

Coastal Integrated Forestry Operations Approval – Protocols

Consultation draft

May 2018



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CHAPTER 1: SCOPE AND INTERPRETATION

Scope and interpretation

1.1 Scope

- (1) These *protocols* support various requirements in the *approval*. The general context of each requirement is set out in the 'Introduction' to each *protocol*.
- (2) The *protocols* must be read in conjunction with the *approval* and with any relevant statutory provisions.

1.2 Interpretation

- (1) The interpretation rules in Part 1 of Schedule 1 of the *approval* apply in the interpretation of these *protocols*.
- (2) Words printed in bold and italics in this document are defined in **Protocol 39: Definitions**.

CHAPTER 2: ADMINISTRATIVE PROTOCOLS

Protocol 1: Registers

1.1 Introduction

- (1) This **protocol** supports the provisions of Chapter 2, Division 1 of the **approval** which requires **FCNSW** to keep an **operations register**, **compliance register** and **complaints register**.

1.2 Operations register

- (1) **FCNSW** must keep a register of any of the following **forestry operations** which **FCNSW** plans to commence, has commenced, or has **completed**:

- (a) **harvesting operations**;
- (b) road **construction**;
- (c) road **upgrading**;
- (d) **pre-harvest burns**;
- (e) **post-harvest burns**; and
- (f) **regeneration** activities.

- (2) The **operations register** must include the following information for each relevant **forestry operation**:

- (a) **operational area** including a copy of the **operational map** and **location map** for the **forestry operation**;
- (b) event ID;
- (c) **Coastal IFOA Subregion**;
- (d) **State Forest** name;
- (e) **compartment** numbers and **coupe** numbers (where applicable);
- (f) type of active or proposed **forestry operation** and, for each operation:
 - (i) the actual or proposed date of commencement;
 - (ii) any dates on which the operation temporarily ceased and recommenced; and
 - (iii) if relevant, the date of **completion**;
- (g) for a **harvesting operation** or **regeneration activity**, the year of commencement of the previous **harvesting operation** or **regeneration activity** in the **operational area**;
- (h) the intensity of any **forestry operation** (**selective harvesting**, **intensive harvesting**, **alternate coupe logging** and **mixed intensity harvesting**), including the estimated **average basal area** the stand will be reduced to;
- (i) the **inherent hazard level**;
- (j) the total length of all new **roads** to be **constructed**;
- (k) the length of new **roads** to be **constructed** with a grade greater than 10 degrees;

- (l) the length of new **roads** to be **constructed** on slopes greater than 30 degrees;
 - (m) the number of new **drainage feature crossings** to be **constructed**; and
 - (n) the number of existing **drainage feature crossings** in the **operational area**.
- (3) **FCNSW** must update the **operations register** to record that a **forestry operation** has temporarily ceased when field-based activity for that **forestry operation** has stopped and machinery has been temporarily removed from the **operational area**.
- (4) **FCNSW** must update the **operations register** to record that a **forestry operation** is taken to be completed when field-based activities are complete across the **operational area** and no further work under the **operational plan** will be undertaken in the **operational area**.
- (5) **FCNSW** must review the currency of any **operational plan**, and update it to include any new **species-specific conditions** for fauna and **species-specific conditions** for flora for any **forestry operation** that has been temporarily ceased for six months or longer.
- (6) **FCNSW** must update the **operations register** as necessary by the first business day of each calendar month and provide the **EPA** and **DPI** with full access to the **operations register** on that date.
- (7) **FCNSW** may also update the **operations register** from time to time as required and must update the **operations register** if there is an adjustment to the location and times set out in an **annual plan** or **operations register** if it is required to respond to particular circumstances (including, but not limited to, prolonged periods of wet weather, fire events and market factors).

1.3 Compliance register

- (1) **FCNSW** must enter the following information into the **compliance register** within 14 days of it becoming aware of a non-compliance with the conditions of the **approval**:
- (a) the **approval** condition not complied with;
 - (b) date, time and duration of the non-compliance;
 - (c) date that **FCNSW** became aware of the non-compliance;
 - (d) if a location is applicable, the exact location of the non-compliance;
 - (e) name of person who caused the non-compliance;
 - (f) nature of the non-compliance;
 - (g) cause of the non-compliance;
 - (h) if the non-compliance resulted in actual or potential **harm to the environment**;
 - (i) what action was taken, is being taken, or will be taken to mitigate any adverse impacts of the non-compliance; and
 - (j) what action was taken, is being taken, or will be taken to prevent recurrence of the non-compliance.

1.4 Complaints register

- (1) **FCNSW** must enter the following information into the **complaints register** within five days of receiving a complaint described in condition 38 of the **approval**:

- (a) date and time of the complaint;
 - (b) method by which the complaint was lodged;
 - (c) name, address and telephone number of complainant and/or further contact person;
 - (d) name of person receiving the complaint;
 - (e) nature of the alleged non-compliance;
 - (f) conditions of the **approval** not complied with;
 - (g) follow-up action taken by **FCNSW**;
 - (h) precise location of the alleged breach or **harm to the environment**;
 - (i) description of the alleged **harm to the environment**;
 - (j) where relevant, **waters** said to be polluted; and
 - (k) where relevant, substance said to cause **pollution**.
- (2) **FCNSW** must provide any information in the **complaints register** to the **EPA** and **DPI** upon request.

Protocol 2: Annual plan of forestry operations

2.1 Introduction

- (1) This **protocol** supports condition 39.1 in Chapter 2, Division 2 of the **approval**, which relates to the preparation of an **annual plan**.

2.2 Requirement for submission of an annual plan

- (1) **FCNSW** must submit a copy of the **annual plan** to the **EPA** and **DPI** on or before 20 June of the current year.

2.3 Content of the annual plan

- (1) The **annual plan** must include the information set out in condition 2.3(2) below for the following **forestry operations** which it proposes to carry out in the coming year:

- (a) **harvesting operations**;
- (b) **road construction**;
- (c) **pre-harvest burns**;
- (d) **post-harvest burns**; and
- (e) **regeneration** activities.

- (2) The **annual plan** must specify the following matters:

- (a) the type of each proposed **forestry operation**;
- (b) the intended location of each proposed **forestry operation**, by reference to:
 - (i) State Forest name and compartment number;
 - (ii) management zone and harvesting zone; or
 - (iii) in the case of **Crown-timber land** that is not **State Forest**, other identifying particulars;
- (c) the expected start and finish months for each proposed **forestry operation**;
- (d) for proposed **harvesting operations**:
 - (i) whether the operation is intensive harvesting, selective harvesting, alternate coupe logging or mixed intensity harvesting, and
 - (ii) whether the estimated total volume (combined productions) per hectare to be removed from each compartment or track is High, Medium or Low, as per the following table:

Class	Estimated total volume
High	Greater than 80 cubic metres per hectare
Medium	Between 30–80 cubic metres per hectare

Low	Less than 30 cubic metres per hectare
-----	---------------------------------------

- (e) where **intensive harvesting, alternate coupe logging or mixed intensity harvesting** is proposed, the year in which the most recent **harvesting operation** was conducted in each **coupe** adjoining a **coupe** in which an **intensive harvesting operation or alternate coupe logging operation** is proposed to be carried out; and
- (f) the year in which the most recent **harvesting operation** was conducted in each **compartment** in which a **forestry operation** is proposed to be carried out.

2.4 Variation to an annual plan

- (1) **FCNSW** may only make an adjustment to the location and time periods set out in an **annual plan** if it is required to respond to particular circumstances (including, but not limited to, prolonged periods of wet weather, fire events or market factors); and
- (2) **FCNSW** must provide the **EPA** a copy of the amended **annual plan**.

2.5 The annual plan must demonstrate planning to reduce cumulative impact

- (1) The **annual plan** must demonstrate that **FCNSW** has planned proposed **forestry operations**, including the location and timing of those operations, to reduce the cumulative impacts of **forestry operations** in the **Coastal IFOA Region**.

Protocol 3: Operational tracking

3.1 Introduction

- (1) Condition 46 in Chapter 2, Division 4 of the **approval** requires **FCNSW** to record its operations in accordance with this **protocol**.
- (2) For the purposes of condition 46 of the **approval**, **FCNSW** must keep a copy of the information required in this **protocol** on site while conducting a **forestry operation** within a **compartment**.

3.2 Information to be recorded for all forestry operations

- (1) **FCNSW** must record the following information for each **forestry operation**:
 - (a) the date of commencement and date of **completion** of the **forestry operation**;
 - (b) the date, details, location and extent of any non-compliance with a condition of the **approval** in the course of carrying out the **forestry operation**;
 - (c) any action undertaken to remedy or restrain the actual or potential harm associated with a non-compliance with a condition of the **approval**;

*Note: All non-compliance records must be incorporated into the **compliance register**.*

 - (d) the supervisory or monitoring arrangements of **authorised persons**, sufficient to verify compliance with condition 25.3(d) of the **approval**; and
 - (e) details of any **subject species**, **threatened species** or **habitat features** located during the **forestry operation** and the location of any associated **ESA** or other required protection.

3.3 Specific information to be recorded for harvesting operations

- (1) **FCNSW** must record the following information for each **harvesting operation**:
 - (a) the progress of the **harvesting operation** across the **net harvest area** on an **operational map**;
 - (b) the dates of commencement and **completion** for:
 - (i) a harvesting operation at a log dump;
 - (ii) construction, upgrading or maintenance of each road;
 - (iii) construction, upgrading or maintenance of each road crossing;
 - (iv) construction, upgrading or maintenance of each track crossing; and
 - (v) construction, use and removal (including for drainage feature stabilisation and rehabilitation) of a temporary log crossing;
 - (c) details required by **Protocol 33: Work health and safety and accidentally felled trees** in relation to accidentally felled trees and trees felled to comply with the **WHS Act**;
 - (d) the location and identification of **retained trees**;
 - (e) the location of **patches**, **wildlife habitat clumps** and **tree retention clumps**;

- (f) each instance where saturated soils prevent permanent stabilisation measures from being implemented for areas that are disturbed in a **drainage feature, riparian exclusion zone** or **ground protection zone**;
- (g) records of native forest biomaterial sourced from the harvesting operation;
- (h) records of assessments for Koalas as a demonstration of the application of condition 82; and
- (i) details of coarse woody debris management decisions as required by **Protocol 17: Fish passage**.

3.4 Specific information to be recorded for pre- and post-harvest burning

- (1) **FCNSW** must record the following details on each day of a **pre-harvest burn** and **post-harvest burn** and on the day after the **burn event** is **complete**:
 - (a) the name of each person undertaking the burn and their role and responsibility;
 - (b) where the **burn event** incurs into an **ESA**:
 - (i) the location, extent, severity and intensity of the incursion; and
 - (ii) the reasons why the incursion occurred;
 - (c) the weather across the fire ground, as collected at a frequency to ensure that representative weather conditions are captured (being a frequency no less than once every four hours on each day of the **burn event** from the time of first ignition until the **burning operations** are concluded for the day), including:
 - (i) fire indices readings for each day of the **burn event**;
 - (ii) the name of the person taking the readings;
 - (iii) the date and time readings were taken; and
 - (iv) the location where the reading was taken.

3.5 Specific information to be recorded for a forest products operation

- (1) **FCNSW** must record the following information for each **forest products operation**:
 - (a) the progress of the **forest products operation** across the **net harvest area** mapped on an **operational map**;
 - (b) the dates of commencement and **completion** of the **forest products operation** within each **compartment**; and
 - (c) the type and amount of each **forest product** removed from each **compartment**.

3.6 Specific information to be recorded for regeneration remedial actions

- (1) **FCNSW** must record the following information for each **forestry operation** carried out for the purposes of promoting **regeneration**:
 - (a) the progress of any **regeneration remedial action** across the **net harvest area** mapped on an **operational map**;

- (b) the dates of commencement and **completion** of any **regeneration remedial action** within each **compartment**; and
- (c) the results of any assessment of achievement of **regeneration** standards conducted for the purposes of **Protocol 37: Regeneration and stocking**.

CHAPTER 3: PLANNING PROTOCOLS

Protocol 4: Pre-operational plans

4.1 Introduction

- (1) Condition 60 in Chapter 3, Division 4 of the **approval** requires the preparation of an **operational plan**, **location map** and an **operational map** for proposed **forestry operations**, in accordance with this **protocol**, for the purposes of the **pre-operational plan**.
- (2) This **protocol** sets out content requirements, as follows:
 - (a) **operational plan** requirements, being:
 - (i) general requirements; and
 - (ii) specific requirements relating to **harvesting**, **roading**, burning, **forest products operations** and **regeneration remedial actions**;
 - (b) **location map** requirements; and
 - (c) **operational map** requirements.

4.2 Operational plans

- (1) Template for **operational plans**
 - (a) **FCNSW** must:
 - (i) prepare an **operational plan** template based on the requirements in this **protocol**; and
 - (ii) use the template when preparing **operational plans** under this **protocol**.
- (2) General **operational plan** requirements
 - (a) An **operational plan** must include the following details of the **operational area** in which a **forestry operation** is proposed to be conducted:
 - (i) description of the **operational area**;
 - (ii) event ID;
 - (iii) type of **forestry operation** proposed;
 - (iv) each **State Forest** name and **compartment** number;
 - (v) for **Crown-timber land** that is not **State Forest**, identifying features such as Lot and DP and/or Lease number; and
 - (vi) local landscape area requirements; and
 - (vii) **NSW BioNet** update requirements, including a list of all plant and animal species records that occur in the **operational area** (inclusive of **BioNet** Sighting Keys).
 - (b) **FCNSW's operational plan** must include all information prepared for **forestry operations** in accordance with any **protocol** in:
 - (i) Chapter 3: Planning protocols; and

- (ii) Chapter 4: Operational planning and implementation protocols.
- (c) If **FCNSW** proposes a **forestry operation** in any area within the **known habitat** or **potential habitat** of a **species**, the **operational plan** must include the requirements of:
 - (i) any **flora road management plan** required to be implemented during the **forestry operation** in the **operational area** for that species under condition 90 of the **approval**;
 - (ii) any **species management plan**:
 - (A) required for that species under condition 91.1(a) and (b) of the **approval**; and
 - (B) identified under condition 91.1(c) of the **approval** to be applied for a particular **species** in all or a part of its range.
 - (d) If the **forestry operation** is a **harvesting operation**, **burning operation** or **roading** in an **operational area** with **known habitat** or **potential habitat**, the **operational plan** must also include the results of the surveys required under **Protocol 20: Pre-operational surveys**.
- (3) Specific **operational plan** requirements for harvesting
 - (a) An **operational plan** for a proposed **harvesting operation** must include the following additional details:
 - (i) event ID;
 - (ii) planned intensity of the harvesting operation (**selective harvesting**, **intensive harvesting**, **mixed intensity harvesting** or **alternate coupe logging**) in accordance with Chapter 3, Division 2 of the **approval**;
 - (iii) information to demonstrate that the planned intensity of the **harvesting operation** complies with the harvesting intensity requirements in Chapter 3, Division 2 of the **approval**;
 - (iv) information to demonstrate that the **harvesting operation** is authorised by the **approval** as set out in condition 13.1(a)(i) to (vi) of the **approval**;
 - (v) each tree species that will be targeted for removal as **timber products** as this will inform **regeneration** activities;
 - (vi) estimated quantity of timber that will be yielded in the following categories.
 - (A) **high quality large sawlogs** and **large veneer logs**;
 - (B) **high quality small sawlogs** and **small veneer logs**;
 - (C) **poles**, **piles** and **girder logs**;
 - (D) **low quality timber**;
 - (E) **pulp grade timber**; and
 - (F) **heads** and **offcuts**;
 - (vii) areas where **seasonality** restrictions apply as determined in accordance with **Protocol 12: Seasonality restrictions**;

- (viii) **soil regolith** assessment (including distribution of **soil regolith** types) completed in accordance with **Protocol 15: Inherent soil erosion and water pollution hazard assessment**;
- (ix) **inherent hazard level** assessment completed in accordance with **Protocol 15: Inherent soil erosion and water pollution hazard assessment**;
- (x) occurrence and distribution of:
 - (A) **dispersible soils** as determined in accordance with **Protocol 11: Soil dispersibility assessment**;
 - (B) existing or potential **mass movement hazard** as determined in accordance with **Protocol 13: Mass movement assessment**; and
 - (C) any historical or existing erosion;
- (xi) where a risk of occurrence or susceptibility to **Bell Miner associated dieback** has been identified for the purposes of condition 4.2(7)(a)(v), details of each management action to be implemented in the **operational area** to mitigate the impact or further spread of **Bell Miner associated dieback**;
- (xii) each site-specific measure and technique for the **operational area** prepared in accordance with **Protocol 9: Pre-operational road and crossing assessments**;
- (xiii) each **species-specific condition** to be applied to the **forestry operation** in accordance with Chapter 4, Divisions 4 and 5 of the **approval**;
- (xiv) each **site-specific biodiversity condition** prepared under **Protocol 31: Species covered by the approval** which applies to the **operational area**;
- (xv) each **site-specific research condition** relevant to the **operational area** as approved under **Protocol 5: Approvals for restricted activities**.
- (xvi) each **site-specific limit condition** issued under **Protocol 7: Harvesting limits**;
- (xvii) the information required to be obtained, recorded or reported in relation to a **forestry operation** required by applying the following **protocols**:
 - (A) **Protocol 20: Pre-operational surveys**;
 - (B) **Protocol 21: Species management plan**;
 - (C) **Protocol 22: Wildlife habitat and tree retention clumps**;
 - (D) **Protocol 23: Tree retention**;
 - (E) **Protocol 24: Identification of old growth on unassessed land**;
 - (F) **Protocol 25: Identification of rainforest on unassessed land**;
 - (G) **Protocol 26: Identification of large forest owl exclusion zones on unassessed land**;
 - (H) **Protocol 27: Threatened ecological communities**;
 - (I) **Protocol 28: Rocky outcrops and cliffs**;
 - (J) **Protocol 29: Ridge and headwater habitat**;

- (K) **Protocol 30: Subterranean bat roosts and flying-fox camps;** and
- (xviii) the information obtained from the following **protocols**:
 - (A) **Protocol 16: Riparian protection;**
 - (B) **Protocol 18: Aquatic habitat assessment;** and
 - (C) **Protocol 19: Determination of drainage class and stream order.**
- (4) Specific operational plan requirements for roading
 - (a) If **road construction, upgrading or maintenance** or **crossing construction, upgrading or maintenance** is proposed, an **operational plan** must include road assessments or crossing assessments as required by:
 - (i) **Protocol 9: Pre-operational road and crossing assessments;**
 - (ii) **Protocol 10: Road design;**
 - (iii) **Protocol 14: Design methods for crossings and drainage structures;** and
 - (iv) **Protocol 17: Fish passage.**
- (5) Specific operational plan requirements for burning operations
 - (a) For the purposes of condition 92.1(a) of the **approval** the **operational plan** must include a **burn plan** for any proposed **pre-harvest burn** or **post-harvest burn** which includes the following information:
 - (i) whether FCNSW proposes to carry out a pre-harvest burn, post-harvest burn or hazard reduction burning;
 - (ii) a clear statement that **FCNSW** elected to apply the terms of the **approval**, in lieu of the requirements of the Bushfire Environmental Assessment Code under the *Rural Fires Act 1997* (NSW), to the proposed **pre-harvest burn** or **post-harvest burn**;
 - (iii) a unique code to identify the **burn**;
 - (iv) description and map of the proposed area to be burnt (burn area);
 - (v) description of the objectives of the **burn event**;
 - (vi) description and map of all areas including **ESAs** which will be excluded from the **burn event**;
 - (vii) seasonal timing of the **burn event**;
 - (viii) the year and type of the last fire event in the burn area (either the previous prescribed burn or wildfire);
 - (ix) the on-ground measures and approaches that will be used to ensure that the requirements of the **approval** will be met, including locations of firebreaks and control lines;
 - (x) the planned fire indices, including fuel, weather (temperature, humidity, wind direction and wind speed) and lighting patterns under which the **burn event** will be

conducted, to ensure that the **burn event** is conducted in accordance with the requirements of the **approval**;

- (xi) the planned fire behaviour parameters (such as flame height, coverage, acceptable scorch); and
 - (xii) constraints over the timing of the **burn event** such as **seasonality**, the period in which a **pre-harvest burn** is permitted or the period in which a **post-harvest burn** is permitted.
- (b) If a **burning operation** is proposed in relation to a **forestry operation**, the **operational plan** for the **forestry operation** must identify whether the **burning operation** is either:
- (i) a **pre-harvest burn** or **post-harvest burn** conducted in accordance with the **approval**; or
 - (ii) a **hazard reduction burn** conducted under the requirements of the *Rural Fires Act 1997* (NSW).
- (c) If **FCNSW** elects to carry out **burning operations** under the Bushfire Environmental Assessment Code under the *Rural Fires Act 1997* instead of in accordance with the **approval**, **FCNSW** must include the information in conditions 4.2(5)(a)(i), 4.2(5)(a)(ii) and 4.2(5)(a)(iii) of this protocol.
- (6) Specific operational plan requirements for forest products operations
- (a) An **operational plan** must include the following details for a proposed **forest products** operation:
- (i) the type of **forest products** that are proposed to be removed by the **forest products operation**;
 - (ii) the estimated quantity or volume of each type of **forest product** that is proposed to be removed by the **forest products operation**; and
 - (iii) the extent and location of **net harvest area** across which **forest products** will be removed.
- (7) Specific operational plan requirements for regeneration
- (a) An **operational plan** must include the following details in relation to proposed activities to promote **regeneration** and stocking in the proposed **operational area**:
- (i) the **regeneration** requirements of the **mapped forest types** present;
 - (ii) an identification of the factors which may affect achievement of the regeneration and stocking standards in condition 127 of the **approval** and proposed mitigation actions to address those factors;
 - (iii) an assessment of the likelihood that **regeneration** and stocking standards will not be achieved for the mapped forest types in the area of the proposed **harvesting operation** and proposed mitigation actions to avoid failure to achieve those standards;
 - (iv) mapping of areas where there is a high risk that **FCNSW** will not achieve **regeneration** and stocking standards;
 - (v) the occurrence and susceptibility of the **operational area** to **Bell Miner associated dieback**; and

- (vi) the suggested timing after **harvesting** for an assessment of achievement of **regeneration** standards based on the range of forest types present and risks identified.

4.3 Location maps

- (1) The **location map** must clearly:
 - (a) identify the location of the **operational area** in relation to the surrounding region;
 - (b) show the proposed haulage route for a **harvesting operation**;
 - (c) show the **roads** proposed to be used for a **harvesting operation** to access the **operational area** by unloaded log trucks; and
 - (d) show relevant emergency evacuation and safety points.

4.4 Operational maps

- (1) The **operational map** for **forestry operations** in an **operational area** must show:
 - (a) map scale and grid coordinates;
 - (b) contour lines;
 - (c) **State Forest** name;
 - (d) tenure ID for other **Crown-timber land** (such as Lot and DP numbers and/or Lease numbers);
 - (e) **operational area**, including its boundaries, as set in the **operations register**;
 - (f) area that will be impacted by the **forestry operation**, including:
 - (i) **base net area** (less all known **ESAs**) in the case of a **harvesting operation**;
 - (ii) burn area in the case of a pre-harvest burn or post-harvest burn;
 - (iii) area to be treated for **regeneration** purposes in the case of **regeneration**;
 - (iv) forest products removal area in the case of a forest products operation; and
 - (v) roadwork footprint in the case of **roading**;
 - (g) location and extent of all areas excluded from **forestry operations** including:
 - (i) known **ESAs**;
 - (ii) all exclusion zones; and
 - (iii) other areas on which **forestry operations** cannot be carried out;
 - (h) any other area or **habitat feature** required to be protected under this **approval**.
 - (i) the location and extent of areas in the **Upper North East Subregion** and **Lower North East Subregion** where **Koala browse prescription 1** or **Koala browse prescription 2** apply;
 - (j) location of new **roads** to be **constructed**;

- (k) location and names of **roads** to be used (all **roads** must be labelled on the **operational map** so that the descriptions are consistent with the planning documentation for the **operational area**);
 - (l) location of **roads** and trails not to be used;
 - (m) areas of land mapped as **inherent hazard level 4** following determination in accordance with **Protocol 15: Inherent soil erosion and water pollution hazard assessment**;
 - (n) areas of **mass movement hazard** where there is an impact on a **forestry operation**;
 - (o) areas of the **compartment** where **seasonality** restrictions apply;
 - (p) areas of **class 1 aquatic habitat**;
 - (q) areas of plantation;
 - (r) areas of land adjoining the **operational area**, including the identity of that land (Lot and DP) and the nature of that land (such as private property, **National Parks Estate** or a **compartment**);
 - (s) drainage network (**classified drainage** from **LiDAR** or **ordered drainage** from **LPI**) and **riparian exclusion zone** widths;
 - (t) location of **road crossings** (all **road crossings** must be labelled on the **operational map** so that the descriptions are consistent with the planning documentation for the relevant **forestry operation**);
 - (u) location of **log dumps** (for **harvesting** and **forest products operations** maps only); and
 - (v) location of containment lines (for a **pre-harvest burn** and **post-harvest burn operational map** only).
- (2) The **operational map** must be presented at a scale that is fit for purpose for operational use.
- (3) The **operational map** must be geo-referenced at a resolution that is fit for use on handheld GPS devices.

Protocol 5: Approvals for restricted activities

5.1 Introduction

- (1) This **protocol** supports various conditions of the **approval** which require approval of **restricted activities**.

5.2 Requirement for approvals for restricted activities

- (1) The conditions require approval by the authority or person in column 4 of the table below, in accordance with this **protocol**, before **FCNSW** carries out a **restricted activity**, as set out in column 2 of the table below:

No.	Restricted activity	Reference in approval	Approval body/person
1	The construction or upgrading of a road, track or drainage feature crossing in a category 1 ESA or a category 2 ESA of a: <ul style="list-style-type: none"> • subject species or a TEC; • birds nest and roost and all associated exclusion zones; • bat roost trees, flying-fox camps, subterranean bat roosts and all associated exclusion zones; and • rocky outcrops or cliffs and all associated exclusion zones. 	Condition 98.1(e) and 99.1(e)	EPA
2	Deliberate ignition of a pre-harvest burn or post-harvest burn in a category 1 ESA, category 2 ESA or ground protection zone	Condition 94.3	EPA
3	The re-opening of an existing log dump in a category 1 ESA or category 2 ESA where: <ul style="list-style-type: none"> • the trees are less than 20 cm diameter at breast height (DBH); and • the category 1 ESA or category 2 ESA is not an ESA of a TEC. 	Condition 98.1(g) and Condition 99.1(g)	EPA
4	A research activity which is inconsistent with the requirements of the approval	Condition 27.1	EPA
5	An amendment to a TEC (indicative) area.	Protocol 27: Threatened ecological communities – condition 27.2(4)	EPA
6	Location and mapping of a local landscape area	Condition 51	EPA
7	Special provisions requiring a review or amendment to the approval at a specific site in a specific circumstance	Condition 28.3	EPA or DPI

No.	Restricted activity	Reference in approval	Approval body/person
8	Amendment to the location of a wildlife habitat clump that was implemented in a previous forestry operation	Condition 57.4(b)	EPA
9	Road maintenance within a soak or seepage with a record of <i>Assa darlingtoni</i> or <i>Phyloria</i> species	Condition 76.6	EPA
10	All in-stream works in class 1 aquatic habitat , including the construction or upgrading of a road, track or drainage feature crossing , that do not comply with Protocol 17: Fish passage	Conditions 110.15 and 113.19	DPI
11	Road maintenance within a soak or seepage with no record of <i>Assa darlingtoni</i> or <i>Phyloria</i> species	Condition 76.6	FCNSW planning supervisor
12	The construction or upgrading of roads, tracks or drainage feature crossings in a category 1 ESA or category 2 ESA , other than those identified in this protocol as requiring EPA or DPI approval	Condition 98.1 and 99.1	FCNSW planning supervisor
13	A pre-harvest burn conducted more than one year before the commencement of a harvesting operation due to unforeseen circumstances	Condition 93.1	FCNSW planning supervisor
14	Fell, push or remove trees, dead standing trees or vegetation greater than three metres inside any ESA or associated exclusion zone for matters relevant to the <i>Work Health and Safety Act 2011</i>	Condition 29.1	FCNSW planning supervisor
15	Amendment to the location of a wildlife habitat clump that has not been implemented in any forestry operation	Condition 57.4(b)	FCNSW operations supervisor
16	Fell, push or remove trees, dead standing trees or vegetation within any ESA or exclusion zone associated with a threatened species for matters relevant to the <i>Work Health and Safety Act 2011</i>	Condition 29.1	FCNSW operations supervisor
17	Vegetation and groundcover disturbance greater than three metres upstream or downstream of a road crossing	Condition 110.10	FCNSW operations supervisor
18	Vegetation and groundcover disturbance greater than three metres upstream or downstream of a track crossing	Condition 113.18	FCNSW operations supervisor

- (2) **FCNSW** may only propose to carry out a **restricted activity** where there is no practical alternative.
- (3) **FCNSW** may apply in accordance with this **protocol** for a **restricted activity** approval in accordance with condition 5.3 below.

5.3 Report content requirements for restricted activities

- (1) If **FCNSW** proposes to carry out a **restricted activity**, it must make a written application to the relevant authority or person.
- (2) Except for the applications for the following **restricted activities**, the written application must be submitted together with a report prepared in accordance with this condition:
 - (a) number 5 (amendment of **TEC (indicative)** area) – note the specific report requirements for proposals to amend a **TEC (indicative)** area below;
 - (b) numbers 9 and 10 (felling etc. under the **WHS Act**) – note that separate requirements apply under **Protocol 33: Work health and safety and accidentally felled trees** and **Protocol 5: Approvals for restricted activities**.
- (3) A report required under this condition must include the following information:
 - (a) the location of the **restricted activity** and related information including:
 - (i) the State Forest name;
 - (ii) the compartment;
 - (iii) the location identified by the grid reference on the **operational map**;
 - (iv) an identifying description (for example, the description of the proposed **crossing** or **road** name); and
 - (v) the **exclusion zone** at the location (for example, **category 1 ESA**);
 - (b) details of the **restricted activity**, including:
 - (i) a description of the restricted activity (for example, the construction or upgrade of a road, track or crossing through category 1 ESA);
 - (ii) the reasons why the **restricted activity** must be conducted;
 - (iii) details of all other options that were considered, including the cost of those other options and the reasons why the selected option or route was chosen and why each other option or route was not; and
 - (iv) the mitigation and ameliorative measures to be applied;
 - (c) details of the proposal and field assessment, including:
 - (i) the dimensions of the area that will be affected by the **restricted activity**;
 - (ii) the work proposed to be undertaken to carry out the **restricted activity**, including the method of **road** or **crossing construction** (if applicable);
 - (iii) results of a survey for any **subject species** and **habitat features** conducted in accordance with **Protocol 20: Pre-operational surveys**, which includes traversing the proposed area of **disturbance** of the **restricted activity** at an average speed no greater than one kilometre per hour. This survey does not contribute to pre-operational survey requirements of the **forestry operation**;
 - (iv) an assessment and description of any **threatened species**, **subject species** or any **habitat** that will be or are likely to be directly or indirectly affected by the **restricted activity** or occur within 50 metres of the **restricted activity**;

- (v) the potential impacts of the **restricted activity** either directly or indirectly on any **threatened species, subject species** or **habitat**, including aquatic habitat, **wetlands**, waterbodies and **threatened species habitat** (for example, the creation of a barrier to movement, increasing threats); and
- (vi) an assessment of past **disturbance** in the proposed area of the **restricted activity**.

5.4 Specific content requirements for certain restricted activities

(1) Re-opening of **log dumps**

- (a) Where the **restricted activity** relates to re-opening an existing **log dump** in an **ESA**, **FCNSW** must also include the following information in the report:
 - (i) the date (year) of commencement and conclusion of the previous **log dump** usage; and
 - (ii) an assessment and description of forest structure and forest health in the **ESA** at the **log dump** location.

(2) Research activities

- (a) Where the **restricted activity** relates to a **research activity** that is inconsistent with the requirements of the **approval**, **FCNSW** must also demonstrate in the report how the objectives of the **approval** are to be achieved through this **research activity**.

(3) Special provisions requiring a review or amendment to the approval at a specific site

- (a) Where the **restricted activity** is inconsistent with the requirements of the **approval**, **FCNSW** must also demonstrate in the report how the objectives of the **approval** are to be achieved.

(4) Soak and seepages

- (a) Where the **restricted activity** relates to **road maintenance** in a **soak or seepage** within *Phyloria* or *Assa darlingtoni* **modelled habitat**, **FCNSW** must:
 - (i) demonstrate if a visual inspection of the **soak or seepage** by a **suitably qualified person** was carried out immediately in advance of proposed **road maintenance identified**; and
 - (ii) if records of *Phyloria* species or *Assa darlingtoni* were identified in, or within 10 metres, of the **soak or seepage**.

(5) TEC (indicative) areas

- (a) The report required under this condition must include the following information in relation to identification of a **TEC** in a **TEC (indicative)** mapped area:
 - (i) the location of the **TEC**, and related information including:
 - (A) the **State Forest** name;
 - (B) the name and location of the **compartment**;
 - (C) a description of the **TEC** that is the subject of the review request; and

- (D) an **operational map** identifying all **TECs** within the **operational area** by location, area and in relation to landscape features; and
- (ii) a field assessment, including:
 - (A) an explanation of how any boundary was determined including detail of the survey effort and methods applied;
 - (B) a description of the **TEC** and other vegetation present in the areas, including information on structure and floristic composition;
 - (C) results of the application of any **TEC field key** and any relevant likelihood of occurrence thresholds adopted for each survey point;
 - (D) a description of any detectability issues relating to individual species in a relevant **TEC field key**;
 - (E) an assessment of condition and past **disturbance** in the area;
 - (F) details of the persons undertaking the field assessment; and
 - (G) the date the field assessment was conducted.

5.5 Requests for further information

- (1) The **EPA** or **DPI** may request further information from **FCNSW** in relation to a report prepared under this **protocol** if the **EPA** or **DPI** is not satisfied that the report has adequately addressed the requirements of this condition. **FCNSW** must provide the requested information to the **EPA** or **DPI** within the time specified in the request.

5.6 Approval of restricted activities

- (1) **FCNSW** cannot carry out a **restricted activity** unless the relevant authority or person has provided written approval, following consideration of **FCNSW's** application and any required report prepared and submitted under this **protocol**, setting out any relevant conditions and other terms.
- (2) For the **restricted activities** or matters requiring the approval of the **EPA** listed in the following table, approval is deemed after 15 working days unless the **EPA** has written to **FCNSW** to:
 - (a) notify an extended time for consideration of a request for approval for a **restricted activity**;
 - (b) request further information or data;
 - (c) notify of a variation to **FCNSW** proposal; or
 - (d) has denied **FCNSW** request to carry out a **restricted activity**.

Restricted activities where approval can be deemed in accordance with condition 6.6(2)
Location and mapping of a local landscape area
Deliberate ignition of a pre-harvest burn or post-harvest burn in a category 1 ESA , category 2 ESA or ground protection zone

5.7 Requirements when carrying out a restricted activity

- (1) When carrying out a **restricted activity**, **FCNSW** must:

- (a) act in accordance with the approval granted for that **restricted activity**, including any terms or conditions of that approval; and
- (b) take all practical measures to minimise any adverse impacts of the **restricted activity** on the environment.

Protocol 6: Suitably qualified persons – training and experience

6.1 Introduction

- (1) Condition 23.1(c) of the **approval** imposes a general requirement for every **forestry operation** to be planned, implemented and conducted by a **suitably qualified person**.
- (2) This **protocol** supplements the general definition of **suitably qualified person** in **Protocol 39: Definitions** which provides specific guidance on what constitutes a **suitably qualified person** for the purposes of certain **protocols**.

6.2 Training requirements for an approved soil assessor

- (1) **FCNSW** must run courses, approved by the **EPA**, in **soil regolith** assessment and **dispersible soil** identification and management on a needs basis for the purpose of qualifying soil assessors as **approved soil assessors**.
- (2) These courses can include:
 - (a) the course developed and approved by the **EPA** in 2007 and previously delivered by the Soil and Land Conservation Consulting and TAFE NSW Riverina Institute; or
 - (b) another course developed and approved by the **EPA** for the purposes of condition 6.2.
- (3) **FCNSW** must maintain an up-to-date list of all people who have completed these courses, available on request by the **EPA**.
- (4) **FCNSW** must ensure that persons responsible for verifying **soil regolith** or the detection of **dispersible soils** are **approved soil assessors**.

6.3 Aquatic habitat assessment – surveyor experience

- (1) The surveyor responsible for conducting an **aquatic habitat assessment** must have, to **DPI's** satisfaction:
 - (a) experience with aquatic **habitat** survey work and **aquatic habitat assessments**; and
 - (b) familiarity with the types of **habitat** in which locally occurring **threatened species** occur.
- (2) Tertiary biological or ecological qualifications are preferable but not essential, provided that the requirements in condition 6.3(1) are met.

6.4 Broad area habitat search – staff skill and training

- (1) A person conducting a broad area habitat search must:
 - (a) be properly trained and proficient, to the **EPA's** satisfaction, in the identification of flora and fauna **subject species** and **habitat** within their area of operation. This includes **subject species** and features listed in Table 2 in condition 6.4.3 of the **approval**; and
 - (b) undergo annual refresher training via semi-formal or formal delivery methods on the identification of **subject species** and **habitat**; and
 - (c) be up to date on new listings of **threatened species, populations** and **EECs** under relevant legislation.

6.5 Targeted survey – surveyor experience

- (1) A person undertaking a **targeted flora and fauna survey** under **Protocol 20: Pre-operational surveys** must be ecologically trained and capable of identifying flora and fauna **subject species** in their area to the **EPA's** satisfaction.

6.6 TEC (indicative)

- (1) For the purpose of identification of **TEC (indicative)**, a **suitably qualified person** is a person who has extensive and bioregionally-specific experience in the field identification of **TECs**, as well as similar ecological communities that may be confused with **TECs**.

6.7 Assessment of Koala presence during harvesting

- (1) A person tasked with undertaking assessments of the presence of Koala in trees in the course of **harvesting operations** (for the purpose of condition 82 of the **approval**) must:
 - (a) be properly trained and proficient, to the **EPA's** satisfaction, in:
 - (i) the identification of Koalas;
 - (ii) preferred **Koala browse tree** identification;
 - (iii) Koala habitat use and habits; and
 - (b) undergo periodic refresher training on any new or updated information on the subject matter listed in condition 6.7(1)(a) of this **protocol** via semi-formal or formal delivery methods on the matters in (a) above and when new information on Koala habitat use or survey methods become available.

Protocol 7: Harvesting limits

7.1 Introduction

- (1) This **protocol** supports:
 - (a) the meaning of 'adjacent' in condition 52.5 in Chapter 3, Division 2 of the **approval**;
 - (b) the measurement of **average basal area** under condition 53.2 of the **approval**; and
 - (c) the development of a **site-specific limit condition** which **FCNSW** is required to request from the **EPA** under condition 54.3 of the **approval**.

7.2 Tract mapping

- (1) In **local landscape areas** within the **intensive harvesting zone**, **FCNSW** must map the long-term future harvesting intent of **net harvest area** as either **intensive harvesting** or **selective harvesting** prior to the commencement of any **intensive harvesting** in the **local landscape area** and supply this map to the **EPA**.
- (2) Where the harvesting intent changes following the creation of the tract map specified in condition 7.2(1) of this **protocol**, **FCNSW** must obtain the **EPA's** approval to update the map by submitting a revised map and a brief report outlining the reasons for the change to the **EPA**.
- (3) **Intensive harvesting** must not occur within areas designated on the tract map as **selective harvesting**, unless approved by the **EPA** in accordance with condition 7.2(2).

