

Coastal Integrated Forestry Operations Approval – Protocols



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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

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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) **road maintenance**;
 - (e) **pre-harvest burns**;
 - (f) **post-harvest burns**; and
 - (g) **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 **forestry 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 **harvesting 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 **ground 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** 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** or **reportable harm**;

- (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 31 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 complaint;
 - (f) where a complaint alleges a non-compliance with a condition of the **approval**, details of the condition of the **approval** alleged to have not been complied with;
 - (g) follow-up action taken by **FCNSW**;
 - (h) precise location of the alleged breach, **harm to the environment** or **reportable harm**;
 - (i) description of the alleged **harm to the environment** or **reportable harm**;
 - (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** upon request.

Protocol 2: Annual plans and reports

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

2.1 Introduction

(1) This **protocol** supports:

- (a) condition 32.1 in Chapter 2, Division 2 of the **approval**, which relates to the preparation of an **annual plan** that sets out the planned **forestry operations** for the upcoming financial year;
- (b) condition 33 in Chapter 2, Division 2 of the **approval**, which relates to the preparation of an annual return that details the **forestry operations** undertaken in the previous financial year; and
- (c) condition 34 in Chapter 2, Division 2 of the **approval**, which relates to the preparation of an **annual timber and biomaterial report** that details the area and volume of timber products harvested in the previous financial year.

2.2 Annual plan of forestry operations

(1) Requirement for submission of an **annual plan**

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

(2) Content of the **annual plan**

- (a) The **annual plan** must include the following information for the following **forestry operations** which **FCNSW** proposes to carry out in the coming year:
 - (i) **harvesting operations**;
 - (ii) **road construction**;
 - (iii) **pre-harvest burns**;
 - (iv) **post-harvest burns**; and
 - (v) **regeneration** activities.
- (b) The **annual plan** must specify the following matters:
 - (i) the type of each proposed **forestry operation**;
 - (ii) the intended location of each proposed **forestry operation**, by reference to:
 - (A) **State Forest** name and **compartment** number;
 - (B) **management zone** and **harvesting zone**; or
 - (C) in the case of **Crown-timber land** that is not **State Forest**, other identifying particulars;

- (iii) the expected period of commencement and **completion** for each proposed **forestry operation** (June-August, September-November, December-February, March-May);
- (iv) for proposed **harvesting operations**:
 - (A) whether the operation is **intensive harvesting, selective harvesting, alternate coupe logging** or **mixed intensity harvesting**, and
 - (B) whether the estimated total volume (combined products) per hectare to be removed from each **compartment** or **tract** 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

- (v) 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
 - (vi) 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.
- (3) Variation to an **annual plan**
- (a) **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
 - (b) **FCNSW** must provide the **EPA** a copy of the amended **annual plan** within 7 days of any variation being made.
- (4) The **annual plan** must demonstrate planning to reduce cumulative impact
- (a) 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**.

2.3 Annual return

- (1) Content required by condition 33.1(f) of the **approval**
 - (a) No additional annual return content is currently required by condition 33.1(f) of the approval.

2.4 Annual report on timber volumes

- (1) Content of the **annual timber and biomaterial report**
 - (a) An **annual timber and biomaterial report** must include, but is not limited to, the following details:

- (i) Area information:
 - (A) **Coastal IFOA Subregion**;
 - (B) **management zone**;
 - (C) **local landscape area**;
 - (D) **State Forest** name or **Crown-timber land** name;
 - (E) **compartment** number, and **coupe** number (if relevant);
 - (F) **regrowth zone** or **non-regrowth zone**;
 - (G) **harvesting zone** (**intensive harvesting**, **selective harvesting**, **mixed intensity harvesting** or **alternate coupe logging**);
 - (H) the total **net harvest area** of the **compartment** (in hectares);
 - (I) area of the **net harvest area** subject to **selective harvesting** (in hectares);
 - (J) average retained **basal area** in the **harvested area** subject to **selective harvesting** (square metres per hectare);
 - (K) area of the **net harvest area** subject to **intensive harvesting** (in hectares); and
 - (L) area of the **net harvest area** subject to **alternate coupe logging** (in hectares).
- (ii) Volume information (produced and sold):
 - (A) the volume of **high quality large sawlogs** and **large veneer logs** (in cubic metres);
 - (B) the volume of **high quality small sawlogs** and **small veneer logs** (in cubic metres);
 - (C) the volume of **poles**, **piles** and **girder logs** (in cubic metres);
 - (D) the volume of **low quality logs** (in tonnes);
 - (E) the volume of **pulpwood logs**, export and domestic (in tonnes);
 - (F) the volume of other **timber products** sold (including firewood, fencing and wood-chop blocks) (in tonnes);
 - (G) the volume of **heads and offcuts** (in tonnes); and
 - (H) the volume of **native forest biomaterial** sold for electricity generation (in tonnes).

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Protocol 3: Operational tracking

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

3.1 Introduction

- (1) Condition 39 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 39 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) a **GIS** record in the 'Forestry_Operation_History' **spatial dataset** that includes the:
 - (i) boundary of the area subject to a **forestry operation**;
 - (ii) the type of **forestry operation**; and
 - (iii) the date of commencement and date of **completion** of the **forestry operation**;
 - (b) the date and details of any non-compliance with a condition of the **approval** that occurred while 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 20.3(d) of the **approval**; and
 - (e) details of any **threatened species, habitat features** or **ESAs** located during the **forestry operation**.
- (2) **FCNSW** must map the location or boundary of any non-compliance recorded under part (1)(b) of this protocol or any **threatened species** or **ESA** recorded under part (1)(e) of this **protocol** in accordance with condition 117 of the **approval**.

