite belt of south-east Queensland. In NSW, mainly found west of the escarpment in the tablelands and western slopes, extending to coastal districts through the dry forest corridor of the Hunter Valley, although it occurs widely through most of eastern NSW
Macrohabitat: Open woodlands and dry sclerophyll forests and adjacent grasslands, often in rocky, broken country. Also found along watercourses.
Microhabitat: Feeds on the ground, typically in small groups, primarily on grass and herb seeds. May favour ecotonal areas. Nests are seldom more than a metres or so above the ground and are in hollows in small trees, often dead eucalypts or in holes or stumps, fence posts, or even logs lying on the ground.

(iv) Mammals

Black-striped Wallaby ***Macropus dorsalis*** ***1***

Distribution: Distributed from near Townsville in north Queensland, south to northern NSW. In NSW it occurs west of the Great Dividing Range, in small remnant colonies and in the upper Clarence and western edge of the Richmond Vallies.
Macrohabitat: Occurs in a variety of forest types, including rainforest (particularly dry rainforests), wet sclerophyll forests, brigalow scrub, Lantana thickets and open forests with a dense understorey.
Microhabitat: A dense shrub layer for shelter appears to be critical, associated with open forest or grassland edges for night feeding.

Broad-toothed Rat ***Mastacomys fuscus*** ***2***

Distribution: Disjunct distribution throughout south-east Australia from northern NSW to western Tasmania. In NSW, known from the Barrington Tops area on the southern edge of the northern Tablelands. From this patchily through southern NSW, north-east and south Victoria.

Macrohabitat: Cool, moist areas, such as wet sclerophyll forests, woodlands, alpine and sub-alpine swamps, grasslands, sedgelands and heathlands. Appears to prefer high altitudes, although has been recorded at sea level (although not in NSW).
Microhabitat: A dense ground cover of grasses, sedges and shrubs appears to be critical, also a high level of ground moisture, mainly near creeks.

Brush-tailed Phascogale ***Phascogale tapoatafa*** ***2***

Distribution: From north of Rockhampton, south through NSW and Victoria, to the Mt Lofty Ranges in south-east South Australia, from near sea-level up to 1500 metres. North-east NSW appears to represent a stronghold.
Macrohabitat: Utilises a range of habitat types. Dry sclerophyll forest and woodlands <= 600 metres asl are preferred, usually with shrub understorey. The species has been found in coastal swamps, woodlands and heathlands, wet sclerophyll forest and cool temperate rainforest.
Microhabitat: Rough-barked dominated forests provide more suitable substrates for climbing than smooth-barked dominated forests. Nests and dens in tree hollows.

Brush-tailed Rock Wallaby ***Petrogale penicillata*** ***2***

Distribution: Restricted to south-east Australia from Nanango in southern Queensland, to the Grampians in western Victoria. It occurs as isolated and highly localised populations in the upper reaches of easterly flowing rivers between south-east Queensland and Gippsland in eastern Victoria, and as isolates in western Victoria and central NSW. In NSW, the species is concentrated around the Great Dividing Range.
Macrohabitat: Rocky areas with escarpments, ledges, caves, tumbled boulder fields and terraces, (Northerly aspects are favoured), in, or adjacent to wet and dry sclerophyll forest or woodlands, which in turn are in close proximity to grasslands, open, grassy forest or river flats. Also occasionally found in drier rainforest types.
Microhabitat: Shelters in rocky areas during the day and feeds in adjacent grasslands and riparian areas from dawn and dusk.

Eastern Quoll ***Dasyurus vivverinus*** ***1***

Distribution: Not verified in NSW since 1950s, when known from Sydney suburbs. Unconfirmed reports in recent years from the escarpment forests of the upper Macleay and Hasting Rivers and the Barrington Tops areas.
Macrohabitat: Variety of habitats, including dry sclerophyll forest, scrub and heathland.

Long-footed Potoroo ***Potorous longipes*** ***1***

Distribution: From south-east NSW to East Gippsland in Victoria, and near Mt. Buffalo in north-east Victoria.
Macrohabitat: Not well known. Recorded from variable sites, however many were comprised of moist vegetation types.
Microhabitat: A dense understorey component appears to be critical.

Long-nosed Potoroo ***Potorous tridactylus*** ***2***

Distribution: Disjunct distribution along coastal south-east Australia from near Gladstone in Queensland, to south-west Victoria and in Tasmania. Found from sea level up to 1500 metres in altitude. In NSW, it is found throughout coastal and subcoastal areas.
Macrohabitat: Potential habitat for this species is diverse: coastal forest and woodland with a moderately dense heathy understorey, dense coastal scrubs, wet and dry sclerophyll forest and sub-tropical, warm temperate and cool temperate rainforest of the eastern slopes and highlands. Often associated with gullies and forest ecotones.
Microhabitat: Open areas are used for foraging while areas of dense ground cover / understorey provide areas for shelter and protection from predators. Feeds on fungi, moving up and down slope as they become seasonally available in these areas.