7.3 Measurement of average basal area

- (1) For the purposes of condition 53 of the **approval**, the average **basal area** must be calculated by averaging the stand **basal area** measured at sample points within the **harvested area**.
- (2) This calculation of average **basal area** must include all **net harvest area** where **harvesting operations** have occurred as part of the current **forestry operation** excluding approved **roads, tracks, log dumps** and other **forestry operation** infrastructure and not including any areas of:
 - (a) **category 1 ESA** and **category 2 ESA** and associated **exclusion zones**; and
 - (b) forest where **harvesting operations** have not occurred as part of the current **forestry operation**.
- (3) For the purpose of calculating average **basal area**:
 - (a) the sample points must be located randomly at multiple spots across the **harvested area** with a minimum inter-point distance of 60 metres;
 - (b) samples must be taken using angle count sampling or fixed area plot measurements; and
 - (c) the total number of samples to be taken must be in accordance with Table 1.

Table 1: Minimum number of sample points required for differently sized harvested areas

Size of harvested area	Minimum number of sample points required
0–30 hectares	20
31–50 ha	30
51–100 ha	40
101–200 ha	50
201 ha+	60

(d) Table 1 may be interpolated for **harvested areas** greater than 30 hectares to accurately determine the minimum number of sample points for the size of the **harvested area**.

(4) Further limits

- (a) All **forestry operations** must have an **average basal area** equal to or above the average minimum limit for **basal area**;
- (b) The stand **basal area** at more than half of the sampling points is equal to or above the average minimum limit for **basal area**; and
- (c) The **basal area** at no more than 25% of sampling points within the **harvested area** can have a **basal area** below:
 - (i) eight square metres per hectare in the non-**regrowth zone**; or
 - (ii) six square metres per hectare in the **regrowth zone**.

7.4 Site-specific limit conditions

- (1) For the purposes of condition 54.3 in the **approval**, **FCNSW** must provide to the **EPA** for approval a **site-specific limit condition** that:
 - (a) outlines measures to minimise the impacts of proposed **mixed intensity harvesting operations** over time and across the landscape;
 - (b) identifies areas in that **local landscape area** which are planned for **intensive harvesting** in a future **intensive harvesting cycle** and during the current **intensive harvesting cycle**.
- (2) In developing the **site-specific limit condition**, the **FCNSW** must consider the following matters, and any additional relevant matters:
 - (a) spatial arrangement of **intensive harvesting** and **selective harvesting** during that cycle;
 - (b) proximity to other reserved areas;
 - (c) the amount of reserved area within the **local landscape area**;
 - (d) **subject species** known or likely to occur in the **local landscape area**;

- (e) land use and habitat condition in the area adjoining the **local landscape area**,
 - (f) stand condition; and
 - (g) proposed harvesting intensity in **selective harvesting** areas.
- (3) **FCNSW** must provide any information which the **EPA** requests to assist it in reviewing the **site-specific limit condition**.
- (4) A **site-specific limit condition** only applies after the **EPA** has provided written approval, following consideration of **FCNSW's** application and any required report prepared and submitted under this condition, setting out any relevant conditions and other terms.
- (5) **Harvesting operations** must cease within any **local landscape area** where the threshold in condition 54.3 of the **approval** has been reached and where a **site-specific limit condition** has not been approved by the **EPA**.

Protocol 8: Local landscape areas

8.1 Introduction

- (1) Condition 51 of the **approval** requires **FCNSW** to develop and map **local landscape areas** in accordance with this **protocol**, for the **EPA's** approval.
- (2) This **protocol** also supports the amendment of the location of a mapped **local landscape area** in accordance with condition 51.2 of the **approval**.

8.2 Developing local landscape areas

- (1) **FCNSW** must develop **local landscape areas** in accordance with this **protocol** before commencing **forestry operations**.
- (2) Each **local landscape area** must be no larger than 1500 hectares of largely contiguous native **State Forest** and native **Crown-timber land**.
- (3) The **local landscape area** is calculated from the gross area of native **State Forest** or **Crown-timber land** within the **local landscape area** boundary.
- (4) When identifying **local landscape area**, **FCNSW** must achieve as many as possible of the following design outcomes:
 - (a) **Shape** – The boundary-to-area ratio should be kept as small as possible. Circular or square shapes are preferred and long and linear shapes should be avoided.
 - (b) **Logical boundaries** – Boundaries should use features such as existing **State Forest** and **compartment** boundaries, **roads** and creeks.
 - (c) **Consistent management boundaries** – The planning unit should avoid going over **FCNSW management zones**.
 - (d) **Contiguity** – Avoid areas separated by large areas of private land or cleared areas (including plantation or farmland) as far as practical. Isolated areas of less than 500 hectares may be included with logical nearby areas.
- (5) Every **local landscape area** must be mapped in accordance with condition 8.3 of this **protocol**.
- (6) **FCNSW** cannot change the mapped **local landscape area** planning unit unless authorised by the **EPA** in accordance with condition 8.4 of this **protocol**.

8.3 Mapping of local landscape areas

- (1) The location of a **local landscape area** must be digitally mapped and included in the digital map called LocalLandscapeArea. An area is only taken to be a **local landscape area** when it is digitally mapped in that digital map.
- (2) The **EPA** will update accompanying metadata and attributes with any amendments as necessary.

8.4 Changing the area of mapped local landscape areas

- (1) **FCNSW** cannot change the location of any mapped **local landscape area** unless the **EPA** approves the proposed change.

- (2) When applying for a change under this condition, **FCNSW** must provide the **EPA** with the following:
- (a) reasons for the proposed change;
 - (b) evidence which clearly demonstrates that the proposed change in the mapped **local landscape area** will not result in a loss of environmental values;
 - (c) alternative options considered;
 - (d) a spatial dataset of the relevant segment of the existing **local landscape area**;
 - (e) a digital map of the proposed location for the new segments of **local landscape area**;
 - (f) a report that addresses:
 - (i) the continuity with adjacent **local landscape area** and wildlife habitat clumps applied in any preceding forestry operations;
 - (ii) **wildlife habitat clumps** as identified and protected in condition 57 of the **approval** are not reduced below the threshold set by that condition.

Protocol 9: Pre-operational road and crossing assessments

9.1 Introduction

- (1) **Protocol 4: Pre-operational plans** requires that **operational plans** for **forestry operations** which propose **road construction, upgrading** or **maintenance** or **crossing construction** must include **road** assessments or **crossing** assessments as required by this **protocol**.

9.2 New road construction assessment

- (1) An **operational plan** for a **forestry operation** must include the following details for each **road** greater than 40 metres in length that is to be **constructed** as part of, or in order to conduct, the **forestry operation**:

- (a) name of **road** to be **constructed** (corresponding with the **operational map**);
- (b) length of new **road construction**;
- (c) site-specific design and **stabilisation** measures to be used on any **road** to be **constructed** on **ground slopes** exceeding 30 degrees in accordance with **Protocol 10: Road design**;
- (d) site-specific design and **soil stabilisation** measures to be used on any **road** to be **constructed** on areas that have or are likely to have a **mass movement hazard** in accordance with **Protocol 10: Road design** and **Protocol 13: Mass movement assessment**;
- (e) site-specific design and **soil stabilisation** techniques to be used on **road batters** over one metre in height;
- (f) type and location of **road drainage structures** to be installed;
- (g) site-specific **soil stabilisation** measures for the management of **dispersible soil** (where applicable);
- (h) measures to **stabilise disturbed areas** within a **category 1 ESA** of a **drainage line, wetland** or swamp; and
- (i) site-specific measures for **road drainage structure** outlets.

9.3 Existing roads maintenance assessment

- (1) An **operational plan** must include the following details for each existing **road** that will be used during a **forestry operation** (corresponding with the **operational map**):
- (a) name of the existing **road** to be used (corresponding with the **operational map**);
 - (b) assessment of the **stability** of the **road surface**, cut batter, fill batter and **road drainage structures**;
 - (c) type and location of any new or additional **road drainage structure**;
 - (d) requirements for **road surface maintenance**;
 - (e) site-specific **stabilisation** measures for a **road** that traverses a ground slope in excess of 30 degrees in accordance with **Protocol 10: Road design**;

- (f) site-specific **stabilisation** measures for a **road** in an area that has, or is likely to have a **mass movement hazard** in accordance with **Protocol 10: Road design** and **Protocol 13: Mass movement assessment**;
- (g) site-specific **stabilisation** techniques to be used on an unstable **road batter**;
- (h) site-specific measures for a **road drainage structure** outlet; and
- (i) measures to **stabilise disturbed** areas within a **category 1 ESA** of a **drainage line**, **wetland** or swamp.

*Note: An existing **road** which will not be used as part of the **forestry operation** does not require the above assessment.*

9.4 General requirements for a new or replaced crossing

- (1) An **operational plan** must include the following details for each new or replaced **crossing**:
 - (a) location of the **crossing** to be **constructed** (corresponding with the **operational map**);
 - (b) if a **road crossing** is to be **constructed**, whether the **crossing** is a **causeway**, **culvert** or bridge;
 - (c) if a **track crossing** is to be **constructed**, whether the **crossing** is a **causeway**, **culvert**, bridge or **temporary log crossing**;
 - (d) site-specific **sediment control measures** to be used;
 - (e) measures required to **stabilise** any **disturbed** area within 20 metres either side of a **drainage line**;
 - (f) specific requirements to **stabilise dispersible soils** within 20 metres either side of a **drainage line**; and
 - (g) if a **crossing** requires in-stream works where there is an expected **threatened species** distribution as presented in documentation provided to **FCNSW** by **DPI**, an **aquatic habitat assessment** undertaken in accordance with the **Protocol 18: Aquatic habitat assessment**.

9.5 New or replacement culverts

- (1) In addition to the general requirements for new **crossings**, an **operational plan** must include the following requirements for each new or replaced **culvert crossing**:
 - (a) design and installation requirements to convey the **peak flow** from a 1:5 year storm event and withstand the **peak flow** from a 1:10 year storm event (determined in accordance with **Protocol 14: Design methods for crossings and drainage structures**);
 - (b) measures to be used to **stabilise** fill material around inlets and outlets of pipes;
 - (c) measures to be used to **stabilise** outlet discharge areas;
 - (d) measures to retain the surface material at the **crossing**; and
 - (e) design and installation requirements in accordance with **Protocol 17: Fish passage**.

9.6 Bridge construction or replacement

- (1) In addition to the general requirements for a new **crossing**, an **operational plan** must include the following requirements for each new or replaced bridge **crossing**:
 - (a) design and installation requirements for the bridge to convey the peak flow from a 1:5 year storm event and withstand the peak flow from a 1:10 year storm event (determined in accordance with the **Protocol 14: Design methods for crossings and drainage structures**);
 - (b) site-specific measures to **stabilise** the bridge embankments;
 - (c) site-specific measures to retain the surface material at the **crossing**;
 - (d) design and installation requirements in accordance with **Protocol 17: Fish passage**.

9.7 Causeway construction or replacement

- (1) In addition to the general requirements for a new **crossing**, an **operational plan** must include the following requirements for each new or replaced **causeway crossing**:
 - (a) design and installation requirements for the causeway to withstand the **peak flow** from a 1:10 year storm event (determined in accordance with **Protocol 14: Design methods for crossings and drainage structures**);
 - (b) site-specific techniques to minimise the **disturbance** of the bed and banks of the **drainage feature**;
 - (c) type of surface material to be used;
 - (d) site-specific measures to retain the surface material at the **crossing**;
 - (e) site-specific measures to **stabilise** the outlet (if required); and
 - (f) **aquatic habitat assessment** must be undertaken in accordance with **Protocol 18: Aquatic habitat assessment** for **crossings** requiring in-stream works where there is expected **threatened species** distributions as presented in documentation provided to **FCNSW** by **DPI**.

9.8 General requirements for each existing crossing assessment

- (1) An **operational plan** must include the following details for each existing **crossing**:
 - (a) location of the **crossing** (as shown on the **operational map**);
 - (b) type of existing **drainage feature crossing**;
 - (c) **stability** assessment of the existing **crossing** structure;
 - (d) a description of any **stabilisation** works to be undertaken to ensure the **crossing** can withstand the **peak flow** from a 1:10 year storm event (if required) (determined in accordance with **Protocol 14: Design methods for crossings and drainage structures**);
 - (e) **stability** assessment of the existing **crossing** surface;
 - (f) the type of surface material to be used on the **drainage feature crossing** (if required);
 - (g) site-specific measures to retain the surface material at the **crossing**;
 - (h) reshaping of the bed and banks that will be required;

- (i) site-specific ***sediment control measures*** to be used;
- (j) ***crossing*** works to be in accordance with **Protocol 17: Fish passage**; and
- (k) ***aquatic habitat assessment*** must be undertaken in accordance with **Protocol 18: Aquatic habitat assessment** for ***crossings*** requiring in-stream works where there is expected ***threatened species*** distributions as presented in documentation provided to **FCNSW** by **DPI**.

Protocol 10: Road design

10.1 Introduction

- (1) **Road construction** and the **maintenance** and **upgrade** of **existing roads** on steep slopes or areas of **mass movement hazard** has the potential to create more **soil** erosion than other **forestry operations**.
- (2) Condition 62 of the **approval** requires **FCNSW** to comply with this **protocol** where there is **mass movement hazard** or **ground slope** greater than 30 degrees, the design of **new** or **upgraded roads** and the maintenance of existing **roads** to reduce the risk of **road** or slope failure in these potentially unstable areas.

10.2 Maintenance of existing roads in areas with mass movement hazard or steep ground slope

- (1) Where an existing **road** traverses a location where there is a **mass movement hazard** or the **ground slope** is greater than 30 degrees:
 - (a) a **suitably qualified person** must inspect the **road** to assess its stability and prescribe measures that must be implemented to ensure stability of the **road, road drainage structures** and **batters**; and
 - (b) the **road, road drainage structures**, and **batters** must be **maintained** in accordance with those measures.
- (2) This assessment of stability must include a consideration of:
 - (a) evidence of historical **mass movement**;
 - (b) the presence of bedding planes in cut **batters** that dip out of the slope;
 - (c) the stability of cut **batter** and fill **batter** surfaces;
 - (d) the presence of tension cracks above the fill **batter**;
 - (e) the stability of fill **batters** and the ground surface at the outlets of **road drainage structures**; and
 - (f) the stability of the **table drain** and **road surface**.

10.3 Road construction or upgrade in an area with steep ground slope

- (1) The **construction** or **upgrade** of a **road** in any location where the **ground slope** is greater than 30 degrees must be in accordance with an engineering design to ensure the stability of the **road, road drainage structures** and **batters**.
- (2) In developing the design of the **new** or **upgraded road** the following matters must be taken into account:
 - (a) road alignment standards (for example, horizontal and vertical alignment, formation width);
 - (b) the **construction** methods to be used (for example, full cut, cut and fill, benched, compaction);
 - (c) drainage;
 - (d) **batter** angles;

- (e) **batter** surface **stabilisation** methods and drainage outlet protection (if required);
- (f) erosion and **sediment control measures**; and
- (g) any other matters relevant to ensuring the stability of the **road, road drainage structures** and **batters**.

10.4 Road construction or upgrade in an area with a mass movement hazard

- (1) The **construction** or **upgrade** of a **road** in any location where there is a **mass movement hazard** must:
 - (a) be designed to ensure the stability of the **road, road drainage structures** and **batters**; and
 - (b) be **constructed** or **upgraded** in accordance with that design.
- (2) In developing the design of the **new** or **upgraded road**, the following matters must be taken into account:
 - (a) applicable **road** alignment standards (including standards relevant to the horizontal and vertical alignment, formation and width);
 - (b) the **construction** methods to be used (for example full cut, cut and fill, benched, compaction);
 - (c) drainage;
 - (d) **batter** angles;
 - (e) **batter** surface **stabilisation** methods and **road drainage structure** outlet protection (if required); and
 - (f) erosion and **sediment control measures**.

Protocol 11: Soil dispersibility assessment

11.1 Introduction

- (1) **Protocol 4: Pre-operational plans** requires an **operational plan** for proposed **harvesting operations** to include information on the occurrence and distribution of **dispersible soils** as determined in accordance with this **protocol**.

11.2 Detection of dispersible soils

- (1) When preparing an **operational plan** for a proposed **forestry operation**, **FCNSW** must include in the relevant **operational plan** a written determination from an **approved soil assessor**, made in accordance with this **protocol**, as to whether **dispersible soil** is present in the **relevant area** of the proposed **forestry operation**.
- (2) The written determination must involve the **approved soil assessor**:
 - (a) carrying out such field investigations and inspections as the **approved soil assessor** considers necessary;
 - (b) carrying out the **soil** testing procedure set out in this **protocol** in relation to **aggregates** from each layer of **soil** that will be **disturbed** by the proposed **forestry operation** within the **relevant area**;
 - (c) ensuring that the sites selected for the **soil** testing procedure set out in this **protocol** represent the range of **soil** types in the **operational area**;
 - (d) scoring a **dispersibility rating** for the **soil** in accordance with the **soil** testing procedure set out in this **protocol**; and
 - (e) recording in writing:
 - (i) a description of the field investigations or inspections carried out for the purposes of the written determination, and any observations from the **soil** testing procedure; and
 - (ii) the dispersibility rating of each **air-dry aggregate** tested.
- (3) **FCNSW** must ensure that the **approved soil assessor** takes a conservative approach when assessing **dispersibility**.

11.3 Soil testing procedure

- (1) For the purpose of this **protocol**, the **soil** testing procedure is as follows:
 - (a) select three **air-dry aggregates** from each layer of the **soil** (that is, each layer that will be **disturbed** by the proposed works) at the site selected for testing;
 - (b) place approximately 75 millimetres of de-ionised water in a clean, wide-bottomed container;
 - (c) place three **air-dry aggregates** taken from the same layer of **soil** in the container of de-ionised water, spaced evenly around the sides of the container; ensure that the de-ionised water completely covers all the **aggregates** and do not stir the contents of the container or otherwise **disturb** the contents;
 - (d) observe and record the extent to which each **aggregate** has dispersed or **slaked** (or both):

- (i) first, after 10 minutes; and
 - (ii) second, after two hours,
- from when they were placed in the water; and
- (e) repeat the steps described in conditions 11.3(1)(a)(a) to (d) of this **protocol** for each layer of **soil** from which the three **air-dry aggregates** were taken.
- (2) The **approved soil assessor** may, in relation to the testing of the **air-dry aggregates** from a particular layer of **soil**, stop observing the behaviour of the **aggregates** after 10 minutes if satisfied that all three **aggregates** show **strong dispersion** or **complete dispersion** within that time.

11.4 Dispersibility rating

- (1) The **approved soil assessor** must record a **dispersibility rating** for each **air-dry aggregate** that was observed and recorded in accordance with this **protocol** as follows:

Dispersibility rating	Observation of aggregate
0	No dispersion within two hours of placement in water
1	Slight dispersion within two hours of placement in water
2	Slight dispersion within 10 minutes of placement in water and strong dispersion within two hours of placement
3	Strong dispersion within 10 minutes of placement in water and complete dispersion within two hours of placement
4	Complete dispersion within 10 minutes of placement in water

- (2) If the three **air-dry aggregates** taken from a particular layer of **soil** and tested in accordance with the **soil** testing procedure score different **dispersibility ratings**, then the highest rating is taken to be the **dispersibility rating** of the **soil** from that layer.

11.5 Application of dispersible soil operating conditions

- (1) Where the **approved soil assessor** has identified **dispersible soil** within a relevant area in a **compartment** or **roading area**, then conditions 110.11 and 113.13 of the **approval** must be applied to all **forestry operations** in that **compartment** or **roading area**.

Protocol 12: Seasonality restrictions

12.1 Introduction

- (1) Condition 115 in Chapter 5, Division 6 of the **approval** imposes **seasonality** restrictions, on the carrying out of **forestry operations** and **road construction**, in accordance with this **protocol**.
- (2) This **protocol** supports condition 115 of the **approval** by providing the methodology for determining applicable **seasonality** restrictions, having regard to **inherent hazard level** classified under **Protocol 15: Inherent soil erosion and water pollution hazard assessment** and **rainfall erosivity**, **rainfall zone** and **soil regolith class**.

12.2 Determining seasonality restrictions

- (1) **Seasonality** restrictions are set out in conditions 12.3 and 12.4 of this **protocol**, depending on **rainfall erosivity** levels.
- (2) Where **seasonality** restrictions are to be determined for a length of **road**, **FCNSW** must use the most conservative (highest) value from the **compartments** adjacent to that **road**.
- (3) Where the **seasonality** determination is being carried out for a **roading area**, **FCNSW** must either verify the **soil regolith** class or accept that the **soil regolith** class is 2, 3 or 4.

12.3 Seasonality restrictions for rainfall erosivity levels between 4000 and 6000

- (1) For the purposes of condition 115.1 of the **approval**, where the proposed **compartment** or **roading area**:
 - (a) has been classified as **inherent hazard level 3** under **Protocol 15: Inherent soil erosion and water pollution hazard assessment**; and
 - (b) has an average annual **rainfall erosivity** between 4000 and 6000,
 - (i) the periods of **seasonality** restriction in the second column in the table below apply to the relevant **rainfall zones** set out in the first column of the table below, regardless of **soil regolith** class:

Rainfall erosivity zone	Period of seasonality restriction	Management requirements
Zone 1 and 3	1 January to 31 March (inclusive)	During the periods specified: <ul style="list-style-type: none"> • new road construction (on any inherent hazard level) is not permitted on ground slopes > 30 degrees; and • forestry operations are not permitted in inherent hazard level 3 compartments.
Zone 2	1 December to 31 March (inclusive)	

12.4 Seasonality restrictions for rainfall erosivity levels greater than 6000

- (1) For the purposes of condition 115.2 of the **approval**, where the annual average **rainfall erosivity** is greater than 6000, regardless of the **inherent hazard level** of the **compartment** or **roading area** under **Protocol 15: Inherent soil erosion and water pollution hazard assessment**, the periods of **seasonality** restriction below apply depending on the relevant **rainfall zones** and **soil regolith** classes referred to in the table below:

	Rainfall Erosivity Zone 1	Rainfall Erosivity Zone 2	Rainfall Erosivity Zone 3
Soil Regolith Class 1	Forestry operations are not permitted from 1 January to 31 March (inclusive) on slopes greater than or equal to 25 degrees	Forestry operations are not permitted from 1 December to 31 March (inclusive) on slopes greater than or equal to 25 degrees	Forestry operations are not permitted from 1 January to 31 March (inclusive) on slopes greater than or equal to 25 degrees
Soil Regolith Class 2	Forestry operations are not permitted from 1 December to 30 April (inclusive) on slopes greater than or equal to 20 degrees	Forestry operations are not permitted from 1 December to 30 April (inclusive) on slopes greater than or equal to 20 degrees	Forestry operations are not permitted from 1 December to 30 April (inclusive) on slopes greater than or equal to 20 degrees
Soil Regolith Class 3			
Soil Regolith Class 4			

*Note: Forestry activities (including new **road construction**) are permitted in the **seasonality** restricted **compartments** but not on areas with the specified **ground slopes** during the periods specified in this table.*

12.5 Seasonality restrictions map

- (1) Before commencing a **forestry operation** in a **compartment** or **roading** area, **FCNSW** must provide a map to the **EPA** that:
 - (a) clearly identifies the location of each area within the **compartment** or **roading** area that is subject to **seasonality** restrictions; and
 - (b) identifies the **seasonality** restrictions that apply to each such area, as ascertained in accordance with this **protocol**.

Protocol 13: Mass movement assessment

13.1 Introduction

- (1) Under condition 62.1 in Chapter 4, Division 1 of the **approval**, **FCNSW** must apply the assessment procedures set out in this **protocol** to determine the **mass movement hazard** for any proposed **forestry operation** that involves the:
 - (a) **maintenance** or **upgrading** of **existing roads**;
 - (b) **construction** of new **roads**; or
 - (c) use of **side-cut snig tracks** that have **batters** greater than one metre in height.
- (2) Determination of **mass movement hazard** is also required for the purposes of:
 - (a) **operational plan** and **operational map** preparation – condition 4.2(3)(a)(x)(B) and condition 4.4(1)(n) of **Protocol 4: Pre-operational plans**;
 - (b) **operational plan** requirements relating to **road construction** and **maintenance** – condition 9.2(1)(d) and condition 9.3(1)(f) of **Protocol 9: Pre-operational road and crossing assessments**.

13.2 Procedure for assessing mass movement hazard

- (1) Where **LiDAR** coverage is available, **FCNSW** must undertake the assessment procedure required by Module 1 of this **protocol**, set out in the table below.

Module 1: Mass movement assessment using LiDAR
Step 1: Use of LiDAR and consideration of existing information
<p>Use LiDAR-derived hillshade relief images to identify areas of existing or potential mass movement.</p> <p>Consider all existing information which is relevant to mass movement within the proposed operational area. This information could include, but is not restricted to:</p> <ul style="list-style-type: none"> • published reports and surveys (for example: local investigations or studies of mass movement, soil conservation reports and technical notes; and the Office of Environment and Heritage soil landscape map series); • consultation with local branches of the Office of Environment and Heritage; and • historical evidence, either in the form of internal reports or file notes, or as anecdotal evidence.
Step 2: Field assessment
<p>The purpose of the field assessment is to determine if there is evidence of existing or potential mass movement within a proposed operational area.</p> <p>The procedure for field assessment is as follows:</p> <p>Undertake a field survey and investigation of each compartment or roading area and determine if any mass movement is present or likely to occur.</p> <p>The field survey and investigation must, at a minimum, include existing roads, side-cut snig tracks, gravel pits, quarries, major excavations, cleared slopes and those areas identified on the hillshade relief images as areas of potential mass movement.</p>

Evidence of **mass movement** or potential **mass movement** includes, but is not limited to:

- scarps or small cliffs;
- steep curving concave slopes;
- reverse slopes;
- hummocky terrain;
- **disturbed** drainage patterns;
- convex bulges on lower slopes;
- sharp vegetation boundaries;
- different vegetation patterns;
- recent or revegetated scars, where more than 10 cubic metres of **soil** has slipped or moved downslope;
- slumped or slipped **road batters**;
- tension cracks along fill **batters**;
- bedding planes which dip at an angle parallelling the ground surface;
- mixed or buried **soil** profiles;
- bent timber;
- split timber; and
- springs at the toe of the slope.

The person carrying out the investigation must document evidence of **mass movement** or potential **mass movement** within the **compartment** or **roading** area.

- (2) Where **LiDAR** coverage is not available, **FCNSW** must undertake the assessment required by Module 2 of this **protocol**, set out in the table below.

Module 2: Mass movement assessment for areas without LiDAR coverage
Step 1: Consideration of existing information for areas without LiDAR coverage
<p>FCNSW must consider all existing information that is relevant to mass movement within the proposed operational area. This information could include, but is not restricted to:</p> <ul style="list-style-type: none"> • published reports and surveys (for example: local investigations or studies of mass movement, soil conservation reports and technical notes; and the Office of Environment and Heritage soil landscape map series); • consultation with local branches of the Office of Environment and Heritage; and • historical evidence, either in the form of internal reports or file notes, or as anecdotal evidence.
Step 2: Field assessment
<p>The purpose of the field assessment is to determine if there is evidence of existing or potential mass movement within a proposed operational area.</p> <p>The procedure for field assessment is as follows:</p> <p>Undertake a field survey and investigation of each compartment or roading area and determine if any mass movement is present or likely to occur.</p>

The field survey and investigation must at a minimum include existing **roads**, **side-cut snig tracks**, **gravel pits**, quarries, major excavations and cleared slopes.

Evidence of **mass movement** or potential **mass movement** includes, but is not limited to:

- scarps or small cliffs;
- steep curving concave slopes;
- reverse slopes;
- hummocky terrain;
- **disturbed** drainage patterns;
- convex bulges on lower slopes;
- sharp vegetation boundaries;
- different vegetation patterns;
- recent or revegetated scars, where more than 10 cubic metres of **soil** has slipped or moved downslope;
- slumped or slipped **road batters**;
- tension cracks along fill **batters**;
- bedding planes which dip at an angle parallelling the ground surface;
- mixed or buried **soil** profiles;
- bent timber;
- split timber; and
- springs at the toe of the slope.

Evidence of **mass movement** or potential **mass movement** within the **compartment** or **roading** area must be mapped by the person carrying out the investigation.

Step 3: Aerial photo interpretation

If after completing Step 1 and 2 of Module 2, the findings from those steps are inconsistent, **FCNSW** must undertake aerial photograph interpretation to establish if the geological and landscape units have a **mass movement hazard**.

The purpose of this assessment procedure is to determine whether there is evidence of **mass movement hazard** or slope instability on land within the **compartment** or **roading** area, or on areas outside the **compartment** or **roading** area that have similar geological and geomorphological characteristics.

In determining the areas of existing or potential **mass movement**, **FCNSW** must take a conservative approach. For example, a potentially unstable area which shows no signs of actual **mass movement** but is similar in other aspects to nearby unstable areas, must be considered to have a **mass movement hazard**.

The following procedure must be adopted to identify areas of potential or actual **mass movement** within a proposed **operational area** using aerial photograph interpretation, prior to the commencement of a **forestry operation** in that **operational area**:

- aerial photograph interpretation must be undertaken on the largest scale of photographs available for the total extent of each geological unit which occurs within the **compartment** or **roading** area
- aerial photograph interpretation must be undertaken on the most recent series held by **State Forests** unless older photographs held by **State Forests** have a better resolution;
- aerial photograph interpretation must be undertaken on the geological unit, which may include tenures outside **State Forests**; and

Areas of the *compartment* that show evidence of **mass movement** must be mapped. Evidence of **mass movement** includes those areas described in Step 2 of Module 2.

13.3 Steps to be taken after undertaking the assessment procedures in Module 1 or Module 2

- (1) Where the investigation and results from Module 1 or Module 2 indicate that there is no existing or potential **mass movement hazard**, **FCNSW** is not required to further assess for **mass movement**.
- (2) The person undertaking the assessment set out in Module 1 or Module 2 must:
 - (a) conduct all necessary investigations and inspections to verify and determine if there is an existing or potential **mass movement hazard**, in accordance with this **protocol**; and
 - (b) take a conservative approach in assessing the existing or potential **mass movement**.
- (3) Where the investigation and results from Module 1 or Module 2 indicate that there is an existing or potential **mass movement hazard**, **FCNSW** must procure detailed written expert advice:
 - (a) on whether the proposed **forestry operation** should proceed; and
 - (b) if so, the site-specific conditions and mitigation measures and techniques that must be applied when carrying out the proposed **forestry operation** to prevent or mitigate potential or actual **mass movement**.
- (4) If the expert advice in condition 13.3(3) is that the **forestry operation** should proceed, the person undertaking the assessment must develop mitigation measures which must, at a minimum, apply to the following:
 - (a) **road construction**;
 - (b) **road upgrading** and **maintenance**;
 - (c) **road drainage** design and management;
 - (d) **road** batter **stabilisation**;
 - (e) **seasonality** or weather restrictions;
 - (f) exclusion area from **forestry operations**;
 - (g) side-cut **snig track construction** techniques;
 - (h) side-cut **snig track** drainage;
 - (i) side-cut **snig track** batter **stabilisation**;
 - (j) **harvesting** restrictions and prescriptions; and
 - (k) proximity of unstable areas to **drainage features**.

Protocol 14: Design methods for crossings and drainage structures

14.1 Introduction

- (1) Chapter 5, Divisions 4 and 5 of the **approval** include various requirements for **road crossings** and **tracks drainage structures, track crossings and permanent track crossings** to be designed to withstand certain **peak flow** levels, as determined under this **protocol**.

14.2 Design of crossings

- (1) Design calculations used to determine the **peak flow** for the specified recurrence intervals relating to the design of **crossings**, within catchments less than 2000 hectares in area must be undertaken in accordance with the 'Modified Rational Method' specified in the **FCNSW Technical Guidance for Roadworks Volume 1** (1998).
- (2) **FCNSW** must not use an alternative method for calculating the **peak flow** for the specified recurrence intervals required by the **approval** for **crossings**, without the **EPA's** prior written approval.

*Note: All **crossings** are required to withstand the **peak flow** from a 1:10 year storm event. For existing and temporary **crossings**, **FCNSW** is not necessarily required to conduct the calculation described above but the requirement for that **crossing** to withstand the specified storm event remains.*

14.3 Design of road and track drainage structures

- (1) Design calculations used to determine the design capacity for the specified recurrence interval relating to **road** and **track drainage structures** must be undertaken in accordance with the following methodology and recorded with the planning documentation for the relevant **forestry operation**:

*Note: The design calculation to determine the capacity of **road** and **track drainage structures** is a two-stage calculation.*

- (a) Determine the peak flow (Q) using the 'Rational Method' described in *Australian Rainfall and Runoff* (1987, page 293). The rational method uses the equation:

$$Q = C.I.A/360 \quad \dots(1)$$

where

Q = **peak flow** (cubic metres/second)

C = runoff coefficient (set at 0.85)

I = rainfall intensity (millimetres/hour)

A = catchment area (hectare)

*Note: The rainfall intensity (I) factor to be used in this equation must be derived using the 'Kinematic Wave Equation' provided in *Australian Rainfall and Runoff* (1987, page 300) or in *Australian Rainfall and Runoff* (1998 reprinted edition, Book 8, page 12).*

- (b) Once the **peak flow** (Q) has been calculated, 'Manning's Equation', equation (2) below, must be used to determine the minimum depth of water flow in the **drainage structure**:

$$Q = 1/n.A.R^{2/3}.S^{1/2} \quad \dots(2)$$

where

Q = **peak flow** (cubic metres/second)

N = roughness coefficient (derived from *Australian Rainfall and Runoff*, 1987)

A = cross-sectional area of flow (metres²)

R = hydraulic radius

S = **drainage line** slope (m/m)

- (c) **FCNSW** must not use an alternative method for calculating the **peak flow** for the specified recurrence intervals required by the **approval** for **road** and **track drainage structures**, without the **EPA's** prior written approval.

*Note: The recommended maximum spacing for **road** and **track** drainage will be contained in the guidance material.*

14.4 Requirements for existing relief pipes on roads

- (1) Relief pipes on **roads** are required to convey the **peak flow** from a 1:5-year storm event.
- (2) For existing relief pipes on **roads**, **FCNSW** is not required to conduct the calculation set out in 14.3(1) of this **protocol** but must still comply with the requirement in condition 14.4(1) of this **protocol**.

14.5 Requirements for crossbanks on tracks

- (1) Where **crossbanks** are used on **tracks**, **FCNSW** may elect not to calculate the capacity of the **crossbanks** in accordance with the design calculation set out in 14.3(1) of this **protocol**. In these cases, the **crossbanks** must be constructed to a minimum unconsolidated **effective bank height** of 35 centimetres or a consolidated **effective bank height** of 25 centimetres. A maximum height of 50 centimetres unconsolidated is recommended.

*Note: The recommended maximum spacing for **track** drainage will be contained in the guidance material.*

Protocol 15: Inherent soil erosion and water pollution hazard assessment

15.1 Introduction

- (1) This **protocol** sets out the procedure for **FCNSW** to determine the **inherent hazard level** for **harvesting operations** covered by the **approval**. This **protocol** does not apply to **roading operations**.
- (2) **Inherent soil erosion and water pollution hazard** for a particular **forestry operation** is determined on the basis of the following interrelated factors:
 - (a) **rainfall erosivity**;
 - (b) **ground slope**; and
 - (c) **soil regolith** stability, having regard to the cohesion and sediment delivery potential of **soil regolith**.
- (3) **FCNSW** must take a conservative approach in categorising the **inherent hazard level** under this **protocol**.

15.2 Data sources for inherent hazard level assessment

- (1) **FCNSW** must carry out the **inherent hazard level** assessment procedure for each **compartment**, as set out further below, using the following **spatial datasets** only:

Data type	Data description	Data source
Compartment boundary data	FCNSW's GIS compartment dataset	FCNSW's GIS as supplied to the EPA
Slope class	FCNSW's GIS slope dataset	Where LiDAR data is available, slope class must be produced in accordance with the guideline: 'LiDAR data processing and products'. Where LiDAR data is not available, slope class must be produced using Land and Property Information 25 x 25 m grid cell.
Rainfall erosivity	Table of rainfall erosivity and rainfall zone by compartment dataset	FCNSW's GIS as supplied to the EPA (1998)
Soil regolith stability	<i>Soil Regolith Stability Classification for State forests in Eastern NSW</i> (1998) and FCNSW's GIS soil regolith* dataset	Murphy, C; Fogarty, P; and Ryan, P. – ISSN 1324-6860

*The **FCNSW GIS soil regolith** dataset contains **soil regolith** stability classification identified during the **soil regolith** verification process undertaken since 1999.

- (2) **FCNSW** may only use alternative data sets to assess the **inherent hazard level** with the **EPA's** written approval.

(3) **FCNSW** may only amend the data sources used in this **protocol**, in accordance with **Protocol 34: Spatial datasets** and the following procedures:

- (a) **FCNSW** can only amend the table of **rainfall erosivity** for a **compartment** with the **EPA**'s written approval;
- (b) If **FCNSW** amends:
 - (i) the **compartment** boundary information held in the **FCNSW GIS compartment** dataset; or
 - (ii) the slope information held in the **FCNSW GIS** slope dataset,

FCNSW must provide the amended **GIS** dataset to the **EPA** within 21 days of making the amendment.

- (c) If as a result of the **soil regolith** assessment process the verified regolith is found to differ from the mapped regolith, **FCNSW** must:
 - (i) amend the **FCNSW GIS soil regolith** stability classification dataset; and
 - (ii) by the end of the **financial year**, submit the amended **FCNSW GIS soil regolith** stability classification dataset to the **EPA**.

15.3 Soil erosion and water pollution hazard assessment procedure

(1) **FCNSW** must carry out the **inherent hazard level** (IHL) assessment procedure separately for each **compartment** with the following steps i.e. **compartments** must not be amalgamated for the purpose of determining the **inherent hazard level**.

(a) **Step 1: Determining soil regolith class of a compartment**

- (i) Subject to sub-condition (ii), **FCNSW** must use the *Soil Regolith Stability Classification for State Forests in Eastern NSW (1998)* 'Soil regolith determination methodology' set out at sub-condition (iv) to verify the **soil regolith** class or classes for all **compartments** where:
 - (A) the **forestry operation** involves greater than 50% canopy removal;
 - (B) the **rainfall erosivity** is greater than or equal to 6000;
 - (C) the **rainfall erosivity** is between 4000 and 6000 and a desktop assessment indicates that the mapped dominant and sub-dominant regolith classes will result in an IHL3; or
 - (D) there are areas of mapped **soil regolith** class 4 identified in an area within a **compartment** that is not a **riparian exclusion zone**.
- (ii) Despite paragraph (i), **FCNSW** does not need to apply the 'Soil regolith determination methodology' (set out at paragraph (iv)) if **FCNSW**:
 - (A) holds previously determined (since 1999) **soil regolith** data for the **compartment**; and
 - (B) can produce the **soil regolith** assessment report for the relevant **compartment**.

- (iii) For a **compartment** where paragraph (ii) applies, the assessment procedure at Step 2 must be conducted using existing **soil regolith** information held in **FCNSW's GIS**.
- (iv) The '**Soil regolith** determination methodology' is as **follows**:
 - (A) An **approved soil assessor** must determine which **soil regolith** class or classes are present within the **compartment**, using FCNSW's GIS dataset.
 - (B) Where there is no existing **soil regolith** information held in **FCNSW's GIS**, the **approved soil assessor** must undertake a site and **soil assessment** of the **compartment**, using all field inspections, investigations and testing procedures that are necessary to determine all **soil regolith** classes present within the **compartment**.
 - (C) The same **approved soil assessor** must verify that the **soil regolith** class or classes specified in the **GIS** dataset are consistent with the **soil regolith** that actually occurs within the **compartment** and must mark any **soil regolith** boundaries on a map at the same scale as the **operational map**.
 - (D) The **approved soil assessor** must undertake the above verification using all field inspections, investigations and testing procedures that are necessary to confirm that the **soil regolith** in the **compartment** is consistent with that presented by the **GIS** dataset.
 - (E) The **approved soil assessor** must document all field inspections and investigations that they make and the tests they perform to verify the **soil regolith** classes. The **approved soil assessor** must also document the results of those investigations, inspections and tests and the reasons why each conclusion was made about the **soil regolith**.
 - (F) Where a **soil regolith** class is not consistent with the information specified in the GIS dataset, the **approved soil assessor** must undertake a field investigation of the **compartment** to determine the **soil regolith** class.
 - (G) All investigations of **soil regolith** must be undertaken using the classification scheme specified in *Soil Regolith Stability Classification for State Forests in Eastern NSW* (Murphy et al. 1998).
 - (H) The **approved soil assessor** must document the field investigation they made in accordance with paragraphs (F) and (G), the results of that investigation, and the reasons why the **approved soil assessor** classified the **soil regolith** classes.
 - (I) In all field inspections and investigations referred to in paragraphs (A) to (H), the **approved soil assessor** must take a conservative approach. The level of investigation, inspection and testing required is to be determined by the **approved soil assessor**, based on their professional judgement.
 - (J) If the EPA considers that the **approved soil assessor** has conducted the verification and classification of **soil regolith** negligently, demonstrated a lack of competency, or not applied a conservative approach, the **EPA** may choose to disapprove of the **approved soil assessor**. Where this occurs, the **approved soil assessor** will cease to be approved from the date specified in writing by the **EPA** and must no longer perform the role or function of an **approved soil assessor** under this **protocol**.
 - (K) The **approved soil assessor** must certify in writing that they have conducted all necessary investigations, inspections and tests to verify and (if required) determine the **soil regolith** classes, in accordance with this

protocol and giving regard to the most sensitive **soil regolith** within the proposed **net harvest area**.