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** mapped on an **operational map**;
 - (b) the following information about the **harvesting operation** in the 'Forestry_Operation_History' **spatial dataset**:
 - (i) the type of **harvesting operation** (**intensive harvesting, selective harvesting, mixed intensity harvesting** or **alternate coupe logging**);
 - (ii) the volume of **timber products** and **forest products** removed; and

- (iii) results of **regeneration** and stocking assessments;
 - (c) 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**;
 - (d) 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**;
 - (e) the location and identification of **retained trees**;
 - (f) the location of **patches, wildlife habitat clumps** and **tree retention clumps**;
 - (g) 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**;
 - (h) records of **native forest biomaterial** sourced from the **harvesting operation**;
 - (i) records of assessments for Koalas as a demonstration of the application of condition 75 of the **approval**;
 - (j) details of **large woody debris** management decisions as required by **Protocol 17: Fish passage**; and
 - (k) the location of the **ground protection zone earthworks** including:
 - (i) the locations of the **ground protection zone earthworks** approved in **Protocol 5: Approvals for restricted activities**;
 - (ii) the date of completion of **ground protection zone earthworks**;
 - (iii) the date of implementation of **soil stabilisation, sediment control** and **rehabilitation** measures required by condition 97.7 of the **approval**.
- (2) **FCNSW** must map the location of **harvesting** track logs in accordance with condition 117 of the **approval**.

3.4 Specific information to be recorded for pre-harvest burning 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 **burning operation** is **complete**:
 - (a) the name of each person undertaking the **burn** and their role and responsibility;
 - (b) where the **burning operation** incurs into an **ESA**:
 - (i) the location, extent, severity and intensity of the incursion; and

- (ii) the reasons why the incursion occurred; and
- (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 **burning operation** from the time of first ignition until the **burning operation** is concluded for the day), including:
 - (i) fire indices readings for each day of the **burning operation**;
 - (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**; and
 - (b) the type and amount of each **forest product** removed from each **forestry operation** in the 'Forestry_Operation_History' **spatial dataset**.

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**; and
 - (b) 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: Operational plans

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

4.1 Introduction

- (1) Condition 53 in Chapter 3, Division 4 of the **approval** requires the preparation of an **operational plan**, for a proposed **forestry operation**, in accordance with this **protocol**.
- (2) This **protocol** sets out **operational plan** requirements, as follows:
 - (a) general requirements for all **operational plans**;
 - (b) additional specific requirements for **operational plans** relating to **harvesting operations, roading, burning operations, forest products operations** and **regeneration**;
 - (c) **location map** requirements; and
 - (d) **operational map** requirements.
- (3) An **operational plan** must include all information required to be included by the **protocols** listed in conditions 43 and 54 of the **approval** to enable **FCNSW** or an **authorised person** conducting a **forestry operation** to comply with Chapter 4 and Chapter 5 of the **approval**.

4.2 Requirements for 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 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** identifier.

- (b) If **FCNSW** proposes a **forestry operation** in any area within the **known habitat** or **potential habitat** of a relevant **subject 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 83 of the **approval**; and
 - (ii) any **species management plan** required for that **species** under condition 82.1 of the **approval**.
- (c) If the **forestry operation** is a **harvesting operation** or **roading** or **burning operation** in an **operational area**, the **operational plan** must also include:
 - (i) the results of the **targeted flora and fauna surveys** and **broad area habitat search** where conducted, as required by condition 56 and 57 of the **approval** and **Protocol 20: Pre-operational surveys**;
 - (ii) each **species-specific condition** to be applied to the **forestry operation** in accordance with Chapter 4, Divisions 4 and 5 of the **approval**;
 - (iii) each **site-specific biodiversity condition** prepared under **Protocol 31: Matters covered by the approval** which applies to the **operational area**;
 - (iv) each **site-specific research condition** relevant to the **operational area** as approved under **Protocol 5: Approvals for restricted activities**; and
 - (v) identification of areas of the **compartment** that are subject to **seasonality** restrictions and the **seasonality** restrictions that apply to each area as determined in accordance with **Protocol 12: Seasonality restrictions**.
- (3) Specific **operational plan** requirements for **harvesting operations**
 - (a) An **operational plan** for a proposed **harvesting operation** must include the following additional details:
 - (i) **base net area** in hectares;
 - (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) site-specific **harvesting limits** that apply to the **forestry operation** under conditions 45 to 48 of the **approval**;
 - (iv) each **site-specific limit condition** issued under **Protocol 7: Harvesting limits**;
 - (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 logs**;

- (E) **pulpwood logs**; and
 - (F) **heads and offcuts**;
 - (vii) the total area (in hectares) of **tree retention clumps** to be identified and permanently retained under condition 63 of the **approval**;
 - (viii) **inherent hazard level** assessment and **soil regolith** assessment (including distribution of **soil regolith** types) completed in accordance with **Protocol 15: Inherent soil erosion and water pollution hazard assessment**;
 - (ix) 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**;
 - (x) where a risk of occurrence or susceptibility to **Bell Miner associated dieback, biosecurity matter** or other **regeneration** risk has been identified the **operational plan** must include the items identified in 4.2(7) of **Protocol 4: Operational Plans**, and include details of each management action to be implemented in the **operational area** to mitigate the impact or further spread of **Bell Miner associated dieback, biosecurity matter** or other **regeneration** risk; and
 - (xi) each site-specific measure and technique for the **operational area** prepared in accordance with **Protocol 9: Pre-operational road and crossing assessments**.
- (4) Specific **operational plan** requirements for **roading operations**
- (a) If **road construction, upgrading or maintenance** or **crossing construction, upgrading or maintenance** is proposed, an **operational plan** must also include the following additional details:
 - (i) **road** assessments or **crossing** assessments as required by:
 - (A) **Protocol 9: Pre-operational road and crossing assessments**;
 - (B) **Protocol 10: Road design**;
 - (C) **Protocol 14: Design methods for crossings and drainage structures**; and
 - (D) **Protocol 17: Fish passage**; and
 - (ii) 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**.
- (5) Specific **operational plan** requirements for **burning operations**