Parma Wallaby ***Macropus parma*** ***2***

Distribution: Now extinct south of Gosford, and confined to high rainfall areas in the coast and ranges of central and northern NSW; from the Watagan Mountains to the Richmond and Border Ranges area, with the Washpool-Gibraltar Range and Bulga-Dingo Tops areas being areas of greatest importance.

Macrohabitat: Potential habitat is wet sclerophyll forest and rainforest patches in moist sclerophyll forest, with a moist shrubby understorey, often associated with grassy areas. They are occasionally found in dry sclerophyll forest and rainforest edges are considered important refugia. Ecotones between open and closed forest are favoured.
Microhabitat: Open areas are used for foraging, while areas of dense ground cover / understorey provide areas for shelter and protection from predators.

Red-legged Pademelon ***Thylogale stigmatica*** ***2***

Distribution: Restricted to the coastal and subcoastal strip of eastern Australia, from the tip of Cape York in north Queensland, south to the Hunter Valley, just north of Newcastle in NSW. Populations are confined mainly to areas of high rainfall.
Macrohabitat: Coastal and sub-coastal rainforests and wet sclerophyll forest. Dense understorey and ground cover is important. Ecotones between open and closed forest are favoured.
Microhabitat: Open areas are used for foraging while areas of dense ground cover / understorey provide areas for shelter and protection from predators.

Rufous Bettong ***Aepyprymnus rufescens*** ***2***

Distribution: From Cooktown in north Queensland, to north-east NSW, where it occurs east of the Dividing Range. In Queensland, it still occurs on both sides of the Great Divide.
Macrohabitat: Found in a variety of forest types from wet sclerophyll to dry open woodland, where grass tussocks or fallen timber are present. Also known to occupy a mosaic of open forest and grasslands.
Microhabitat: It appears to prefer a more open forest structure, with an sparse shrub layer and a diverse ground cover. Builds nests in grass tussocks and under logs. Strongly associated with dry sclerophyll forest particularly those dominated by Spotted Gum.

Smoky Mouse ***Pseudomys fumeus*** ***1***

Distribution: From a relatively small number of sites in western, southern and eastern Victoria, south-east NSW and the ACT, with a very disjunct distribution which includes both coastal and montane sites.
Macrohabitat: Dry sclerophyll or heathland with diverse understorey. Associated primarily with ridge-top sites.
Microhabitat: Areas containing a high diversity of seed-bearing legumes and fruiting epacrids and a high number of rocks or fallen logs.

Southern Brown Bandicoot ***Isoodon obesulus*** ***1***

Distribution: Restricted to areas around Sydney and the far south-east coastal area.
Macrohabitat: Dry sclerophyll forests with heathy understorey, heathlands, woodlands and grasslands. Found in all aspects of the topographic sequence.
Microhabitat: Areas with dense, low ground cover.

Squirrel Glider ***Petaurus norfolcensis*** ***2***

Distribution: Restricted to mainland eastern Australia. In NSW, it occurs on either side of the Great Divide, with coastal records from south of Sydney to the Queensland border, and extends as far west as the Coonabarabran area.
Macrohabitat: Dry, open forest and woodland with high nutrient soils, where high nectar-producing eucalypts and flowering shrubs are present. Inhabits open, xeric forests and woodlands and is generally absent from mesic, closed forests, however, in north-east NSW and south-east Queensland it occurs in some wet forest areas bordering on rainforest.
Microhabitat: The generas *Banksia*, *Xanthorrhoea* and *Acacia* provide important food resources. Nests and dens in tree hollows.

Tiger Quoll ***Dasyurus maculatus*** ***2***

Distribution: From the Bundaberg area in south-east Queensland, south through NSW to western Victoria and Tasmania. In NSW, it occurs on both sides of the Great Dividing Range and north-east NSW represents a national stronghold.
Macrohabitat: Wide range of forest types, although appears to prefer moist forest types and riparian habitat. Most common in large unfragmented patches of forest. It has been recorded from dry sclerophyll forest, open woodland and coastal heathland, and despite its occurrence in riparian areas, it also ranges over dry ridges. Generally nocturnal, although it may sometimes hunt during daylight

Microhabitat: Potential den sites include small caves, rocky crevasses, boulder fields, stags, hollow tree bases and hollow logs. Latrine sites are often areas of exposed rock with a sparse ground cover which show evidence of regular use, however large fallen logs are also used occasionally.