- (L) All documentation referred to above, must be kept with the **compartment** file.

(b) **Step 2: Applying the inherent hazard level tables**

- (i) **FCNSW** must use the applicable inherent hazard table, set out at the end of this **protocol**, to determine the overall **inherent hazard level** for the **compartment** based on information on **ground slope** class, **rainfall erosivity** and **regolith** class, in accordance with the following procedure:
- (A) Using **FCNSW's GIS** slope dataset (**LiDAR** data or **Land Property Information** (LPI) 25 x 25 metres), determine the percentage of the gross area of the **compartment** that falls into the slope classes specified in the inherent hazard matrices for the proposed operation type.
- (B) Select the appropriate inherent hazard table applicable to the proposed **forestry operation** (based on the forest type, **harvesting** intensity and **extraction** method).
- (C) Determine the **rainfall erosivity** value for the compartment by referring to **FCNSW's GIS rainfall erosivity** consistent with the data source table at condition 15.2(1) of this **protocol**.
- (D) Using the **rainfall erosivity** (R-factor) value for the proposed **compartment**, locate the row on the inherent hazard table that is applicable for the **compartment**.

For example, if the rainfall erosivity factor for the compartment is 2734, use the row labelled 2000-3000.

- (E) Using the **soil regolith** class provided in writing by the **approved soil assessor** for the proposed **compartment**, identify the **inherent hazard levels** that correspond to the slope classes, and hence the percentage of the gross area of the **compartment** classified as **inherent hazard level** 1, 2, 3 or 4.

(c) **Step 3: Identification of areas of inherent hazard level 4**

- (i) **FCNSW** cannot carry out any **forestry operations** on areas within the **compartment** with **ground slope** classes that have been identified as having **inherent hazard level 4**.
- (ii) Where 90% or more of the gross area of the **compartment** is **inherent hazard level 4**, all of the **compartment** must be classified **inherent hazard level 4** for that particular forest type, **harvesting** intensity and **extraction** method.
- (iii) Where less than 90% of the gross area of the **compartment** is **inherent hazard level 4**, all **harvesting operations** must be excluded from the slope classes in which **inherent hazard level 4** is applicable. This exclusion applies regardless of the application of Step 4.

(d) **Step 4: Determination of net harvest area**

- (i) The following procedure must be used by **FCNSW** to determine the **net harvest area** for the **compartment**.

- (A) After removing the areas within the **compartment** of **inherent hazard level 4**, **FCNSW** must remove all other **exclusion zones** known at the time the **pre-operational plan** is made.
 - (B) The remaining area within the **compartment** is known as the **net harvest area**.
 - (C) The **net harvest area** must be documented as part of the pre-operational plan, and must not be changed or recalculated once a forestry operation commences in that area.
- (e) **Step 5: Determination of inherent hazard level for the net harvest area**
- (i) **FCNSW** must comply with the following procedure to determine the **inherent hazard level** for the **net harvest area** from the percentage breakdown of the various **inherent hazard levels** throughout the **compartment**. Only one **inherent hazard level** can be determined for the **net harvest area** for each **compartment**:
 - (A) **FCNSW** must identify the percentage of the **net harvest area** within each of the **inherent hazard levels** 1, 2 and 3.
 - (B) Where the whole of the **net harvest area** is contained within one **inherent hazard level**, that level must apply to the **compartment**.
 - (C) Where 20% or more of the **net harvest area** is classified as **inherent hazard level 3**, all of the **net harvest area** must be assigned **inherent hazard level 3**.
 - (D) Where less than 20% of the **net harvest area** is classified as **inherent hazard level 3**, **FCNSW** must proceed to paragraph (E).
 - (E) Where 40% or more of the **net harvest area** is classified as **inherent hazard level 2** or a combination of **inherent hazard levels 2** and 3, all of the **net harvest area** must be assigned **inherent hazard level 2**.
 - (F) Where less than 20% of the **net harvest area** is classified as **inherent hazard level 3** and less than 40% of the **net harvest area** is classified as **inherent hazard level 2** or a combination of **inherent hazard levels 2** and 3, **FCNSW** must proceed to step (G).
 - (G) Where 60% or more of the **net harvest area** is classified as **inherent hazard level 1**, all of the **net harvest area** must be assigned **inherent hazard level 1**.

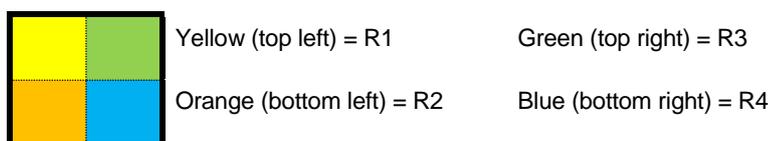
15.4 Inherent hazard level tables

- (1) There are three inherent hazard level (IHL) tables at the end of this **protocol** which apply depending on the forest type, **harvesting** intensity and **extraction** method, as follows:

IHL Table no.	Forest type	Harvesting intensity	Extraction method
IHL Table 1	Native forest harvesting	Greater than or equal to 50% canopy removal within the net harvest area	Dozer/skidder extraction
IHL Table 2	Native forest harvesting	Less than 50% canopy removal within the net harvest area	Dozer/skidder extraction

IHL Table no.	Forest type	Harvesting intensity	Extraction method
IHL Table 3	Native forest thinning	Any intensity	Forwarder extraction

- (2) Each IHL Table provides a matrix for working out **inherent hazard level** based on a combination of:
- slope class (x axis);
 - average annual R-factor (y axis);
 - soil regolith** stability classification, (R1, R2, R3 or R4) represented by cell colour shading, as follows:



- (3) The **inherent hazard level** for each combination in the IHL Table is indicated by numbers 1, 2, 3 or 4, which represent the following inherent hazard classification levels:

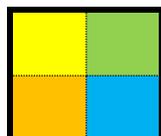
Inherent hazard level	Meaning
Level 1	Low soil erosion and water pollution hazard
Level 2	High soil erosion and water pollution hazard
Level 3	Very high soil erosion and water pollution hazard
Level 4	Extreme soil erosion and water pollution hazard – forestry operations prohibited for this proposed method of timber harvesting and extraction

- Where a combination of **harvesting** or **extraction** methods or techniques is proposed to be used within one **compartment**, **FCNSW** must use the most conservative IHL Table in determining the **inherent hazard level**.
- Where **intensive harvesting** would be carried out in a **compartment** on more than 25% of the **net harvest area**, **FCNSW** must assume that the **harvesting operation** for the **compartment** will result in a greater than 50% canopy removal within the **net harvest area**.

IHL Table 1

Average annual R-factor	Slope class (degrees)									
	0<10		10<20		20<25		25<30		30+	
0–2000	1	1	1	2	1	2	2	2	4	4
	1	2	2	2	2	2	2	2	4	4
2000–3000	1	1	1	2	1	2	2	2	4	4
	1	2	2	2	2	2	2	4	4	4
3000–4000	1	2	2	2	2	2	2	2	4	4
	1	2	2	2	2	4	4	4	4	4
4000–5000	1	2	2	2	2	2	2	4	4	4
	2	2	2	2	4	4	4	4	4	4
5000–6000	2	2	2	2	2	2	2	4	4	4
	2	2	2	4	4	4	4	4	4	4
6000+	2	2	2	2	2	4	4	4	4	4
	2	2	4	4	4	4	4	4	4	4

Soil regolith key



Yellow (top left) = R1

Green (top right) = R3

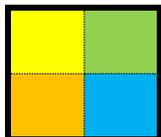
Orange (bottom left) = R2

Blue (bottom right) = R4

IHL Table 2

Average annual R-factor	Slope class (degrees)									
	0<10		10<20		20<25		25<30		30+	
0–2000	1	1	1	2	1	2	1	2	4	4
	1	2	1	2	2	2	2	2	4	4
2000–3000	1	1	1	2	1	2	2	2	4	4
	1	2	2	2	2	2	2	2	4	4
3000–4000	1	2	2	2	2	2	2	2	4	4
	1	2	2	2	2	2	2	4	4	4
4000–5000	1	2	2	2	2	2	2	3	4	4
	1	2	2	2	2	3	3	4	4	4
5000–6000	1	2	2	2	2	2	2	3	4	4
	2	2	2	3	2	3	3	4	4	4
6000+	2	2	2	2	2	3	3	4	4	4
	2	2	2	3	3	3	4	4	4	4

Soil regolith key



Yellow (top left) = R1

Green (top right) = R3

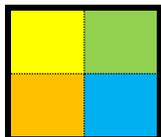
Orange (bottom left) = R2

Blue (bottom right) = R4

IHL Table 3

Average annual R-factor	Slope class (degrees)									
	0<10		10<20		20<25		25<30		30+	
0–2000	1	1	1	1	1	1	1	2	4	4
	1	1	1	1	1	1	2	2	4	4
2000–3000	1	1	1	1	1	1	2	2	4	4
	1	1	1	1	1	2	2	2	4	4
3000–4000	1	1	1	1	1	1	2	2	4	4
	1	1	1	2	1	2	2	2	4	4
4000–5000	1	1	1	1	1	2	2	2	4	4
	1	1	1	2	2	2	2	2	4	4
5000–6000	1	1	1	1	2	2	2	2	4	4
	1	1	1	2	2	2	2	4	4	4
6000+	1	1	2	2	2	2	2	2	4	4
	1	1	2	2	2	2	2	4	4	4

Soil regolith key



Yellow (top left) = R1

Green (top right) = R3

Orange (bottom left) = R2

Blue (bottom right) = R4

CHAPTER 4: OPERATIONAL PLANNING AND IMPLEMENTATION PROTOCOLS

Protocol 16: Riparian protection

16.1 Introduction

- (1) This **protocol** supports the requirements in Chapter 5, Division 3 of the **approval** for the measurement and application of **riparian exclusion zones**. **Protocol 4: Pre-operational plans** also requires the inclusion of information obtained under this **protocol** in the **operational plan**.

16.2 Riparian exclusion zones for ordered drainage features

- (1) For the purposes of condition 103 of the **approval**, Table 1 is as follows:

Table 1: Minimum riparian exclusion zone for ordered drainage features and unmapped drainage lines

Drainage	ESA category for non-regrowth zone (except Eden Subregion and Tumut Area) and regrowth zone (non-intensive)	ESA category for Eden Subregion, Tumut Area and Regrowth Zone (Intensive)	Minimum riparian exclusion zone width
Drainage feature	Width of drainage feature as measured from the bankfull level	Category 1 ESA	n/a
Unmapped drainage line	Category 1 ESA	Category 1 ESA	10 metres
1st Order	Category 1 ESA	Category 1 ESA	10 metres
2nd Order	Category 2 ESA	Category 1 ESA	20 metres
3rd Order	Category 2 ESA	Category 1 ESA	30 metres
4th Order (and above)	Category 2 ESA	Category 1 ESA	50 metres

16.3 Measurement of riparian exclusion zones

- (1) A riparian exclusion zone must:
- be measured along the ground surface from the **bankfull level**; and
 - commence from the **channel head** for a class 1 **classified drainage line**, first order **drainage feature** or **unmapped drainage line** as determined in the field (field verified).
- (2) If a segment of a **classified drainage line** below the **channel head** is a **drainage depression**, **FCNSW** must treat that segment as a **classified drainage line** and the relevant **riparian exclusion zone** must be determined and applied in accordance with condition 102.1 of the **approval** and condition 16.2 of this **protocol**.
- (3) A **riparian exclusion zone** does not need to be applied to an **ordered drainage feature** if it is not present in the field.
- (4) Despite condition 16.3(3) of this **protocol**, if a segment of an **ordered drainage feature** below the **channel head** is a **drainage depression**, it must be treated as an **ordered drainage**

feature and the relevant **riparian exclusion zone** must be determined and applied in accordance with condition 16.2 of this **protocol**.

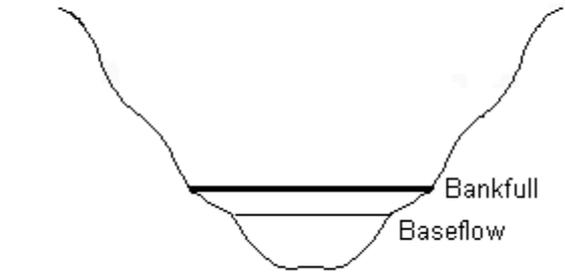
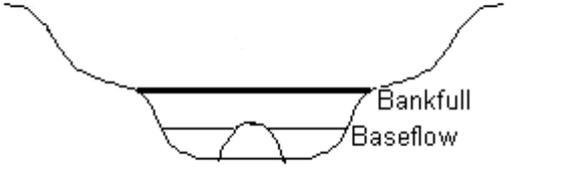
16.4 Determination of bankfull level

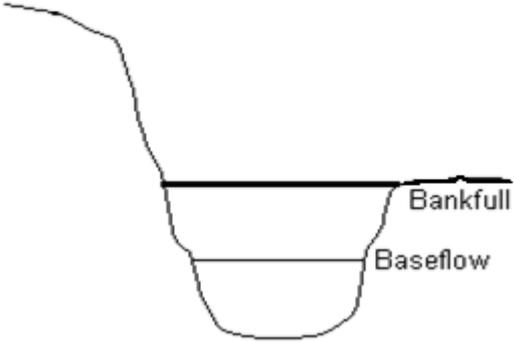
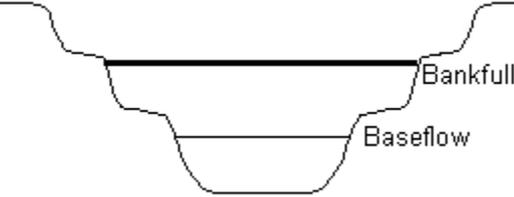
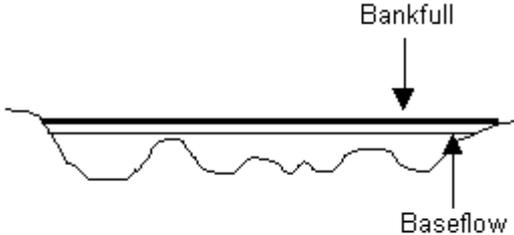
- (1) Where a **drainage line** is clearly defined, the **bankfull level** is the point at the top of the **drainage line** where, under high flow conditions, the water level would be even with the top of the banks or as determined using the examples in condition 16.5 below.
- (2) Where **drainage line** banks are not clearly defined, the **bankfull level** is:
 - (a) the point identified using the **bankfull level** indicators in condition 16.5 and 16.6 below; or
 - (b) if a point cannot be identified using the **bankfull level** indicators, the top of each bank or, where there is no defined bank, from the edge of the **drainage line**, as determined in the field.

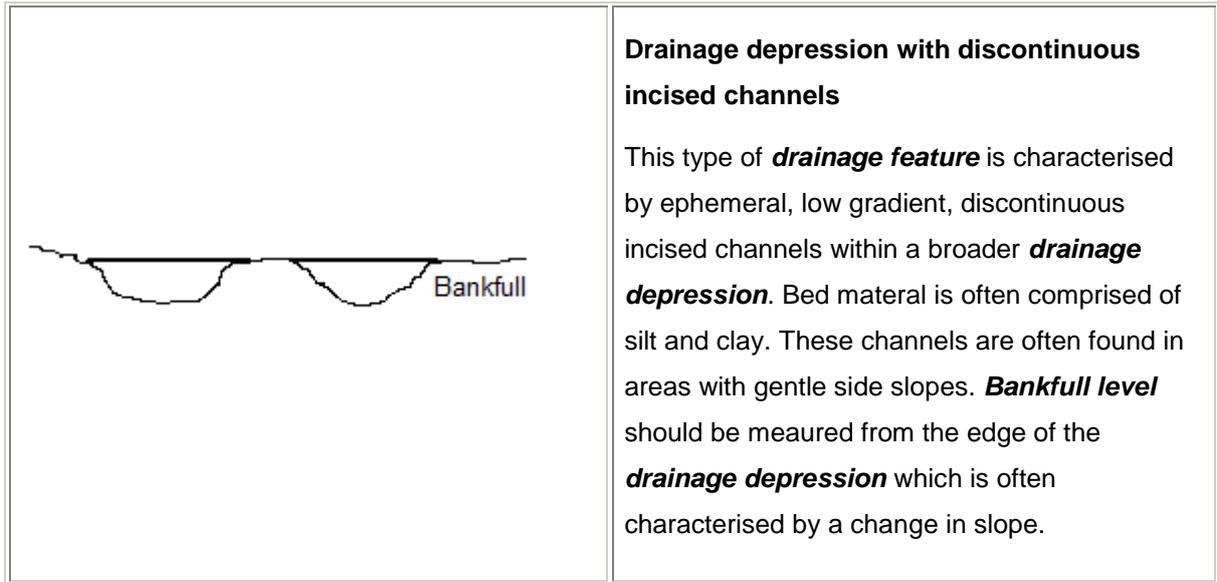
16.5 Examples to assist with identifying the bankfull level in different drainage line types

- (1) The diagrams below identify the **bankfull level** in different **drainage line** types (modified from *Australian River Assessment System: AusRivAS Physical Assessment Protocol*).

Note: Baseflow is shown for context, although baseflow and its indicators may not be present in an ephemeral channel.

	<p>Confined channel</p> <p>Confined channels have no floodplain development and are generally found in upland areas often with steep side slopes. The bankfull level in a confined channel is evidenced by a change in vegetation type, the growth of aquatic vegetation, the presence of erosion or scour marks or a break in bank slope.</p>
	<p>Channelised feature</p> <p>This type of drainage feature is found where bars have formed within the channel. The bars may be vegetated or unvegetated. Bankfull level should include the bar portion.</p>

	<p>Uneven bank height</p> <p>When one bank is higher than the other, bankfull level is measured to the top of the lowest bank. This is because the top of the lowest bank represents the point where water would overtop the bank and spill onto the floodplain. Upland channels may have uneven bank heights and in those instances bankfull level indicators listed in condition 16.6 should be used to assist bankfull level identification.</p>
	<p>Channel with instream bars</p> <p>This type of drainage feature occurs where bars have formed and are attached to the banks. Bankfull level should include the top of the bar portion where it is attached to the channel bank.</p>
	<p>Terraced channel</p> <p>Terraced channels are drainage features in which the banks are characterised by bench formations. Terraced channels generally occur in lowland floodplain rivers. Regardless of the number of benches present, bankfull level is always measured to the top of the first bench only.</p>
	<p>Braided channels</p> <p>Braided channels contain multiple channels that diverge and converge around many islands. Braided channels are high energy, permanent features. Banks may be poorly defined in these types of channels, although the lateral limit of the channel can often be identified. Bankfull width should be measured across all the threads of a braided channel.</p>



16.6 Bankfull level indicators

- (1) The following indicators should be considered to assist in determining the **bankfull level** of the **drainage line** in the field:
 - (a) the **drainage line** features, including:
 - (i) break in slope from the **drainage line** bank to a terrace, bench or hillslope;
 - (ii) erosion or scour features along the **drainage line** banks;
 - (iii) the top elevation of a point bar, where the bar attaches to the **drainage line** bank; and
 - (iv) stain lines on rocks or the face of the **drainage line** bank;
 - (b) changes in vegetation type or density such as the transition from lower areas that are either bare or have aquatic vegetation to higher areas with perennial vegetation such as ferns, shrubs and trees.
 - (c) a change in the particle size of the bank material, such as the boundary between coarse cobble or gravel and fine-grained sand or silt.

Protocol 17: Fish passage

17.1 Introduction

- (1) This **protocol** supports the requirements in Chapter 5, Division 4 of the **approval** regarding **road crossings** and **permanent track crossing**.
- (2) This **protocol** applies to all **crossings** that are **constructed** or installed across a **drainage feature** deemed to be **class 1 aquatic habitat** during the term of the **approval** (to enable or assist **forestry operations**), including any existing **crossing** that is replaced in part or in whole during the term of the **approval**.

17.2 No construction of crossings unless approved by FCNSW

- (1) A crossing of a drainage feature may only be constructed to enable or assist forestry operations if:
 - (a) it is a **bridge, culvert** or **causeway**; and
 - (b) **FCNSW** has first approved (in writing) its location and its type, having assessed the crossing in accordance with the design, **construction** and **maintenance** requirements set out in this **protocol**.
- (2) Where **new, upgraded** or replacement crossings within **class 1 aquatic habitat** cannot comply with the requirements of this **protocol**, **FCNSW** must complete field-based **aquatic habitat assessments** in accordance with Appendix A of **Protocol 18: Aquatic habitat assessment** and obtain written approval from **DPI** before **constructing** the proposed **crossing**.

17.3 Permissible types of drainage feature crossings

- (1) A **crossing** of a **drainage feature** by a **road, track**, or fire trail may only be used in a **forestry operation** if the:
 - (a) **crossing** consists of a **bridge, culvert** or **causeway**; and
 - (b) surface of the **crossing** consists of a stable natural surface or an erosion resistant material.

17.4 Bridges and culverts

- (1) For all new and replacement **bridges** and **culverts** in **class 1 aquatic habitat**:
 - (a) the **bridges** and **culverts** must be designed, **constructed** and **maintained** so that:
 - (i) flows up to and including a **peak flow** from a 1:5 year storm event or a **bankfull level** flow, whichever is the lesser, are conveyed underneath the **road** formation without water flowing over the **road surface**;
 - (ii) the existing morphology of the banks of the watercourse is not **disturbed** or modified in any way except where necessary for the **construction** of approaches, abutments and erosion protection works associated with the structure;
 - (b) in-stream erosion protection works associated with a **bridge** or **culvert** must be designed, **constructed** and **maintained** so the upper surface of the base varies by no more than 100 millimetres from the natural surface level of the **drainage feature**;

- (c) **bridges** and **culverts** must be designed, **constructed** and **maintained** so that the cross-sectional area of the opening under the structure never reduces by more than 10% the natural cross-sectional area of the **drainage feature** at that location;
- (d) structures must be in place to prevent surface material from entering the **drainage feature**;
- (e) **bridges** and **culverts** must be designed, **constructed**, **upgraded** and **maintained** to withstand the **peak flow** during a **bankfull** flow event;
- (f) the base of a **culvert** must be designed, **constructed** and **maintained** so the upper surface of the base varies by no more than 100 millimetres from the natural invert level of the **drainage feature**, both upstream and downstream of the **culvert**;
- (g) during any works to **construct**, **upgrade** or **maintain** a **culvert crossing**, **FCNSW** must ensure that the **culvert** discharges so that scouring of the **drainage feature** below the outlet does not occur; and
- (h) any work to recover (or remove) a **bridge** or **culvert** (whether or not part of a **crossing** to which this condition applies) or remove any associated **soil** fill associated with the **crossing** must be carried out in a manner that minimises **disturbance** to the bed and banks of the **drainage feature** and maintains **fish passage**.

17.5 Causeways

- (1) **Causeways** must be designed, **constructed** and **maintained** so that the upper surface of the **causeway** varies by no more than 100 millimetres from the natural centre line surface level of the **drainage feature**, both upstream and downstream of the **causeway**.
- (2) When any **maintenance** is being carried out on the **causeway**, **FCNSW** must ensure that the **causeway** continues to comply with the condition 17.5(1) of this **protocol**.
- (3) During any works to **construct**, **upgrade** or **maintain** a **causeway crossing**, **FCNSW** must ensure that the **causeway** discharges so that scouring of the **drainage feature** below the outlet does not occur.

17.6 Vegetation clearing at crossings

- (1) Clearing of **vegetation** for the purpose of works associated with a **drainage feature crossing** may only occur at, or as close as possible to, right angles to the water flow unless an angled approach reduces **soil disturbance**.
- (2) When carrying out works relating to a crossing of a **drainage feature**, or its associated **road**, **track** or fire trail, vegetation must not be **disturbed** or cleared in:
 - (a) the **riparian exclusion zone** for the **drainage feature**; or
 - (b) the **riparian exclusion zone** that is more than three metres upstream or downstream from the crossing or **road**, **track** or trail.

17.7 Drainage feature crossing to be constructed at right angles to feature

- (1) A crossing of a **drainage feature** must be constructed only at (or as close as practicable to) right angles to the **drainage feature** unless an angled approach reduces **soil disturbance**.

17.8 Large woody debris management

- (1) **Large woody debris** within **class 1 aquatic habitat** must not be **disturbed** for any reason except for the realignment or relocation of a snag which materially affects the passage of water underneath a **crossing**.
- (2) **FCNSW** must approve each **large woody debris** management decision and document the approval and the reasons why it was necessary. This documentation must be maintained as a record in accordance with the **approval**.

Protocol 18: Aquatic habitat assessment

18.1 Introduction

- (1) This **protocol** supports the requirements in Chapter 5, Division 4 of the **approval** regarding the **road crossings** and **permanent track crossing**. This **protocol** also supports requirements in **Protocol 9: Pre-operational road and crossing assessments for aquatic habitat assessment** in various circumstances.
- (2) **Protocol 4: Pre-operational plans** requires the inclusion of information obtained under this **protocol** in the **operational plan** for **harvesting operations**.
- (3) Further, this **protocol** supports the requirement in **Protocol 17: Fish passage** for assessment under this **protocol** where **new, upgraded** or replacement crossings within **class 1 aquatic habitat** cannot comply with the requirements of that **protocol**.

18.2 General requirements

- (1) **FCNSW** must not carry out a **forestry operation** in any **compartment** unless it has undertaken an **aquatic habitat assessment** in relation to that proposed **forestry operation**.
- (2) The **pre-operational plan** for that **forestry operation** must take into account the requirements of this **protocol** and show any of the following areas or features within the subject **compartment**:
 - (a) **class 1 aquatic habitat**;
 - (b) **riparian protection zones**;
 - (c) **wetlands** and associated **exclusion zones**;
 - (d) existing **drainage feature crossings** proposed to be used, **maintained, upgraded** or replaced; and
 - (e) any **new drainage feature crossings** proposed to be **constructed**.

18.3 Class 1 aquatic habitat

- (1) **Class 1 aquatic habitat** comprises areas which the following **DPI** mapping identifies as including indicative distributions of any **threatened species, populations or ecological communities**, listed in Schedules 4, 4A or 5 of the *Fisheries Management Act 1994*:
 - (a) the **DPI**-supplied **IFOA spatial dataset** and accompanying **metadata** held by the **EPA** titled:
 - (i) 'Class1_AquaticHabitat_Area'; and
 - (ii) 'Class1_AquaticHabitat_Line'.
- (2) For the purpose of this **protocol**, **DPI** will provide **FCNSW** and the **EPA** with one or more of **threatened species** indicative distribution maps, **GIS** layers and general **habitat** descriptions to assist with determining the presence of **class 1 aquatic habitat**.

18.4 Aquatic habitat assessment of proposed forestry operations

- (1) **FCNSW** must record the following for each aquatic habitat assessment:
 - (a) date of the **aquatic habitat assessment**;

- (b) **management zone, State Forest** name, **compartment** number;
 - (c) name and position of person(s) conducting assessment;
 - (d) **operational map** for the subject **compartment** showing:
 - (i) **class 1 aquatic habitat**;
 - (ii) **riparian exclusion zones**;
 - (iii) **wetland** exclusion zones;
 - (iv) the location of existing **drainage feature crossings** proposed to be used, **maintained, upgraded** or replaced; and
 - (v) any new **drainage feature crossings** proposed to be **constructed**.
 - (e) a description of the design and construction methods for any **new, upgraded** or replaced **drainage feature crossings** to be used and an assessment of compliance with **Protocol 17: Fish passage**; and
 - (f) a list of species as described in Schedule 4, 4A or 5 of the *Fisheries Management Act 1994* (NSW) identified in the assessment as potentially occurring within the subject **compartment**.
- (2) With respect to **new, upgraded** or replacement crossings within **class 1 aquatic habitat** the information specified in condition 18.4(1) of this **protocol** must be recorded and provided to **EPA** or **DPI** on request. For assistance in completing an aquatic habitat assessment, see the list of information and data required by **Appendix A** of this **protocol**.
- 18.5 Approval of drainage feature crossings within class 1 aquatic habitats that are not compliant with the requirements of **Protocol 17: Fish passage**.
- (1) When applying for approval to **construct** or **upgrade** a **drainage feature crossing** in **class 1 aquatic habitat** which is non-compliant with **Protocol 17: Fish passage, FCNSW** must provide **DPI** with a **drainage feature crossing** report addressing the matters identified for an **aquatic habitat assessment (Appendix A** of this **protocol)** and the following:
- (a) justification for the non-compliance with the **Protocol 17: Fish passage**;
 - (b) a review and justification of alternative crossing designs;
 - (c) the reasons why the works must be undertaken;
 - (d) any mitigation measures to be applied; and
 - (e) results of the field assessment which must be undertaken and must include:
 - (i) a description of the proposed works, including dimensions of area to be affected (crossing footprint, runoffs, etc.), method of **construction** including any cutting, filling and bed **disturbance** that may be involved and full design details;
 - (ii) an assessment and description of any **threatened species** likely to occur within the subject **drainage feature** and a description of the **habitat** of those species;
 - (iii) an assessment of the potential for the proposed crossing to create a long-term barrier to movement of **threatened species** or potential to increase the threats to **threatened species**; and

- (iv) a field assessment of any aquatic **habitat** that will or is likely to be directly or indirectly affected by the **construction**, as determined by the **aquatic habitat assessment** checklist at **Appendix A** of this **protocol**.

18.6 Planning checklist

- (1) The planning checklist at **Appendix B** of this **protocol** provides guidance on the processes which may apply in complying with this **protocol** and additional matters under s.199 of the *Fisheries Management Act 1994*.

Appendix A: Aquatic habitat assessment: information and data required

State Forest:

Compartment:

Crossing identifier:

Name of assessor:

Date of assessment:

Plan no:

Site details

Drainage class/drainage order: 1/2/3/4

Stream flow patterns: *Permanent/semi-permanent/intermittent/dry gully*

Catchment size: *ha*

Stream grade at site: *Gentle/intermediate/steep*

Pooling: *Are the pools present? Are they likely to be permanent? How far between pools? What is the pools size/depth?*

Presence of aquatic vegetation: *e.g. Lomandra*

Other site details: *Include a brief description of any other site details that may be relevant, e.g. rocky substrate, underground water flows, streamside vegetation, snags, barriers to fish passage upstream/downstream, etc.*

Three site photographs: *1 Upstream/2 Downstream/3 Existing or proposed crossing site*

Construction details

Crossing diagram showing a description of the proposed works, including dimensions of area to be affected (road footprint, runoffs, etc.), method of construction including any cutting, filling and bed disturbance that may be involved and full design details.

Justification of location and type of crossings: *i.e. are there other practical means of access?*

Reasons for selecting this option: *If yes above, what are the options and why select the chosen option?*

Mitigation and ameliorative measures to be applied: *For example, to protect fish habitat, the installation of mitre drains to mitigate road erosion; to reduce the potential for soil erosion and sediment flow into a crossing, build gravelled approaches to crossings.*

Fish species likely to be affected: *An assessment and description of any fish species or potential habitat that will or is likely to be directly or indirectly affected by construction.*

Aquatic habitat likely to be affected:

Likelihood of road to create a barrier to movement:

Past disturbance of the site:

Appendix B: Planning checklist

	Question	Yes/No/ N/A	Comments
1.	Is there class 1 aquatic habitat within the planning unit and/or Indicative habitat of threatened species likely to occur in the locality?		If Yes , go to Step 2 or 3(a) for new or upgraded crossings. If Yes for existing non-compliant crossing that requires maintenance only, go to Step 3(b). If No , go to Step 4 for all drainage crossing works.
2.	New/upgraded crossings?		Comply with Protocol 17: Fish passage approval . If proposed crossing will not comply, go to Step 3(a).
3(a)	Is a field-based aquatic habitat assessment required? Notification and assessment sent to DPI Approval received from DPI		If Yes , comply with Protocol 18: Aquatic habitat assessment approval (see assessment list of info and data required). Consult with DPI . Once approval has been received, works may proceed.
3(b)	Are the drainage feature crossing works – maintenance of existing crossing only? Notify DPI in accordance with the Aquatic Habitat Assessment Protocol		Notify DPI of maintenance works applicable to existing crossings that are within class 1 aquatic habitat and non-compliant with Protocol 17: Fish passage .
4.	Are dredging and/or reclamation works proposed within drainage features outside of class 1 aquatic habitat ? DPI – Fisheries notified of works in accordance with s.199 of the <i>Fisheries Management Act 1994</i> (NSW).		If Yes , undertake a field-based assessment (see assessment list of info and data required). Consider and apply fish passage requirements consistent with the DPI – Fisheries Policy and Guidelines for Fish Habitat Conservations and Management (updated 2013) where practical and provide notice to DPI – Fisheries in accordance with s.199 of the <i>Fisheries Management Act 1994</i> .

Protocol 19: Determination of drainage class and stream order

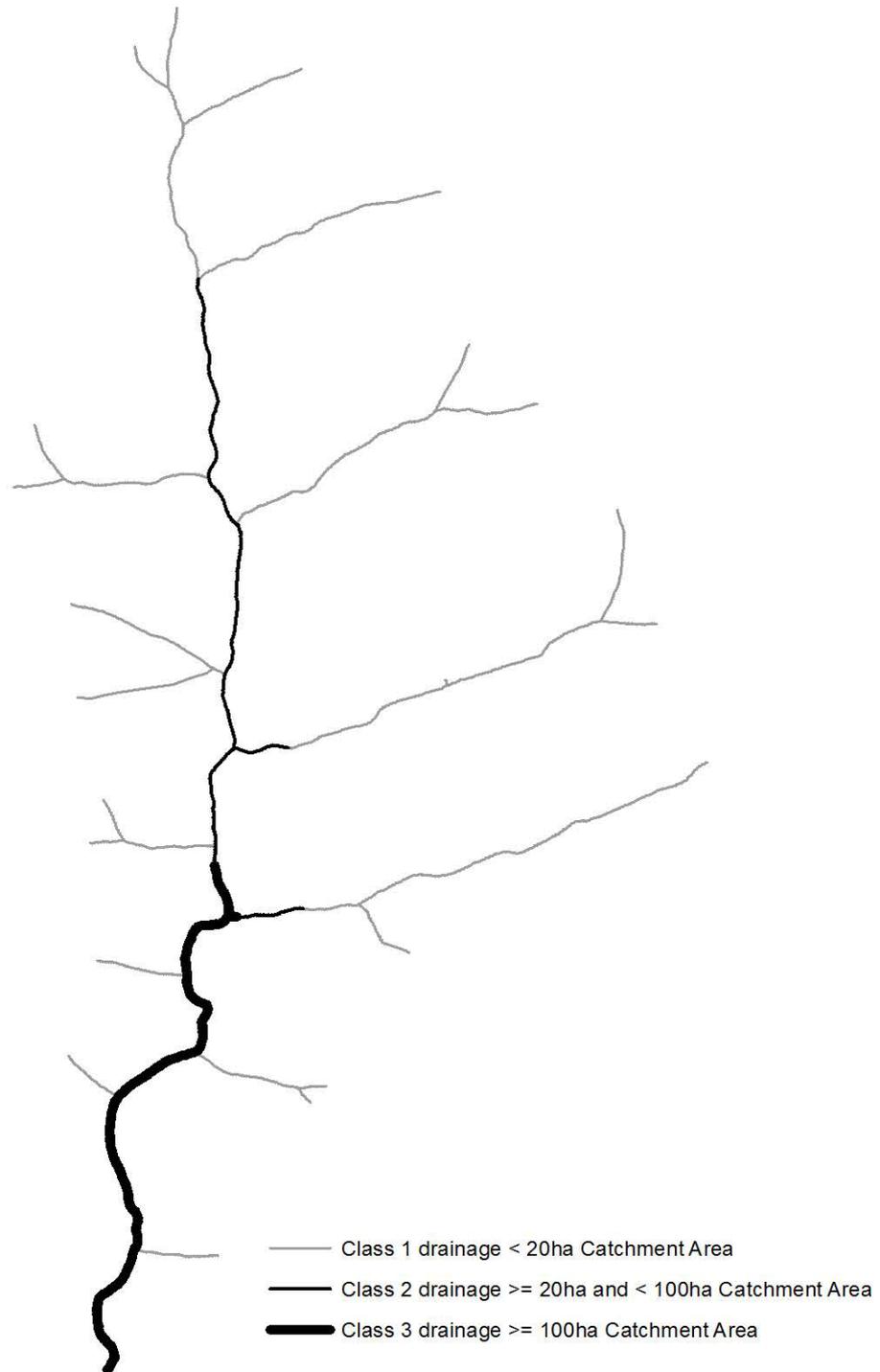
19.1 Introduction

- (1) This *protocol* supports the requirements in Chapter 5 Division 3 of the *approval* relating to *drainage class* and the identification of *drainage order*.

19.2 Where LiDAR data exists

- (1) Where *LiDAR data* exists, the applicable *drainage class* for a *mapped drainage line* must be determined as follows:
 - (a) A '*Class 1 drainage line*' is a *mapped drainage line* that is less than 20 hectares in catchment size. The headwater or point of origin of a *Class 1 drainage line* may extend beyond or fall short of the *mapped drainage line* and must be verified in the field.
 - (b) A '*Class 2 drainage line*' is a *mapped drainage line* that is greater than 20 hectares and less than 100 hectares in catchment size.
 - (c) A '*Class 3 drainage line*' means a *mapped drainage line* that is greater than 100 hectares and less than 400 hectares in catchment size.
 - (d) A '*Class 4 drainage line*' means a *mapped drainage line* which is greater than 400 hectares in catchment size.
- (2) The determination of *drainage class* must commence from the *catchment boundary*, even if that boundary is outside the *operational area*.
- (3) A diagram of *drainage class* is provided below.