- (a) An **operational plan** for a proposed **burning operation** must include the following additional details:
- (i) For the purposes of condition 85.1 of the **approval** the **burn plan** for any proposed **burn** (including **hazard reduction**) must clearly state whether the proposed **burn** is either:
 - (A) a **pre-harvest burn** or **post-harvest burn** conducted in accordance with the **approval**; or
 - (B) a **hazard reduction burn** conducted under the requirements of the *Rural Fires Act 1997* (NSW);
 - (ii) If **FCNSW** elects to carry out a **hazard reduction burn** under the *Rural Fires Act 1997* (NSW), instead of a **burning operation** in accordance with the **approval**, the **burn plan** must also include a description and map of the proposed area to be burnt (burn area); and
 - (iii) If **FCNSW** elects to carry out a **burning operation** in accordance with the **approval**, the **burn plan** must include the following information:
 - (A) description and map of the proposed area to be burnt (**burn area**);
 - (B) description of the objectives of the **burning operation**;
 - (C) description and map of all areas including **ESAs** which will be excluded from the **burning operation**;
 - (D) seasonal timing of the **burning operation**;
 - (E) the year and type of the last **burn event** in the **burn area** (either the previous prescribed **burn** or wildfire);
 - (F) 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;
 - (G) the planned fire indices, including fuel, weather (temperature, humidity, wind direction and wind speed) and lighting patterns under which the **burning operation** will be conducted, to ensure that the **burning operation** is conducted in accordance with the requirements of the **approval**;
 - (H) the planned fire behaviour parameters (such as flame height, coverage, acceptable scorch); and
 - (I) constraints over the timing of the **burning operation** such as **seasonality**, the period in which a **pre-harvest burn** is permitted or the period in which a **post-harvest burn** is permitted.
- (6) Specific **operational plan** requirements for **forest products operations**
- (a) An **operational plan** for a proposed **forest products operation** must include the following additional details:
- (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** for a proposed **harvesting operation** where a risk of occurrence or susceptibility to **Bell Miner associated dieback, biosecurity matter** or other **regeneration** risk has been identified must include the following additional 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 **Protocol 37: Regeneration and Stocking** 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, biosecurity matter** or other **regeneration** risk that may negatively impact on the achievement of **regeneration**; 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.

*Note: The specific **operational plan** requirements for **regeneration** contained in 4.2(7) of this **protocol** do not constitute the requirements for a **regeneration rehabilitation plan** or **regeneration remedial action** for the purpose of **Protocol 37: Regeneration and Stocking**.*

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 additional **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) areas 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 where a **regeneration remedial action** is to be carried out or a **regeneration rehabilitation plan** applies for the purposes of **Protocol 37: Regeneration and stocking**;
 - (iv) **forest products** removal area in the case of a **forest products operation**; and
 - (v) **roading area** in the case of a **roading operation**;
- (g) location and extent of all areas excluded from **forestry operations** including:
 - (i) known **ESAs**; and
 - (ii) other areas on which **forestry operations** cannot be carried out;
- (h) any other area, **retained tree** or **habitat feature** required to be protected under the **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** that are subject to **seasonality** restrictions and the **seasonality** restrictions that apply to each area as determined in accordance with **Protocol 12: Seasonality restrictions**;
- (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 (Cadastre) and the nature of that land (such as private property, **National Parks Estate** or a **compartment**);
- (s) drainage network (**classified drainage feature** from **LiDAR** or **ordered drainage feature** 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

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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 table 1 below, in accordance with this **protocol**, before **FCNSW** carries out a **restricted activity**, as set out in column 2 of table 1 below:

Table 1:

No.	Restricted activity	Reference in approval or protocol	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; nest, roost or den 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 91.1(e) and 92.1(e) of the approval	EPA
2	Deliberate ignition of a pre-harvest burn or post-harvest burn in an area not referenced in Table 2 of this protocol	Condition 87 of the approval and Table 2 of this Protocol	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 centimetres diameter at breast height (DBH); and the category 1 ESA or category 2 ESA is not an ESA of a TEC 	Condition 91.1(g) and Condition 92.1(g) of the approval	EPA
4	A research activity which is inconsistent with the requirements of the approval	Condition 22.1 of the approval	EPA
5	An amendment to a TEC (indicative) area	Condition 27.2(4) in Protocol 27: Threatened	EPA

No.	Restricted activity	Reference in approval or protocol	Approval body/person
		ecological communities	
6	Special provisions requiring a review or amendment to the approval at a specific site in a specific circumstance	Condition 23.4 of the approval	EPA
7	Road maintenance within a soak or seepage with a record of <i>Assa darlingtoni</i> or <i>Phyloria</i> species	Condition 69.6 of the approval	EPA
8	Applying Table 6b of the approval for riparian exclusion zones in compartments with areas classified as inherent hazard level 4	Condition 94.2(d)(i) of the approval	EPA
9	All in-stream works in class 1 aquatic habitat , including the construction or upgrading of a road drainage feature crossing or a track drainage feature crossing , that do not comply with Protocol 17: Fish passage	Conditions 103.15 and 106.19 of the approval	DPI
10	Road maintenance within a soak or seepage in areas of known habitat or potential habitat for <i>Assa darlingtoni</i> or <i>Phyloria</i> species with no record of <i>Assa darlingtoni</i> or <i>Phyloria</i> species	Condition 69.6 of the approval	FCNSW planning supervisor
11	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 approval	Condition 91.1 and 92.1 of the approval	FCNSW planning supervisor
12	A pre-harvest burn conducted more than one year before the commencement of a harvesting operation due to unforeseen circumstances	Condition 86.1 of the approval	FCNSW planning supervisor
13	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 24.1 of the approval	FCNSW planning supervisor
14	Earthworks in the outer 5 meters of a ground protection zone for a maximum length of 30 meters	Condition 97.3 of the approval	FCNSW planning supervisor
15	Deliberate ignition of a pre-harvest burn or post-harvest burn in an area referenced in Table 2 of this protocol	Condition 87 of the approval and Table 2 of this Protocol	FCNSW planning supervisor