Yellow-bellied Glider ***Petaurus australis*** ***2***

Distribution: From east of Melbourne in Victoria, to Sarina near Mackay in central-northern Queensland, occupying coastal forests and adjacent subcoastal forests of mid-to-high elevations and the dry and moist escarpment forests in north-east NSW.
Macrohabitat: Moist and dry sclerophyll forest where suitable floriferous and sap providing eucalypt species are present. Often commonly associated with the ecotones between wet and dry sclerophyll forests where there is a high diversity of tree species.
Microhabitat: Forests containing winter flowering species and smooth-barked species with decorticating bark. Feeds on sap from incisions made in the bark of suitable trees, leaving distinctive V-shaped (and other shaped) marks on bark. Often such trees are heavily marked. Large, mature hollow-bearing trees are required for denning and breeding.

(v) Bats

Beccari's Mastiff Bat ***Mormopterus beccarii*** ***2***

Distribution: Across northern Australia from Western Australia to Queensland. The species is regionally rare, with few records in NSW. Recorded from Clybucca to Queensland border.
Macrohabitat: Records mainly from dry sclerophyll forest and woodlands, but little is known of its habitat preferences.
Microhabitat: The few records of roost sites of this species are in hollows in trees and under the roofs of houses.

Black Flying-fox ***Pteropus alecto*** ***2***

Distribution: Found in northern parts of Western Australia and the Northern Territory, Queensland. It has a primarily coastal distribution in north-east NSW south to Bellinger River.
Macrohabitat: Roosting in camps, often with Grey-headed Flying-fox, typically in lowland rainforest and swamp forest. Forages in rainforest, heaths, coastal scrub, sclerophyll forests and woodlands.
Microhabitat: Feeds on fruit and nectar, with preference for fruit.

Common Bent-wing Bat ***Miniopterus schreibersii*** ***2***

Distribution: Eastern Australia, from north Queensland to far south-east South Australia. Isolated subspecies occur in northern Northern Territory and northern Western Australia. Widely distributed throughout north-east and south-east NSW, where it is widespread and common, although less abundant at low elevations in far north-eastern NSW
Macrohabitat: Rainforest, wet and dry sclerophyll forest, and woodland.
Microhabitat: This species roosts in high humidity caves, and roost selection varies in response to seasonal and yearly climatic variations. The species forages for flying invertebrates, possibly above the tree canopy.

Eastern Little Mastiff-bat ***Mormopterus norfolcensis*** ***2***

Distribution: From far south-east Queensland, south to Pambula in eastern NSW. All records are east of the Dividing Range. The species is known from less than about 15 widely scattered localities within its range, and appears to be sparse and localised in NSW. Recorded from the lower north coast and ranges.
Macrohabitat: Habitat requirements are poorly defined, but records occur mainly from low elevation dry sclerophyll forest and woodlands, with some from rainforest.
Microhabitat: Known to roost in tree hollows.

Golden-tipped Bat ***Kerivoula papuensis*** ***2***

Distribution: Disjunct distribution in eastern Australia from Cape York Peninsula south to southern NSW. Although widely distributed, the species appears to be localised and sparse.
In NSW the species is known from sites from coastal areas to the escarpment of the Dividing range, where it has been recorded at altitudes of up to 1000 metres. Most records from NSW are from the north-east region, but it has been recorded as far south as the Bega area.
Macrohabitat: Rainforest, wet sclerophyll forest with rainforest understorey, wet and dry sclerophyll forests adjacent to rainforest. Has also been recorded in dry sclerophyll forest at distances from rainforest.

Microhabitat: Roost requirements are poorly known, but the species has been recorded roosting in dense clumps of vegetation, scrubwren and gerygone nests, and tree hollows. Has an unusual diet, which includes orb weaving spiders.

Greater Broad-nosed Bat ***Scoteanax rueppellii*** ***2***

Distribution: From southern NSW through to south-east Queensland in the Atherton Tablelands region and has a sparse, but wide, distribution in north-east NSW. Most records in NSW are east of the Great Dividing Range.
Macrohabitat: Records exist from sclerophyll forests, woodlands (more commonly) and also rainforests.
Microhabitat: Known to roost in tree hollows.