Drainage Class

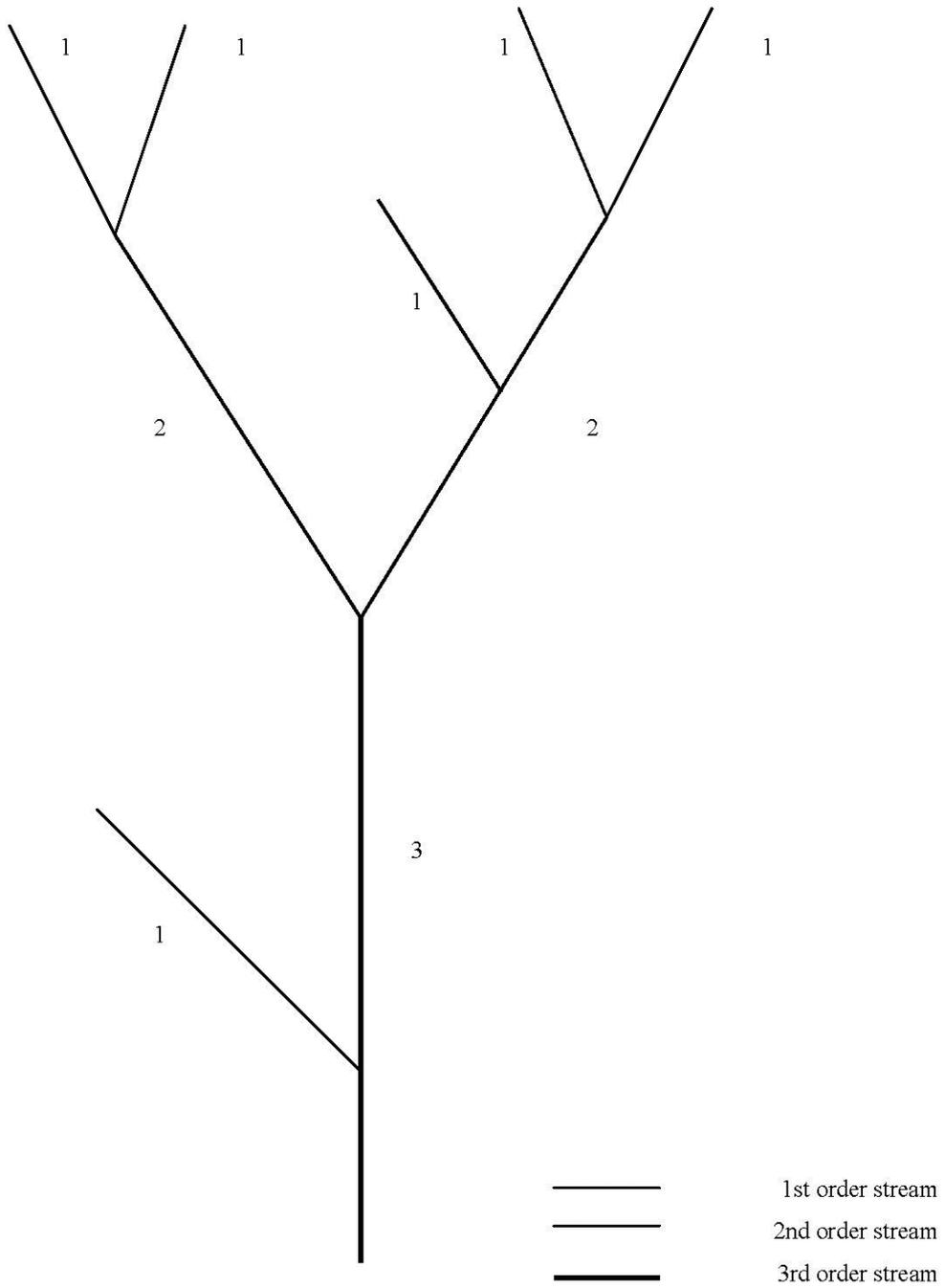


19.3 Where no LiDAR data exists

- (1) For **operational areas** that have not been mapped using **LiDAR** data, the applicable **stream order** for **drainage feature** protection must be determined as follows:
 - (a) a '**first order drainage feature**' is that part of a **drainage network** between its point of origin and the first junction with another drainage feature;
 - (b) a '**second order drainage feature**' commences at the junction of two first order drainage features;

- (c) a '**third order drainage feature**' commences at the junction of two second order drainage features;
 - (d) a '**fourth order drainage feature**' commences at the junction of two third order drainage features;
 - (e) downstream from the junction of two streams of different **stream order**, the higher **stream order** must be maintained;
 - (f) the determination of **stream order** must commence from the **catchment boundary**, even if that boundary is outside the **operational area**;
 - (g) **stream order** must be derived from the **drainage network** provided on:
 - (i) the relevant topographic maps for the proposed **operational area** from a 1:25,000 map sheet produced by Land and Property Information; or
 - (ii) if a 1:25,000 topographic map sheet is not available for **operational area**, the best available scale map sheet produced by Land and Property Information.
- (2) The location of an **ordered drainage feature** or **unmapped drainage line** must be determined in the field.
- (3) A diagram of **stream order** is provided below.

Stream Order



(after Strahler 1964)

Protocol 20: Pre-operational surveys

20.1 Introduction

- (1) This **protocol** supports:
 - (a) the requirement in Chapter 4, Division 1 of the **approval** for **FCNSW** to undertake **broad area habitat searches** and **targeted flora and fauna surveys**; and
 - (b) surveys for **species** and **habitat features** required for **restricted activity** proposals under **Protocol 5: Approvals for restricted activities**.
- (2) **Protocol 4: Pre-operational plans** requires information obtained pursuant to this **protocol** to be included in **FCNSW's operational plan** for proposed **harvesting operations**.
- (3) In this **protocol**:
 - (a) any reference to a **broad area habitat search** or **targeted flora and fauna survey** rate of effort per hectare(s) excludes any areas which at the time of the survey or search are already mapped in the **IFOA spatial dataset** titled 'Tree_Retention_Clump' or 'Wildlife_Clump' (as current from time to time) as a **tree retention clump** or **wildlife habitat clump**; and
 - (b) Any reference to **base net area** is a reference to the **base net area** of the **operational area** for the applicable **forestry operation**.

20.2 Broad area habitat search

- (1) The following requirements apply to conducting a **broad area habitat search**:
 - (a) a **broad area habitat search** must include a traverse in and within 100 metres of the **base net area** at an average across a **patch** of:
 - (i) at least 50 metres per hectare in the **base net area**; and
 - (ii) no greater than one kilometre per hour.
 - (b) the search area must cover all available **forest types** in and within 100 metres of the **base net area** and, where possible, avoid tracks or roads, unless particular features or **species** habitat is known to occur adjacent to tracks and roads;
 - (c) where a **patch** contains areas of **impenetrable understorey** and the requirements in condition 20.2(1)(a)(i) and condition 20.2(1)(b) of this **protocol** cannot be met;
 - (i) the maximum safe distance must be traversed; and
 - (ii) an additional search must be carried out, focusing on the periphery of those **impenetrable understorey** areas; and
 - (iii) the additional search in and around **impenetrable understorey** areas must be documented.

20.3 Targeted flora surveys

- (1) The following requirements apply to conducting a **targeted flora and fauna survey** for any of the following flora **species**:

- (a) A targeted flora survey consistent with this condition 20.3 must be conducted in the **operational area** for each of the flora **species** listed in Part 3 and Part 4 of the tables in condition 31.2(2) of **Protocol 31: Species covered by the approval** for which there is a **record** within five kilometres of the **operational area**.
- (b) Prior to commencing a targeted survey, **FCNSW** must document each **species** requiring survey under condition 20.3(1)(a) above and the apparent location, extent of **potential habitat** and relevant survey season for each of those **species**.
- (c) The targeted survey must be carried out in the survey season (if any) identified in Part 3 or Part 4 of the tables in condition 31.2(2) of **Protocol 31: Species covered by the approval** for the applicable **species** requiring survey under condition 20.3(1)(a).
- (d) A targeted survey:
 - (i) must consist of a traverse searching for the **species** requiring survey under condition 20.3(1)(a), at a maximum speed of 1 kilometre per hour;
 - (ii) must be conducted in the survey seasons and in areas of **potential habitat** for the **species** requiring survey under condition 20.3(1)(a) that are in or within 20 metres of the **base net area**;
 - (iii) is not required in areas more than 20 metres inside the boundary of identified **wildlife habitat clumps**, **tree retention clumps** or other areas which are already **ESAs** under the **approval**; and
 - (iv) must be conducted at the rate (or combination of rates where areas of **potential habitat** and timings of survey season coincide in part but not completely) specified in Table 1 below:

Table 1

No. of species for which potential habitat and survey season coincide	Minimum survey rate
1	3 km per 100 hectares of potential habitat in the base net area
2	3.5 km per 100 hectares of potential habitat in the base net area
3 or more	4 km per 100 hectares of potential habitat in the base net area

- (e) Where less than 100 hectares of **potential habitat** of **species** requiring survey under condition 20.3(1)(a) exists in and within 20 metres of the **base net area**, a minimum of a one-kilometre traverse is required per 10 hectares of **potential habitat** in the **base net area**, up to a maximum of a four-kilometre traverse.
- (f) Where there is a **record** of a **species** in or within 20 metres of the **base net area**, including a **record** made subsequent to a **targeted flora and fauna survey** set out in this **protocol**, a minimum of 10 minutes additional search is required in surrounding areas of **potential habitat** for that **species**.
- (g) Where there are areas of **impenetrable understorey** which mean that the requirements of condition 20.3(1)(d) to (f) cannot be met:
 - (i) the maximum safe distance must be traversed;

- (ii) an additional search must be carried out, focusing on the periphery of those **impenetrable understorey** areas; and
- (iii) the additional search in and around **impenetrable understorey** areas must be documented.

20.4 Targeted fauna surveys

(1) The following requirements apply to conducting a **targeted flora and fauna survey** for each of the following fauna **species**.

(2) Rufous Scrub-bird

(a) Surveys for Rufous Scrub-bird must be conducted as set out in this condition 20.4(2):

- (i) where there is Rufous Scrub -bird **modelled habitat** in an **operational area**; or
- (ii) where there is a **record** of Rufous Scrub -bird in or within two kilometres of an **operational area**,

(b) Surveys for Rufous Scrub-birds must be conducted:

- (i) in and within 100 metres of the **base net area**; and
- (ii) between August and February at the rate of four survey sites per 50 hectares of **Rufous Scrub-bird micro-habitat** in the **base net area**, with a minimum number of four survey sites where less than 50 hectares of **Rufous Scrub-bird micro-habitat** occurs in that area.

(c) At each survey site for Rufous Scrub -birds, the survey must consist of listening for calls of that **species** with a minimum duration of 10 minutes, repeated on two different days.

(d) If a Rufous Scrub -birds survey cannot be carried out during the peak calling season (August to February), eight sites per 50 hectares of **Rufous Scrub-bird micro-habitat** in the **base net area** must be conducted.

(e) Each Rufous Scrub -birds survey must be conducted within or adjacent to areas of suitable **Rufous Scrub-bird micro-habitat**.

(3) Albert's Lyrebird

(a) Surveys for Albert's Lyrebird must be conducted as set out in this condition 20.4(3):

- (i) where there is 10 hectares or more of Albert's Lyrebird **modelled habitat** in an **operational area**; or
- (ii) where there is a **record** of Albert's Lyrebird in or within two kilometres of an **operational area**.

(b) Surveys for Albert's Lyrebird must be:

- (i) conducted in and within 100 metres of the **base net area**;
- (ii) conducted in the early morning, giving attention to finding the location of nests;
- (iii) where there is Albert's Lyrebird **modelled habitat** in or within 100 metres of the **base net area**, conducted at the rate of 15 minutes per 50 hectares or part thereof in the **base net area**;

- (iv) where there is no Albert's Lyrebird **modelled habitat** in or within 100 metres of the **base net area**, conducted in or adjacent to areas within the vegetation formations, classes and types identified in the relevant species profile published by the Office of Environment and Heritage or identified by other literature if more relevant information exists; and
 - (v) conducted with a minimum survey effort of one hour.
- (4) Marbled Frogmouth
- (a) Surveys for Marbled Frogmouth must be conducted as set out in this condition 20.4(4):
 - (i) where there is 10 hectares or more of Marbled Frogmouth **modelled habitat** in an **operational area**; or
 - (ii) there is a **record** of Marbled Frogmouth in or within two kilometres of an **operational area**,
 - (b) Surveys for Marbled Frogmouth must:
 - (i) consist of at least five minutes of call broadcast, being the playing of recorded Marbled Frogmouth call on a loudspeaker and 10 minutes of listening at the same site (a 'call playback site');
 - (ii) conducted in and within 100 metres of the **base net area**;
 - (iii) where there is Marbled Frogmouth **modelled habitat** in or within 100 metres of the **base net area**, be conducted at the rate of:
 - (A) one call playback site for each 100 hectares of Marbled Frogmouth modelled habitat in the base net area with sites distributed across the Marbled Frogmouth modelled habitat in the base net area; or
 - (B) where less than 100 hectares of Marbled Frogmouth modelled habitat is present in that area, a minimum of one call playback site must be conducted;
 - (iv) where there is no **modelled habitat** in or within 100 metres of the **base net area**, the call playback site must be undertaken in or adjacent to areas within the vegetation formations, classes and types identified in the relevant species profile published by the Office of Environment and Heritage or identified by other literature if more relevant information exists.
- (5) Pouched Frog (*Assa darlingtoni*) (Southern meta-population)
- (a) Surveys for Pouched Frog must be conducted as set out in this condition 20.4(5):
 - (i) where there is 10 hectares or more of *Assa darlingtoni* **modelled habitat** in an **operational area**; or
 - (ii) where there is a **record** of Pouched Frog in or within two kilometres of the **operational area**.
 - (b) Surveys for Pouched Frog must be:
 - (i) conducted in and within 50 metres of the **base net area**;

- (ii) where there is *Assa darlingtoni* **modelled habitat** in or within 50 metres of the **base net area**, conducted at a rate of 10 minutes for each 50 hectares in the **base net area**;
 - (iii) where there is no *Assa darlingtoni* **modelled habitat** in or within 50 metres of the **base net area**, conducted in or adjacent to areas within the vegetation formations, classes and types identified in the relevant species profile published by the Office of Environment and Heritage or identified by other literature if more relevant information exists;
 - (iv) conducted for a minimum of 30 minutes per survey; and
 - (v) conducted each with a 10-minute survey period with at least two minutes of call broadcast, unless the species is calling freely.
- (c) Surveys must assess a range of **soaks and seepages** and **drainage features** within *Assa darlingtoni* **modelled habitat** in the **operational area**.
- (d) Surveys must only be conducted between 1 August and 31 March and during periods of **likely high-calling activity**.
- (6) *Phyloria* species
- (a) Surveys for *Phyloria* species must be conducted as set out in this condition 20.4(6):
 - (i) where there is 10 hectares or more of *Phyloria* spp. **modelled habitat** in an **operational area**; or
 - (ii) where there is a **record** of *Phyloria* spp. in or within two kilometres of the **operational area**.
 - (b) Surveys for *Phyloria* species must be:
 - (i) conducted in and within 50 metres of the **base net area**;
 - (ii) where there is *Phyloria* spp. **modelled habitat** in or within 50 metres of the **base net area**, conducted at a rate of 10 minutes for each 50 hectares in the **base net area**;
 - (iii) where there is no *Phyloria* spp. **modelled habitat** in or within 50 metres of the **base net area**, conducted in or adjacent to areas within the vegetation formations, classes and types identified in the relevant species profile published by the Office of Environment and Heritage or identified by other literature if more relevant information exists;
 - (iv) for a minimum of 30 minutes per survey; and
 - (v) each with a 10-minute survey period with at least two minutes of call broadcast, unless the species is calling freely.
 - (c) Surveys must assess a range of soaks and seepages and drainage features within *Phyloria* spp. **modelled habitat** in the operational area.
 - (d) Surveys must only be conducted between 1 August and 31 March, and be conducted during periods of **likely high-calling activity**.
- (7) Northern Corroboree Frog

- (a) Surveys for Northern Corroboree Frog must be conducted in each **operational area** with Northern Corroboree Frog **modelled habitat** in Bondo and Micalong **State Forests**.
 - (b) Surveys for Northern Corroboree Frog must consist of the shout-response technique, being a loud shout conducted every five metres followed by a 30-second listening period around bogs and ponds with Northern Corroboree Frog **modelled habitat** in and within 30 metres of the **base net area**.
 - (c) Surveys for Northern Corroboree Frog must be conducted during February in the daytime when weather conditions are fine.
- (8) Hastings River Mouse habitat suitability assessment
- (a) Habitat suitability assessment or equivalent rapid habitat assessment for Hastings River Mouse must be conducted in and within 200 metres of the **base net area**, where there is 10 hectares or more of Hastings River Mouse **modelled habitat** in the **operational area** or a **record** of Hastings River Mouse in or within 200 metres of the **operational area**.
 - (b) The assessment required under this condition 20.4(8) must be carried out as set out below:
 - (i) Classify and map vegetation cover using aerial photographs, other remote-sensing technology 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.
 - (ii) 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:
 - (A) wet or dry sclerophyll forests with a grass, sedge, rush, heath or fern understorey;
 - (B) woodland with a grass, sedge, rush, heath or fern understorey; and
 - (C) wet or dry sclerophyll forest or woodland with dispersed patches of grass, sedge, rush, heath or fern.
 - (iii) Topographic maps, aerial photographs, other remote-sensing technology and field survey must be used to identify and map any areas with outcropping rock cover occurring in conjunction with vegetation types in condition 20.4(8)(b)(ii) of this **protocol**.
 - (iv) For every 10 hectares of vegetation type mapped in condition 20.4(8)(b)(ii), one 100 metres microhabitat transect in the form and manner previously approved in writing by the **EPA** must be established.
 - (v) Each microhabitat transect must be located to sample a representative area within each 10 hectare patch of vegetation type and within 100 metres of outcropping rock cover referred to in condition 20.4(8)(b)(iii) of this **protocol** where present.
 - (vi) Each microhabitat transect must, where possible, be orientated parallel to drainage lines or transects and sample areas of high total vegetation cover of sedges, rushes, grass, heath and fern.
 - (vii) Where mapped vegetation type is patchy in distribution, each patch greater than five hectares must be sampled.
 - (viii) Other than for a rapid habitat assessment for Hastings River Mouse, using the model in Table 2 below, the suitability of habitat must be determined as either:

- (A) unsuitable, moderate or high suitability using model 1, or
- (B) unsuitable, moderate or high suitability using model 2.

Table 2

	Score		
	Low 0	Moderate 1	High 2
Sedge/rush/grass/fern cover (GSRC)	<10%	>10% or <30%	>30%
Shelter index (SI)	<17	>16	Rock scarp present
Vegetation cover 10 to 75 cm (VC)	<2.6 contacts	>2.5 contacts	–
Heath cover (HC)	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 = 0
High quality habitat	GSRC score = 2, 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

* Where the **base net area** has been burnt in the preceding two years of a habitat assessment, the scores for grass, sedge and rush cover and vegetation cover must be increased by one category (for example, increased from low to moderate).

- (c) Where **FCNSW** undertakes a rapid habitat assessment approach for Hastings River Mouse:
 - (i) **FCNSW** must **record** and **report** all information in the form and manner approved in writing by the **EPA** for rapid habitat assessments for Hastings River Mouse;
 - (ii) any staff using this approach must be trained in the use of the method;
 - (iii) the method must be subject to regular calibration by **FCNSW**; and
 - (iv) any assessment for Hastings River Mouse under this condition 20.4(8) using this approach must be documented.

- (d) In an **operational area** in which an assessment under this condition 20.4(8) is required, the assessment must be completed prior to the commencement of any **pre-harvest burn**.
- (e) Where habitat is assessed as of moderate or high suitability, the targeted surveys in condition 20.4(8)(f) must be implemented within such habitat.

*Note: Further detail of assessment of **Hastings River Mouse micro-habitat** will be contained in the guidance material.*

- (f) Hastings River Mouse trapping surveys
 - (i) Where a Hastings River Mouse habitat suitability assessment carried out under condition 20.4(8)(a) identified 10 hectares or more of **Hastings River Mouse micro-habitat** in and within 200 metres of the **base net area**, surveys for Hastings River Mouse must be conducted in and within 200 metres of the **base net area** at the rate of transects of 25 traps for each 25 hectares of **Hastings River Mouse micro-habitat** in the **base net area**, with a minimum effort of 50 traps.
 - (ii) When conducting a Hastings River Mouse survey, traps must be placed for a minimum of four nights.
 - (iii) When conducting a Hastings River Mouse survey, transects must be distributed throughout the available **Hastings River Mouse micro-habitat**, with traps placed about 10 metres apart on transects in best available **Hastings River Mouse micro-habitat** along the transect.

(9) Koala

- (a) Prior to the commencement of any **forestry operations** in a **local landscape area**, surveys for Koalas consistent with this condition 20.4(9) must be undertaken across **local landscape areas** that include parts of the following State Forests in the **Southern Subregion** or **Eden Subregions**:
 - (i) Tallaganda, Badja, Dampier, Moruya, Wandella and Bodalla State Forests in the **Southern Subregion**; and
 - (ii) Glenbog and Glen Allen State Forest in **Eden Subregion**; and
 - (iii) outside of the State Forests listed in conditions 20.4(9)(a)(i) and 20.4(9)(a)(ii), any **local landscape areas** in **Southern Subregion** or **Eden Subregion** where a Koala **record** occurs in or within two kilometres of the **local landscape area** in the last 10 years.
- (b) Koala surveys required under this condition must be conducted as Koala RgbSAT surveys which:
 - (i) are undertaken at regular intervals identified by a one-kilometre grid;
 - (ii) identify at each survey grid point a 'centre tree' which is considered to be among the most suitable trees in the area for Koala use and must be a **Koala browse tree** (where these are available);
 - (iii) have the centre tree located within 100 metres from the identified grid point in order to avoid cleared areas, boundaries or habitat **disturbances** and to maximise the inclusion of the most suitable trees in the area for Koala use, prioritising **Koala browse trees**, in the sample;
 - (iv) **record** the spatial location of the centre tree;

- (v) ensure that the centre tree and a minimum of 29 surrounding trees (which must not be a palm, cycad, fern or *Xanthorrhoea* spp.) with a minimum **diameter at breast height (DBH)** of 100 millimetres must be marked in the field, the tree species and diameter recorded and the tree sampled for Koala use as follows:
 - (A) a minimum of two minutes must be spent searching the base of each tree for Koala faecal pellets, including an initial cursory inspection of the ground surface within a distance of 100 centimetres from the base of the tree, followed by a more thorough inspection involving **disturbance** of the leaf litter and ground cover within 100 centimetres of the base of the tree; and
 - (B) once a single faecal pellet is identified beneath a tree the search around that tree may cease, a record must be made of the Koala faecal pellet including the spatial location recorded.
- (vi) At each survey grid point the following must also be assessed and recorded:
 - (A) indication of the apparent age of any Koala faecal pellets;
 - (B) soil fertility;
 - (C) overstorey description;
 - (D) understorey description;
 - (E) groundcover percentage;
 - (F) distance from the centre tree to furthest (30th) tree;
 - (G) any observations of Koalas or other signs of Koala use such as scratchings on bark of trees; and
 - (H) if **evidence of Koala** is identified within a one-kilometre grid site, surrounding sites based on a 500-metre grid must be surveyed.

Note: Alternative methods for surveying for Koalas are being developed.

20.5 Recording of surveys

- (1) A tracklog of all **broad area habitat searches** and **targeted flora and fauna surveys** must be recorded electronically (via a GPS-enabled device) and stored in a relevant file format.
- (2) Each search and survey conducted under this **protocol** must record:
 - (a) who carried out the survey;
 - (b) the date the survey was conducted;
 - (c) the start and finish times of the search; and
 - (d) any **threatened species** or **subject species** detected.
- (3) All recorded **threatened species**, **subject species** and **habitat features** must be recorded via GPS, with an accuracy of within less than 10 metres.
- (4) For flora or fauna **threatened species** or **subject species** that are cryptic or difficult to locate in the field, their location must also be marked with flagging tape to ensure their protection.

- (5) All recorded ***threatened species, subject species*** and ***habitat features*** must be protected via the prescriptions identified in condition 26 of the ***approval***.
- (6) All recorded ***threatened species, subject species*** and ***habitat features*** that trigger an action under condition 26 of the ***approval*** must be displayed on an ***operational map***.

Protocol 21: Species management plan

21.1 Introduction

- (1) Condition 91 in Chapter 4, Division 6 of the **approval** requires **FCNSW** to prepare a **species management plan** in accordance with this **protocol** for **species** referred to in condition 91 of the **approval** for the **EPA's** approval.

21.2 Flora and fauna species management plans

- (1) Requirements for the development of **species management plans**

A **species management plan** developed in accordance with this **protocol** must:

- (a) have a commencement date;
 - (b) apply to a single species of flora or fauna or, if previously agreed by the **EPA**, to multiple species with similar management requirements;
 - (c) be based on a comprehensive survey of potential **habitat** within the relevant **operational area**;
 - (d) document the species' distribution and abundance in the relevant area to which the **species management plan** applies;
 - (e) clearly document management measures to be undertaken to protect, conserve or maintain the species;
 - (f) incorporate actions specified in approved recovery plans, action statements and Saving our Species plans published by the Office of Environment and Heritage or equivalent where appropriate;
 - (g) include a survey and monitoring program that assesses:
 - (i) the effect of specified **forestry operations** on the species; and
 - (ii) the effectiveness of the management measures in providing for the species' conservation; and
 - (h) include annual reporting provisions.
- (2) Approval, reporting and review processes
 - (a) **FCNSW** must prepare the **species management plan** in consultation with the **EPA**.
 - (b) **FCNSW** must submit the **species management plan** to the **EPA**, and cannot commence the **forestry operation** in the **operational area** without the **EPA's** written approval of the **species management plan**.
 - (c) **FCNSW** must implement the survey and monitoring program described in an approved **species management plan** when conducting a **forestry operation** in that **operational area**.
 - (d) The area covered by a **species management plan** must have a spatial layer developed in accordance with **Protocol 34: Spatial datasets**.

- (e) **FCNSW** must provide the **EPA** a review report for each **species management plan** approved under this **protocol**:
 - (i) every five years from the date of commencement of a **forestry operation** within an **operational area** to which the plan applies; and
 - (ii) at such other time as required in writing by the **EPA** during the conduct of a **forestry operation** within an **operational area** to which the plan applies.
- (f) Any amendment to a **species management plan** approved under this **protocol** must be:
 - (i) approved by the **EPA**;
 - (ii) updated in the **species management plan**; and
 - (iii) implemented from the date that the **EPA** issues a written approval of the amendment.

21.3 Approved species management plans

- (1) **FCNSW** must implement the following **species management plans** when conducting a **forestry operation**:
 - (a) the Species Management Plan (South Eastern NSW) for the Southern Brown Bandicoot (*Isoodon obesulus*), being *IFOA Species Management Plan No. 1*, as it applies to **FCNSW** on 1 March 2008;
 - (b) the Species Management Plan (South Eastern NSW) for the Giant Burrowing Frog (*Heleioporus australiacus*), being *IFOA Species Management Plan No. 2*, as it applies to **FCNSW** on 1 March 2008;
 - (c) the Species Management Plan (South Eastern NSW) for the Smoky Mouse (*Pseudomys fumeus*), being *IFOA Species Management Plan No. 3*, as it applies to **FCNSW** on 1 March 2008. In particular, **FCNSW** is to assist in carrying out the survey and monitoring program as described in the plan;
 - (d) the Species Management Plan (Bago Plateau) for the Yellow-bellied Glider (*Petaurus australis*), being *IFOA Species Management Plan No. 4*, as it applies to **FCNSW** on xx 2013; and
 - (e) the Species Management Plan (Northern Rivers Region) for the Eastern Bristle Bird (*Dasyornis brachypterus monoides*), being *IFOA Species Management Plan No. 4*, as it applies to **FCNSW** on 1 April 2015.

21.4 Flora road management plans

- (1) This section guides the preparation of a **flora road management plan** under condition 90 of the **approval**.
- (2) In developing a **flora road management plan** for **species** listed in Part 3, Table 4 of condition 31.2 of **Protocol 31: Species covered by the approval**, **FCNSW** must take the following considerations into account:
 - (a) for a species in this group, exclude roadside weedicide spraying within 20 metres of plants, unless the spraying is done in accordance with a weed management plan which has the explicit aim of conserving that species;

- (b) for annuals or other short-lived species with seasonal growth and reproductive pattern, conduct **road maintenance** only during species-specific times (being the times when in most years, plants are not actively growing and have matured or dispersed their seeds);
- (c) for short-lived species (c. 3–10 years) with a **soil**-stored seed bank, which recruit after **disturbance**:
 - (i) ensure that individuals which are reproductive or have reproductive potential are not damaged;
 - (ii) schedule grading at maximum intervals of five to 15 years to encourage recruitment and maintenance of a population of standing plants; and
 - (iii) conduct **road maintenance** by grading, not slashing, so far as is possible; and
- (d) for long-lived species:
 - (i) that are vegetative resprouters;
 - (ii) that colonise roadsides;
 - (iii) that may be intolerant of competition; or
 - (iv) for which recruitment requirements are unknown,the road management plan must:
 - (v) exclude **soil disturbance** from within 1 m of individuals; and
 - (vi) enable **road maintenance** to be conducted only by slashing, at a minimum of two year intervals.

Protocol 22: Wildlife habitat and tree retention clumps

22.1 Introduction

- (1) Chapter 3, Division 3 of the **approval** requires the identification and retention of **wildlife habitat clumps** in accordance with this **protocol**.
- (2) Chapter 4, Division 3 of the **approval** requires the identification and retention of **tree retention clumps** in accordance with this **protocol**.

22.2 General conditions for identifying wildlife habitat and tree retention clumps

- (1) **Wildlife habitat clumps** must include at least one, and as many as possible, of the following:

- (a) existing **hollow-bearing trees, Glider sap feed trees, Glossy Black-Cockatoo feed trees** and **giant trees**;
- (b) **potential future hollow-bearing trees**;
- (c) previously protected **habitat** for **subject species** or **threatened species**;
- (d) **carry-over exclusion zones**;
- (e) **dead standing trees** and **coarse woody debris**;
- (f) previously unmapped **rocky outcrops, cliffs, heath and scrub, wetlands** and their associated **exclusion zones**;
- (g) other **threatened species habitat**;
- (h) areas where **Koala browse prescription 1** or **Koala browse prescription 2** would otherwise apply;
- (i) local populations of threatened or unusual plants (e.g. edge of range or locally uncommon);
- (j) mature forest patches and long-**undisturbed** patches within otherwise more recently harvested areas (data sources – CRAFTI, LIDAR, targeted surveys);
- (k) rocky ground and valuable understorey **habitat** such as grass trees, fruiting and flowering shrubs, allocasuarina stands (data sources targeted and previous surveys);
- (l) **habitat** connectivity to help improve landscape connections between other retained patches of vegetation or as **habitat** islands within a large cutover area (can be corridors or islands, both improve connectivity);
- (m) selection of **habitat** for regional priority species and forest communities, or environmental features important within the **local landscape area**.

Note: FCNSW must consider regional threatened species and habitat priorities, as set out in accompanying guidance material, for the design of each wildlife habitat clump.

- (2) **Tree retention clumps** must:

- (a) include at least one, and as many as possible, of the following:

- (i) existing hollow-bearing trees, Glider sap feed trees, Koala browse trees, Glossy Black-Cockatoo feed trees and giant trees;
 - (ii) potential future hollow-bearing trees; or
 - (iii) dead standing trees.
- (b) Where any of the following **ESAs** occur in conjunction with the **habitat** in condition 22.2(2)(a), they can be incorporated into the **tree retention clump**:
- (i) **bird roosts or nests** and associated **exclusion zones** as described by condition 83 of the **approval**;
 - (ii) **bat roost trees, potential subterranean bat roost** or subterranean sites associated with records of roosting bats and associated **exclusion zones** as described by condition 85 or 87 of the **approval**;
 - (iii) plants requiring the protection of all individuals and associated **exclusion zones** as described by condition 88 of the **approval**;
 - (iv) plants requiring protection of mature individuals as described by condition 89 of the **approval**.
- (3) As a priority, to the extent practicable:
- (a) **wildlife habitat clumps** must include valuable **habitat** patches; and
 - (b) **tree retention clumps** must be designed to provide adequate buffering of vulnerable **hollow-bearing trees** near the boundaries of the **tree retention clump**.
- (4) The following factors must be considered when identifying **wildlife habitat clumps** and **tree retention clumps**:
- (a) the **wildlife habitat clumps** and **tree retention clumps** should, as far as is practicable, improve landscape connections between other retained patches of vegetation or as **habitat** islands within a large cutover area (for example, as either corridors or islands);
 - (b) the selection of **habitat** for inclusion in **wildlife habitat clumps** and **tree retention clumps** must be considered in a local landscape context, in particular, an assessment of the environmental features available and priorities for inclusion in protection areas; and
 - (c) **wildlife habitat clumps** and **tree retention clumps** must be dispersed through the range of **habitat** types and topographic positions that occur within the **base net area** of the **local landscape area**.

22.3 Mapping obligations

- (1) Areas identified under this **protocol** must be added to the relevant spatial dataset using the layer labels in sub-condition (a) and (b) below and identified on the relevant **operational map**:
 - (a) for **wildlife habitat clumps** – 'Wildlife_Habitat_Clump'
 - (b) for **tree retention clumps** – 'Tree Retention Clump'.
- (2) For each **wildlife habitat clump** selected for protection, at least one environmental feature used to select the clump must be recorded in the relevant layer that describes the reason for its establishment.

- (3) For each **tree retention clump** selected for protection, the habitat or environmental features used to select the clump must be recorded in the relevant layer that describes the reason for its establishment.
- (4) Boundaries must be designed to ensure protection of **hollow-bearing trees** retained within clumps (i.e. provide adequate buffering of vulnerable **hollow-bearing trees** near clump boundaries where there is a risk of trees falling into clumps).
- (5) The location of a **wildlife habitat clump** must not be amended unless approved in accordance with **Protocol 5: Approvals for restricted activities**, and:
 - (a) the amendment can clearly demonstrate an equivalent or improved environmental outcome;
 - (b) the amendment is to include **ESAs** listed in conditions 22.2(1)(d) or 22.2(1)(f) of this **protocol**;
 - (c) **FCNSW** has prepared a report and submitted it to the **EPA**, that addresses:
 - (i) the reasons for the proposed amendment;
 - (ii) the location of the existing and proposed **wildlife habitat clump**;
 - (iii) the options that were considered;
 - (iv) whether the **wildlife habitat clump** has been applied in a previous **forestry operation**;
 - (v) a comparison of the **habitat** values and forest types of the existing and proposed **wildlife habitat clump**;
 - (vi) a comparison of the **disturbance** history of the existing and proposed **wildlife habitat clumps**, including any previous harvesting, wildfire and hazard reduction burning, and the existence and length of existing **roads** and **tracks**; and
 - (vii) what **ESAs** will be included in the proposed **wildlife habitat clump**; and
 - (d) a digital map shapefile of the existing and proposed **wildlife habitat clump**.

Protocol 23: Tree retention

23.1 Introduction

- (1) Chapter 4, Division 3 of the **approval** requires the selection and protection of **retained trees** in accordance with this **protocol**.
- (2) Chapter 4, Division 3 of the **approval** also requires the permanent retention of **hollow-bearing trees** in certain circumstances, including where, in accordance with this **protocol**, a minimum of five such trees must be retained in every hectare of **base net area** within the **selective harvesting zone** and **Eden alternate coupe logging zone**.

23.2 Identification and recording of retained trees

- (1) At least 100 metres in advance of any **harvesting operation** occurring at the **active harvesting area** in a **compartment**:
 - (a) the **base net area** must be broken up into **patches** that are no more than 15 hectares in size and identified electronically; and
 - (b) **FCNSW** must search for, identify and record **retained trees** in each **patch**.

Note: Trees marked up in one patch cannot be used to reduce the number required to be retained in another patch. Similarly, a patch does not require additional trees to be retained to make up for a patch that has less than five hollow-bearing trees per hectare available.

- (2) Where more than the minimum number of **hollow-bearing trees** are available for retention in a **patch**, trees must be scattered across the **patch** and selected according to the *Hollow-Bearing Tree Selection Guide*.
- (3) The **Koala browse tree** retention rates within each **patch** must be determined from the area weighted average of **Koala browse prescription 1** and **Koala browse prescription 2** areas within the **base net area** of the **patch**.
- (4) Tallowwood (*E. microcorys*), Swamp Mahogany (*E. robusta*) and Red Gums (*E. tereticornis*, *glauca*, *seeana* and hybrids) must be prioritised for retention when applying the **Koala browse prescription 1** or **Koala browse prescription 2** and must make up at least 50% of the retained **Koala browse trees** where these are available.
- (5) Where more than the minimum number of **Koala browse trees** are available for retention in the relevant area of a **patch**, trees must be scattered across the relevant area of the **patch** and selected according to the *Koala North Guide*.
- (6) **Patch** boundaries must be recorded in the spatial dataset titled 'Patch' and used for subsequent **forestry operations** in that area.
- (7) **Protected trees** must be digitally marked and be included in the 'Retained_Trees' spatial dataset.

23.3 Protection of retained trees

Note: a guideline will be prepared which will support the implementation of this condition.

- (1) **FCNSW** must not **damage retained trees** during a **forestry operation**.
- (2) If a **retained tree** is **damaged** during **forestry operations**, **FCNSW** must replace it with a **comparable tree**.

- (3) Where a **comparable tree** is not available, **FCNSW** must retain a mature tree with a healthy crown.
- (4) **FCNSW** must ensure that each **retained tree** does not have **harvesting debris** accumulated at its base.
- (5) Where debris has accumulated around a **retained tree**, **FCNSW** must remove or flatten the **harvesting debris**:
 - (a) from areas within five metres of the **retained tree**; and
 - (b) to less than one metre in height.
- (6) **FCNSW** is not required to remove or flatten the **harvesting debris** from around the **retained tree** if:
 - (a) **FCNSW** can demonstrate that the removal or flattening of the **harvesting debris** will damage the **retained tree**; and
 - (b) the location of the specific tree has been digitally recorded and **FCNSW** provides justification to the **EPA's** satisfaction for not removing or flattening the **harvesting debris**.

Protocol 24: Identification of old growth on unassessed land

24.1 Introduction

- (1) Chapter 3, Division 3 of the **approval** defines **high conservation value old growth forest** as **category 2 ESA**. Under Chapter 5, Division 2 of the **approval**, **forestry operations** are prohibited in a **category 2 ESA** unless otherwise specified in the **approval**. Chapter 3, Division 3 of the **approval** requires **FCNSW** to apply this **protocol** before commencing any **forestry operation** in **unassessed Crown-timber land**.
- (2) **Protocol 4: Pre-operational plans** requires an **operational map** to identify all **ESAs**.

24.2 CRAFTI old growth taken to be HCVOG

- (1) Where **CRAFTI structural mapping** covers the entire extent of the **operational area**, all areas identified in the **CRAFTI old growth map** are taken to be areas containing **high conservation value old growth** and, therefore, the prohibition in condition 99 of the **approval** applies to such areas.
- (2) As part of a **pre-operational plan** for a **forestry operation**, **FCNSW** must notify the **EPA** where the **CRAFTI old growth map** areas have been accepted as **high conservation value old growth** under condition 24.2(1) of this **protocol**.
- (3) **FCNSW** may apply to the **EPA** to have the extent of the **CRAFTI old growth map** referred to above independently re-evaluated by submitting a written request including:
 - (a) a report and accompanying map that details the extent of the proposed re-evaluation area; and
 - (b) evidence that supports why **FCNSW** considers that the area is not **high conservation value old growth forest**.

Note: Re-evaluation of old growth mapping is only permitted in areas previously unassessed for high conservation value old growth. Existing high conservation value old growth mapping will not be altered under any circumstances.

- (4) The **EPA** will carry out the re-evaluation in accordance with the 'method of evaluation or re-evaluation' set out in condition 24.4 of this **protocol**.

24.3 Requirement to evaluate where old growth is unassessed or land is only partially mapped

- (1) Where a proposed **operational area** is depicted as 'unassessed old growth' in:
 - (a) the Native Forestry map viewer; or
 - (b) in the accompanying **GIS spatial dataset** titled 'Unassessed_OGRF' held by the **EPA**;no **forestry operations** can be carried out until the presence of **high conservation value old growth** in that area is evaluated in accordance with this **protocol**, if **FCNSW** makes such a request.
- (2) Where a proposed **operational area** is not fully covered by **CRAFTI structural mapping**, **FCNSW** must apply to the **EPA** for an evaluation of the whole **operational area** and no **forestry operations** can be carried out until the evaluation is complete.

- (3) The EPA will carry out any evaluation under this condition in accordance with the ‘method of evaluation or re-evaluation’ set out in condition 24.4 of this **protocol**.

24.4 Method of evaluation or re-evaluation

- (1) When evaluating or re-evaluating for the purposes of this **protocol**, the **EPA** will engage an independent review of the mapping by the Office of Environment and Heritage. The evaluation or re-evaluation must be undertaken in accordance with the procedure outlined in the document ‘DECC procedure section (pages 2–9) of *Private Native Forestry Code of Practice Guideline No.2: Protocol for re-evaluating old growth forest on private property* or any other successor document/s provided on the **EPA’s** website (www.epa.nsw.gov.au/resources/pnf/proldgrowth07370.pdf)
- (2) After evaluation or re-evaluation is completed:
- (a) the **EPA** will provide data detailing the extent of mapped **high conservation value old growth** to **FCNSW**;
 - (b) **FCNSW** must add any area identified as **high conservation value old growth** to the **operational map** and protect the assessed area as **high conservation value old growth** in accordance with condition 99 of the **approval**;
 - (c) the **EPA** must add the assessed areas to the ‘HCVOG_Assessed_Areas’ spatial dataset; and
 - (d) the **EPA** will periodically add assessed areas to the ‘Assessed_HCVOG’ spatial dataset.