No.	Restricted activity	Reference in approval or protocol	Approval body/person
17	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 24.1 of the approval	FCNSW operations supervisor
18	Vegetation and groundcover disturbance greater than three metres upstream or downstream of a road crossing	Condition 104.10 of the approval	FCNSW operations supervisor
19	Vegetation and groundcover disturbance greater than three metres upstream or downstream of a track crossing	Condition 106.18 of the approval	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) Table 1: **restricted activity** number 5 (amendment of **TEC (indicative)** area) – note the specific report requirements for proposals to amend a **TEC (indicative)** area below;
 - (b) Table 1: **restricted activity** numbers 13 and 17 (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**;
 - (c) Table 1: **restricted activity** numbers 2 and 15 (**pre-harvest burn** or **post-harvest burn** in a **ESA** or **ground protection zone**) – note the specific report requirements below.
- (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 completion 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 areas of **known habitat** or **potential habitat** for *Phyloria* species or *Assa darlingtoni* **FCNSW** must demonstrate:
 - (i) that a visual inspection of the **soak or seepage** by a **suitably qualified person** has been carried out 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.
- (6) **Earthworks** in a **ground protection zone**
- (a) Where the **restricted activity** relates to **earthworks** in a **ground protection zone** consistent with condition 97.3 of the **approval**, **FCNSW** may only approve **earthworks** in the outer 5 metres of the **ground protection zone** for a maximum length of 30 metres, where the **earthworks** are required to negotiate:

- (i) an **ESA**; or
 - (ii) a **retained tree**; or
 - (iii) a narrow ridge; or
 - (iv) around a **channel head** where the location of a **road** will prevent **track** access.
- (b) Where the **restricted activity** relates to condition 5.4(6)(a) of this **protocol**, **FCNSW** must also include the following information in the report:
- (i) a description of why **earthworks** in a **ground protection zone** is the only option;
 - (ii) a description of the work required;
 - (iii) the site-specific conditions of approval provided by a suitably qualified soil **erosion** and sediment control specialist; and
 - (iv) details of the **soil stabilisation**, **sediment control** and **rehabilitation** measures required to be put in place provided by a suitably qualified soil **erosion** and sediment control specialist.
- (7) Deliberate ignition or fire intrusion into an **ESA** or **ground protection zone**
- (a) Deliberate ignition or fire intrusion into an **ESA** is only permitted where **FCNSW** can demonstrate that:
- (i) burning the **ESA** or **ground protection zone** is the only safe and practical alternative for the **pre-harvest burn** or **post-harvest burn**, or
 - (ii) burning the **ESA** or **ground protection zone** will deliver an improved environmental outcome compared to any reasonable alternative option; and
 - (iii) the extent of burning the **ESA** or **ground protection zone** is limited to the minimum extent necessary.
- (b) **FCNSW** may only approve deliberate ignition in the **ESAs** or **ground protection zone** listed under Table 2.
- (c) **FCNSW** must prepare a report that demonstrates the matters described in condition 5.4(7)(a) of this **protocol**, and the following information:
- (i) description of the restricted burning proposed;
 - (ii) reason why the restricted burning is proposed;
 - (iii) description or comparison between burning and not burning on;
 - (A) safe conduct of the activity;
 - (B) fire escape risk;
 - (C) environmental impacts and disturbance; and
 - (D) cost;
 - (iv) description of how burning will be limited to the minimum extent necessary in the **ESA** or **ground protection zone**;

- (v) when the **ESA** was last subject to a **burn event**;
 - (vi) review of available information regarding the response to burning of the vegetation type or types concerned; and
 - (vii) assessment of **threatened species**, **subject species** or **habitat** that will be, or are likely to be, directly or indirectly affected by the restricted burning.
- (d) **FCNSW** must include in a **burn plan** prepared in accordance with **Protocol 4: Operational plans**:
- (i) mitigative measures to reduce impacts on the **ESA** or **ground protection zone**;
 - (ii) specific actions to be implemented to stabilise and **rehabilitate** each **ESA** or **ground protection zone disturbed**, or likely to be **disturbed**, by the **pre-harvest burn** or a **post-harvest burn**;
 - (iii) appropriate measures to be implemented to ensure that the burning within the **ESA** or **ground protection zone** is minimised and any **damage** from that burning is minimised; and
 - (iv) any other relevant information.

Table 2: ESAs and ground protection zones where FCNSW can approve deliberate ignition	
High Conservation Value Old Growth	Heath and scrub
Ridge and headwater habitat	Dams (not associated with any record of a threatened frog)
Rare forest	Spotted-tailed quoll exclusion zones
Large forest owl exclusion zones	Hastings River Mouse exclusions
FMZ 2 or FMZ 3A	IHL 4
Wildlife habitat clumps	Ground protection zones

5.5 Requests for further information

- (1) The **EPA** may request further information from **FCNSW** in relation to a report prepared under this **protocol** if the **EPA** is not satisfied that the report has adequately addressed the requirements of this condition. **FCNSW** must provide the requested information to the **EPA** 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 Table 3, 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) deny **FCNSW's** request to carry out a **restricted activity**.

Table 3: Restricted activities where approval can be deemed in accordance with condition 5.6(2)

Deliberate ignition of a **pre-harvest burn** or **post-harvest burn** in an area not referenced in Table 2 of this **protocol**

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 **restricted activity** 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

Version 2: Approved by the EPA Chair and CEO on 31 October 2018

6.1 Introduction

- (1) Condition 18.1(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 above.
- (3) **FCNSW** must keep 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**.
- (5) **Approved soil assessors** must undergo refresher training every 5-years via semi-formal or formal delivery methods.

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 57.3 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 survey** or a **targeted fauna survey** under **Protocol 20: Pre-operational surveys** must:
 - (a) be ecologically trained and capable of identifying flora and fauna **subject species** and habitat features relevant to their area to the **EPA's** satisfaction; and
 - (b) undergo annual refresher training via semi-formal or formal delivery methods on the identification of **subject species** and **habitat**.