Greater Long-eared Bat ***Nyctophilus timoriensis*** ***2***

Distribution: From southern Queensland, through inland NSW and northern Victoria, to south-east South Australia. Likely to be restricted to drier habitats on the western side of the Great Dividing Range. In north-east NSW the only record is from the Wingham area.
Macrohabitat: Semi-arid woodland and dry sclerophyll forest and woodland.
Microhabitat: It roosts in tree hollows and under exfoliating bark

Great Pipistrelle ***Falsistrellus tasmaniensis*** ***2***

Distribution: Extends from south-east Queensland to western Victoria and Tasmania. In north-east NSW it is mainly restricted to higher elevation forests.
Macrohabitat: Known from rainforest, wet and dry sclerophyll forests.
Microhabitat: It roosts in tree hollows with a few records of this species roosting in caves. The species forages on moths, beetles and ants, around or just below the tree canopy.

Hoary Bat ***Chalinolobus nigrogriseus*** ***2***

Distribution: Widely distributed throughout Queensland to far northern NSW. In NSW, the lowland dry open forest and woodland of the Clarence and Richmond River valleys appear to be the stronghold. Occurs south to Clybucca.
Macrohabitat: Appears to be restricted to mid to low elevation dry open forests and woodlands, although habitat requirements have not been studied.
Microhabitat: It is known to roost in tree hollows and has not been reported roosting in caves or mine tunnels in NSW.

Large-footed Myotis ***Myotis adversus*** ***2***

Distribution: Represents a species complex ranging eastern Australia from far south-east South Australia, Victoria, New South Wales, Queensland, northern parts of the Northern Territory and northern Western Australia. It is widespread in north-east NSW where three species may occur.
Macrohabitat: Riparian and coastal forests from low to mid elevation.
Microhabitat:. Foraging is associated with streams, reservoirs and estuarine environments either over the water surface and possibly over adjacent riparian vegetation. Roosts in caves, disused mine tunnels, culverts and under bridges, but is also known to roost in tree hollows.

Large Pied Bat ***Chalinolobus dwyeri*** ***2***

Distribution: Restricted distribution from south central Queensland to central and northern New South Wales and is localised and uncommon throughout its range. It has been recorded in the Richmond and Nightcap Ranges and on the central coast, near Singleton.
Macrohabitat: Rainforest, wet sclerophyll forest to dry sclerophyll forest and woodland habitats.
Microhabitat: Roosts in caves, disused mine tunnels and rock overhangs such as in sandstone areas. Unlike other cave dwelling species, it has not been recorded roosting in large numbers.

Little Bent-wing Bat ***Miniopterus australis*** ***2***

Distribution: Eastern Queensland from Cape York to northern NSW, as far south as Newcastle. In NSW it is largely restricted to the subtropical coastal areas in the north-east of the State. Two sub-populations appear to be present in northern NSW, one highland and the other lowland.
Macrohabitat: Rainforest, wet sclerophyll forest, dense coastal scrub and other habitat with dense understoreys.

Microhabitat: *Miniopterus australis* utilises caves for roosting, maternity sites and hibernation. The species forages between shrub and canopy layers of densely wooded areas.

Queensland Long-eared Bat ***Nyctophilus bifax*** ***2***

Distribution: From Cape York Peninsula to far north coastal NSW. All records in NSW are near the coast, where it has a localised distribution south to Woolgoolga.
Macrohabitat: Found predominantly in association with mid to low elevation rainforest in NSW but has also been recorded from wet and swamp sclerophyll forests, and is found commonly in riparian habitats.
Microhabitat: Roost sites include tree hollows, under loose bark, and among epiphytes and palm fronds. Individuals utilise a range of roosts in close proximity and tend to change roost sites nightly. The species feeds on invertebrates both flying and in foliage.

Troughton's bat ***Vespadelus troughtoni*** ***2***

Distribution: Throughout eastern Queensland and eastern NSW, inland to central NSW.
Macrohabitat: Precise habitat requirements unknown. Most records are from dry sclerophyll forests and woodlands often associated with sandstone escarpments.
Microhabitat: Roosts in caves, crevices in cliffs, rock outcrops.

Yellow-bellied Sheathtail Bat ***Saccolaimus flaviventris*** ***2***

Distribution: Across northern Australia north of the Tropic of Capricorn, extending south through western NSW to Victoria and eastern South Australia. In NSW it is know from relatively few dispersed localities, distributed over most of the State from coastal to far western districts, extending further west in the north of the state, and has also been recorded in south-east NSW near Queanbeyan.
Macrohabitat: Forages over a wide range of forest types including rainforest, moist hardwood forest and dry sclerophyll forest, and also occurs in mallee, woodland and open country.
Microhabitat: Roosts in tree hollows and is thought to forage widely above the forest canopy for flying insects.