Protocol 25: Identification of rainforest on unassessed land

25.1 Introduction

- (1) Chapter 3, Division 3 of the **approval** defines **rainforest** as a **category 1 ESA**. Under Chapter 5, Division 2 of the **approval**, **forestry operations** are prohibited in a **category 1 ESA** unless otherwise specified in the **approval**. Chapter 3, Division 3 of the **approval** requires **FCNSW** to apply this **protocol** before commencing any **forestry operation** in **unassessed Crown-timber land**.
- (2) **Protocol 4: Pre-operational plans** requires an **operational map** to identify all ESAs.

25.2 Certain mapped areas taken to be rainforest

- (1) The following areas are taken to be **rainforest** to which the prohibition in condition 98 of the **approval** applies:
 - (a) where **CRAFTI rainforest mapping** covers the entire extent of the proposed **operational area**, all areas of mapped **CRAFTI rainforest**; and
 - (b) all areas within the proposed **operational area** that are **not** identified:
 - (i) in the **spatial dataset** titled 'Areas Assessed to Identify Rainforest'; or
 - (ii) in the accompanying **spatial dataset** titled 'Rainforest_Assessed_Areas' as held by the **EPA**.
- (2) **FCNSW** may not carry out any **forestry operations** on the above areas until the presence of **rainforest** is evaluated in accordance with this **protocol**, at **FCNSW's** request.
- (3) **FCNSW** may apply to the **EPA** to have the above areas independently re-evaluated, by submitting a written request including:
 - (a) a report and accompanying map that details the extent of the proposed re-evaluation area; and
 - (b) evidence that supports why **FCNSW** considers that the area is not **rainforest**.

Note: The EPA can produce a form/template and accompanying guidance in relation to this condition.

*Note: Re-evaluation of rainforest mapping is only permitted in areas previously unassessed for rainforest. Existing areas mapped as **rainforest** will not be altered under any circumstances.*

- (4) The EPA will carry out the re-evaluation in accordance with the 'method of evaluation or re-evaluation' set out in condition 25.4 of this **protocol**.

25.3 Unassessed rainforest

- (1) Where a proposed **operational area** is not fully covered by **CRAFTI mapping**, **FCNSW** must apply to the **EPA** for an evaluation of the whole **operational area** and no **forestry operations** can be carried out until the evaluation is complete.
- (2) Where a proposed **operational area** is depicted as 'unassessed rainforest' in:
 - (a) the Native Forestry map viewer; or

- (b) in the accompanying **spatial dataset** titled 'Unassessed_OGRF' as held by the **EPA**, no **forestry operations** can be carried out until the presence of **rainforest** in that area is evaluated in accordance with this **protocol**, if **FCNSW** makes such a request.
- (3) The EPA will carry out any evaluation under this condition in accordance with the 'method of evaluation or re-evaluation' set out in condition 25.4 of this **protocol**.

25.4 Method of evaluation or re-evaluation

- (1) When evaluating or re-evaluating for the purposes of this **protocol**, the **EPA** will obtain an independent review of the mapping by the Office of Environment and Heritage. The evaluation or re-evaluation must be undertaken in accordance with the procedure outlined in the document 'DECC procedure section (pages 2–9) of *Private Native Forestry Code of Practice Guideline No.2: Protocol for re-evaluating old growth forest on private property* or any other successor document/s provided on the **EPA's** website (<http://www.epa.nsw.gov.au/resources/pnf/proldgrowth07370.pdf>) or by request to the **EPA**.
- (2) After evaluation or revaluation is completed:
- (a) the **EPA** will provide data detailing the extent of mapped **rainforest** to **FCNSW**;
- (b) **FCNSW** must add this assessed area to the **operational map** and protect any part of the assessed area identified as **rainforest** in accordance with condition 98 of the **approval**.
- (3) For the areas of **rainforest** mapped as part of evaluation or re-evaluation above, **FCNSW** must either:
- (a) apply a 20 metre **exclusion zone** around the extent of all 'Assessed_Rainforest'; or
- (b) type the 'Assessed_Rainforest' through an on-ground assessment of the mapped **rainforest**, and:
- (i) for areas in the **Upper North East Subregion** or **Lower North East Subregion** apply a 20 metre **exclusion zone** around any areas identified as RN 17 forest types 10 to 15; or
- (ii) for areas in the **South Coast Subregion** apply a 20 metre **exclusion zone** around any areas identified as RN 17 forest types 10 to 20; or
- (iii) for areas in the **Eden Subregion** apply a 20 metre **exclusion zone** around any areas identified as RN 17 forest types 1 to 26; and
- (iv) prepare and submit a report to the **EPA** detailing the steps undertaken, sampling sites, determination of forest type and all supporting evidence.
- (4) All areas identified in accordance with condition 25.4 will be added by the **EPA** to the 'Rainforest_Assessed_Areas' spatial dataset from time to time.
- (5) All **rainforest** identified in accordance with condition 25.4 must be mapped and added by the **EPA** to the 'Assessed_Rainforest' spatial dataset. Additional **rainforest** typing determined in accordance with condition 25.4 of this **protocol** will be recorded in accompanying sub-labels of either 'Rainforest', 'WT Rainforest' or 'CT Rainforest'.

Protocol 26: Identification of large forest owl exclusion zones on unassessed land protocol

26.1 Introduction

- (1) Chapter 3, Division 3 of the **approval** states that **large forest owl exclusion zones** are a **category 2 ESA**. Under Chapter 5, Division 2 of the **approval**, **forestry operations** are prohibited in a **category 2 ESA** unless otherwise specified in the **approval**.
- (2) **Protocol 4: Pre-operational plans** requires an **operational map** to identify all **ESAs**.
- (3) Chapter 3, Division 3 of the **approval** requires **FCNSW** to apply this **protocol** before commencing any **forestry operation** in **unassessed Crown-timber land**.

26.2 Identification of large forest owl exclusion zones

- (1) Where there is a **record** of a large forest owl **species**, being Powerful Owl, Masked Owl, Sooty Owl or Barking Owl, within an **operational area** which contains **unassessed Crown-timber land** or within two kilometres outside the boundary of the **operational area** which contains **unassessed Crown-timber land**, **FCNSW** must identify **large forest owl exclusion zones** using one of the following approaches:

- (a) **FCNSW** may produce planning documentation to identify **large forest owl exclusion zones** meeting protections identified in supporting guidelines for the Large Forest Owl Landscape Approach; or.

Note that guidance regarding the Large Forest Owl Landscape Approach will provide a basis for considering these areas in the context of how the approach has been previously applied.

- (b) a minimum of 20% of the operational area must be identified as **large forest owl exclusion zones**.

26.3 Composition of large forest owl exclusion zones

- (1) The areas identified as **large forest owl exclusion zones** in condition 26.2(1) must include as much **modelled habitat** as possible or the large forest owl **species** that have a **record** in the **operational area** or within two kilometres outside the boundary of the **operational area**.
- (2) Where less than 20% of the **operational area** is **modelled habitat** for large forest owl **species** then areas of **High Conservation Value Old Growth Forest** that are not otherwise **modelled habitat** for large forest owl species can be included within the required as **large forest owl exclusion zones**.
- (3) Where less than 20% of the **operational area** has been identified by conditions 26.3(1) and 26.3(2), the remaining area must be identified in parts of the **operational area** which are most consistent with the habitat described in the relevant species profile published by the Office of Environment and Heritage and relevant literature.
- (4) The areas of **large forest owl exclusion zones** identified may overlap with other **ESAs** provided they are consistent with conditions 26.3(1), 26.3(2) and 26.3(3) above.

26.4 Measures to protect identified areas

- (1) Areas identified by this **protocol** must be:
 - (a) approved by the **EPA**, and;

- (b) permanently protected as **large forest owl exclusion zones** and added to the **IFOA spatial dataset** titled 'LargeForestOwl'.

Protocol 27: Threatened ecological communities

27.1 Introduction

- (1) Condition 68.1 in Chapter 4, Division 2 of the **approval** requires **FCNSW** to identify the location of all **threatened ecological communities (TECs)** in accordance with this **protocol**. Condition 68.2 of the **approval** requires the retention of a minimum width around each **TEC**, in accordance with this **protocol**.
- (2) Chapter 3, Division 3 of the **approval** states that **TECs** are a **category 1 ESA**. Under Chapter 5, Division 2 of the **approval**, **forestry operations** are prohibited in a **category 1 ESA** unless otherwise specified in the **approval**.

27.2 Identifying the location of TECs

- (1) **FCNSW** must identify the location of **TECs** in **TEC assessed areas** by having regard to the location of **TECs** indicated on the **TEC (certified)** and **TEC (indicative)** mapping referred to in Table 1 and Table 2 of this **protocol**.
- (2) In relation to **TEC (indicative)** mapping referred to in Table 2, **FCNSW** may perform surveys to confirm the actual presence and location of **TECs** within a **TEC (indicative)** mapped area.
- (3) If it performs such a survey as per condition 27.2(2), **FCNSW** must:
 - (a) undertake the survey in accordance with the relevant **TEC field key**, listed at condition 27.4 of this **protocol**; and
 - (b) map the boundary and extent of each **TEC** surveyed in accordance with **Protocol 34: Spatial datasets, Protocol 36: Field mapping** and condition 5.4(5) of **Protocol 5: Approvals for restricted activities**.
- (4) When **FCNSW** completes this survey and mapping:
 - (a) no additional surveys are required for that **TEC** in the relevant **operational area**; and
 - (b) the **EPA** may amend the **TEC (indicative)** map; and
 - (c) the **EPA** may verify and add any areas identified as **TEC** to the relevant **TEC (certified)** map.

*Note: **FCNSW** is not required to undertake surveys to identify additional areas of the specified **TEC** outside of any area identified as **TEC (indicative)** on the relevant map.*

27.3 TEC (certified) and TEC (indicative) maps and exclusion zone width

- (1) For the purposes of condition 68.2 of the **agreement**, minimum width of the required **exclusion zone** is set out in the second column of Table 1 and Table 2 below, for the relevant **TEC**.

Table 1: TECs (certified)

TEC (certified)	TEC exclusion zone minimum width	Date certified
Brogo wet vine forest	20 m	04.11.16
Dry rainforest of the South East Forests	20 m	04.11.16
Coastal saltmarsh on floodplains	20 m or relevant wetland buffer (whatever is larger)*	04.11.16
Swamp oak floodplain forest	20 m or relevant wetland buffer (whatever is larger)*	04.11.16
Swamp sclerophyll forest on coastal floodplains	20 m or relevant wetland buffer (whatever is larger)*	04.11.16
Montane peats and swamps	20 m or relevant wetland buffer (whatever is larger)*	04.11.16
Grey Box–Grey Gum wet sclerophyll forest (Urbenville area only)	0 m	04.11.16
Lowland rainforest on floodplains	10 m	04.11.16
Lowland rainforest	0 m	04.11.16
McKies Stringybark/Blackbutt open forest	20 m	04.11.16
Riverflat eucalypt forest on floodplains	10 m	04.11.16
Subtropical coastal floodplain forest	0 m	04.11.16
Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum grassy woodland	20 m	04.11.16
Bangalay sand forest	Absent in assessed area	04.11.16
Milton–Ulladulla subtropical rainforest	Absent in assessed area	04.11.16

* Where the TEC overlaps with any area meeting the definition of a wetland as per the approval, the buffering of the feature must reflect the greatest extent of either the wetland feature or TEC. The width of the buffering should reflect the widest buffer triggered by either the wetland conditions in the TEC or the TECs listed in Table 1 or Table 2.

*Note: A review of potential gross errors identified by FCNSW in any **TEC (certified)** map should be considered through the application of condition 28.3 of the **approval**.*

Table 2: TECs (indicative)

TEC (indicative)	TEC exclusion zone width*
Lowland grassy woodland	0 m
White gum moist forest	20 m
Littoral rainforest	20 m

* Applied to a TEC identified with reference to condition 27.2(2) of this **protocol**.

27.4 TEC field keys

- (1) For the purposes of condition 68.2 of the **agreement**, Table 3 lists the **TECs** with **TEC field keys**.

Table 3: TEC field keys

TEC field key	Date certified
White gum moist forest	04.11.16
Lowland grassy woodland	04.11.16

27.5 Invalidation of a TEC map

- (1) If a determination of the NSW Scientific Committee is amended or, if the *Biodiversity Conservation Act 2016* is amended so that a **TEC** is no longer listed in that Act:
- (a) any relevant **TEC (certified)** map, **TEC (indicative)** map or **TEC field key** relating to that previously listed **TEC** is void; and
 - (b) the **EPA** may issue a new or amended **TEC (certified)** map, **TEC (indicative)** map or **TEC field key** following review of the amendment.

Protocol 28: Rocky outcrops and cliffs

28.1 Introduction

- (1) Condition 67.1 in Chapter 4, Division 2 of the **approval** requires the protection of **rocky outcrops** and **cliffs**.

28.2 Measuring a rock face to determine if it is a cliff

- (1) To determine the length of a rock face to decide whether it is a **cliff**, the measurement of the rock face must be along the horizontal face of the feature, starting at a point where the rock face is at least three metres high through corresponding points on the rock face which are also at least three metres high. The measurement does not need to be a straight line, but must follow the rock face; and
- (2) To determine the height or slope of a rock face to decide whether it is a **cliff**, the measurement of the rock face must be from the base (ground surface), vertically to highest point of the rock. Rock face height must be measured at three or more points which are at least two metres apart where the height of the rock face is >3 m at each of those points.

[Diagram to explain these setting will be included in the final Coastal IFOA]

28.3 Measuring a contiguous area of rocky outcrop

- (1) To determine the boundaries of a **rocky outcrop** where there is a contiguous area which displays the characteristics of a **rocky outcrop**, the whole contiguous area must be considered as one **rocky outcrop**.

[Diagram to explain these setting will be included in the final Coastal IFOA]

Protocol 29: Ridge and headwater habitat

29.1 Introduction

- (1) Chapter 3, Division 3 of the **approval** states that **ridge and headwater habitat** (40 metre and 80 metre corridors) is a **category 2 ESA**. Under Chapter 5, Division 2 of the **approval**, **forestry operations** are prohibited in a **category 2 ESA** unless otherwise specified in the **approval**.
- (2) **Protocol 4: Pre-operational plans** requires an **operational map** to identify all ESAs.
- (3) Chapter 3, Division 3 of the **approval** requires **FCNSW** to apply this **protocol** before commencing any **forestry operation** in **unassessed Crown-timber land**. Further, condition 59.1 of the **approval** prevents changing the location of **ridge and headwater habitat** without the **EPA's** written approval.

29.2 Identification of ridge and headwater habitat

- (1) For the purposes of the **approval**, **FCNSW** must:
 - (a) determine **class 2 classified drainage lines**, **class 3 classified drainage lines**, **second order drainage features** and **third order drainage features** in accordance with **Protocol 16: Riparian protection**; and
 - (b) determine, for every 500 hectares and in accordance with this **protocol**:
 - (i) a minimum of two **ridge and headwater habitat** corridors at least 40 metres wide which connect **class 2 drainage lines** or **second order drainage features**; or
 - (ii) a minimum of one **ridge and headwater habitat** corridor at least 80 metres wide which connects **class 3 classified drainage lines** or **third order drainage features**.
- (2) **Ridge and headwater habitat** corridors determined under condition 29.2(1)(b) of this **protocol** must establish links between **class 3 classified drainage lines** or **third order drainage features** of different catchments. Where this is not possible, **FCNSW** must establish corridors which have a minimum length of:
 - (a) 250 metres, for each corridor under condition 29.2(1)(b)(i) of this **protocol**; and
 - (b) 500 metres, for each corridor under condition 29.2(1)(b)(ii) of this **protocol**.
- (3) **Ridge and headwater habitat** determined under condition 29.2(1)(a) of this **protocol** must connect the relevant **class 2 classified drainage lines**, **class 3 classified drainage lines**, **second order drainage features** and **third order drainage features** via the associated lower order or class stream(s).
- (4) Areas of identified **high conservation value old growth forest**, **rare forests**, **rainforest** and existing **ESAs** may be used as the basis of the corridors required under condition 29.2(2) of this **protocol**.
- (5) **Ridge and headwater habitat** corridors must not cross **major roads**.

29.3 Amendment to the location of ridge and headwater habitat

- (1) The location of a **ridge and headwater habitat** corridor must not be amended without the prior written approval of the **EPA**.

- (2) Any amendment to the location of a **ridge and headwater habitat** corridor must clearly demonstrate an equivalent or improved environmental outcome.
- (3) When applying for an amendment, **FCNSW** must provide the **EPA** with:
 - (a) a report that addresses:
 - (i) the reasons for the proposed amendment;
 - (ii) the location of the existing and proposed **ridge and headwater habitat** corridor;
 - (iii) the options that were considered;
 - (iv) whether the **ridge and headwater habitat** corridor has been applied in a previous **forestry operation**;
 - (v) a comparison of the **habitat** values and forest types of areas that would be linked by the amended **ridge and headwater habitat** to the **habitat** values and forest types of areas linked by the existing corridor;
 - (vi) a comparison of the tenure of the land that would be linked by the amended **ridge and headwater habitat** corridor to the tenure of the land linked by the existing corridor;
 - (vii) a comparison of the land use of the areas that would be linked by the proposed **ridge and headwater habitat** corridor to the land use of the areas linked by the existing corridor;
 - (viii) a comparison of the **disturbance** history of the proposed **ridge and headwater habitat** corridor to the **disturbance** history of the existing corridor, including any previous harvesting, wildfire and hazard reduction burning and the existence and length of existing **roads** and **tracks**; and
 - (ix) a consideration of the adequacy of the amendment in addressing the intention of the **ridge and headwater habitat corridors** identified in establishing links between **class 3 classified drainage lines** or **third order drainage features** of different catchments as required above; and
 - (b) a digital map shapefile of the segment of the **ridge and headwater habitat** corridor proposed to be amended.

29.4 Mapping of ridge and headwater amendments

- (1) Digital maps provided to the **EPA** under this **protocol**, including specific areas where amendments to **ridge and headwater habitat** have been approved, will be included in the **spatial dataset** 'Ridge_Headwater_Habitat' on a regular basis.
- (2) Where the field application of the **ridge and headwater** conditions is not consistent with the 'Ridge_Headwater_Habitat' **spatial dataset**, **FCNSW** must map the boundary applied in the field and submit it to the **EPA** for review and will update accompanying metadata and attributes with any amendments.

Protocol 30: Subterranean bat roosts and flying-fox camps

30.1 Introduction

- (1) Chapter 3, Division 3 of the **approval** defines **bat roost tree**, **potential subterranean bat roost** and **flying-fox camp** and all associated **exclusion zones** as a **category 1 ESA**. Under Chapter 5, Division 2 of the **approval**, **forestry operations** are prohibited in a **category 1 ESA** unless otherwise specified in the **approval**.
- (2) Condition 86.3 in Chapter 4, Division 4 of the **approval** requires **FCNSW** to determine the full extent of a **flying-fox camp** in accordance with this **protocol**.
- (3) Under condition 87.2 in Chapter 4, Division 4 of the **approval**, a **bat inspection survey** in accordance with this **protocol** is essential to ascertain a **confirmed absence of bats**.
- (4) **Protocol 4: Pre-operational plans** requires an **operational map** to identify all ESAs.

*Note: This **protocol** does not include provisions relating to **bat roost trees**, although these are a **habitat feature** that must be identified under a **broad area habitat search** under condition 64.3 of the **approval**.*

30.2 Survey of potential subterranean bat roost

- (1) Inspection surveys of **potential subterranean bat roost** must only be carried out by a person with suitable experience in identifying and surveying subterranean sites for the evidence of bats.
- (2) For the purposes of this **protocol**, evidence of bats can be identified by:
 - (a) a sighting of one or more bats;
 - (b) the presence of guano (either whole or powdered);
 - (c) the distinctive odour of guano; or
 - (d) a bat call is recorded (including definite and probable ultrasonic bat detection recordings).
- (3) Where searching for **potential subterranean bat roost**, the **subterranean site** must be physically inspected where it is safe to do so:
 - (a) for evidence of bats; and
 - (b) in its entirety.
- (4) Where a physical inspection of the **subterranean site** is undertaken, the surveyor must minimise exposure of noise and light to any bats inhabiting the site.
- (5) Where a **subterranean site** is unable to be physically inspected, or inspected in its entirety because it is not safe to do so, the roost must:
 - (a) be inspected using ultrasonic bat detectors, or
 - (b) be recorded as having evidence of bats in accordance with condition 30.2(2) above, if that is the case.

- (6) Ultrasonic bat detection surveys must be carried out in two different bat survey seasons, being:
 - (a) October to March; and
 - (b) April to September.
- (7) Ultrasonic bat detection surveys must:
 - (a) be undertaken on two separate survey nights; and
 - (b) consist of an ultrasonic call recording of a minimum duration of 60 minutes; and
 - (c) commence from 30 minutes prior to sunset; and
 - (d) place detection units at the entrance to the subterranean site; and
 - (e) not be conducted in windy or rainy conditions; and
 - (f) not be conducted if temperatures are more than three degrees lower than the average regional temperature for the month.
- (8) Ultrasonic call results of 'definite' and 'probable' must count as a record of a bat.
- (9) The survey is valid for a 10-year period.
- (10) **FCNSW** must document the inspections carried using the form at **Protocol 20: Pre-operational surveys**.
- (11) Documentation recorded in accordance with condition 30.2 of this **protocol** must be:
 - (a) attached to the **FCNSW's operational plan**; and
 - (b) provided to the EPA upon request.

30.3 Assessing the full extent of flying-fox camps – occupied camps

- (1) To determine the full extent of an occupied **flying-fox camp**, **FCNSW** must undertake a field inspection of the camp and verify the full extent of a particular camp as displayed in the **flying-fox camp database**.
- (2) Where the actual extent of the camp exceeds the extent shown on the map described above, the additional areas occupied and all associated **ESAs** must be mapped and protected.

30.4 Assessing full extent of flying-fox camps – unoccupied camps

- (1) To determine the full extent of an unoccupied **flying-fox camp**, **FCNSW** must use the full mapped extent of a particular camp in the **flying-fox camp database** as a basis and provide additional mapping that **FCNSW** holds, or is aware of, that demonstrates any additional extents of a particular camp.

Protocol 31: Species covered by the approval

31.1 Introduction

- (1) The **approval** includes various requirements relating to species listed in this **protocol**.
- (2) In particular, the Tables set out under condition 31.2(2) of this **protocol** provide lists of species to which this **approval** applies for the purposes of:
 - (a) ascertaining species to which conditions 16.2 of the **approval** apply;
 - (b) identifying **exclusion zones** under condition 88 of the **approval**;
 - (c) identifying specific protection requirements under condition 89 of the **approval**;
 - (d) identifying plant species for which a **flora road management plan** must be prepared under condition 90 of the **approval**;
 - (e) identifying the species in respect of which **species management plans** must be prepared under condition 91 of the **approval**.
- (3) Condition 31.3 of this **protocol** also supports condition 26 of the **approval**, which imposes a requirement on **FCNSW** to seek a **site-specific biodiversity condition** when **threatened species** other than those listed in **Part 1, 2 or 3** of this **protocol** are identified or recorded within 100 metres of a **compartment**.

31.2 Species listed in this protocol

- (1) This **protocol** sets out species lists under the following part numbers:
 - (a) **Part 1: Threatened species and endangered populations** considered adequately protected by the **multi-scale protection measures** of the **approval**
 - (b) **Part 2: Fauna species and endangered populations** protected by the application of a **species-specific condition**
 - (c) **Part 3: Flora species and endangered populations** protected by the application of a **species-specific condition**
 - (d) **Part 4: Threatened species** requiring development of **site-specific biodiversity conditions**.
- (2) The parts referred to above are set out in the tables below:

Part 1: Threatened Species and endangered populations considered adequately protected by the multi-scale protection measures of the approval		
Table 1: Fauna threatened species considered adequately protected by the multi-scale protection measures		
Scientific name	Common name	NSW region
<i>Adelotus brevis</i> EP	Tusked Frog population in the Nandewar and New England Tableland Bioregions	North

Part 1: Threatened Species and endangered populations considered adequately protected by the multi-scale protection measures of the approval

Table 1: Fauna threatened species considered adequately protected by the multi-scale protection measures

Scientific name	Common name	NSW region
<i>Aepyprymnus rufescens</i>	Rufous Bettong	North
<i>Amaurornis moluccana</i>	Pale-vented Bush-hen	North
<i>Assa darlingtoni</i>	Pouched Frog	North (outside of Dorrigo MA)
<i>Cacophis harriettae</i>	White-crowned Snake	North
<i>Calamanthus fuliginosus</i>	Striated Fieldwren	South
<i>Carterornis leucotis</i>	White-eared Monarch	All
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	All
<i>Chalinolobus nigrogriseus</i>	Hoary Wattled Bat	North
<i>Coeranoscincus reticulatus</i>	Three-toed Snake-tooth Skink	North
<i>Coracina lineata</i>	Barred Cuckoo-shrike	North
<i>Crinia tinnula</i>	Wallum Froglet	All
<i>Cyclopsitta diophthalma coxeni</i>	Coxen's Fig-parrot	North
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	South
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	All
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle (Great Pipistrelle)	All
<i>Grantiella picta</i>	Painted Honeyeater	All
<i>Heleioporus australiacus</i>	Giant Burrowing Frog – outside SMP	All
<i>Hoplocephalus stephensii</i>	Stephens' Banded Snake	North
<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	All
<i>Irediparra gallinacea</i>	Comb-crested Jacana	North
<i>Ixobrychus flavicollis</i>	Black Bittern	All
<i>Kerivoula papuensis</i>	Golden-tipped Bat	All
<i>Lathamus discolor</i>	Swift Parrot	All

Part 1: Threatened Species and endangered populations considered adequately protected by the multi-scale protection measures of the approval

Table 1: Fauna threatened species considered adequately protected by the multi-scale protection measures

Scientific name	Common name	NSW region
<i>Lichenostomus fasciogularis</i>	Mangrove Honeyeater	North
<i>Litoria aurea</i>	Green and Golden Bell Frog	All
<i>Litoria brevipalmata</i>	Green-thighed Frog	North
<i>Litoria daviesae</i>	Davies Tree Frog	North
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog, Heath Frog	North
<i>Litoria olongburensis</i>	Olongburra Frog	North
<i>Litoria subglandulosa</i>	Glandular Frog	North
<i>Macropus dorsalis</i>	Black-striped Wallaby	North
<i>Macropus parma</i>	Parma Wallaby	North
<i>Mastacomys fuscus</i>	Broad-toothed Rat	All
<i>Mastacomys fuscus</i> EP	Broad-toothed Rat at Barrington Tops in the Gloucester, Scone and Dungog LGAs Population	All
<i>Mixophyes balbus</i>	Stuttering Frog (north)	North
<i>Mixophyes fleayi</i>	Fleay's Frog/Fleay's Barred Frog	North
<i>Mixophyes iteratus</i>	Giant Barred Frog	All
<i>Mormopterus lumsdenae</i>	Northern Free-tailed Bat	North
<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	All
<i>Myuchelys bellii</i>	Western Sawshelled Turtle	North
<i>Myuchelys georgesi</i>	Bellinger River Snapping Turtle	North
<i>Myuchelys purvisi</i>	Manning River Helmeted Turtle	North
<i>Myotis macropus</i>	Southern Myotis	All
<i>Nyctimene robinsoni</i>	Eastern Tube-nosed Bat	North
<i>Nyctophilus bifax</i>	Eastern Long-eared Bat	North
<i>Pachycephala olivacea</i>	Olive whistler	All

Part 1: Threatened Species and endangered populations considered adequately protected by the multi-scale protection measures of the approval

Table 1: Fauna threatened species considered adequately protected by the multi-scale protection measures

Scientific name	Common name	NSW region
<i>Petauroides volans</i>	Greater Glider population at Seven Mile Beach	South
<i>Petaurus australis</i>	Yellow-bellied Glider	All
<i>Petaurus norfolcensis</i>	Squirrel Glider	All
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	All
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	North
<i>Planigale maculata</i>	Common Planigale	North
<i>Potorous tridactylus</i>	Long-nosed Potoroo	All
<i>Pseudomys gracilicaudatus</i>	Eastern Chestnut Mouse	North
<i>Ptilinopus magnificus</i>	Wompoo Fruit-dove	All
<i>Ptilinopus regina</i>	Rose-crowned Fruit-dove	All
<i>Ptilinopus superbus</i>	Superb Fruit-dove	All
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	All
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	All
<i>Sminthopsis leucopus</i>	White-footed Dunnart	South
<i>Syconycteris australis</i>	Common Blossom Bat	North
<i>Thylogale stigmatica</i>	Red-legged Pademelon	North
<i>Todiramphus chloris</i>	Collared Kingfisher	North
<i>Turnix melanogaster</i>	Black-breasted Button-quail	North
<i>Uvidicolus sphyurus</i>	Border Thick-tailed Gecko	North
<i>Uperoleia mahonyi</i>	Mahony's Toadlet	North
<i>Varanus rosenbergi</i>	Rosenberg's Monitor (goanna)	All

Part 1: Threatened Species and endangered populations considered adequately protected by the multi-scale protection measures of the approval

Table 2: Flora threatened species considered adequately protected by the multi-scale protection measures

Scientific name	Common name	NSW region
<i>Acacia chrysotricha</i>	Newry Golden Wattle	North
<i>Acacia constablei</i>	Narrabarba Wattle	South
<i>Acacia courtii</i>	North Brother Wattle	North
<i>Acacia georgensis</i>	Bega Wattle	South
<i>Acacia macnuttiana</i>	MacNutt's Wattle	North
<i>Aldrovanda vesiculosa</i>	Waterwheel Plant	All
<i>Alexfloydia repens</i>	Floyd's Grass	North
<i>Allocasuarina defungens</i>	Dwarf Heath Casuarina	North
<i>Allocasuarina simulans</i>	Nabiac Casuarina	North
<i>Almaleea cambagei</i>		North
<i>Ammobium craspedioides</i>	Yass Daisy	South
<i>Ancistrachne maidenii</i>		North
<i>Angophora robur</i>	Sandstone Rough-barked Apple	North
<i>Arthraxon hispidus</i>	Hairy Jointgrass	North
<i>Arthropteris palisotii</i>	Lesser Creeping Fern	North
<i>Asperula asthenes</i>	Trailing Woodruff	North
<i>Astrotricha cordata</i>	Heart-leaved Star Hair	North
<i>Astrotricha</i> sp. Wallagaraugh		South
<i>Bertya</i> sp. Chambigne NR		North
<i>Bertya</i> sp. Clouds Creek		North

Part 1: Threatened Species and endangered populations considered adequately protected by the multi-scale protection measures of the approval

Table 2: Flora threatened species considered adequately protected by the multi-scale protection measures

Scientific name	Common name	NSW region
<i>Boronia deanei</i>	Deane's Boronia	South
<i>Boronia umbellata</i>	Orara Boronia	North
<i>Bossiaea oligosperma</i>	Few-seeded Bossiaea	South
<i>Budawangia gnidioides</i>	Budawang Cliff-heath	South
<i>Bulbophyllum globuliforme</i>	Hoop Pine Orchid	North
<i>Caesalpinia bonduc</i>	Knicker Nut	North
<i>Callistemon linearifolius</i>	Netted Bottlebrush	North
<i>Callitris oblonga</i>	Pygmy Cypress Pine	All
<i>Calotis glandulosa</i>	Mauve Burr-daisy	South
<i>Carex klaphakei</i>	Klaphake's Ssedge	South
<i>Chamaesyce psammogeton</i>	Sand Spurge	North
<i>Clematis fawcettii</i>	Northern Clematis	North
<i>Commersonia rosea</i>		North
<i>Cynanchum elegans</i>	White-flowered Wax Plant	North
<i>Dendrobium melaleucaphilum</i>	Spider Orchid	North
<i>Distichlis distichophylla</i>	Australian Saltgrass	South
<i>Doryanthes palmeri</i>	Giant Spear Lily	North
<i>Eleocharis tetraquetra</i>	Square-stemmed Spike-rush	North
<i>Eucalyptus aquatica</i>	Broad-leaved Sally	South
<i>Eucalyptus caleyi</i> subsp. <i>ovendenii</i>	Ovenden's Ironbark	North
<i>Eucalyptus castrensis</i>	Singleton Mallee	North

Part 1: Threatened Species and endangered populations considered adequately protected by the multi-scale protection measures of the approval

Table 2: Flora threatened species considered adequately protected by the multi-scale protection measures

Scientific name	Common name	NSW region
<i>Eucalyptus glaucina</i>	Slaty Gum	North
<i>Eucalyptus fracta</i>	Broken Back Ironbark	North
<i>Eucalyptus langleyi</i>		South
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	North
<i>Eucalyptus oresbia</i>	Small-fruited Mountain Gum	North
<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>		North
<i>Eucalyptus pumila</i>	Pokolbin Mallee	North
<i>Eucalyptus scoparia</i>	Wallangarra White Gum	North
<i>Eucalyptus tetrapleura</i>	Square-fruited Ironbark	North
<i>Euphrasia orthocheila</i> subsp. <i>peraspera</i>	Tenterfield Eyebright	North
<i>Euphrasia scabra</i>	Rough Eyebright	South
<i>Genoplesium rhyoliticum</i>	Rhyolite Midge Orchid	South
<i>Gentiana wissmannii</i>	New England Gentian	North
<i>Grevillea acanthifolia</i> subsp. <i>paludosa</i>	Bog Grevillea	South
<i>Grevillea banyabba</i>	Banyabba Grevillea	North
<i>Grevillea iaspicula</i>	Wee Jasper Grevillea	South
<i>Grevillea molyneuxii</i>	Wingello Grevillea	South
<i>Grevillea parviflora</i>		North
<i>Grevillea renwickiana</i>		South

Part 1: Threatened Species and endangered populations considered adequately protected by the multi-scale protection measures of the approval

Table 2: Flora threatened species considered adequately protected by the multi-scale protection measures

Scientific name	Common name	NSW region
<i>Grevillea scortechinii</i> subsp. <i>sarmentosa</i>		North
<i>Hakea fraseri</i>	Gorge Hakea	North
<i>Haloragis exalata</i> subsp. <i>exalata</i>	Square Raspwort	South
<i>Haloragis exalata</i> subsp. <i>velutina</i>	Tall Velvet Sea-berry	North
<i>Hibbertia hexandra</i>	Tree Guinea Flower	North
<i>Hibbertia superans</i>		North
<i>Irenepharsus magicus</i>	Elusive Cress	South
<i>Kardomia prominens</i>		North
<i>Kardomia silvestris</i>		North
<i>Lepidium foliosum</i>	Leafy Peppergrass	All
<i>Lepidium pseudopapillosum</i>	Formbe Peppercress	All
<i>Lindernia alsinoides</i>	Noah's False Chickweed	North
<i>Lysimachia vulgaris</i> var. <i>davurica</i>		South
<i>Maundia triglochinoides</i>		North
<i>Melaleuca groveana</i>	Grove's Paperbark	North
<i>Muehlenbeckia costata</i>	Scrambling Lignum	North
<i>Muellerina myrtifolia</i>	Myrtle-leaf Mistletoe	North
<i>Oldenlandia galioides</i>		North
<i>Ozothamnus vagans</i>		North
<i>Paspalidium grandispiculatum</i>		North
<i>Persoonia glaucescens</i>	Mittagong Geebung	South

Part 1: Threatened Species and endangered populations considered adequately protected by the multi-scale protection measures of the approval

Table 2: Flora threatened species considered adequately protected by the multi-scale protection measures

Scientific name	Common name	NSW region
<i>Phaius australis</i>	Southern Swamp Orchid	North
<i>Philothea obovatifolia</i>		North
<i>Philothea ericifolia</i>		North
<i>Pimelea axiflora</i>	Bungonia Rice-flower	South
<i>Plectranthus allopectus</i>	Narrow-leaved Plectranthus	North
<i>Plectranthus nitidus</i>	Nightcap Plectranthus	North
<i>Plinthanthesis rodwayi</i>	Budawangs Wallaby Grass	South
<i>Pomaderris delicata</i>	Delicate Pomaderris	South
<i>Pomaderris notata</i>	McPherson Range Pomaderris	North
<i>Prasophyllum canaliculatum</i>	Summer Leek Orchid	South
<i>Prasophyllum affine</i>	Jervis Bay Leek Orchid	South
<i>Prasophyllum fuscum</i>	Slaty Leek Orchid	South
<i>Prostanthera palustris</i>		North
<i>Pterostylis oreophila</i>	Blue-tongued Greenhood	South
<i>Pultenaea baeuerlenii</i>	Budawangs Bush-pea	South
<i>Pultenaea elusa</i>	Elusive Bush-pea	South
<i>Rotala tripartita</i>		North
<i>Rutidosis leptorrhynchoides</i>	Button Wrinklewort	South
<i>Sarcochilus dilatatus</i>	Brown Butterfly Orchid	North
<i>Sarcochilus fitzgeraldii</i>		North
<i>Sarcochilus hartmannii</i>	Hartman's Sarcochilus	North

Part 1: Threatened Species and endangered populations considered adequately protected by the multi-scale protection measures of the approval

Table 2: Flora threatened species considered adequately protected by the multi-scale protection measures

Scientific name	Common name	NSW region
<i>Sarcophilus weinthalii</i>	Blotched Sarcophilus	North
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	North
<i>Tasmannia purpurascens</i>	Broad-leafed Pepperbush	North
<i>Tasmannia glaucifolia</i>	Fragrant Pepperbush	North
<i>Tephrosia filipes</i>	A shrub	North
<i>Tetradlea glandulosa</i>		North
<i>Tinospora smilacina</i>	Tinospora Vine	North
<i>Tinospora tinoporoides</i>	Arrow-head Vine	North
<i>Triflorensia cameronii</i>	Cameron's Tarenna	North
<i>Triplarina imbricata</i>		North
<i>Velleia perfoliata</i>		North
<i>Viola cleistogamoides</i>	Hidden Violet	South
<i>Wilsonia backhousei</i>	Narrow-leafed Wilsonia	South
<i>Wilsonia rotundifolia</i>	Round-leafed Wilsonia	South
<i>Xerochrysum palustre</i>		South
<i>Zieria baeuerlenii</i>	Bomaderry Zieria	South
<i>Zieria buxijugum</i>	Bow range Zieria	South
<i>Zieria formosa</i>	Shapely Zieria	South
<i>Zieria granulata</i>	Illawarra Zieria	South
<i>Zieria murphyi</i>	Velvet Zieria	South

Part 2: Fauna species and endangered populations protected by the application of a species-specific condition

Table 1: Fauna species and endangered populations protected by a species-specific condition applying to a nest, den, roost, camp or feed tree retention

Scientific name	Common name	NSW region
<i>Anthochaera phrygia</i>	Regent Honeyeater	All
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	All
<i>Burhinus grallarius</i>	Bush Stone-curlew, Bush Thick-knee	All
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	All
<i>Calyptorhynchus lathami</i>	Glossy Black-cockatoo	All
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	All
<i>Chthonicola sagittata</i>	Speckled Warbler	All
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	All
<i>Daphoenositta chrysoptera</i>	Varied Sittella	All
<i>Dromaius novaehollandiae</i> EP	Emu population in the NSW North Coast Bioregion and Port Stephens LGA	North
<i>Falco hypoleucos</i>	Grey Falcon	All
<i>Falco subniger</i>	Black Falcon	All
<i>Glossopsitta pusilla</i>	Little Lorikeet	All
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle	All
<i>Hieraaetus morphnoides</i>	Little Eagle	All
<i>Lophoictinia isura</i>	Square-tailed Kite	All
<i>Melanodryas cucullata cucullata</i>	Hooded Robin (south-eastern form)	All
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern sub-species)	All
<i>Menura alberti</i>	Albert's Lyrebird	All
<i>Miniopterus australis</i>	Little Bentwing-bat	All
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	All
<i>Neophema pulchella</i>	Turquoise Parrot	All