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 75 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; and
 - (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

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

7.1 Introduction

- (1) This **protocol** supports:
 - (a) the mapping of a **tract**;
 - (b) the measurement of average **basal area** under condition 46.2 of the **approval**; and
 - (c) the development of a **site-specific limit condition** which **FCNSW** is required to request from the **EPA** under condition 47.3 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 an **intensive harvesting tract** or **selective harvesting tract** prior to the commencement of any **intensive harvesting** in the **local landscape area**.
- (2) The location of a **tract** mapped under condition 7.2(1) must be included in the 'Tract' **spatial dataset** and must not be changed unless authorised by the **EPA** in accordance with **Protocol 34: Spatial datasets**.
- (3) **Intensive harvesting** must not occur within areas designated on the **tract map** as **selective harvesting**, unless otherwise approved by the **EPA** in accordance with condition 7.2(2).

7.3 Measurement of average basal area

- (1) For the purposes of condition 46 of the **approval**, the average **basal area** must be calculated by averaging the **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 below.
 - (d) Table 1 below 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**.

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 ha	20
31–50 ha	30
51–100 ha	40
101–200 ha	50
201 ha+	60

(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 **basal area** at more than half of the sampling points must be equal to or above the average minimum limit for **basal area**; and
- (c) The **basal area** at no more than 25 per cent of sampling points within the **harvested area** can have a **basal area** below:
 - (i) eight square metres per hectare (8 m²/ha) in the **non-regrowth zone**; or
 - (ii) six square metres per hectare (6 m²/ha) in the **regrowth zone**.

7.4 Site-specific limit conditions

- (1) For the purposes of condition 47.3 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; and
 - (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 47.3 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

Version 2: Approved by the EPA Chief Executive Officer on 15 November 2019

8.1 Introduction

- (1) Condition 44 of the **approval** requires **FCNSW** to develop and map **local landscape areas** in accordance with this **protocol**, for the **EPA's** approval.
- (2) A **local landscape area** is deemed to have been approved, in accordance with Condition 44.1 of the **approval**, after a period of 10 working days has elapsed from the time the **local landscape area** is received by the **EPA** in accordance with (3) below, unless the **EPA** has written to **FCNSW** to:
 - (a) notify an extended time for consideration of a request for approval of the **local landscape area**;
 - (b) request further information or data;
 - (c) request a variation to **FCNSW's** proposed **local landscape area**; or
 - (d) deny approval of **FCNSW's** proposed **local landscape area** because it does not meet the requirements of this **protocol**.
- (3) **FCNSW** must submit the **local landscape area** and other information as requested by the **EPA**, to the **EPA** for approval, via the format and method determined and agreed to by the **EPA** in writing.
- (4) If at any time the **EPA** determines that an approved **local landscape area** does not meet the requirements of this **protocol**, the **EPA** may withdraw approval of the **local landscape area** and require **FCNSW** to amend or issue a new **local landscape area** for approval by the **EPA** within a timeframe specified by the **EPA**. If **forestry operations** have already commenced in this area, they may continue unless otherwise advised by the **EPA**.

*Note: This deemed approval does not apply to changes to an **LLA** under condition 44.2 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 must be kept as small as possible. Circular or square shapes are preferred and long and linear shapes must be avoided where possible;
 - (b) logical boundaries – Boundaries may use features such as existing **State Forest** and **compartment** boundaries, **roads** and creeks;
 - (c) consistent management boundaries – The planning unit must avoid going over **FCNSW management zones** where possible; and
 - (d) contiguity – Avoid areas separated by large areas of private land or cleared areas (including plantation or farmland) as far as possible. 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 **Protocol 34: Spatial datasets**.

8.3 Mapping of local landscape areas

- (1) **FCNSW** must map the location of a **local landscape area** and include it in the 'Local_Landscape_Area' **spatial dataset**.
- (2) **FCNSW** must not change the mapped **local landscape area** unless otherwise authorised by the **EPA** in accordance with **Protocol 34: Spatial datasets**.

Protocol 9: Pre-operational road and crossing assessments

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

9.1 Introduction

- (1) **Protocol 4: 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 road 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**; and
 - (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

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

10.1 Introduction

- (1) **Road construction** and the **maintenance** and **upgrade** of existing **roads** on steep **ground slopes** or areas of **mass movement** hazard has the potential to create more soil **erosion** than other **forestry operations**.
- (2) Condition 55 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 **ground 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

Version 2: Approved by the EPA Chair and CEO on 31 October 2018

11.1 Introduction

- (1) **Protocol 4: Operational plans** requires an **operational plan** for proposed **forestry 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 **operational 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 **operational 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;

- (d) ensure that the de-ionised water completely covers all the **aggregates** and does not stir the contents of the container or otherwise **disturb** the contents;
 - (e) 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
 - (f) repeat the steps described in conditions 11.3(1)(a) to (e) 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 **compartment** or **roading area**, then conditions 103.11 and 106.13 of the **approval** must be applied to all **forestry operations** in that **compartment** or **roading area**.

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Protocol 12: Seasonality restrictions

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

12.1 Introduction

- (1) Condition 108 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 108 of the **approval** by providing the methodology for determining applicable **seasonality** restrictions, having regard to the **inherent hazard level** classified under **Protocol 15: Inherent soil erosion and water pollution hazard assessment**, harvesting intensity 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 **road construction**, **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 108.1 of the **approval**, where the proposed **compartment** has an average annual **rainfall erosivity** between 4000 and 6000, the **forestry operations** identified in Table 1 below are not permitted during the periods specified.

Table 1: Seasonality restrictions for rainfall erosivity levels between 4000 and 6000

	Rainfall Zone 1 and 3	Rainfall Zone 2
Soil Regolith Class 1 and 3	<p>From 1 January to 31 March (inclusive):</p> <ul style="list-style-type: none"> • Forestry operations (except road maintenance and road construction) are not permitted in inherent hazard level 3 compartments; or on ground slopes greater than or equal to 25 degrees in intensive harvesting operations; and • Road construction is not permitted on ground slopes greater than 30 degrees 	<p>From 1 December to 31 March (inclusive):</p> <ul style="list-style-type: none"> • Forestry operations (except road maintenance and road construction) are not permitted in Inherent hazard level 3 compartments; or on ground slopes greater than or equal to 25 degrees in intensive harvesting operations; and • Road construction is not permitted on ground slopes greater than 30 degrees
Soil Regolith Class 2 and 4	<p>From 1 January to 31 March (inclusive):</p>	<p>From 1 December to 31 March (inclusive):</p>

	<ul style="list-style-type: none"> • Forestry operations (except road maintenance and road construction) are not permitted in inherent hazard level 3 compartments; or on ground slopes greater than or equal to 20 degrees in intensive harvesting operations; and • Road construction is not permitted on ground slopes greater than 30 degrees 	<ul style="list-style-type: none"> • Forestry operations (except road maintenance and road construction) are not permitted in inherent hazard level 3 compartments; or on ground slopes greater than or equal to 20 degrees in intensive harvesting operations; and • Road construction is not permitted on ground slopes greater than 30 degrees
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12.4 Seasonality restrictions for rainfall erosivity levels greater than 6000

- (1) For the purposes of condition 108.2 of the **approval**, where the annual average **rainfall erosivity** is greater than 6000, regardless of the **inherent hazard level** of the **compartment** 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 Table 2 below:

Table 2: Seasonality restrictions for rainfall erosivity levels greater than 6000

	Rainfall Zone 1	Rainfall Zone 2	Rainfall Zone 3
Soil Regolith Class 1	Forestry operations (except road maintenance) are not permitted from 1 January to 31 March (inclusive) on ground slopes greater than or equal to 25 degrees	Forestry operations (except road maintenance) are not permitted from 1 December to 31 March (inclusive) on ground slopes greater than or equal to 25 degrees	Forestry operations (except road maintenance) are not permitted from 1 January to 31 March (inclusive) on ground slopes greater than or equal to 25 degrees
Soil Regolith Class 2	Forestry operations (except road maintenance) are not permitted from 1 December to 30 April (inclusive) on ground slopes greater than or equal to 20 degrees	Forestry operations (except road maintenance) are not permitted from 1 December to 30 April (inclusive) on ground slopes greater than or equal to 20 degrees	Forestry operations (except road maintenance) are not permitted from 1 December to 30 April (inclusive) on ground slopes greater than or equal to 20 degrees
Soil Regolith Class 3			
Soil Regolith Class 4			
<i>Note: Forestry operations (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.</i>			

12.5 Seasonality restrictions map

- (1) Before commencing a **forestry operation** in a **compartment**, **FCNSW** must:
- clearly identify the location of each area within the **compartment** that is subject to **seasonality** restrictions on the **operational map** as required by **Protocol 4: Operational plans**; and
 - identify the **seasonality** restrictions that apply to each such area, as ascertained in accordance with this **protocol**.

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Protocol 13: Mass movement assessment

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

13.1 Introduction

- (1) To comply with condition 55.1 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) and condition 4.4(1) of **Protocol 4: 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> <ul style="list-style-type: none"> • Undertake a field survey and investigation of each compartment or roading area and determine if any mass movement is present or likely to occur.

- The field survey and investigation must, at a minimum, include existing **roads**, **side-cut snig tracks**, **gravel pits**, quarries, major excavations, cleared **ground slopes** and those areas identified on the hillshade relief images as areas of potential **mass movement**.

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 paralleling 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 in accordance with condition 117 of the **approval**.

- (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>

Undertake a field survey and investigation of each **compartment** or **roading** area and determine if any **mass movement** is present or likely to occur.

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 in accordance with condition 117 of the **approval**.

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 **ground 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 **FCNSW** unless older photographs held by **FCNSW** have a better resolution; and
- 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 advice from a **suitably qualified person**:
 - (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 written advice provided in condition 13.3(3) is that the **forestry operation** should proceed, the **suitably qualified 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 structure** 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**.

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Protocol 14: Design methods for crossings and drainage structures

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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:
 - (a) 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); and
 - (b) greater than 2000 hectares in area, must be undertaken in accordance with the Regional Flood Frequency Estimation Model that has been developed for *Australian Rainfall and Runoff* (2016).
- (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**:

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

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

Version 2: Approved by the EPA Chair and CEO on 31 October 2018

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 hazard level** for a particular **harvesting 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	Compartment spatial dataset	'Compartment' spatial dataset
Ground slope class	Ground slope class spatial dataset	Where LiDAR data is available, 'Ground_Slope_Class' spatial dataset . Where LiDAR data is not available, ground slope class must be produced using Land and Property Information 25 x 25 m grid cell
Rainfall erosivity	Rainfall erosivity spatial dataset table of rainfall erosivity and rainfall zone by compartment	'Rainfall_Erosivity' spatial dataset
Soil regolith	<i>Soil Regolith Stability Classification for State forests in Eastern NSW</i> (1998) Murphy, C; Fogarty, P; and Ryan, P. – ISSN 1324-6860 and soil regolith spatial dataset*	'Soil_Regolith' spatial dataset

*The **soil regolith spatial 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**.

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** or **coupe** (for **mixed intensity harvesting operations**), 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 **harvesting operation** involves **intensive harvesting** or **alternate coupe logging**;
 - (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 **soil 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 verified by an **approved soil assessor** 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 the **soil regolith spatial dataset**.
- (iv) The '**Soil regolith** determination methodology' is as **follows**:
 - (A) An **approved soil assessor** must determine which **soil regolith** class or classes are mapped in the **compartment**, using the **soil regolith spatial dataset**.
 - (B) The **approved soil assessor** must undertake a site **soil regolith** assessment of the **compartment** to **field-verify** the **soil regolith spatial dataset**.