Part 2: Fauna species and endangered populations protected by the application of a species-specific condition

Table 1: Fauna species and endangered populations protected by a species-specific condition applying to a nest, den, roost, camp or feed tree retention

Scientific name	Common name	NSW region
<i>Ninox connivens</i>	Barking Owl	All
<i>Ninox strenua</i>	Powerful Owl	All
<i>Pandion cristatus</i>	Eastern Osprey	All
<i>Petroica boodang</i>	Scarlet Robin	All
<i>Petroica phoenicea</i>	Flame Robin	All
<i>Petroica rodinogaster</i>	Pink Robin	All
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	All
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	All
<i>Stagonopleura guttata</i>	Diamond Firetail	All
<i>Tyto novaehollandiae</i>	Masked Owl	All
<i>Tyto tenebricosa</i>	Sooty Owl	All
<i>Vespadelus troughtoni</i>	Eastern Cave Bat	North

Part 2: Fauna species and endangered populations protected by the application of a species-specific condition

Table 2: Fauna species that require the application of an individual species-specific condition

Scientific name	Common name	NSW region
<i>Atrichornis rufescens</i>	Rufous Scrub-bird	North
<i>Menura alberti</i>	Albert's Lyrebird	North
<i>Podargus ocellatus</i>	Marbled Frogmouth	North
<i>Assa darlingtoni</i>	Pouched Frog	Southern meta-population
<i>Litoria booroolongensis</i>	Booroolong Frog	South

Part 2: Fauna species and endangered populations protected by the application of a species-specific condition

Table 2: Fauna species that require the application of an individual species-specific condition

Scientific name	Common name	NSW region
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	All
<i>Phascolarctos cinereus</i>	Koala	North
<i>Philoria kundagungan</i>	Mountain Frog	North
<i>Philoria loveridgei</i>	Loveridge's Frog	North
<i>Philoria pughii</i>		North
<i>Philoria richmondensis</i>		North
<i>Philoria sphagnicolus</i>	Sphagnum Frog	North
<i>Pseudomys oralis</i>	Hastings River Mouse	North
<i>Pseudophryne pengilleyi</i>	Northern Corroboree Frog	South
<i>Vombatus ursinus</i>	Bare-nosed Wombat	Northern population management area

Part 2: Fauna species and endangered populations protected by the application of a species-specific condition

Table 3: Fauna species and endangered populations that require the application of a species management plan

Scientific name	Common name	NSW region
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	South (SMP area)
<i>Dasyornis brachypterus monoides</i>	Eastern Bristle Bird	North (SMP area)
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot	South (SMP area)
<i>Petaurus australis</i>	Yellow-bellied Glider on the Bago Plateau Endangered Population	South (SMP area)

Part 2: Fauna species and endangered populations protected by the application of a species-specific condition

Table 3: Fauna species and endangered populations that require the application of a species management plan

Scientific name	Common name	NSW region
<i>Pseudomys fumeus</i>	Smoky Mouse	South (SMP Area)

Part 3: Flora species and endangered populations protected by the application of a species-specific condition

Table 1: Flora species that require a 20-metre exclusion zone around all individuals

Species name	Common name	NSW region	Season (anytime unless noted)
<i>Acacia acrionastes</i>	Pindarri Wattle	North	
<i>Acacia bynoeana</i>	Bynoe's Wattle	North	
<i>Archidendron hendersonii</i>	White Lace Flower	North	
<i>Asterolasia beckersii</i>	Dungowan Starbush	North	
<i>Belvisia mucronata</i>	A fern	North	
<i>Bertya</i> sp. (Clouds Creek, M. fatemi)	A shrub	North	
<i>Callitris baileyi</i>	Bailey's Cypress Pine	North	
<i>Centranthera cochinchinensis</i>	Swamp Foxglove	North	
<i>Chiloglottis anaticeps</i>	Bird Orchid	North	Dec–March
<i>Chiloglottis platyptera</i>	Barrington Tops Ant Orchid	North	July–Oct
<i>Correa baeuerlenii</i>	Chef's Cap Correa	South	
<i>Corybas dowlingii</i>	Red Helmet Orchid	North	
<i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid	All	Dec–Feb inclusive, when flowering
<i>Cyperus aquatilissemifertilis</i>	Water Nutgrass	North	
<i>Desmodium acanthocladum</i>	Thorny Pea	North	

Part 3: Flora species and endangered populations protected by the application of a species-specific condition

Table 1: Flora species that require a 20-metre exclusion zone around all individuals

Species name	Common name	NSW region	Season (anytime unless noted)
<i>Dichanthium setosum</i>	Bluegrass	North	Summer when flowering
<i>Dillwynia glaucula</i>	Michelago Parrot-pea	South	Flowers Oct–Feb
<i>Dipodium atropurpureum</i>		North	Flowers Dec–May
<i>Diuris aequalis</i>	Buttercup Doubletail	South	South: flowers mid-Oct–mid-Nov North of Abercrombie River: flowers mid-Nov–early Dec
<i>Diuris disposita</i>	Willawarrin Doubletail	North	Flowers Sep–Oct
<i>Diuris eborensis</i>	An orchid	North	Flowering latter half of spring to very early summer
<i>Diuris flavescens</i>	Pale yellow Doubletail	North	Flowers Sep–Oct
<i>Diurus praecox</i>	Newcastle Doubletail	North	Flowers July–early Sep
<i>Diuris venosa</i>	Veined Doubletail	North	Flowers Nov–Jan inclusive
<i>Drynaria rigidula</i>	Basket Fern	North	
<i>Galium australe</i>	Tangled Bedstraws	South	
<i>Genoplesium insigne</i>	Variable Midge Orchid	North	Flowering period Sep–Oct
<i>Genoplesium superbum</i>	Superb Midge Orchid	North	Flowers Dec–Mar
<i>Genoplesium vernale</i>	East Lynne Midge Orchid	South	Flowers Nov–late Dec
<i>Geodorum densiflorum</i>	An orchid	North	Flowers Dec–Jan
<i>Grammitis stenophylla</i>	Narrow-leaf Finger Fern	North	
<i>Grevillea beadleana</i>	Beadle’s Grevillea	North	
<i>Grevillea guthrieana</i>	Guthrie’s Grevillea	North	

Part 3: Flora species and endangered populations protected by the application of a species-specific condition

Table 1: Flora species that require a 20-metre exclusion zone around all individuals

Species name	Common name	NSW region	Season (anytime unless noted)
<i>Grevillea masonii</i>	Mason's Grevillea	North	
<i>Grevillea rhizomatosa</i>	Gibraltar Grevillea	North	
<i>Grevillea quadricauda</i>	Four-tailed Grevillea	North	
<i>Hakea archaeoides</i>	Big Nellie Grevillea	North	
<i>Harnieria hygrophiloides</i>	Native Justicia	North	
<i>Hibbertia marginata</i>	Bordered Guinea Flower	North	
<i>Hicksbeachia pinnatifolia</i>	Red Boppel Nut	North	
<i>Indigofera baileyi</i>	Bailey's Indigo	North	
<i>Leionema ralstonii</i>	Ralston's Leionema	South	
<i>Lindsaea incisa</i>	Slender Screw Fern	North	
<i>Marsdenia longiloba</i>	Slender Marsdenia	North	
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	North	
<i>Melaleuca irbyana</i>	Weeping Paperbark	North	
<i>Melichrus hirsutus</i>	A shrub	North	
<i>Melichrus sp. Gibberagee</i>	A shrub	North	
<i>Monotoca rotundifolia</i>	Trailing Monotoca	South	
<i>Myrsine richmondensis</i>	Purple-leafed Muttonwood	North	
<i>Neoastelia spectabilis</i>	Silver Sword Lily	North	
<i>Oberonia complanata</i>	Yellow-flowered King Orchid	North	
<i>Oberonia titania</i>	Soldier's Crest Orchid	North	
<i>Ochrosia moorei</i>	Southern Ochrosia	North	
<i>Olearia cordata</i>		North	
<i>Owenia cepiodora</i>	Onion Cedar	North	
<i>Phebalium speciosum</i>	A shrub	North	

Part 3: Flora species and endangered populations protected by the application of a species-specific condition

Table 1: Flora species that require a 20-metre exclusion zone around all individuals

Species name	Common name	NSW region	Season (anytime unless noted)
<i>Phyllanthus microcladus</i>	A shrub	North	
<i>Polygala linariifolia</i>	Native Milkwort	North	
<i>Pomaderris bodalla</i>	Bodalla Pomaderris	South	
<i>Pomaderris brunnea</i>	Brown Pomaderris	All	
<i>Pomaderris cotoneaster</i>	Cotoneaster Pomaderris	South	
<i>Pomaderris elachophylla</i>	Lacy Pomaderris	South	
<i>Pomaderris parrisiae</i>	Parris' Pomaderris	South	
<i>Pomaderris queenslandica</i>	Scant Pomaderris	North	
<i>Pomaderris sericea</i>	Silky Pomaderris	South	
<i>Prostanthera junonis</i>	Bago Leek Orchid	South	Flowering Oct–mid-Dec
<i>Prostanthera rugosa</i>	Mintbush	South	
<i>Pterostylis chaetophora</i>	Tall Rustyhood	North	Flowers Sep–Nov
<i>Pterostylis elegans</i>	Elegant Greenhood	North	Flowers Jan–April
<i>Pterostylis foliata</i>	Slender Greenhood	South	Flowers Aug–Jan
<i>Pterostylis gibbosa</i>	Illawarra Greenhood	South	Flowers in spring
<i>Pterostylis riparia</i>	A greenhood	South	Flowers in Oct or Nov
<i>Pterostylis ventricosa</i>	Greenhood	South	
<i>Pultenaea parrisiae</i>	Parris' Bush-pea	South	
<i>Pultenaea pedunculata</i>	Matted Bush-pea	South	
Quassia sp. Moonee Creek	Moonee Guassia	North	
<i>Rhizanthella slateri</i> EP	Eastern Underground Orchid population in the Great Lakes LGA	North	
<i>Rhizanthella slateri</i>	Eastern Underground Orchid	North	Flowers Sep–Nov

Part 3: Flora species and endangered populations protected by the application of a species-specific condition

Table 1: Flora species that require a 20-metre exclusion zone around all individuals

Species name	Common name	NSW region	Season (anytime unless noted)
<i>Rhynchosia acuminatissima</i>	Pointed Trefoil	North	
<i>Spyridium burragorang</i> EP	<i>Spyridium burragorang</i> population in Cessnock LGA	North	
<i>Styphelia perileuca</i>	Montane Green Five-corners	North	
<i>Swainsona sericea</i>	Silky Swainson-pea	South	
<i>Tetradlea juncea</i>	Black-eyed Susan	North	Flowers Sep–Nov inclusive
<i>Thelymitra atronitida</i>	Black-hooded Sun Orchid	South	Aug–Dec
<i>Tylophora woollsii</i>	Cryptic Forest Twiner	North	
<i>Westringia davidii</i>	David’s Westringia	South	
<i>Zieria lasiocaulis</i>	Willi Willi Zieria	North	
<i>Zieria tuberculata</i>	Warty Zieria	South	

Part 3: Flora species and endangered populations protected by the application of a species-specific condition

Table 2: Flora species that require protection for mature individuals or populations

Species name	Common name	Min. diameter over bark requiring protection	NSW region	Season (anytime unless noted)
<i>Angophora inopina</i>	Charmhaven Apple	10 cm	North	
<i>Eucalyptus aggregata</i>	Black Gum	30 cm	South	
<i>Eucalyptus camfieldii</i>	Camfield’s Stringybark	10 cm	North	
<i>Eucalyptus glaucina</i> ¹	Slaty Red Gum	30 cm	North	
<i>Eucalyptus kartzoffiana</i>	Araluen Gum	30 cm	South	
<i>Eucalyptus largeana</i> ²	Craven Grey Box	30 cm	North	

<i>Eucalyptus magnificata</i>	Northern Blue Box	10 cm	North	
<i>Eucalyptus mckieana</i>	McKie's Stringybark	30 cm	North	
<i>Eucalyptus parvula</i>	Small-fruited Gum	10 cm	South	
<i>Eucalyptus rubida</i> subsp. <i>barbigerorum</i>	Blackbutt Candlebark	30 cm	North	

- 1 In Camira, Braemer and Myrtle State Forests, *E. glaucina* is known to hybridise with *E. tereticornis* and this prescription applies to both species in those State Forests.
- 2 In the Barrington Tops region, *E. moluccana*/*E. quadrangulata* potentially co-occurs with *E. largeana*. This prescription applies to both species within 200 m of known *E. largeana* records unless tree species can be confirmed with mature fruit.

Part 3: Flora species and endangered populations protected by the application of a species-specific condition

Table 3: Flora species requiring a species management plan

Species name	Common name	NSW region	Season (anytime unless noted)
<i>Euphrasia arguta</i>		North	Jan–April
<i>Commersonia prostrata</i>	Dwarf Kerrawang	South	
<i>Corchorus cunninghamii</i>	Native Jute	North	
<i>Macrozamia johnsonii</i>	Johnson's Cycad	North	
<i>Niemeyera whitei</i>	Rusty Plum	North	
<i>Parsonsia dorrigoensis</i>	Milky Silkpod	North	
<i>Prasophyllum bagoensis</i>	Bago Leek Orchid	South	Leaf regeneration occurs in spring, presumably flowering occurs shortly thereafter
<i>Prasophyllum innubum</i>	Brandy Mary's Leek Orchid	South	Flowers Jan–Feb
<i>Prasophyllum keltonii</i>	Kelton's Leek Orchid	South	
<i>Typhonium</i> sp. aff. <i>brownii</i>	Stinky Lily	North	

Part 3: Flora species and endangered populations protected by the application of a species-specific condition

Table 4: Flora species requiring a road management plan

Species name	Common name	Applicable condition – Protocol 22.4(2)	NSW region	Season (anytime unless noted)
<i>Allocasuarina diminuta</i> subsp. <i>annectans</i>	She Oak	a + d	South	
<i>Callistemon foresterae</i>	Forresters Bottlebrush	a + d	South	
<i>Cyperus aquatilis</i>	Water Nutgrass	a + b	North	
<i>Dampiera fusca</i>	Kydra Dampiera	a + c	South	Flowers Oct–Feb
<i>Diuris ochroma</i>	Pale Golden Moths	a + c	South	Flowers Nov–Dec
<i>Dodonaea procumbens</i>	Creeping Hop-bush	a + c	South	
<i>Dracophyllum macranthum</i>		a + d	North	
<i>Euphrasia ciliolata</i>	Polblue Eyebright	a + b	North	Dec–May
<i>Fontainea australis</i>	Southern Fontainea	a + d	North	
<i>Monotaxis macrophylla</i>	Large-leafed Monotaxis	a + b	South	
<i>Olearia flocktoniae</i>	Dorrigo Daisy Bush	a + c	North	
<i>Persicaria elatior</i>	Tall knotweed	a + b	All	
<i>Senna acclinis</i>	Rainforest Cassia	a + c	North	Spring–summer when flowering and fruiting
<i>Solanum limitare</i>	Border Ranges Nightshade	a + c	North	Flowers winter to spring
<i>Solanum sulphureum</i>	A nightshade	a + c	North	
<i>Sophora fraseri</i>	Brush Sophora	a + c	North	

Part 4: Threatened species requiring development of site-specific biodiversity conditions		
Table 1: Fauna species		
Species name	Common name	Season (anytime unless noted)
<i>Calyptrorhynchus banksia</i>	Red-tailed Black-Cockatoo	
<i>Poephila cincta</i>	Black-throated Finch	
<i>Litoria castanea</i>	Yellow-spotted Tree Frog	
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog, Heath Frog (southern populations)	
<i>Litoria piperata</i>	Peppered Frog	
<i>Litoria raniformis</i>	Southern Bell Frog	
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot (outside the SMP area)	
<i>Mixophyes balbus</i>	Stuttering Frog in areas south of Sydney	
<i>Bettongia penicillata penicillata</i>	Brush-tailed Bettong	
<i>Dasyurus viverrinus</i>	Eastern Quoll	
<i>Potorous longipes</i>	Long-footed Potoroo	
<i>Pseudomys fumeus</i>	Smoky Mouse (all areas outside the Smoky Mouse Species Management Planning Area)	
<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake	
<i>Phascolarctos cinereus</i> in Southern subregion and Eden subregions	Koala in Southern and Eden subregions	

Part 4: Threatened species requiring development of site-specific biodiversity conditions		
Table 2: Flora species		
Species name	Common name	Season (anytime unless noted)
<i>Acalypha eremorum</i>	Turkey Bush	

Part 4: Threatened species requiring development of site-specific biodiversity conditions

Table 2: Flora species

Species name	Common name	Season (anytime unless noted)
<i>Acronychia littoralis</i>	Scented Acronychia	May–Aug
<i>Boronia hapalophylla</i>	Shannon Creek Boronia	
<i>Caesia parviflora</i> var. <i>Minor</i>	Small Pale Grass Lilly	Spring–summer
<i>Elyonurus citreus</i>	Lemon-scented Grass	Flowers in summer
<i>Genoplesium baueri</i>	Yellow Gnat-orchid	Flowers Feb–Mar
<i>Leionema lamprophyllum</i> subsp. <i>fractum</i>		
<i>Lepidium peregrinum</i>	Wandering Peppercross	
<i>Pilularia novae-hollandiae</i>	Austral Pillwort	
<i>Prostanthera cineolifera</i>	A mintbush	
<i>Pseudanthus ovalifolius</i>	Oval-leafed Pseudanthus	
<i>Pterostylis hians</i>	Opera House Orchid	Flowers Mar–April

31.3 Process for requesting approval of a site-specific biodiversity condition

- (1) When a **site-specific biodiversity condition** is required by condition 26, of the **approval**:
- (a) the **site-specific biodiversity condition** must specify if it applies to either a single record of the species or population concerned or if it is to apply to all relevant records of the species within a particular geographic area (including a **compartment, operational area, local landscape area**, specified **management zone, Coastal IFOA subregion** or bioregion);
 - (b) within one week of being notified by **FCNSW**, the **EPA** must consult with **FCNSW** to prepare a preliminary determination on whether **forestry operations** may commence or recommence in all or part of the **local landscape area**. The final condition must be developed within four weeks or such longer period as is agreed between the **EPA** and **FCNSW**;
 - (c) **FCNSW** must provide the **EPA** with the following information to inform the consultation on and development of the **site-specific biodiversity condition**:
 - (i) species name
 - (ii) number of individuals recorded

- (iii) record details, including coordinates in MGA (Map Grid Australia), observation date, observation type and accuracy;
 - (iv) **State Forest** and **compartment** in which the species was recorded;
 - (v) forest types and description of locality;
 - (vi) **operational map** showing the **net harvest areas**, all **ESAs** and **exclusion zones** as known at the time, and the location of the record and **roads**;
 - (vii) recent **harvesting** and burning histories;
 - (viii) proposed **harvesting** and burning locations;
 - (ix) **FCNSW's** assessment of the validity of the record, if the record is indicative of permanent territory or regular **habitat** use, appropriate management actions, and any other relevant matters;
- (d) the **site-specific biodiversity condition** may include requirements for **FCNSW** to survey for that species; and
- (e) the **site-specific biodiversity condition** must be added to **operational maps** and **operational plans** prior to the commencement or recommencement of **forestry operations** in an **operational area** in which the record of the species is located.

CHAPTER 5: OPERATIONAL PROTOCOLS

Protocol 32: Temporary log crossings

32.1 Introduction

- (1) Chapter 5, Division 5 of the **approval** requires that the **construction**, use and removal of each **temporary log crossing** must be carried out in accordance with this **protocol**.

32.2 Management requirements

- (1) The following management requirements must be implemented for the construction, use and removal of temporary log crossings:
- (a) A temporary log crossing must only be **constructed** on a **drainage depression**, first **order drainage feature**, second **order drainage feature**, class 1 **classified drainage line** or class 2 **classified drainage line** that is no more than one metre deep.
 - (b) Water must not be flowing at the time of **temporary log crossing construction**.
 - (c) Only one **track** with a **temporary log crossing** can be used in a **compartment** at any time.
 - (d) Earth fill is not permitted to be used in a **temporary log crossing**.
 - (e) A **temporary log crossing** must be capable of withstanding **snigging**.
 - (f) No branches or tree heads are to be used in the **construction** of a **temporary log crossing**.
 - (g) The location of a **temporary log crossing** must be approved and shown on the **operational map**.
 - (h) A **temporary log crossing** must not be used after the date that is two weeks from the date of **construction**.
 - (i) A **temporary log crossing** must be removed within five days of the completion of **snigging** at that crossing, and following removal, the area in which the crossing was located must be **stabilised** and **rehabilitated** prior to opening another crossing in that area.
 - (j) When removing a **temporary log crossing**, logs must be lifted out of the **drainage feature**.
 - (k) Where a **temporary log crossing** causes a diversion of the **drainage feature** or erosion, such as undercutting:
 - (i) the crossing must be removed within five business days of the occurrence of the diversion or erosion; and
 - (ii) if the soil is:
 - (A) not **saturated**, **soil stabilisation** measures must be put in place within five days of the occurrence of the diversion or erosion to achieve a stable cross-section; or
 - (B) **saturated**, then the **saturated soil** condition in condition 105 of the **approval** applies.

- (l) A **temporary log crossing** must not be used in an area of a **compartment** that is subject to **seasonality** restrictions.
- (m) Where a **temporary log crossing** is removed, the crossing must be reshaped and:
 - (i) if the **soil** is not **saturated**, **soil stabilisation** measures put in place within five days to achieve a stable cross-section; or
 - (ii) if the **soil** is **saturated**, saturated **soil** conditions apply.
- (n) Following the removal of a **temporary log crossing**, material used to construct the **temporary log crossing** must not be left in the **riparian exclusion zone** or **ground protection zone**.

Protocol 33: Work health and safety and accidentally felled trees

33.1 Introduction

- (1) Chapter 1, Division 5 of the **approval**, requires that any felling, pushing or removal of **dead standing trees** ordinarily prohibited by condition 29 of the **approval**, but which is necessary to comply with the **WHS Act**, must be documented and notified in accordance with this **protocol**.
- (2) This **protocol** also supports Chapter 5, Division 2, condition 100.1(c) of the **approval** relating to recording of accidentally felled trees.
- (3) Chapter 4, Division 3, condition 71.4 of the **approval** states that **retained trees** must not be deliberately felled unless it is in accordance with this **protocol** (and the tree is replaced with a comparable **retained tree**).

33.2 Felling, pushing or removing trees, dead standing trees or vegetation for WHS Act compliance – information to be recorded

- (1) For the purposes of condition 29 of the **approval**, the following documentation and notification requirements apply:
 - (a) the location of the tree, **dead standing tree** or vegetation that was felled, pushed or removed (by reference to its grid co-ordinates);
 - (b) the date on which the felling, pushing, or removal occurred;
 - (c) the species of the tree, **dead standing tree** or vegetation that was felled, pushed or removed;
 - (d) the reasons **FCNSW** took the felling, pushing, or removal action;
 - (e) whether remedial works were required; and
 - (f) the date that any required remedial works were completed.
- (2) If the tree, **dead standing tree** or vegetation was felled, pushed or removed more than three metres inside an **ESA** or within any **ESA** associated with a **subject species**, the following additional information must be recorded:
 - (a) the name of the person who approved the felling, pushing or removal, and the date of that approval;
 - (b) a description of the compliance requirement under the **WHS Act** that made such felling necessary to carry out a **forestry operation**; and
 - (c) photographs of the tree, **dead standing tree** or vegetation prior to its felling, pushing or removal.
- (3) **FCNSW** must create a form for ongoing use which includes all the information requirements listed above. This form may be electronic.
- (4) The information recorded under this **protocol** must be promptly provided to the **EPA** upon request.

33.3 Accidentally felled trees – information to be recorded

- (1) For the purposes of condition 100.1(c) of the **approval**, the following information must be recorded in relation to the tree or part of a tree accidentally felled:
 - (a) the location of the felled tree (by reference to its grid co-ordinates);
 - (b) the date on which the tree was felled;
 - (c) the diameter of the remaining tree stump;
 - (d) the species of the tree felled or removed;
 - (e) details of how the tree was accidentally felled;
 - (f) whether remedial works were required; and
 - (g) the date that any required remedial works were completed.

33.4 Felling of retained trees

- (1) For the purposes of condition 71.4 of the **approval**, the following information must be recorded in relation to a retained tree which has been deliberately felled:
 - (a) the location of the felled tree (by reference to its grid co-ordinates);
 - (b) the date on which the tree was felled;
 - (c) the diameter of the remaining tree stump;
 - (d) the species of the tree felled;
 - (e) details of why the tree was deliberately felled;
 - (f) whether remedial works were required;
 - (g) the date that any required remedial works were completed; and
 - (h) the location of the comparable retained tree to replace the retained tree which has been deliberately felled.

CHAPTER 6: MAPPING AND SPATIAL DATASET PROTOCOLS

Protocol 34: Spatial datasets

34.1 Introduction

- (1) This **protocol** supports provisions in the **approval** relating to the use and updating of **spatial datasets**, by guiding:
 - (a) updates to **spatial datasets** to incorporate field mapped records; and
 - (b) general updates, i.e. *ad hoc* proposals by **FCNSW** to amend existing datasets, such as ridge and head water **habitat** relocations.

34.2 Updates to spatial datasets to incorporate field mapped records

- (1) Each field mapped record contained within an **FCNSW field mapped dataset** must be quality assured by **FCNSW** to ensure that the record:
 - (a) includes the minimum required attributes detailing the feature type, capture date, capture time, capture name and any other attributes that may be requested by the **EPA**;
 - (b) contains accurate information;
 - (c) is not duplicated; and
 - (d) is in the Lambert Projection for NSW based on the GSA94 datum.
- (2) **FCNSW** must incorporate quality-assured field mapped records contained within an **FCNSW field mapped dataset** into a quality-assured version at least once every quarter.
- (3) The **EPA** may request any record not yet incorporated into the quality-assured **FCNSW field mapped dataset** under the above condition and **FCNSW** must supply this within 7 days from the date of a request.
- (4) The **EPA** may incorporate into an IFOA **spatial dataset**:
 - (a) quality-assured field mapped records contained within an **EPA field mapped dataset**, and
 - (b) records from the quality assured **FCNSW** field mapped dataset.

34.3 Updates to the Forest Management Zoning FCNSW dataset

- (1) **FCNSW** may only update the 'ForestManagementZones' **FCNSW spatial dataset** in accordance with the documents titled:
 - (a) *Forest Management Zoning in State Forests (State Forests of NSW)*, dated December 1999; and
 - (b) *FCNSW Forest Practices Circular No 2005/03 Guidelines for Using the Forest Management Zoning System* (as updated from time to time).

34.4 Updating a spatial dataset – general updates

- (1) Any addition, variation or exception to an **IFOA spatial dataset** associated with an **ESA** must not result in reduced environmental outcomes in respect of the **ESA** it was intending to protect, unless otherwise specified by the **approval**.
- (2) Any addition, variation or exception to a **spatial dataset** in:

- (a) an **IFOA spatial dataset** or an **indicative IFOA spatial dataset** other than an update made under conditions 34.2 and 34.3; or
- (b) an **FCNSW spatial dataset** that is a slope class, rainfall erosivity, soil regolith,
is only permitted with the **EPA** or **DPI's** written approval in accordance with an application from **FCNSW** which includes:
 - (c) the reasons for the proposed addition, variation or exception;
 - (d) a response to any specific requirements listed in the relevant conditions for that **spatial dataset**;
 - (e) other alternative locations considered in the instance of a feature relocation; and
 - (f) a **GIS dataset** containing
 - (i) any existing mapped area that is proposed to be added to, varied or excepted; or
 - (ii) the proposed area that includes the addition, variation or exception that is to be included in the **spatial dataset**,

and must be provided to the **EPA** in accordance with **Protocol 35: Data and information management**.

- (3) The **EPA** or **DPI** may, by written notice, request **FCNSW** to provide additional information to support a request made pursuant to the above condition and **FCNSW** must provide that additional information within the timeframe specified in that notice.
- (4) The **EPA** or **DPI** will advise **FCNSW** in writing of the determination of the request made under this condition.
- (5) **FCNSW** must:
 - (a) incorporate any approved addition, variation and exception:
 - (i) into a **FCNSW spatial dataset** (along with an update to the metadata for that **spatial dataset**) or an **indicative IFOA spatial dataset** within two weeks of the date of approval in accordance with **Protocol 35: Data and information management**; and
 - (ii) into the **operational map** for an **operational area** before commencing or continuing the **forestry operation** in that area; and
 - (b) make those documents available to the **EPA** or **DPI** in accordance with **Protocol 35: Data and information management**.
- (6) **FCNSW** must provide the **EPA** or **DPI** with automatically generated reports of any update to any of the **FCNSW spatial datasets** that show **compartment boundaries** or **State Forest boundaries** on a monthly basis.
- (7) The **EPA** or **DPI** may make any addition, variation or exception to an **IFOA spatial dataset** at any time. The **EPA** or **DPI** will notify **FCNSW** of any updates.

34.5 Replacing a spatial dataset

- (1) A replacement to an **IFOA spatial dataset** associated with an **ESA** must not result in **reduced environmental outcomes** in respect of the **ESA**.

- (2) **FCNSW** may only replace an **IFOA spatial dataset** with the prior written approval of the **EPA** or **DPI** in accordance with this condition.
- (3) **FCNSW** must submit a written request to the **EPA** or **DPI** if it proposes to replace an **IFOA spatial dataset**. The written request must include:
 - (a) the reasons why the existing **IFOA spatial dataset** is no longer considered appropriate;
 - (b) the reasons supporting the proposed replacement **IFOA spatial dataset**;
 - (c) background information on the proposed replacement **IFOA spatial dataset** including information about:
 - (i) the history and origin of the development of the proposed replacement **IFOA spatial dataset** including information about any source data used to construct the proposed replacement **IFOA spatial dataset**;
 - (ii) the spatial and temporal extent of the proposed replacement **IFOA spatial dataset**;
 - (iii) any specific limitations for use of the proposed replacement **IFOA spatial dataset**;
 - (iv) the completeness and accuracy of the proposed replacement **IFOA spatial dataset**; and
 - (v) any other relevant information to support the request; and
 - (d) a report on the field verification of the proposed replacement **IFOA spatial dataset** which at a minimum includes:
 - (i) dates of field verification;
 - (ii) name of **FCNSW** officers conducting the field verification;
 - (iii) spatial location and mapped extent of the field verification sites;
 - (iv) method used to field verify the proposed replacement **IFOA spatial dataset**; and
 - (v) results or findings from the field verification; and
 - (vi) any other relevant information;
 - (e) a **GIS dataset** of the proposed replacement **IFOA spatial dataset** and associated **metadata** and must be provided in accordance with the 'Data and Information Management Protocol'.
- (4) The **EPA** or **DPI** may, by written notice, request **FCNSW** to provide additional information to support the request made pursuant to this condition and **FCNSW** must provide that additional information within the timeframe specified in that notice.
- (5) The **EPA** or **DPI** will advise **FCNSW** in writing of the determination of the request to replace a **spatial dataset**.
- (6) **FCNSW** must make each approved replacement **spatial dataset** available to the **EPA** and **DPI** in accordance with **Protocol 35: Data and information management**.
- (7) The **EPA** or **DPI** will consult with **FCNSW** if **EPA** or **DPI** proposes to replace an **IFOA spatial dataset**. The **EPA** or **DPI** will notify **FCNSW** prior to the replacement of any **spatial dataset**. Upon its replacement, the **spatial dataset** will become immediately enforceable.

Protocol 35: Data and information management

35.1 Introduction

- (1) This **protocol** supports requirements relating to Data and Information Management in:
 - (a) **Protocol 34: Spatial datasets**; and
 - (b) the following conditions of the **approval**:
 - (i) condition 123, which relates to **spatial datasets**;
 - (ii) condition 124, which relates to **field mapping**; and
 - (iii) condition 125, which relates to species data transfer to the **NSW BioNet**.
- (2) In this **protocol**, **register** means the **operations register**, **compliance register**, **complaints register** and the **annual plan** required under condition 39 of the **approval**.

35.2 Register data

- (1) **FCNSW** must submit all records and any amended records to be contained in a **register** to the **EPA** via the agreed online form or other format as agreed to by the **EPA** in writing.

35.3 Documents and files

- (1) **FCNSW** must submit all documents and files, and any amended documents and files, that are required to be submitted to the **EPA** under the **approval** or a **protocol** via a format to be determined and as agreed to by the **EPA** in writing.

35.4 Public availability of data and information

- (1) All **register** data, documents and files and **spatial datasets** that are required to be made publicly available under a condition of the **approval** that does not contain personal information will be made publicly available via the **NSW Environmental Data Portal** or an alternative approach as agreed to by the **EPA** in writing.

35.5 Spatial data

- (1) All **spatial datasets** and archived **spatial datasets** must be made available as real-time ESRI Feature Services or in an alternative system as agreed to by the **EPA**.
- (2) **FCNSW** must make all **GIS datasets** required to be submitted to the **EPA** under **Protocol 34: Spatial datasets** available to the **EPA** as real-time **ESRI Feature Services** or alternative system agreed to by the **EPA**.
- (3) All **FCNSW field mapped dataset** data captured by **FCNSW** in the field using an **FCNSW mobile application** must be made available to:
 - (a) the **EPA** for viewing via an **FCNSW mobile application** as soon as that data has been captured and synced by the **FCNSW** field officer; and
 - (b) the **EPA** for real-time viewing in a **GIS**.

35.6 Species data transfer to the NSW BioNet

- (1) For the purposes of the requirements under condition 125 of the **approval**, **FCNSW** must submit any identified **subject species** or **threatened species records** to the **NSW BioNet** by using BioNet data entry tools or other agreed electronic means.
- (2) Each **subject species** and **threatened species record** must meet mandatory **NSW BioNet** data requirements, including all associated BioNet sighting keys.

Protocol 36: Field mapping

36.1 Introduction

- (1) Condition 124 of the **approval** requires field mapping in accordance with this **protocol**.

36.2 Identification and recording

- (1) For each:

- (a) unmapped ESA that has been field identified;
- (b) **indicatively mapped ESA** found to be incorrectly mapped and **field verified**; or
- (c) other **field-identified** feature required to be mapped under a condition of the **approval**:

the field location of the **ESA** or other feature must be:

- (d) identified in accordance with the relevant conditions of the **approval**; and
- (e) recorded using a **GNSS**-enabled device or any other device that can accurately record the location of the **ESA** or other feature as a point, line or polygon (area) record; and
- (f) a **GIS** digital record must be created that:
 - (i) identifies the location of the **ESA** or other feature;
 - (ii) identifies the boundary of all associated **exclusion zones**; and
 - (iii) contains completed attribute information for minimum required fields contained in the **spatial dataset**.

CHAPTER 7: REGENERATION

Protocol 37: Regeneration and stocking

37.1 Introduction

- (1) Chapter 7 of the **approval** requires **harvested areas** to be **regenerated** to the standards in this **protocol**.
- (2) **Regeneration** to achieve the standards in this **protocol** is only required for **harvested areas** where the **natural floristic composition** exists at a **basal area** of less than 14 square metres per hectare (14 m²/ha).
- (3) This **protocol** does not apply to the carrying out of **regeneration** activities where the **natural floristic composition** of the **harvested area** exists at a **basal area** greater than or equal to 14 m²/ha.

37.2 Standard to be achieved for regeneration and stocking

- (1) For the purposes of compliance with condition 127.1 of the **approval**, the **regeneration** and stocking standard for **harvested areas** to which this **protocol** applies is met if at least 65% of a **harvested area** to which this **protocol** applies is **stocked** with **natural floristic composition** within the timeframes specified in column 2 of Table 1 below for the forest group in column 1.
- (2) Where there is more than one forest group in a **harvested area** the timing for assessment of achievement of **regeneration** standards in the **harvested area** must be the timing for the forest group that covers the largest proportion of the **harvested area**.

Table 1: Timing for the assessment of achievement of regeneration standards for each forest group (in accordance with Research note 17)

Forest group	Timing for assessment of achievement of regeneration standards after harvesting has been completed or after remedial action has been implemented
Dry Blackbutt, Dry Sclerophyll and Silvertop Ash (RN 17 Types: 37–42, 61–66, 112–11)	2–3 years
All other types, including identified Bell Miner associated dieback at risk stands	2–5 years

37.3 Procedure where only 40–65% of the regeneration and stocking standard is met

- (1) Where between 40% and 65% of a **harvested area** is **stocked** with **natural floristic composition** within the timeframes specified in column 2 of Table 1 for the Forest Group in column 1, **FCNSW** must determine whether the implementation of **regeneration remedial action** or a site-specific **regeneration rehabilitation plan** is required.
- (2) Where **FCNSW** determines that **regeneration remedial action** or a site-specific **regeneration rehabilitation plan** is not required, **FCNSW** must justify the reasons for this decision, including how and when the **regeneration** and stocking standard will be achieved. These decisions must be made publicly available.
- (3) Where **FCNSW** determines that **regeneration remedial action** or a site-specific **regeneration rehabilitation plan** is required, **FCNSW** must prepare and implement the action or plan in accordance with conditions 37.5 or 37.7 below, as applicable.

37.4 Procedure where less than 40% of the regeneration and stocking standard is met

- (1) Where less than 40% of a **harvested area** is **stocked** with **natural floristic composition** within the timeframes specified in column 2 of Table 1 for the Forest Group in column 1, **FCNSW** must implement **regeneration remedial action** or a site-specific **regeneration rehabilitation plan**.
- (2) **FCNSW** must prepare and implement the action or plan in accordance with conditions 37.5 or 37.7 below, as applicable.

37.5 Preparation and implementation of regeneration remedial action

- (1) A plan of operations for **regeneration remedial action** must include the following detail:
 - (a) the mapped area that will be subject to **remedial actions**;
 - (b) details of **remedial actions** to be applied and detail on which part of the mapped area that they will be applied;
 - (c) proposed timing for when **remedial actions** and treatments will be undertaken; and
 - (d) for seeding or planting operations the proposed proportional mix of species to be established with reference to the **natural floristic composition**.
- (2) **FCNSW** must implement a plan of operations for **remedial action** within 24 months of the date that the last plot was assessed.

37.6 Procedure where regeneration remedial action is unsuccessful

- (1) Where **regeneration remedial action** is unsuccessful in meeting the **regeneration** standard in condition 37.2, **FCNSW** must develop a site-specific **regeneration rehabilitation plan** in accordance with condition 37.7 and implement the plan.

37.7 Preparation and implementation of site-specific regeneration rehabilitation plans

- (1) Site-specific **regeneration rehabilitation plans** must:
 - (a) justify any proposed changes to **regeneration** standards including how any revised standards will still meet the **regeneration** outcome of the **approval** and **Principles of Ecologically Sustainable Forest Management (ESFM)** objectives;
 - (b) detail any alternative measurable and timebound **regeneration** standards that are specific to the area that is to be rehabilitated;
 - (c) describe the **regeneration remedial actions** to be applied and the mapped location of where they will be applied in the **harvested area**;
 - (d) detail the proposed proportional mix of species to be established, with reference to the **natural floristic composition** if planting or seeding is to be carried out;
 - (e) contain specific monitoring, evaluation and reporting actions;
 - (f) be reviewed, include specified input and be endorsed by an independent expert; and
 - (g) be implemented, monitored and reported on in accordance with the endorsed plan requirements.

37.8 Representative and adequate sampling of harvested areas

- (1) **FCNSW** must assess a representative and adequate sample of **harvested areas** to demonstrate the achievement of the **regeneration** and stocking standards.

- (2) A minimum of 10% of **harvested areas** with a **basal area** less than 14 m²/ha in each **management zone** must be randomly selected for stocking assessments.
- (3) A minimum of 40% of **harvested areas** that have been identified as high **regeneration** risk under **Protocol 4: Pre-operational plans** must be randomly selected for stocking assessments.
- (4) All **harvested areas** subject to **regeneration remedial action** or a **regeneration rehabilitation plan** must be selected for stocking assessments in accordance with condition 37.9 below.
- (5) Stocking assessments must be conducted in accordance with the stocking assessment methodology in condition 37.9, unless another method is agreed to by the **EPA**.
- (6) Stocking assessment results for each **harvested area** assessed must be made publicly available.