- (C) The **approved soil assessor** must undertake the above **field-verification** using all inspections, investigations and testing procedures that are necessary to determine all **soil regolith** classes present and to verify that the **soil regolith** in the **compartment** is consistent with that presented in the **soil regolith spatial dataset**.
 - (D) The **approved soil assessor** must record the location of the **soil regolith** boundaries on a map of the **compartment** and 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 provide the reasons for each **soil regolith** classification.
 - (E) 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**.
 - (F) Where the **field-verified soil regolith** class(es) is not consistent with the **soil regolith** class(es) specified in the **soil regolith spatial dataset**, **FCNSW** must make all necessary amendments to the **soil regolith spatial dataset** to reflect the **field-verified soil regolith**.
 - (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) In all field inspections and investigations referred to in paragraphs (A) to (F), 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.
 - (I) 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**.
 - (J) All documentation referred to above, must be kept with the **forestry operation** history record.
- (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 **soil regolith** class, in accordance with the following procedure:
 - (A) Select the appropriate inherent hazard table applicable to the proposed **harvesting operation** in 15.4(1).
 - (B) Using the **ground slope class spatial dataset** (**LiDAR** data or NSW Land Registry Services 25 x 25 metres), determine the percentage of the gross area of the **compartment** that falls into each of the **ground slope classes** specified in the inherent hazard matrices for the proposed operation type.

- (C) Determine the **rainfall erosivity** for the **compartment** by referring to the **rainfall erosivity spatial dataset**.
- (D) Using the **rainfall erosivity** 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 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 **ground 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) Where 90 per cent 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**.
- (ii) Where less than 90 per cent of the gross area of the **compartment** is **inherent hazard level 4**, all **harvesting operations** must be excluded from the **ground 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 **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 **operational plan**, and **inherent hazard level** must not be changed or recalculated once a **harvesting operation** commences in that area.

Note: the calculation of net harvest area in Step 4 is relevant for the purposes of this Protocol 15: Inherent soil erosion and water pollution hazard assessment only

(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 per cent 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 per cent of the **net harvest area** is classified as **inherent hazard level 3**, **FCNSW** must proceed to paragraph (E).
- (E) Where 40 per cent 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 per cent of the **net harvest area** is classified as **inherent hazard level 3** and less than 40 per cent 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 per cent 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**.

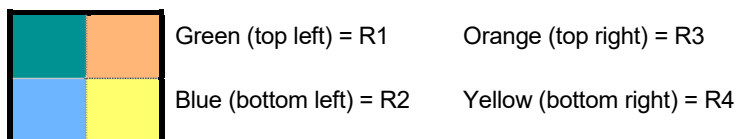
15.4 Inherent hazard level tables

- (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	Intensive harvesting, alternate coupe logging	Snigging (Dozer/skidder) extraction
IHL Table 2	Native forest harvesting	Selective harvesting	Snigging (Dozer/skidder) extraction
IHL Table 3	Native forest harvesting	Selective harvesting	Forwarder extraction

- (2) Each IHL Table provides a matrix for working out **inherent hazard level** based on a combination of:

- (a) **ground slope class** (x axis);
- (b) average annual **rainfall erosivity** (y axis);
- (c) **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 – harvesting operations prohibited for this proposed method of timber harvesting and extraction

- (4) Where a combination of **extraction** methods is proposed to be used within one **compartment**, **FCNSW** must use the most conservative IHL Table in determining the **inherent hazard level**.

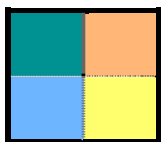
15.5 Mapping areas of Inherent Hazard Level 4

- (1) Areas within the **compartment** with **ground slope classes** that have been identified as **inherent hazard level 4** must be included in the 'Inherent_Hazard_Level_4' **spatial dataset**.
- (2) Areas of **unmapped inherent hazard level 4** within the **compartment** must be mapped in accordance with condition 117 of the **approval**.

IHL Table 1: Intensive harvesting or alternate coupe logging

Average annual rainfall erosivity value	Ground 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



Green (top left) = R1

Orange (top right) = R3





Blue (bottom left) = R2

Yellow (bottom right) = R4

**IHL Table 2: Selective harvesting with snigging
(dozer/skidder) extraction**

Average annual rainfall erosivity value	Ground 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

	Green (top left) = R1		Orange (top right) = R3
	Blue (bottom left) = R2		Yellow (bottom right) = R4

IHL Table 3: Selective harvesting with forwarder extraction

Average annual rainfall erosivity value	Ground 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

	Green (top left) = R1		Orange (top right) = R3
	Blue (bottom left) = R2		Yellow (bottom right) = R4

CHAPTER 4: OPERATIONAL PLANNING AND IMPLEMENTATION PROTOCOLS

Protocol 16: Riparian protection

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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: Operational plans** also requires the inclusion of information obtained under this **protocol** in the **operational plan**.

16.2 Riparian exclusion zones and ground protection zones for ordered drainage features

- (1) For the purposes of condition 97 of the **approval** a **ground protection zone** with a minimum width of 5 metres must be retained in respect of each **drainage depression (mapped or unmapped)**.
- (2) For the purposes of condition 96 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	Category 1 ESA	n/a
Unmapped drainage line	Category 1 ESA	Category 1 ESA	10 metres
1st order ordered drainage feature	Category 1 ESA	Category 1 ESA	10 metres
2nd order ordered drainage feature	Category 2 ESA	Category 1 ESA	20 metres
3rd order ordered drainage feature	Category 2 ESA	Category 1 ESA	30 metres
4th order (and above) ordered drainage feature	Category 2 ESA	Category 1 ESA	50 metres

16.3 Measurement of riparian exclusion zones

- (1) A **riparian exclusion zone** must:
- (a) be measured along the ground surface from the **bankfull level**; and

- (b) commence from the **channel head** for a class 1 **classified drainage line**, first order **ordered 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 95.1 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**.