37.9 Stocking assessment

- (1) A minimum of 50 randomly located plots must be assessed for stocking levels in the **harvested area** or the area subject to **regeneration remedial action** or a **regeneration rehabilitation plan**.
- (2) Plots must be separated by at least 20 metres.
- (3) Plots must be established using fixed 2.26 metre radius plots.
- (4) A plot is stocked if it contains **natural floristic composition**, either within the plot or overtopping the plot.
- (5) A plot is also stocked where the retained **basal area** around the centre of the plot exceeds 14 m²/ha.
- (6) **Regeneration** standards are calculated by summing the number of plots that are stocked in accordance with condition 37.9(4) or 37.9(5) and dividing them by the total number of plots assessed in accordance with condition 37.9(1). The number is then multiplied by 100 to determine the **regeneration** standards (as a percentage).
- (7) A dominant or associate tree species within a plot may be recorded under condition 37.9(4) if it is a seedling, lignotuber, coppice or advanced regrowth.

37.10 Recordkeeping

- (1) The following details must be recorded for **regeneration** and stocking activities:
 - (a) **regeneration** assessments carried out under condition 4.2(7) of **Protocol 4: Pre-operational plans**;
 - (b) details of **FCNSW** decisions not to implement **regeneration remedial action** or a site-specific **regeneration rehabilitation plan** in accordance with condition 37.3 of this **protocol**;
 - (c) **harvested areas** selected by **FCNSW** for stocking assessment in accordance with condition 37.9;
 - (d) the spatial location of plots assessed and dates plots were assessed under condition 37.9;

- (e) the results of stocking assessments under condition 37.9 and the names of the person or people that have undertaken each plot assessment;
 - (f) the spatial location and mapped extent of **harvested area** or areas subject to remedial actions with associated data that details:
 - (i) when **regeneration remedial action** work commenced and when it was completed;
 - (ii) the location and extent and type of **regeneration remedial action** and treatments applied;
 - (iii) the proportions of different tree species that were planted and seeded; and
 - (iv) the provenance from which the species planted and seeded have come.
- (2) **FCNSW** must record and keep copies of plans of operation for **regeneration remedial action** and site-specific **regeneration rehabilitation plans** for a minimum of 10 years after they have been implemented.

37.11 Regeneration register requirements

- (1) **FCNSW** must keep a **regeneration** register for each **harvested area** to which this condition applies. The **regeneration** register must contain the following information:
 - (a) State Forest name and compartment;
 - (b) Forest group(s);
 - (c) the date harvesting was **completed** in the compartment;
 - (d) the timing for assessment of achievement of **regeneration** based on Table 1 in condition 37.2 of this **protocol**;
 - (e) stocking assessment results for each **harvested area** assessed; and
 - (f) spatial data showing the extent of the **harvested area** subject to the **protocol**.
- (2) **FCNSW** must update the **regeneration** register on **completion** of each **harvesting operation** and each stocking assessment.
- (3) **FCNSW** must make the regeneration register available to the EPA upon request.

CHAPTER 8: MONITORING

Protocol 38: Monitoring program

38.1 Introduction

- (1) This **protocol** supports Chapter 8 of the **approval**, which imposes requirements on **FCNSW** in relation to a **monitoring program**.
- (2) The conditions of the **approval** must be monitored to ensure they are effective in achieving the objectives and outcome statements set by the **approval**.

38.2 Monitoring steering committee

- (1) **FCNSW** must establish a monitoring steering committee, required under condition 129.1 of the **approval**, with the following composition:
 - (a) a minimum of three independent and suitably qualified scientists that have demonstrated expertise in:
 - (i) ecology;
 - (ii) soil erosion and water quality/pollution; and
 - (iii) forest regeneration and **Principles of Ecologically Sustainable Forest Management (ESFM)**; and
 - (b) NSW Government agency representatives responsible for other programs relating to monitoring of the environment (for example Saving our Species, NSW Koala Strategy or NSW Scientific Committee).
- (2) The monitoring steering committee must:
 - (a) ensure the **monitoring program** is designed to meet the requirements in condition 38.3 below;
 - (b) oversee the implementation of the **monitoring program**;
 - (c) review the effectiveness of the **monitoring program** and inform necessary amendments to ensure it is progressing and providing scientifically robust results; and
 - (d) review and analyse the **monitoring program** data and provide expert scientific advice to the **EPA, DPI** and **FCNSW**.

*Note: In reviewing the design and timing of the **monitoring program**, the monitoring steering committee will need to consider the priorities listed in condition 38.3 and the **monitoring program's** available budget and resources.*

38.3 Design and contents of a monitoring program

- (1) **FCNSW** must design a **monitoring program** to:
 - (a) monitor and evaluate the effectiveness of the conditions of the **approval**, including but not limited to:
 - (i) the multi-scale landscape protections;
 - (ii) drainage feature crossing and road conditions;

- (iii) riparian exclusion zones and ground protection zones on class 1 classified drainage lines;
 - (iv) the effectiveness of soil and water protection in intensive harvesting silviculture;
 - (v) Koala conditions;
 - (vi) the effectiveness of selective harvesting limits in achieving regeneration and stocking standards as measures of longer term **regeneration**; and
 - (vii) the maintenance of sufficient levels of **coarse woody debris**;
- (b) provide environmental trend monitoring at the landscape scale, including but not limited to:
- (i) water quality monitoring;
 - (ii) forest **regeneration**; and
 - (iii) biodiversity trend monitoring;
- (c) provide species specific monitoring, including but not limited to those management plans listed in **Protocol 21: Species management plan**;
- (d) provide species-specific monitoring for other species which require monitoring under existing programs relating to the monitoring of threatened flora;
- (e) meet **Principles of Ecologically Sustainable Forest Management (ESFM)** under the Regional Forest Agreements with the Australian Government and NSW Forest Agreements; and
- (f) provide linkages to other relevant NSW Government programs relating to the monitoring of State Forest management, including but not limited to:
- (i) *NSW Report on Native Vegetation* (Office of Environment and Heritage);
 - (ii) Saving Our Species (Office of Environment and Heritage); and
 - (iii) DPI-Fisheries Strategic Research Plan 2014–2018 (DPI-Fisheries).

38.4 Monitoring program review and reporting

- (1) The **monitoring program** required under Chapter 8 of the **approval** must incorporate reviews and public reporting of results and progress including:
- (a) an annual review of the monitoring program must be provided to the **EPA** as part of the monitoring and complaints summary in an annual return as required by condition 40 of the **approval** and must include:
 - (i) monitoring program results;
 - (ii) monitoring program progress; and
 - (iii) an assessment of the adequacy of the monitoring program;
 - (b) a major review of the monitoring program must be completed with each formal review for the **approval** and must include:
 - (i) detailed reporting of monitoring program progress and all results;

- (ii) detailed analysis of trends; and
 - (iii) an assessment of the adequacy of the monitoring program
- (c) consideration of any changes required to the **approval** generally under Part 5B of the *Forestry Act 2012 (NSW)* or condition 28 of the **approval** as a result of effectiveness monitoring.
- (2) The reviews of the monitoring program must be overseen by the **monitoring steering committee**.
- (3) Reviews of the monitoring program must be provided to the **EPA** and **DPI** and published on the **EPA** website.

CHAPTER 9: DEFINITIONS

Protocol 39: Definitions

39.1 Introduction

- (1) This **protocol** sets out all defined words and phrases of the **approval** as specified in condition 2 of the **approval**.

39.2 Definitions

- (1) In the **approval** and in each **protocol**, unless expressed or implied to the contrary, words, terms and phrases that are printed in bold italics text have the meanings given to them in the following table:

Term	Meaning
aggregate	A unit of soil structure consisting of primary soil particles held together by cohesive forces or by secondary soil materials, such as iron oxides, silica or organic matter
air-dry aggregate	The state of dryness of a soil aggregate at equilibrium with the water content in the surrounding atmosphere, depending on the relative humidity and temperature of the surrounding atmosphere
alternate coupe logging	A type of intensive harvesting that is described by the limits set by condition 55 of the approval and Protocol 7: Harvesting limits
animal	Has the same meaning as in the <i>Biodiversity Conservation Act 2016</i>
annual plan	The plan of forestry operations required to be prepared under condition 39 of the approval and mapped in the FCNSW -supplied spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Plan_of_Forestry_Operations'
annual timber and biomaterial report	A report required to be prepared under condition 41 of the approval
approval	The approval granted to FCNSW under Part 5B of the <i>Forestry Act 2012</i> , which includes protocols . Where there is a reference to a condition of the 'approval', it is a reference to a condition in the main body of the approval (Conditions 1–133).
approved soil assessor	Any person listed on the relevant list maintained by FCNSW as referred to in condition 6.2(3) of Protocol 6: Suitably qualified persons – training and experience
aquatic habitat assessment	An assessment required to be carried out in accordance with Protocol 18: Aquatic habitat assessment
armoured	A protective surface that is resistant to erosion or displacement by machinery or vehicles
authorised officer	An authorised officer of the EPA or DPI and a person appointed as an authorised officer under the following legislation: <ul style="list-style-type: none"> • <i>Protection of the Environment Operations Act 1997</i> • <i>Biodiversity Conservation Act 2016</i> • <i>Fisheries Management Act 1994</i>.
authorised person	An officer, employee, contractor, subcontractor or agent of FCNSW (or any other person) authorised by FCNSW to carry out a forestry operation or any part of a forestry operation in accordance with this

Term	Meaning
	approval. This excludes any persons operating within a small quantity authorisation as described conditions 31 or 32 of the approval .
authorised plantation	Has the same meaning as in the <i>Plantations and Reafforestation Act 1999</i>
bankfull level	The point in a drainage line determined in accordance with Protocol 16: Riparian protection
basal area	The sum of cross-sectional area of trees that are greater than 10 cm in diameter at breast height (DBH). Basal area is measured at breast height and in square metres per hectare (m ² /ha).
base net area	<ol style="list-style-type: none"> 1. The area identified in the base net area spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Base_Net_Area_Map_Layer'; or 2. The area of Forest Management Zone 3B, 4 and 8 in an operational area less any mapped riparian exclusion zones, rainforest, high conservation value old growth forest, rare forest, threatened ecological communities, ridge and headwater habitat, large forest owl exclusion zones and Forest Management Zones 1, 2, 3A, 5, 6 and 7.
bat inspection survey	A survey for a potential subterranean bat roost as described in Protocol 30: Subterranean bat roosts and flying-fox camps .
bat roost tree	<p>A tree or dead standing tree:</p> <ol style="list-style-type: none"> 1. where there is evidence that a microchiropteran bat has roosted or is roosting. This includes, but is not limited to a tree with a hollow at its base within which there is an accumulation of bat guano or a tree where a microchiropteran bat has been seen flying into or out of a hollow, crevice or other hole in the tree; or 2. depicted and mapped with the title 'Bat_Roost_Tree' in a map supplied IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA.
batter	An earth slope formed by the placing of fill material or by cutting into the natural hillside
BC Act	Means the <i>Biodiversity Conservation Act 2016</i>
Bell Miner associated dieback	Dieback of various species of eucalyptus trees in a consolidated area where there is, or has been, the presence of populations of Bell Miner and severe infestations of phytophagous insects, especially psyllids
biodiversity conservation licence	Has the same meaning as in the <i>Biodiversity Conservation Act 2016</i>

Term	Meaning
bird nest and roost	<p>A feature that includes at least one of the following:</p> <ol style="list-style-type: none"> 1. a bird nest including, but 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 cannot be seen or found, although there is clear evidence of breeding nearby and it is considered likely that a nest occurs nearby (i.e. within 50 metres); 2. a roost (specifically in relation to an owl roost) that: <ol style="list-style-type: none"> (a) includes a site where an owl of the relevant species has been observed roosting (that is sheltering or resting during the day); or (b) a site where there is evidence that an owl has roosted such as where there are owl pellets, remains of prey, or owl excreta; or (c) a combination of these; 3. identified and titled 'Bird_Nest_Roost' IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA; or 4. a record in the NSW BioNet that is attributed to a record type E which is 'nest/roost'.
blading off	The removal of surface soil from a snig track or road in wet conditions to expose a drier or firmer surface for use by machinery
bog	<p>A small, usually saturated wetland, with a very high organic matter content. Often located in an elevated position in the landscape.</p> <p><i>Note: This definition applies specifically to provisions regarding Northern Corroboree Frog and only has effect within Bondo and Micalong State Forests.</i></p>
Booroolong Frog mapped layer	The area identified in the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Booroolong_Frog_Map_Layer'.
borrow pit	An excavation which does not form part of the road from which fill material is extracted for road construction , upgrading or maintenance
breast height	The point of a tree at 1.3 metres above the ground (on the upslope side of the tree, if the tree is on a slope) or where the tree is deformed or branched at 1.3 metres above the ground, at a point above that height (but as close to it as possible) where the trunk or stem becomes more cylindrical
bridge	A structure designed to carry a road or track over a drainage feature by spanning it from bank to bank
broad area habitat search	A search described in condition 64.2 of the approval
burn event	Any known fire resulting from burning operations , including a hazard reduction burn or wildfire
burn plan	A plan required to be prepared under condition 92.1 of the approval
burning operations	A pre-harvest burn or post-harvest burn
carry-over exclusion zones	Previously protected areas for Squirrel Glider, Brush-tailed Phascogale and Koala high-use areas identified in the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Carry_over_Exclusion_Zones'

Term	Meaning
category 1 ESA	An area listed in column (a) of the table in in condition 56.1 of the approval
category 2 ESA	An area listed in column (b) of the table in in condition 56.1 of the approval
causeway	<p>A natural or constructed crossing which enables vehicles to ford a drainage feature. The pavement of a causeway may consist of gravel, rock, bitumen or concrete or of a stable natural surface.</p> <p>The upper surface of a causeway must not vary by more than:</p> <ul style="list-style-type: none"> • 10 centimetres from the bed of the drainage feature upstream of the causeway; and • 50 centimetres from the bed of the drainage feature downstream of the causeway. <p><i>Note: This definition sets out the physical attributes of what defines a causeway. Compliance with this definition does not imply compliance with the fish passage provisions of the approval and associated protocols or the FM Act and associated Policy and Guidelines for fish habitat conservation and management (updated 2013). Refer to the Protocol 17: Fish passage for compliance requirements.</i></p>
channel head	The furthest upslope location of a drainage line
class 1 aquatic habitat	The area identified by the application of condition 18.3 of Protocol 18: Aquatic habitat assessment
classified drainage line	A drainage line classified according to Protocol 19: Determination of drainage class and stream order and mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Classified_Drainage_Lines' derived using LiDAR data
cliff	<p>Is any of the following features:</p> <ol style="list-style-type: none"> 1. A rocky slope that is part of bedrock, which includes a rock face: <ol style="list-style-type: none"> (a) with a slope greater than 70 degrees (as measured under Protocol 28: Rocky outcrops and cliffs); (b) that is three metres high or more for at least 10 metres (as measured under Protocol 28); and 2. areas contained within the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'RockOutcrop_CliffFeatures'. <p><i>Note: While a rock face or rocky slope can include multiple rocks which are separated by crevices, cracks or fissures, isolated boulders are not cliffs.</i></p>
coarse woody debris	<p>Dead timber (including a log or head of a tree) that has fallen on the forest floor where the bark has been completely separated from the sapwood due to decay and:</p> <ol style="list-style-type: none"> 1. the smallest end of the dead tree has a minimum diameter of 10 centimetres under bark; and 2. is greater than three metres long.
Coastal IFOA Region	State Forest and other Crown-timber lands to which this approval applies and which is mapped in the spatial dataset and accompanying metadata held by the EPA titled 'Coastal_IFOA_Region'
Coastal IFOA Subregion	Four subregions that stretch across the following areas: Upper North East Subregion, Lower North East Subregion, Southern Subregion

Term	Meaning
	and Eden Subregion ; and is mapped in the spatial dataset and accompanying metadata held by the EPA titled 'Coastal_IFOA_Subregions'
coastal management SEPP	Land to which <i>State Environment Planning Policy: Coastal Management</i> applies
commencement date	The date on which the approval commenced, as set out in condition 11.1 of the approval
Bare-nosed Wombat (Northern Population Management Area)	The extent of Bare-nosed Wombat (<i>Vombatus ursinus</i>) occurrence in the Coastal IFOA Region north of the Oxley Highway as mapped in the indicative IFOA spatial dataset and accompanying metadata held by the EPA titled 'Bare_Nosed_Wombat_NthPopMngtArea'
comparable tree	A tree selected to replace a damaged retained tree that has the characteristics to fulfil the same purpose for which the damaged retained tree has been retained under the approval and which has similar physical attributes to the damaged retained tree
compartment	An area of forest designated for forestry operations located within a local landscape area and management area that is identified by a unique compartment number and a State Forest name, as mapped in the spatial dataset and accompanying metadata held by the EPA titled 'FCNSW_Compartment'
complete dispersion	In relation to an aggregate , means the total breakdown of the aggregate into its constituent particles (clay, silt and sand), leaving only the sand grains in a cloud of clay
completion	In the context of any forestry operations , has the meaning set out in condition 1.2(4) of Protocol 1: Registers . In any other context, 'completion' has its ordinary meaning.
concentrated water flow	The discharge of water from a structure across a surface in a manner, other than a sheet of water, up to the peak discharge from a storm event of less than or equal to the required design specification for that structure. Concentrated water flow is evidenced by rivulets, rills, gullies or streams of water or the eroded areas where rivulets, rills, gullies or streams of water have flowed.
confirmed absence of bats	Where a bat inspection survey carried out in accordance with condition 30.2 of Protocol 30: Subterranean bat roosts and flying-fox camps does not result in finding evidence of bats
construct	Means to build, erect or install. In relation to a road , means the construction of a road where no previous road existed. Construction includes road realignment beyond three metres of the existing road prism for a length of 20 metres or greater. In relation to a crossing , means the construction of a crossing where no previous crossing existed.
contemporary Koala record	A record of a Koala detected in the previous 10 years
coupe	A mapped area of contiguous native forest that has been or will be subject to: 1. intensive harvesting in the intensive harvesting zone ; or 2. alternate coupe logging in the Eden alternate couple logging zone ; and

Term	Meaning
	mapped in the spatial dataset and accompanying metadata held by the EPA titled 'Coupe'
CRAFTI old growth/ CRAFTI old growth mapping	Forests identified as old growth mapped as part of the Comprehensive Regional Assessment under the National Forest Policy Statement (an agreement between the Commonwealth, State and Territory governments made in 1992); and also mapped in the indicative IFOA spatial dataset and accompanying metadata held by the EPA titled 'CRAFTI_OldGrowth'
CRAFTI rainforest/ CRAFTI rainforest mapping	Forests identified as rainforest mapped as part of the Comprehensive Regional Assessment under the National Forest Policy Statement (an agreement between the Commonwealth, State and Territory governments made in 1992); and also mapped in the indicative IFOA spatial dataset and accompanying metadata held by the EPA titled 'CRAFTI_Rainforest'
CRAFTI structural mapping	Vegetation structural mapping from the Comprehensive Regional Assessment under the National Forest Policy Statement (an agreement between the Commonwealth, State and Territory governments made in 1992); and also mapped in the indicative IFOA spatial dataset and accompanying metadata held by the EPA titled 'CRAFTI_Structural'
critical habitat	For the purposes of a biodiversity conservation licence , has the same meaning as in the <i>Biodiversity Conservation Act 2016</i> . For the purposes of a fisheries licence , has the same meaning as in Part 7A of the FM Act .
crossbank	A hump of earth constructed across a snig track, log dump or road to baulk the flow of water so that it can be diverted
crossing	A structure designed to allow the crossing of a drainage feature and is either a track crossing or road crossing
crossing outlet	The downstream point of a crossing where water exits the crossing and flows into a drainage feature
Crown-timber land	Has the same meaning as in the <i>Forestry Act 2012</i>
culvert	One or more adjacent enclosed conduits for conveying water, flowing in a drainage feature underneath a road formation
dam	A body of water held by a barrier constructed to hold back water, forming a reservoir
damage	In the context of habitat , has the same meaning as in the <i>Biodiversity Conservation Act 2016</i> . In the context of a retained tree , means the tree's longevity or suitability to fulfil the purpose for which it has been retained under the approval has been compromised. In any other context, 'damage' has its ordinary meaning.
dead standing tree	A standing dead tree: 1. where the bark is fully separated from the sapwood due to decay and is greater than 30 centimetres in diameter at breast height and greater than three metres tall; or 2. that has hollows and could still have bark.
declared area of outstanding biodiversity value	Has the same meaning as in the <i>Biodiversity Conservation Act 2016</i> .

Term	Meaning
diameter at breast height (DBH)	The diameter of a tree (including its bark) measured, using a diameter tape, at right angles to the axis of the tree at breast height
diameter at stump height over bark (DSHOB)	The diameter of a tree (including its bark) measured, using a diameter tape, at right angles to the axis off the tree at stump height .
dispersibility/dispersion	The behaviour of a soil material, whereby aggregates break down and separate into their constituent particles in water, due to deflocculation
dispersibility rating	A rating of an air-dry aggregate scored by the approved soil assessor under condition 11.4 of Protocol 11: Soil dispersibility assessment
dispersible soils	Soil aggregates that have been classified class 2, 3 or 4 under condition 11.4 of Protocol 11: Soil dispersibility assessment
disturbed	In the context of soils, it means susceptibility to erosion because the vegetative cover has been removed or altered. The disturbance may be accompanied by the mixing or removal of some soil horizons. In any other context, 'disturbed' has its ordinary meaning.
DPI	Department of Primary Industries – Fisheries Division
drainage class	Any drainage line mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Classified_Drainage_Lines' derived using LiDAR data. Drainage class is categorised as class 1, class 2, class 3 and class 4 and must be determined in accordance with Protocol 19: Determination of drainage class and stream order .
drainage depression	A feature that is a level to gently inclined shallow, open depression with a smoothly concave cross-section, rising to moderately inclined hillslopes
drainage feature	A drainage depression, drainage line, major water storage or wetland
drainage line	A feature down which surface water naturally concentrates and flows and which exhibits one, or a combination, of the following features which distinguish them from drainage depressions : 1. evidence of active erosion or 'deposition', e.g. gravel, pebble, rock, sand bed, scour, hole, nick points; and/or 2. an incised channel of more than 30 centimetres depth with defined bed and banks. A drainage line includes a gully . 'Deposition' means the laying down of solid material which has been eroded and transported from a distant part of the land surface.
drainage order	An order applied and assigned to drainage lines where no LiDAR data exists and is determined in accordance with Protocol 19: Determination of drainage class and stream order
drainage structure	A road drainage structure or a track drainage structure
drainage structure outlet	The point at which water discharges from a road drainage structure or track drainage structure
earthworks	Mechanical soil movement and disturbance created using a machine blade or similar implement

Term	Meaning
Eden Subregion	A subregion of the Coastal IFOA Region attributed as 'Eden Subregion' and mapped in the spatial dataset and accompanying metadata held by the EPA titled 'Coastal_IFOA_Subregions'
Eden alternate coupe logging zone	The area within the Eden Subregion attributed as 'Eden Regrowth B' and mapped in the FCNSW -supplied spatial dataset (as current from time to time) held by the EPA titled 'Harvesting_Zones'
effective bank height	The minimum height of a crossbank above the outlet
endangered ecological community	For the purposes of a biodiversity conservation licence , has the same meaning as in the <i>Biodiversity Conservation Act 2016</i> . For the purposes of a fisheries licence , has the same meaning as in the <i>Fisheries Management Act 1994</i> .
endangered population	For the purposes of a biodiversity conservation licence , has the same meaning as in the <i>Biodiversity Conservation Act 2016</i> . For the purposes of a fisheries licence , has the same meaning as in Part 7A of the <i>Fisheries Management Act 1994</i> .
energy dissipation	The reduction in velocity and depth of running water by spreading the water flow over a larger area. Energy dissipaters are constructed in the base of a drainage feature or in the flow path of running water.
EPL (environment protection licence)	An environment protection licence under the POEO Act as described in condition 17 of the approval
EPA (Environment Protection Authority)	The authority constituted by section 5 of the <i>Protection of the Environment Administration Act 1991</i> (NSW)
EPA field-mapped dataset	A GIS dataset maintained by the EPA to temporarily store field mapped point, line and polygon features
erosion	The wearing away of the land (or soil) by running water, rainfall, wind, ice or geomorphological agent, including but not limited to processes such as detachment, entrainment, suspension, transportation and mass movement, at a rate accelerated due to forestry operations
ESA (environmentally significant areas)	An area listed in Table 1 of condition 56.1 of the approval
evidence of bats	A sighting or a record of a bat or bats, guano (either whole or powdered) including the distinctive odour of guano or a bat call detected using an ultrasonic bat detector.
evidence of Koala	An observation of a live or dead Koala or a sign that indicates the species' presence, including scat, hearing the call of a Koala, tracks or scratching
exclusion zone	An area around a protected feature where forestry activities are not allowed or are restricted
extinct species	A species listed in Schedule 3 of the <i>Biodiversity Conservation Act 2016</i>
extraction	The transport of logs from the point of felling to the log dump
FCNSW	Forestry Corporation of NSW constituted under section 5 of the Forestry Act
FCNSW field-mapped dataset	A GIS dataset maintained by FCNSW to temporarily or permanently store field mapped point, line and polygon features that are required to be mapped by this approval

Term	Meaning
FCNSW mobile application	Means a mobile device application: <ol style="list-style-type: none"> developed by FCNSW for an FCNSW officer; and used by an officer of FCNSW or the EPA to capture point, line, and polygon and attribute data in a GIS format.
FCNSW planning supervisor	A Level 6 Manager in accordance with the Forestry Corporation Enterprise Agreement who has responsibility for overseeing operational planning for the operational area within which a forestry operation is to be undertaken or, if there is no person in this role or this role no longer exists, an equivalent manager as agreed with the EPA
field boundary	A boundary of an area that has been identified in the field, having been either field-identified or field-verified
field-identified	A previously unidentified feature that is identified in the field by an officer of FCNSW , EPA or DPI to represent an area or location defined or described in this approval or a protocol
field-verified	A feature that is verified in the field by an officer of FCNSW , EPA or DPI to represent an otherwise indicatively mapped area or location defined or described in this approval or a protocol
fill	Previously excavated material that is used to raise the surface of an area to a specified level
fisheries licence	A licence under Part 7A of the Fisheries Management Act 1994 as described in condition 18 of the approval
fish passage	The connectivity that facilitates the movement of native fish species between upstream and downstream habitats (longitudinal connectivity) and adjacent riparian and floodplain areas (lateral connectivity). Areas that are important for fish passage include rivers, creeks, estuaries and flood flow paths. Fish passage can be affected by physical (dam wall), hydrological (flow intensity and timing), chemical (water temperature) and behavioural (light levels) factors.
flora road management plan	A management plan required to be established under condition 90 of the approval
flying-fox camp	<ul style="list-style-type: none"> An area where more than a hundred flying foxes congregate to roost on tree branches, whether they contain a single species or more than one species of flying-fox; and 'Occupied' in relation to a flying-fox camp means any number of flying foxes are occupying the camp at any time of a forestry operation.
flying-fox camp database	Means the database or spatial dataset (as current from time to time) produced by CSIRO for the Australian Government's National Flying-fox Monitoring Program census that contains the location and/or extent of flying-fox camps identified and included in the flying-fox camp database; or The area mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Flying-fox_Camp'.
FM Act	<i>Fisheries Management Act 1994</i> (NSW)
Forest Management Zone	Areas determined to be a Forest Management Zone : <ol style="list-style-type: none"> in accordance with the document <i>Forest Management Zoning in State Forests</i> (State Forests of NSW, December 1999); and mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'ForestManagementZones'

Term	Meaning
forest products	The products of trees and other vegetation (other than timber) that are of economic value
forest products operations	The harvesting or removal of forest products from an operational area
Forestry Act	<i>Forestry Act 2012</i> (NSW)
Forestry Act Conditions	The conditions of an approval granted under section 69P of the <i>Forestry Act 2012</i>
forestry operations	<p>Has the same meaning as in the <i>Forestry Act 2012</i></p> <p>Where referred to as a ‘forestry operation’, it is any individual component of forestry operations, being either:</p> <ul style="list-style-type: none"> • a harvesting operation, • roading • pre-harvest burn • post-harvest burn • forest product operations; or • regeneration.
forest types	A classification based on dominant vegetation known and “forest type” which is described in the document “Research Note 17 – Forest Types of NSW”. These forest types are depicted as mapped forest types for planning purposes, however where the IFOA requires identification of forest types through field assessment this is determined with reference to the descriptions in “Research Note 17 – Forest Types of NSW”.
giant tree	<p>In relation to Blackbutt or Alpine Ash trees, means any live tree of these species with a diameter at stump height over bark (DSHOB) of 160 centimetres or greater.</p> <p>In relation to all other tree species, means a live tree with a diameter at stump height over bark (DSHOB) of 140 centimetres or greater.</p>
girder log	A log suitable for use as a high-strength structural support, such as a bridge
GIS	A geographic information system
GIS dataset	A geographical record or dataset that can be used in a GIS
Glider sap feed tree	A living tree that exhibits incisions, including V-notch incisions, made by a Gliding Possum for feeding on exuding sap which has not been fully occluded by bark or scar tissue
Glossy Black-Cockatoo feed tree	A tree of an <i>Allocasuarina</i> spp. which shows evidence of Glossy Black-Cockatoo feeding by the presence of characteristic crushed cones at, or around, its base
GNSS	A global navigation satellite system including the global positioning system (GPS), GLONASS, Galileo or other satellite-based navigation systems used to pinpoint a geographic location of a GNSS-enabled device user
gravel pit	A pit formed by extraction of gravel for the purposes of road construction, upgrading or maintenance
ground protection zone	A strip of vegetation or groundcover that must be retained adjacent to specified riparian features or ESAs set out in Division 3, Chapter 5 of the approval , where modified harvesting practices are required to minimise soil disturbance

Term	Meaning
groundcover	Natural or artificial material which covers the ground surface and has the effect of reducing erosion
ground slope	The angle of inclination of the ground surface from the horizontal expressed in degrees
gully	An open incised channel with a depth of >0.3 metres and characterised by moderately to very gently inclined floor and steep walls. For the purpose of this licence, a gully is a type of drainage line.
gully stuffer	A type of crossing for a road , snig track or extraction track across a drainage feature . It is formed by filling the drainage feature with trees, debris, spoil, soil, rock or other material to the level of the road or track . A crossing constructed in accordance with Protocol 32: Temporary log crossings is not considered a gully stuffer .
habitat	For the purposes of a biodiversity conservation licence , has the same meaning as in the <i>Biodiversity Conservation Act 2016</i> . For the purposes of a fisheries licence , has the same meaning as in the <i>Fisheries Management Act 1994</i> . In any other context, 'habitat' has its ordinary meaning.
habitat feature	A feature listed in Table 2 in condition 64.3 of the approval
harm to any animal, threatened species, population or ecological community	Has the same meaning as the <i>Biodiversity Conservation Act 2016</i> and includes the picking of a plant that is a threatened species, population or threatened ecological community or protected plant under the Act. In relation to fish or marine vegetation, has the same meaning as Part 7A of the <i>Fisheries Management Act 1994</i> .
harm to the environment	Has the same meaning as the <i>Protection of the Environment Operations Act 1997</i>
harvest area	An area of land that is subject to active harvesting operations or forest products operations
harvested area	The portion of the operational area that has been subject to harvesting operations or forest products operations as part of the current forestry operation
harvesting debris	Tree heads, tree offcuts or bark that have resulted from the current forestry operation
harvesting/ harvesting operation	The cutting and removal of timber or forest products
harvesting zone	The areas depicted in the IFOA spatial datasets and accompanying metadata held by the EPA titled: <ul style="list-style-type: none"> • intensive harvesting zone; • selective harvesting zone; • Eden alternate coupe logging zone.
Hastings River Mouse micro-habitat	Areas where habitat is assessed as moderate or high suitability for Hastings River Mouse under a habitat suitability assessment as described in Protocol 20: Pre-operational surveys
haulage operation	The removal and transport of timber products from the point of loading within an operational area by machinery or truck along a road
hazard reduction burn	A burn proposed to be, or which has been, conducted under the requirements of the <i>Bush Fire Environmental Assessment Code</i> under the Rural Fires Act 1997 (NSW), instead of the approval

Term	Meaning
heads and offcuts	Those parts of a tree that are removed to obtain a pulp wood log or sawlog from the tree, but excluding: <ol style="list-style-type: none"> any part of a sawlog, pulpwood log or tree stump; and any part of a dead tree.
heath and scrub	Any of the following areas: <ol style="list-style-type: none"> areas with greater than 50% crown cover (this is the area of ground covered by projecting the outline of the crown vertically to the ground) dominated by woody shrubs and graminoids generally less than two metres tall at maturity, but up to seven metres tall; or land mapped in the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Heath_and_Scrub'. Heath and scrub may include areas of Forest Type identified as 'heath' (FT no. 223) or 'scrub' (FT no. 224).
high conservation value old growth forest or HCVOG	The following areas: <ol style="list-style-type: none"> land as mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'HCVOG'; and land as mapped in the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Assessed_HCVOG'.
high quality large sawlog	A log that in the opinion of FCNSW is of high quality and: <ol style="list-style-type: none"> in the Upper North East Subregion, Lower North East Subregion, South Coast Subregion and Tumut Subregion: <ol style="list-style-type: none"> is at least 2.4 metres long; and has a centre diameter under bark of 40 cm or more. in the Eden Subregion and Ingebirah State Forest and other Crown-timber lands within Tumut Subregion east of Kosciuszko National Park: <ol style="list-style-type: none"> is at least 2.4 metres long; or is between 2.4 metres and 4 metres in length and has a butt diameter under bark of 40 cm or greater; or is longer than 4 metres and has a butt diameter under bark of 36 cm or greater.
high quality small sawlog	A log that in the opinion of FCNSW is of high quality and: <ol style="list-style-type: none"> in the Upper North East Subregion, Lower North East Subregion, South Coast Subregion and Tumut Subregion: <ol style="list-style-type: none"> is at least 2.4 metres long; and has a centre diameter under bark of 40 cm or more. in the Eden Subregion and Ingebirah State Forest and other Crown-timber lands within Tumut Area east of Kosciuszko National Park: <ol style="list-style-type: none"> is at least 2.4 metres long; or has a butt diameter smaller than that specified for high quality large sawlogs in the area.
hollow-bearing tree	A tree that is alive which has 'evidence of hollows' means either: <ol style="list-style-type: none"> visible hollows, holes or cavities that have formed because of decay, injury or other damage as trees age, or where hollows are not visible from the ground, but are apparent from the combination of trees of an older growth stage and the obvious presence of deformities such as burls, protuberances or broken limbs.

Term	Meaning
	<i>Note: Guidance will support the application of this definition.</i>
impenetrable understorey	An area covered in dense understorey, such as lantana or vines, in which it is unsafe for a person to traverse on foot
incised channel	A channel that has eroded into the landscape
IFOA spatial dataset	A GIS dataset that contains the boundary of each ESA relevant to this approval. The methods for locating the field-identified boundary and associated exclusion zones are listed in the conditions of the approval and/or protocols for each individual ESA .
indicative IFOA spatial dataset	A GIS dataset where the features are only indicative and have not been field-verified
indicatively mapped ESA	An ESA that is contained in an indicative IFOA spatial dataset , the boundaries of which have not been field-verified
inflexion point	In relation to a road prism , means the point at which the top edge of a cut batter meets the natural ground surface or the toe of a fill batter meets the natural ground surface
inherent hazard level (IHL)	A classification of the potential for soil erosion and water pollution to occur in an area as a result of forestry operations and determined in accordance with Protocol 15: Inherent soil erosion and water pollution hazard assessment . For inherent hazard level 4, means an area of land depicted in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Mapped_Inherent_Hazard_Level 4'
intensive harvesting	A type of harvesting operation with high levels of tree removal and ground disturbance undertaken to promote regeneration which is further described by the limits set by condition 52 of the approval
intensive harvesting coupe	Means a coupe in an intensive harvesting zone
intensive harvesting cycle	One cycle in a series of three cycles in which intensive harvesting may occur over the timeframes and areas specified in condition 52.2 of the approval
intensive harvesting tract	An area within the intensive harvesting zone where the long-term intent is for intensive harvesting to occur and labelled 'intensive harvesting tract' and mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'harvesting tract'
intensive harvesting zone	The area where intensive harvesting is permitted (as well as selective harvesting) which is attributed as 'NC_Regrowth_B' and mapped in the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Harvesting_Zones'
known habitat	In relation to a flora record , means the area within five kilometres of the record In relation to a fauna record , means the area within two kilometres of the record; other than for Spotted-tailed Quoll in which case it means the area within five kilometres of the record.
Koala browse prescription 1	An area where Koala browse tree retention in accordance with condition 72.1(a) of the approval applies and is labelled 'Koala browse prescription 1' in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Koala_Browse_Tree_Prescriptions'
Koala browse prescription 2	An area where Koala browse tree retention in accordance with condition 72.1(b) of the approval applies and which is labelled 'Koala

Term	Meaning
	browse prescription 2' in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Koala_Browse_Tree_Prescriptions'
Koala browse tree	<p>1. In the Upper North East Subregion and Lower North East Subregion, means a live tree which may be selected for retention under condition 72 of the approval that is:</p> <ul style="list-style-type: none"> (a) greater than 20 cm DBH or 22 cm at DSHOB, (b) is live and healthy; and (c) of the following tree species: <ul style="list-style-type: none"> (i) primary browse trees – <ul style="list-style-type: none"> Tallowwood (<i>E. microcorys</i>) Swamp Mahogany (<i>E. robusta</i>) Red Gums (<i>E. tereticornis, glaucina, seeana</i> + hybrids) (ii) secondary browse trees – <ul style="list-style-type: none"> Grey Gums (<i>E. biturbinata, propinqua, punctata, canaliculata</i>) Grey Box (<i>E. moluccana, largeana</i>) Peppermints (<i>E. radiata, acaciaformis</i>) Sydney Blue Gum (<i>E. saligna</i>) Ribbon Gum (<i>E. nobilis, viminalis</i>) Messmate (<i>E. obliqua</i>) Snow Gum (<i>E. pauciflora</i>) Mountain Gum (<i>E. dalrympleana</i>) New England Blackbutt (<i>E. andrewsii, campanulata</i>). <p>2. In all other IFOA subregions, means a live healthy tree, greater than 30 cm DBH of the following tree species:</p> <ul style="list-style-type: none"> <i>Eucalyptus longifolia</i> <i>E. cypellocarpa</i> <i>E. globoidea</i> <i>E. mannifera</i> <i>E. rossii</i> <i>E. viminalis</i> <i>E. tereticornis</i> <i>E. amplifolia</i> <i>E. bosistoana</i> <i>E. maidenii</i> <i>E. muelleriana</i> <i>E. tricarpa</i> <i>E. punctata</i> <i>E. nortonii</i> <i>E. eugenioides</i>.
large veneer log	A veneer log with a centre diameter under bark of 40 cm or greater
large woody debris	Trees and shrubs that have fallen or been washed into rivers or streams and onto floodplains that are wholly or partially submerged in water. These include whole trees, trunks, branches, tree heads or root masses.

Term	Meaning
LiDAR	Light Detection and Ranging, which is a remote-sensing technique similar to radar, but uses laser light. It is used to accurately identify the locations of drainage lines and potential areas of mass movement.
local landscape area	Areas required to be developed in accordance with Protocol 8: Local landscape areas or which are mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Local_Landscape_Area'
location map	A map which is required to be prepared under condition 60.3(b) of the approval
log dump	An area within an operational area where timber and other forest products are collected for processing and sorting prior to loading onto a truck
log furrow	A depression or incision made in the ground caused by the pulling of logs from the point of felling to the log dump
low quality log	A log other than the following: high quality large sawlog, high-quality small sawlog, veneer log, pile, pole, girder log and pulpwood log
Lower North-East Subregion	A subregion of the Coastal IFOA Region attributed as 'Lower North East Subregion' and depicted in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Coastal_IFOA_Subregions'.
maintain/maintenance	<p>In relation to a road, means to carry out work within three metres of the existing road prism to enable continued trafficability and compliance with this approval. This may include work such as vegetation control (removal of trees < 20 cm DBHOB), grading, installing road drainage structures and installing soil erosion and sediment control measures.</p> <p>In relation to a crossing, means to carry out work on an existing crossing to ensure compliance with this approval. This may include work such as gravelling, grading and installing soil erosion and sediment control measures.</p> <p>In any other context, 'maintain' and 'maintenance' have their ordinary meaning.</p>
major roads	The roads mapped in the Geoscience Australia spatial dataset titled 'Roads250k' and attributed in the class field as 'Dual Carriageway', 'Principal Road' or 'Secondary Road'.
major water storage	A dam constructed for public irrigation or the supply of town water
management zone	An area of State Forest or other Crown-timber land that is no more than 50,000 hectares and is mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Management_Zone'
mapped drainage depression or mapped drainage line	A feature that is mapped on the classified spatial dataset using LiDAR data including and titled 'Classified_Drainage_Lines' or the Order Drainage Feature spatial dataset titled 'Ordered_Drainage'
mapped forest type	Areas depicting the forest types described by the document "Research Note 17 – Forest Types of NSW" in the spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'RN17_ForestTypes'
mass movement	The downslope movement of greater than 10 cubic metres of soil regolith or rock, where gravity is the primary force acting on material that has lost cohesion, typically as a result of an increase in water content. The key factors which affect mass movement are slope angle, material

Term	Meaning
	strength, vegetal cover and site drainage. This may include, but is not limited to, earth slumps, translational slides and earth flows. Mass movement is addressed in Protocol 13: Mass movement assessment .
material harm to the environment	Has the same meaning as in the <i>Protection of the Environment Operations Act 1997</i>
maximum annual harvest area limit	Means 10% of the net harvest area of a management zone
mechanical soil disturbance	Soil disturbance caused by machinery to make a seed bed for successful regeneration
metadata	Textual data that provides information about a spatial dataset and is prepared using the 'Environmental Data Portal template'
Ministers	The ministers referred to in Part 5B of the Forestry Act 2012
mixed intensity harvesting	Harvesting operations in local landscape areas in the intensive harvesting zone where both intensive harvesting and selective harvesting occurs, or is proposed to occur, in different tracts , as set out in condition 54 of the approval
modelled habitat	<p>A habitat model for the following flora or fauna species as mapped in the corresponding IFOA spatial dataset:</p> <ol style="list-style-type: none"> 1. Albert's Lyrebird – the area identified in indicative IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Alberts_Lyrebird_Model'. 2. Marbled Frogmouth – the area identified in the indicative IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Marbled_Frogmouth_Model'. 3. Phyloria spp. – the area identified in the indicative IFOA spatial dataset (current from time to time) and accompanying metadata held by the EPA titled 'Phyloria_spp_Model'. <i>Note: This layer may incorporate outputs from multiple models for each of the relevant Phyloria species.</i> 4. Pouched Frog (southern meta-population) – the area identified the indicative IFOA spatial dataset (current from time to time) and accompanying metadata held by the EPA titled 'Pouched_Frog_Sthmetapop_Model'. 5. Rufous Scrub-bird – the area identified in the indicative IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Rufous_Scrub_bird_Model'. 6. Northern Corroboree Frog – the area identified in the indicative IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Northern_Corroboree_Frog_Model'. 7. Hastings River Mouse – the area identified in the indicative IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Hastings_River_Mouse_Model'. 8. Powerful Owl – the area identified in the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Powerful_Owl_Model'. 9. Masked Owl – the area identified in the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Masked_Owl_Model'.

Term	Meaning
	<p>10. Sooty Owl – the area identified in the <i>IFOA spatial dataset</i> (as current from time to time) and accompanying <i>metadata</i> held by the <i>EPA</i> titled 'Sooty_Owl_Model'.</p> <p>11. Barking Owl – the area identified in the <i>IFOA spatial dataset</i> (as current from time to time) and accompanying <i>metadata</i> held by the <i>EPA</i> titled 'Barking_Owl_Model'.</p>
monitoring (in relation to Principles of ESFM)	<p>The monitoring of the <i>Principles of ESFM</i> set out in the following documents, as may be amended or superseded from time to time:</p> <ol style="list-style-type: none"> 1. <i>Criteria, Indicators, Targets and Monitoring Processes of Ecologically Sustainable Forest Management for the Upper North East and Lower North East RFA Regions</i> (ESFM PA 3 Working Group, NSW and Commonwealth Governments, July 1999) for the Upper North East Region; 2. <i>Criteria, Indicators, Targets and Monitoring Processes Ecologically Sustainable Forest Management for the Lower North East and Lower North East RFA Regions</i> (ESFM PA 3 Working Group, NSW and Commonwealth Governments, July 1999) for the Lower North East Region; 3. <i>Criteria, Indicators, Targets and Monitoring Processes of Ecologically Sustainable Forest Management for Southern RFA Region</i> (ESFM PA 3 Working Group, NSW and Commonwealth Governments, April 2000) for the Southern Region; and 4. <i>Criteria, Indicators, Targets and Monitoring Processes of Ecologically Sustainable Forest Management for the Eden and Lower North East RFA Regions</i> (ESFM PA 3 Working Group, NSW and Commonwealth Governments, July 1999) for the Eden Region.
monitoring program	The program required to be designed and adopted pursuant to condition 129 of the approval
multi-scale protection measures	The combination of the protection of ESAs and limits set in Chapter 3-Division 2 under the approval that apply at the management area , local landscape area and compartment scales
National Parks Estate	Has the same meaning as in the Forestry Act 2016
native forest biomaterial	A pulp wood log, heads and off-cuts , or a tree, cleared as a result of thinning or as a byproduct of a forestry operation
natural floristic composition	Tree species that naturally occur in the operational area , either as observed in the field or as described as dominant and associate species in Research Note 17 for each mapped forest type
net harvest area	The portion of an operational area that is available for harvesting operations and forest products operations , less all exclusion zones and ESAs
non-regrowth zone	The land mapped in the <i>IFOA spatial dataset</i> and accompanying <i>metadata</i> held by the EPA titled 'NonRegrowth_Zone'
NSW BioNet	The primary biodiversity data management system in NSW that is administered of the Office of Environment and Heritage
NSW Environmental Data Portal	The NSW Government online data portal
OEH	Office of Environment and Heritage.
operational area	An area defined in the operational plan and operations register in which a forestry operation (excluding forest product and timber

Term	Meaning
	operations conducted under section 45 of the <i>Forestry Act 2012</i>) is occurring or will occur
operational map	A map required to be prepared under condition 60.3(c) of the approval
operational plan	A plan required to be prepared under condition 60.3(a) of the approval
operations register	A register required to be kept and prepared under condition 35 of the approval
operations supervisor	A FCNSW employee who is responsible for routine monitoring of a forestry operation and compliance with the conditions of the approval
ordered drainage feature	Any drainage line , drainage depression , stream or watercourse shown in the LPI -supplied and FCNSW -categorised indicative IFOA spatial dataset held by the EPA titled 'Ordered_Drainage'. Drainage order must be determined in accordance with Protocol 19: Determination of drainage class and stream order .
outcome statement	Any section of the approval entitled 'outcome statement'
outfall	Drainage that occurs when the surface of a road , snig track or extraction track has a cross-slope that causes water to flow across and off the surface and the water flows away from and not into the hillside
outlet	The point at which water discharges from a road drainage structure or a track drainage structure
patch	An area of land: <ol style="list-style-type: none"> 1. described in condition 23.2 of Protocol 23: Tree retention in which tree retention rates have been identified and retained to meet the requirements of condition 71 of the approval and Protocol 23; and 2. mapped in the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Patch'.
peak flow	The maximum flow which occurs during a flood of a specified average recurrence interval as determined under Protocol 14: Design methods for crossings and drainage structures .
permanent track crossing	A crossing or crossing structure that is retained at the completion of forestry operations
pick/picking	Has the same meaning as in the <i>Biodiversity Conservation Act 2016</i>
pile	A log suitable for use in the ground as foundation support
plant	Has the same meaning as in the <i>Biodiversity Conservation Act 2016</i>
POEO Act	Means the <i>Protection of the Environment Operations Act 1997</i> (NSW)
pole	A log suitable for use as a support structure, typically for power and communications transmission
pollution	Has the same meaning as in the POEO Act
pollution incident	Has the same meaning as in the POEO Act
post-harvest burn	A burning operation conducted after the completion of a harvesting operation , other than a hazard reduction burn
potential future hollow-bearing tree	A living tree that is of mature or late mature growth stage which has potential for developing hollows, good crown development, minimal butt damage and is not suppressed.
potential habitat	In the context of flora , means areas within the regions and vegetation formations, classes and types identified in the relevant species profile

Term	Meaning
	and locality descriptions published by the Office of Environment and Heritage or otherwise identified by relevant literature. In the context of fauna , means modelled habitat and Rufous Scrub-bird micro-habitat and Hastings River Mouse micro-habitat
potential subterranean bat roost	A cave, disused mine shaft, mine or tunnel or rock overhang where: <ol style="list-style-type: none"> 1. a cave that meets the following description: <ol style="list-style-type: none"> (a) at least one entrance has a diameter of at least 0.5 metres; (b) the diameter of the cave chamber (that is, the longest distance between any two points on the perimeter of the cave's base) is at least 0.5 metres; (c) the length of the cave (from the entrance to the furthest point from the entrance) is at least three metres; and (d) the height of a dome of the cave is at least one metre higher than the top of an entrance; 2. a disused mine shaft that is at least four metres deep and has one or more of the following features: <ol style="list-style-type: none"> (a) not all faces of the shaft are visible from the surface; (b) it has ledges that are suitable for bats to roost under; and (c) it links to a horizontal shaft that is at least one metre long; 3. a mine or tunnel that meets the following description: <ol style="list-style-type: none"> (a) at least one entrance has a diameter of at least 0.5 metres; (b) the length of the mine or tunnel running horizontally is at least three metres; and (c) the cavity is at least one metre high at some point; or 4. a rock overhang with holes or crevices (or both) in the roof or wall protected by the overhang.
pre-harvest burn	A burning operation conducted prior to the commencement of a harvesting operation , other than a hazard reduction burn
pre-operational plan	Plans and maps required to be prepared under condition 60 of the approval
premises	The premises to which an environment protection licence applies
Principles of Ecologically Sustainable Forest Management (ESFM)	The principles of ecologically sustainable forest management as described in the Regional Forest Agreements for Eden, Southern and Northeast
protected animal	Has the same meaning as in the <i>Biodiversity Conservation Act 2016</i>
protected plant	Has the same meaning as in the <i>Biodiversity Conservation Act 2016</i>
Protocol	Any document entitled 'protocol' which is attached to or forms part of the approval
pulpwood log	A log suitable for the manufacture of reconstituted products, including paper and panel board, and does not include timber suitable to be high quality large sawlogs
rainfall erosivity	A measure of the ability of rainfall to cause erosion, determined using data sources referred to in Protocol 15: Inherent soil erosion and water pollution hazard assessment and mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Rainfall_Erosivity'

Term	Meaning
rainfall zone	A zone comprising areas of land within NSW that have the same seasonal distribution of rainfall erosivity , determined in accordance with Protocol 15: Inherent soil erosion and water pollution hazard assessment
rainforest	<p>The following areas of land:</p> <ol style="list-style-type: none"> 1. land mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Rainforest'; and 2. land mapped in the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Assessed_Rainforest'. <p><i>Note: As per agency agreement, all unmapped rainforest identified by FCNSW throughout the course of forestry operations must be mapped and supplied to the EPA to be added to the digital layer. The approval will not prescribe the requirements for the identification of any unmapped rainforest.</i></p>
rare forest	An area of land mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Rare_Forest'
record	<ol style="list-style-type: none"> 1. In relation to fauna, means an observation of a live or dead individual of a species or any part of a species (hair, feathers, skin, bone, teeth or eggs) or a sign that indicates the species' presence (call heard, tracks, diggings, incisions, species' scat, raptor pellet, owl pellet, nest, roost or den); that is: <ol style="list-style-type: none"> (a) recorded on the NSW BioNet 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 operational plan; (b) recorded by FCNSW or their agents during a targeted flora and fauna survey (as required in condition 63 of the approval) or broad area habitat search (as required by condition 64 of the approval) or at any other time during the planning or carrying out of a forestry operation; or (c) any other information about the location of a threatened species held by FCNSW. 2. In relation to flora, includes any part of a plant including, but not limited to, roots, stems, branches, leaves, fruits, seeds and flowers; that is: <ol style="list-style-type: none"> (a) recorded on the NSW BioNet 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 operational plan; (b) recorded by FCNSW or their agents during a targeted flora and fauna survey (as required in condition 63 of the approval) or broad area habitat search (as required by condition 64 of the approval) or at any other time during the planning or carrying out of a forestry operation; or (c) any other information about the location of a threatened species held by FCNSW. <p>A record remains valid unless the EPA approves in writing the record is invalid for the purpose of the approval or, in the case of flora records, surveys carried out to the satisfaction of EPA demonstrates that the plant is no longer at the location or cannot be relocated.</p> <p>Where the presence of a fauna species is determined from analysis of hair or scat samples conducted by a suitably qualified person, a result</p>

Term	Meaning
	<p>of 'definite' or 'probable' must be counted as a record where it refers to a threatened species listed in Part 1 or Part 2 of Schedule 1 of the BC Act. A result of 'definite' must be counted as a record where it refers to a threatened species listed in Part 3 of Schedule 1 of the BC Act.</p> <p>Where a species requiring the application of a species-specific condition is identified from within a predator scat or pellet, FCNSW must consult with the EPA to determine where the condition must 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.</p> <p>In any other context, 'record' has its ordinary meaning.</p>
regeneration	The re-establishment of forest suitable for future harvesting operations
regeneration rehabilitation plan	A plan required to be developed and implemented by FCNSW to facilitate the rehabilitation of harvested areas that have failed to meet regeneration and stocking standards through regeneration remedial action under Protocol 37: Regeneration and stocking
regeneration remedial action	Management techniques to promote an appropriate environment to establish regeneration in a forest after harvesting operations . It is limited to, burning within two years of a harvesting operation , mechanical soil disturbance, planting or seeding.
regrowth zone	Areas mapped in in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Regrowth_Zone'
rehabilitate	To return an area of land to a stable condition when stabilisation measures are inadequate and may include mulching, re-seeding or replanting
relevant IFOA	<p>The Integrated Forestry Operations Approval that was in place prior to the commencement date of the approval, for each of the:</p> <ul style="list-style-type: none"> • Upper North East Subregion • Lower North East Subregion • Southern Subregion • Eden Subregion
relief pipe	A pipe used to direct water from a table drain and under a road
replanting	The re-establishment of trees in an area after a harvesting operation by planting seedlings
reportable harm	<p>The definition is actual or potential harm to the environment that:</p> <ol style="list-style-type: none"> 1. is not trivial; 2. could be considered and offence under the BC Act or FM Act; 3. requires remedial work which would take more than 1 day; or 4. has the potential for impact on the environment for a period of six months or greater.
reporting period	<p>In reference to:</p> <ol style="list-style-type: none"> 1. an annual plan, means the 12-month period over a financial year 2. an annual return, means the 12-month period from the date of issue anniversary date or the last renewal of the environment protection licence following the commencement of the POEO Act.
research activity	Research undertaken to gain an improved understanding of the environmental impacts of forestry operations or alternative forest or species management practices

Term	Meaning
research activity area	The area defined for a research activity by the relevant site-specific research condition issued by the EPA in accordance with Protocol 5: Approvals for restricted activities
restricted activity	Any activity as specified and approved in accordance with condition 5.2 of Protocol 5: Approvals for restricted activities
retained tree	<ol style="list-style-type: none"> 1. A hollow-bearing tree, giant tree, dead standing tree, Glossy Black-cockatoo feed tree, glider sap feed tree or Koala browse tree, or 2. A tree mapped on the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Retained_Trees'.
ridge and headwater habitat	The area mapped in the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Ridge_Headwater_Habitat'
Rill	A form of erosion that is characterised by small channels up to 0.3 metres deep which have cut into the surface of a slope
riparian exclusion zone	A protected area mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Riparian_Exclusion_Zones'
road	Any route used for vehicular access to, and the transport of logs from, the point of loading within the compartment or roading area
road crossing	<p>A structure designed to allow the crossing of a drainage feature with a road comprising either:</p> <ul style="list-style-type: none"> • a bridge; • a culvert; • a causeway; • an existing stable gully stuffer; or • an existing sidecut causeway.
road drainage structure	Any structure designed to direct water along, across or underneath a road, including a catch drain, mitre drain, relief pipe , rollover bank, spoon drain and table drain
road prism	That part of the road from the inflexion point at the toe of the fill batter to the inflexion point at the top edge of the cut batter or, where there is no cut or fill batter as part of the road , that part of the road from the outside edge of the pavement on either side of the road
road surface	That part of the road from the top edge of the fill batter to the toe of the cut batter or, where there is no cut or fill batter as part of the road , that part of the road from the outside edge of the pavement on either side of the road
roading	The construction, upgrading or maintenance of a road or road crossing within a compartment or other defined operational area identified in the operational register
roading area	The land which is disturbed by the construction, upgrading or maintenance of access roads necessary to enable or assist a forestry operation
rocky outcrop	<i>Consultation note: The tree stem density references in this definition will be updated to reflect data being collected of standard tree densities in representative woodlands across the Coastal IFOA region.</i>

Term	Meaning
	<p>1. Any area of 0.1 ha (as measured in accordance with Protocol 28: Rocky outcrops and cliffs) or more where:</p> <p>(a) the land surface is</p> <p>(i) greater than 70% rock;</p> <p>(ii) skeletal soils; or</p> <p>(iii) a combination of these; and</p> <p>(b) in that area there are less than [Rate to be determined] trees per hectare (on average), which are greater than 30 cm at stump height;</p> <p><i>Note: Rocky outcrops can include but are not limited to, all areas of forest type 'rock' (FT no. 234)</i></p> <p>or</p> <p>2. Land contained within the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'RockOutcrop_CliffFeatures'.</p>
roosting bat	A species of microchiropteran bat that is known to roost in subterranean sites
Rufous Scrub-bird micro-habitat	<p>Areas of rainforest and/or wet sclerophyll forest that are:</p> <ol style="list-style-type: none"> one hectare or greater in size; and contain extremely dense cover between two and 50 cm above the ground, or moderate cover between 50 and 100 cm above the ground. <p>The cover may consist of living or non-living plant material or both. These areas generally have a moist microclimate and abundant leaf litter.</p> <p><i>Note: Rufous Scrub-bird micro-habitat is further described in associated guidance material.</i></p>
runoff	That portion of the precipitation falling on a catchment area that flows from the catchment past a specified point
saturated soil	The physical condition of soil where no more moisture can be absorbed or accepted
sawlog	A collective term for a high quality large sawlog, high quality small sawlog, veneer log, pile, pole, girder log or low quality log
scheduled forestry operation/non-scheduled forestry operation	The scheduled activities listed in clause 24 of Schedule 1 of the POEO Act as 'harvesting operations'. Non-scheduled activities are not listed in clause 24 of Schedule 1 of the POEO Act .
seasonality	Where the combination of the seasonal variation of rainfall erosivity , spatial distribution of rainfall and soil regolith stability require modified forestry operation management practices
sediment control measure	A control measure used to mitigate, reduce or prevent the amount of sediment in runoff
sediment trapping	The ability to mitigate, reduce or prevent the amount of sediment in runoff
seeding	The re-establishment of trees in an area after a harvesting operation via spreading seed
selective harvesting	A harvesting operation that selectively removes trees from the harvest area and is further described by selective harvesting limits

Term	Meaning
<i>selective harvesting limits</i>	The limits required by condition 53 of the <i>approval</i> and Protocol 7: Harvesting limits for <i>selective harvesting</i>
<i>selective harvesting tract</i>	An area within the <i>intensive harvesting zone</i> where the long-term intent is for <i>selective harvesting</i> to occur which is labelled 'selective harvesting tract' and mapped in the <i>IFOA spatial dataset</i> and accompanying <i>metadata</i> held by the <i>EPA</i> titled 'harvesting tract'
<i>selective harvesting zone</i>	The area attributed as 'NC_Regrowth_A', 'SC_Regrowth_A' or 'Non_Regrowth' and mapped in the <i>IFOA spatial dataset</i> (as current from time to time) and accompanying <i>metadata</i> held by the <i>EPA</i> titled 'Harvesting_Zones'
<i>side-cut snig tracks</i>	A side-cut snig track is formed by cutting soil or rock material from a hillside to create a level <i>track surface</i>
<i>side-cut causeway</i>	A type of crossing for a side-cut road or side-cut snig track across a <i>drainage feature</i> formed by filling the <i>drainage feature</i> with spoil creating a fill batter on the downstream side of the crossing. The upstream side of the crossing is generally level with the bed of the <i>drainage feature</i> .
<i>site-specific biodiversity condition</i>	A condition developed for a species at a specific site/location as specified in that site-specific biodiversity condition to be applied for the protection of the relevant species as approved by the <i>EPA</i>
<i>site-specific limit condition</i>	A condition relating to <i>mixed intensity harvesting</i> in a specified <i>local landscape area</i> as approved by the <i>EPA</i>
<i>site-specific operating condition</i>	A condition issued by the <i>EPA</i> or the <i>Ministers</i> to be applied in a specific area or in a specific circumstance, in lieu of the conditions of the <i>approval</i>
<i>site-specific research condition</i>	A condition required to be implemented in a <i>research activity area</i> as approved by the <i>EPA</i>
<i>slaked</i>	The partial breakdown of soil aggregates in water due to the swelling of clay and the expulsion of air from pore spaces
<i>slight dispersion</i>	In relation to an <i>aggregate</i> , means the partial breakdown of the <i>aggregate</i> in water, with less than 50% of the <i>aggregate dispersed</i> .
<i>small quantity authorisation</i>	A small quantity authorisation issued under section 45 of the <i>Forestry Act</i>
<i>small veneer log</i>	A <i>veneer log</i> having a centre diameter under bark of 40 cm or less.
<i>SMP exclusion zones</i>	An area of land shown in the <i>IFOA spatial dataset</i> (as current from time to time) and accompanying <i>metadata</i> held by the <i>EPA</i> titled 'SMP', including those attributed as: <ul style="list-style-type: none"> • 'SBB_Eden' • 'GBF_Eden' • 'Smoky_Mouse_Eden'
<i>snig and snigging</i>	The practice of hauling or dragging a log to a <i>log dump</i> , landing or stockpile
<i>soak and seepage</i>	Where water: <ul style="list-style-type: none"> • percolates from or below the ground; or • collects on or below the surface, of an area of hill slope, <i>road batter</i> or other landscape feature.

Term	Meaning
	The soil is generally saturated soil and may contain a high organic content. The vegetation present suggests a wetter micro-environment than adjoining land, such that it supports more mesic vegetation, such as ferns, sedges, rushes or other water plants . These areas are most likely to occur at the headwater of streams and other elevated positions in the landscape.
soil regolith	The mantle of earth and rock, including rocks and sediment altered or formed by land surface processes. Regolith may be either saprolite or sediment. Saprolite means part of the weathered soil regolith profile. It is characterised by the preservation of structures that are present in the unweathered rock material. The area mapped in the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Soil_Regolith'.
soil stabilisation	The provision of vegetative, structural or mechanical measures to prevent or control erosion by providing an energy-absorbent or energy resistant barrier on the soil surface
South Coast Area	An area of the Southern Subregion attributed as 'South Coast' and mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Tumut_SouthCoast_SouthernSubregion'
Southern meta-population	The area identified in the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Pouched_Frog_Sthmetapop_Map_Layer'
Southern Subregion	A subregion of the Coastal IFOA Region attributed as 'Southern Subregion' and depicted in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Coastal_IFOA_Subregions'
spatial dataset	Data that can be used in a geographic information system and includes (but is not limited to) any of the following: <ul style="list-style-type: none"> • IFOA spatial dataset • indicative IFOA spatial dataset • FCNSW field-mapped dataset • EPA field-mapped dataset • FCNSW spatial dataset • external spatial dataset.
species	Has the same meaning as in the <i>Biodiversity Conservation Act 2016</i>
species-specific condition	A condition to be applied to the forestry operation in accordance with Chapter 4, Divisions 4 and 5 of the approval for a species listed in Part 2 and Part 3 of Protocol 31
species extinct in nature	A species extinct in nature listed in Schedule 3 of the <i>Biodiversity Conservation Act 2016</i>
species management plan (SMP)	A management plan for a specified fauna or flora species prepared and required to be implemented in accordance with Protocol 21: Species management plan
spoil	Excess soil, rock or other material excavated during forestry operations
Spotted-tailed Quoll latrine site	Any site where: <ol style="list-style-type: none"> 1. three or more Spotted-tailed Quoll scats, or records of scats, have been detected within a five metres radius, or

Term	Meaning
	<p>2. a site where a Spotted-tailed Quoll scat has been observed, or recorded, on more than one occasion within a five metres radius.</p> <p>For the purposes of the approval, Spotted-tailed Quoll scats detected on roads will not constitute a Spotted-tailed Quoll latrine site.</p> <p>Once a Spotted-tailed Quoll latrine site has been identified it will be considered as such for the duration of the approval.</p>
Spotted-tailed Quoll maternal den	<p>Any Spotted-tailed Quoll den if it is recorded being used by a Spotted-tailed Quoll during the period June to November, unless it can be demonstrated to the satisfaction of the EPA that the individual using the den is male or that the female using the den does not have young.</p> <p>Once a maternal den has been identified it will be considered as such for the duration of the approval.</p>
Spotted-tailed Quoll permanent den	<p>Any Spotted-tailed Quoll den where there are records of use by Spotted-tailed Quoll on more than one occasion. For the purposes of the approval 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 the approval.</p>
stable	<p>In relation to a road, road surface, road batter or table drain, means the physical condition of a road, road surface, road batter or table drain shows no appreciable evidence of rilling, gullyng, slumping or tension cracks.</p> <p>In relation to a crossing, means the physical condition of the crossing structure is structurally sound and shows no appreciable evidence of erosion or sedimentation.</p> <p>In relation to a stable surface (road crossing outlet or drainage structure outlet), means an outlet is protected from erosion up to peak discharge of water flow from a storm event of less than or equal to the design specification of the structure.</p> <p>In relation to an area of land, means the area shows no appreciable evidence of erosion.</p> <p>For all other references, means a soil conservation or hydraulic structure is functioning effectively and is not adversely affected by erosive agents.</p>
stabilise/ stabilisation	<p>Stabilise to make a disturbed area stable and may include reshaping the soil and spreading and flattening harvesting debris to return an area of land to a stable condition or draining and reshaping a road or track surface so that it is stable.</p> <p>Stabilisation means the provision of adequate vegetative, structural or mechanical measures to control erosion or make an area stable.</p>
State Forest	Has the same meaning as in the Forestry Act
stick nest	A collection of sticks in the branches, fork, trunk and or head of a live or dead tree that, when combined, form a nest that is greater than 50 cm in diameter.
stream breeding threatened frog	<p>Any of the following species:</p> <ul style="list-style-type: none"> • <i>Litoria booroolongensis</i> (Booroolong Frog) • <i>Litoria castanea</i> (Yellow-spotted Tree Frog) • <i>Litoria piperata</i> (Peppered Tree Frog) • <i>Mixophyes iteratus</i> (Giant Barred Frog) • <i>Mixophyes fleayi</i> (Fleay's Frog) • <i>Mixophyes balbus</i> (Stuttering Frog)

Term	Meaning
<i>strong dispersion</i>	In relation to an <i>aggregate</i> , means the partial breakdown of the <i>aggregate</i> in water, with more than 50% (but less than 100%) of the <i>aggregate dispersed</i>
<i>stump height</i>	The point of a tree or a tree stump, measured at 30 cm above the ground (on the upslope of the tree, if the tree is on a slope) or, where the tree stump is less than 30 cm, the highest point of the tree stump.
<i>subject species</i>	<i>Species</i> (including populations) of plants or animals that require a protective measure to be taken under this <i>approval</i> as they are subject to Parts 2, 3 or 4 of Protocol 31: Species covered by the approval
<i>Subterranean site</i>	Means a: <ol style="list-style-type: none"> 1. cave – a naturally occurring underground cavity that is enclosed except for one or more entrances (or exits) 2. disused mine shaft – a vertical tunnel constructed for the purpose of mining, but no longer used for that purpose 3. mine or tunnel – an underground cavity that has been created or constructed by people and that is enclosed except for one or more entrances (or exits) 4. rock overhang – a rock that projects outward from the rock face below it, protruding at least three metres from the wall of the rock face and is at least three metres wide.
<i>suitably qualified person</i>	A person who has experience or qualifications, or both, which enable them to carry out the requirements of a described job or task in a competent and professional manner and, where relevant, comply with the specific requirements in Protocol 6: Suitably qualified persons – training and experience .
<i>targeted flora and fauna survey</i>	A survey described in condition 63.2 of the <i>approval</i>
<i>table drain</i>	The side drain of a <i>road</i> adjacent to the shoulders of the <i>road</i>
<i>TEC assessed areas</i>	The area labelled ‘TEC assessed area’ in the <i>IFOA spatial dataset</i> and accompanying <i>metadata</i> held by the <i>EPA</i> titled ‘TEC’
<i>TEC (certified)</i>	The area labelled ‘TEC (certified)’ in the <i>IFOA spatial dataset</i> and accompanying <i>metadata</i> held by the <i>EPA</i> titled ‘TEC’ and listed in Table 1 or 2 of Protocol 27: Threatened ecological communities
<i>TEC field key</i>	A field identification guideline prepared by the <i>EPA</i> for the specific <i>TEC</i> listed in condition 27.4 of Protocol 27: Threatened ecological communities and displayed on the <i>EPA</i> website
<i>TEC (indicative)</i>	The area labelled ‘TEC (indicative)’ in the <i>IFOA spatial dataset</i> and accompanying <i>metadata</i> held by the <i>EPA</i> titled ‘TEC’ and listed in Table 2 of Protocol 27: Threatened ecological communities
<i>temporary log crossing</i>	A type of <i>temporary track crossing</i> where logs are temporarily placed in a <i>drainage feature</i> to enable the short-term passage of a machine or vehicle
<i>temporary track crossing</i>	A type of <i>track crossing</i> or <i>crossing</i> structure that is removed at the <i>completion</i> of <i>harvesting operation</i> in the areas specified in the <i>approval</i>
<i>threatened ecological community (TEC)</i>	A vegetation community or ecosystem identified in the <i>IFOA spatial dataset</i> and accompanying <i>metadata</i> held by the <i>EPA</i> titled ‘TEC’, and listed in Table 1 of Protocol 27: Threatened ecological communities

Term	Meaning
threatened species, population or ecological community	For the purposes of a biodiversity conservation licence , has the same meaning as in the BC Act . For the purposes of a fisheries licence , has the same meaning as in Part 7A of the FM Act .
timber product	Any of sawlogs, pulpwood logs, heads and offcuts and any other part of a tree sold under the Forestry Act
track	A snig track or an extraction track
track crossing	A structure designed to allow the crossing of a drainage feature with a track comprising: <ul style="list-style-type: none"> • a bridge; • a culvert; • a causeway; • a temporary log crossing; or • an existing gully stuffer.
track drainage structure	Any structure designed to direct water across an extraction track or snig track surface, including crossbanks, hay bales or sand bags
tract maps	The IFOA spatial dataset and accompanying metadata (as current from time to time) titled 'harvesting_tract' held by the EPA
transition period	The two-year period from the commencement date of the approval
tree retention clumps	An area required to be identified in accordance with condition 70.1 of the approval and the areas mapped in the IFOA spatial dataset titled 'Tree_Retention_Clump' (as current from time to time) and accompanying metadata held by the EPA
Tumut Area	The area of the Southern Subregion attributed as 'Tumut' and mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Tumut_SouthCoast_SouthernSubregion'
unassessed Crown-timber land	An area of other Crown-timber land that has not previously been subject to a relevant assessment and/or planning process to identify any areas of high conservation value old growth forest, rainforest, large forest owl exclusion zones or ridge and headwater habitat (as the case may be) that may occur within it
unmapped	In the following contexts means: <ol style="list-style-type: none"> 1. Drainage depression and drainage line – any drainage feature that is not mapped on the: <ol style="list-style-type: none"> (a) IFOA spatial dataset titled 'Classified_Drainage_Lines' and accompanying metadata held by the EPA; or (b) IFOA spatial dataset titled 'Ordered_Drainage' and accompanying metadata held by the EPA. 2. Wetland – any wetland that is not mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Mapped_Wetlands'. 3. Inherent hazard level 4 – any area of land classified as inherent hazard level 4 that is not mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Mapped_Inherent_Hazard_Level 4'. 4. ESA – any ESA that is not mapped in an IFOA spatial dataset. 5. Rainforest: any rainforest that is not mapped in the: <ol style="list-style-type: none"> (a) IFOA spatial dataset titled 'Rainforest' and accompanying metadata held by the EPA;

Term	Meaning
	(b) IFOA spatial dataset titled 'Assessed Rainforest and accompanying metadata held by the EPA .
upgrade	<p>The act of improving or replacing.</p> <p>In relation to a road, means to improve, realign, re-open or replace a road. Road upgrade includes the removal of trees of 20 cm or greater DBH from an existing road or table drain surface and road realignment beyond three metres of the existing road prism for a length of 20 m or greater.</p> <p>In relation to a crossing, means to improve or replace a crossing structure.</p>
Upper North East Subregion	A subregion of the Coastal IFOA Region attributed as 'Upper North East Subregion' and mapped in the IFOA spatial dataset and accompanying metadata held by the EPA titled 'Coastal_IFOA_Subregions'
veneer log	A log suitable for peeling or slicing thin sheets of timber, typically for the manufacture of plywood
walkover techniques	<p>Timber extraction or snigging where:</p> <ul style="list-style-type: none"> • no snig track construction or blading off of groundcover is performed; • at least 70% existing natural groundcover is retained; and • the path of the timber extraction or snigging remains stable.
waste	Has the same meaning as in the <i>Protection of the Environment Operations Act 1997</i>
watercourse	A channel, having a distinct bed and banks, down which surface water flows on a permanent or semi-permanent basis
water pollution or pollution of waters	Has the same meaning as in the <i>Protection of the Environment Operations Act 1997</i> .
waters	Has the same meaning as in the <i>Protection of the Environment Operations Act 1997</i>
wetland	<p>Any of the following areas:</p> <ol style="list-style-type: none"> 1. any vegetated depression with a permanent, seasonal or intermittent watertable 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; and 2. land mapped in the IFOA spatial dataset (as current from time to time) and accompanying metadata held by the EPA titled 'Mapped_Wetlands'. <p>Wetlands include, but are not limited to, areas of Coastal Management SEPP 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).</p>
WHS Act	<i>Work Health and Safety Act 2011 (NSW)</i>
wildlife habitat clumps	Areas required to be identified in accordance with condition 57.1 of the approval and mapped in the IFOA spatial dataset titled 'Wildlife_Clump' (as current from time to time) and accompanying metadata held by the EPA .

CHAPTER 10: TRANSITIONAL ARRANGEMENTS

Protocol 40: Transitional arrangements

40.1 Introduction

- (1) This **protocol** applies to the transition of **forestry operations** from **relevant IFOA** in place prior to the **commencement date** of the **approval**.
- (2) This **protocol** only applies to the specific conditions of the **approval** referenced.
- (3) This **protocol** is intended to allow a stable transition from old to new conditions without unduly disrupting previously planned **forestry operations**.

40.2 Reporting

- (1) **FCNSW** must provide the **EPA** a report each year from the **commencement date** of the **approval**, demonstrating the ongoing relevancy of the transitional arrangements set out in this **protocol**.

40.3 Status of operational plans approved before the commencement

- (1) Where an **operational plan** for forestry operations has been signed by a **FCNSW Planning Supervisor** before the **commencement date** of the **approval**, during the **transition period** **FCNSW** must elect for these **forestry operations** to be carried out either:
 - (a) in accordance with the previous conditions of the **relevant IFOA** in place prior to the **commencement date** of the **approval**; or
 - (b) in accordance with the conditions of the **approval**.
- (2) After the expiry of the **transition period**, all **forestry operations** must be carried out in accordance with the **approval**, except as otherwise permitted under this **protocol**.
- (3) After the **commencement date** of the **approval** all new **operational plans** must be developed and implemented in accordance with the conditions of the **approval**.

40.4 Annual plan of forestry operations

- (1) The first **annual plan of forestry operations** required under condition 39.1 of the **approval** must be prepared for the first full financial year after the **commencement date** of the **approval**.

40.5 Local landscape areas

- (1) The establishment of **local landscape area** maps under condition 51.1 of the **approval** must be prepared prior to the commencement of the first **forestry operation** conducted under the **approval** in each **local landscape area**.

40.6 Intensive harvesting limits

- (1) Maximum coupe size
 - (a) In the first five years from the **commencement date** of the **approval** or until the first formal review of the **approval**:
 - (i) the maximum size of each **intensive harvesting coupe** established under condition 52.3 of the **approval** may be up to 60 hectares; and
 - (ii) only one **intensive harvesting coupe** described in condition 40.6(1)(a)(i) is permitted in each **local landscape area**.

- (2) Coupe adjacency
- (a) In the first five years from the **commencement date** of the **approval** or until the first formal review of the **approval**, the minimum period between **intensive harvesting** in adjacent **intensive harvesting coupes** as specified in condition 52.4 of the **approval** may be reduced to a minimum of seven years.

40.7 Wildlife habitat clumps

- (1) The establishment of **wildlife habitat clumps** in each **local landscape area** as specified in condition 57.1 of the **approval** must be prepared prior to the commencement of the first **forestry operation** conducted under the **approval** in that **local landscape area**.

40.8 Pre-operational planning

- (1) During the **transition period**, where **FCNSW** has undertaken **pre-operational planning** for an **operational area** under the previous conditions of the **relevant IFOA** in place prior to the **commencement date** of the **approval**, the following **protocols** are deemed to have met the requirements of condition 60 of the **approval**:

- (a) **Protocol 9: Pre-operational road and crossing assessments**
- (b) **Protocol 10: Road design**
- (c) **Protocol 11: Soil dispersibility assessment**
- (d) **Protocol 12: Seasonality restrictions**
- (e) **Protocol 13: Mass movement assessment**
- (f) **Protocol 14: Design methods for crossings and drainage structures**
- (g) **Protocol 15: Inherent soil erosion and water pollution hazard assessment.**

- (2) Pre-operational planning referred to in condition 40.8(1) is only deemed to have been met if:

- (a) the **pre-operational planning** is less than five years old; and
- (b) it complies with the conditions of the **relevant IFOA** in place prior to the **commencement date** of the **approval**.

Note: This transitional arrangement avoids the need for FCNSW to review contemporary road and track assessments undertaken under the previous methods of the relevant IFOA and enable plans to be more readily updated to new conditions.

40.9 Targeted flora and fauna surveys

- (1) During the **transition period**, where **FCNSW** has undertaken **pre-logging and pre-roading compartment traverse surveys** for an **operational area** under the previous conditions of the **relevant IFOA** in place prior to the **commencement date** of the **approval**, the requirements of **targeted flora and fauna surveys** required for flora under condition 63.1 of the **approval** and **Protocol 20: Pre-operational surveys** in the relevant operational area are deemed to have been met if:

- (a) the **compartment survey** is less than five years old; and
- (b) it complies with the conditions of the **relevant IFOA** in place prior to the **commencement date** of the **approval**.

Note: This transitional arrangement aims to avoid the need for FCNSW to repeat surveys recently undertaken under the previous methods of the relevant IFOA and enable plans to be more readily updated to new conditions. This condition is required due to the change from a random meander survey method to a targeted survey method and because the current survey program is often well ahead of current operations.

40.10 Regeneration requirements

- (1) The requirements of condition 127 of the **approval** only apply to parts of the **operational area** that have been subject to **forestry operations** under the **approval**.

Coastal Integrated Forestry Operations Approval – Protocols

Consultation draft

May 2018

Disclaimer: The Coastal IFOA will include revisions from this draft version when it is granted by the Ministers, reflecting consideration of the outcomes of public consultation, and legislative changes being undertaken in line with the NSW Government Forest Industry Roadmap.