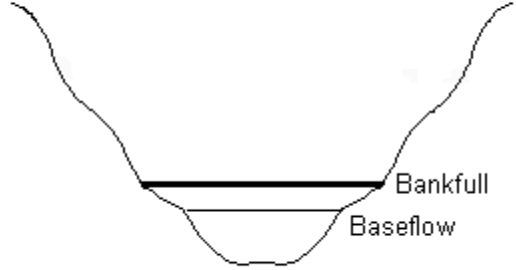
16.4 Determination of bankfull level

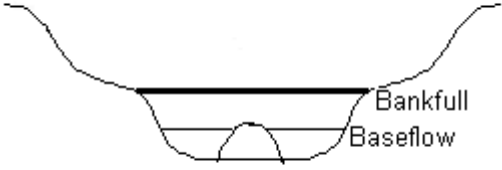
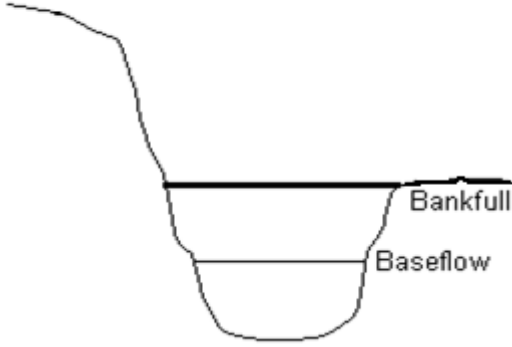
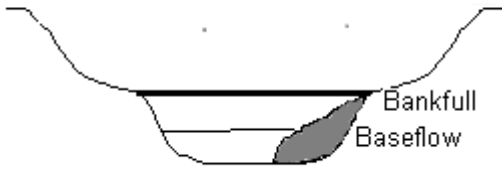
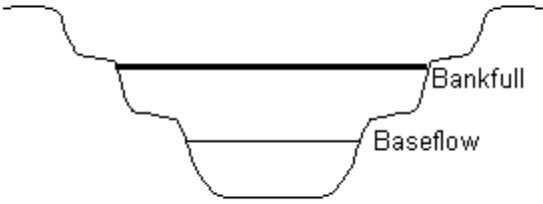
- (1) Where a **drainage line** is clearly defined, the **bankfull level** is the point at the top of the **drainage line** where, under high flow conditions, the water level would be even with the top of the banks or as determined using the examples in condition 16.5 below.
- (2) Where **drainage line** 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.

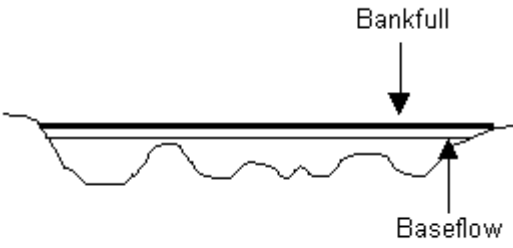
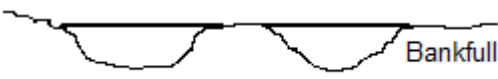
16.5 Examples to assist with identifying the bankfull level in different drainage line types

- (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>
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	<p>Channelised feature</p> <p>This type of <i>drainage feature</i> 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 <i>drainage feature</i> 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 <i>drainage features</i> 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>
	<p>Drainage depression with discontinuous incised channels</p> <p>This type of drainage feature is characterised by ephemeral, low gradient, discontinuous incised channels within a broader drainage depression. Bed material is often comprised of silt and clay. These channels are often found in areas with gentle side slopes. Bankfull level should be measured from the edge of the drainage depression which is often characterised by a change in slope.</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 **ground 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; and
 - (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.

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Protocol 17: Fish passage

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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 Construction of approved crossings

- (1) A **crossing** of a **drainage feature** may only be **constructed** to enable or assist **forestry operations** if:
 - (a) it is a **bridge, culvert, causeway** or **temporary log crossing** on a **track** managed in accordance with **Protocol 32: Temporary log crossings**; and
 - (b) **FCNSW** has assessed the crossing in accordance with the design, **construction** and **maintenance** requirements set out in this **protocol**, and an authorised person has approved (in writing) its location and its type prior to its construction.
- (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, causeway** or **temporary log crossing** on a **track** managed in accordance with **Protocol 32: Temporary log crossings**; and
 - (b) the 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**; and
 - (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 per cent of 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 level** 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 allows for **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 kept as a record in accordance with the **approval**.

Protocol 18: Aquatic habitat assessment

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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: 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 **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 exclusion 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) 'Class1_Aquatic_Habitat_Area' **spatial dataset**; and
 - (b) 'Class1_Aquatic_Habitat_Line' **spatial dataset**.
- (2) For the purpose of this **protocol**, **FCNSW** must obtain from **DPI** contemporary **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 there 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?		<p>If Yes, go to Step 2 or 3(a) for new or upgraded crossings.</p> <p>If Yes for existing non-compliant crossing that requires maintenance only, go to Step 3(b).</p> <p>If No, go to Step 4 for all drainage crossing works.</p>
2.	New/ upgraded crossings?		<p>Comply with Protocol 17: Fish passage.</p> <p>If proposed crossing will not comply, go to Step 3(a).</p>
3.(a)	<p>Is a field-based aquatic habitat assessment required?</p> <p>Notification and assessment sent to DPI</p> <p>Approval received from DPI</p>		<p>If Yes, comply with Protocol 18: Aquatic habitat assessment (see assessment list of info and data required).</p> <p>Consult with DPI. Once approval has been received, works may proceed.</p>
3.(b)	<p>Are the drainage feature crossing works – maintenance of existing crossing only?</p> <p>Notify DPI in accordance with Protocol 18: Aquatic habitat assessment</p>		<p>Notify DPI of maintenance works applicable to existing crossings that are within class 1 aquatic habitat and non-compliant with Protocol 17: Fish passage.</p>
4.	<p>Are dredging and/or reclamation works proposed within drainage features outside of class 1 aquatic habitat?</p> <p>DPI – Fisheries notified of works in accordance with s.199 of the <i>Fisheries Management Act 1994</i> (NSW).</p>		<p>If Yes, undertake a field-based assessment (see assessment list of info and data required).</p> <p>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> (NSW).</p>

(1)

Protocol 19: Determination of drainage class and stream order

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

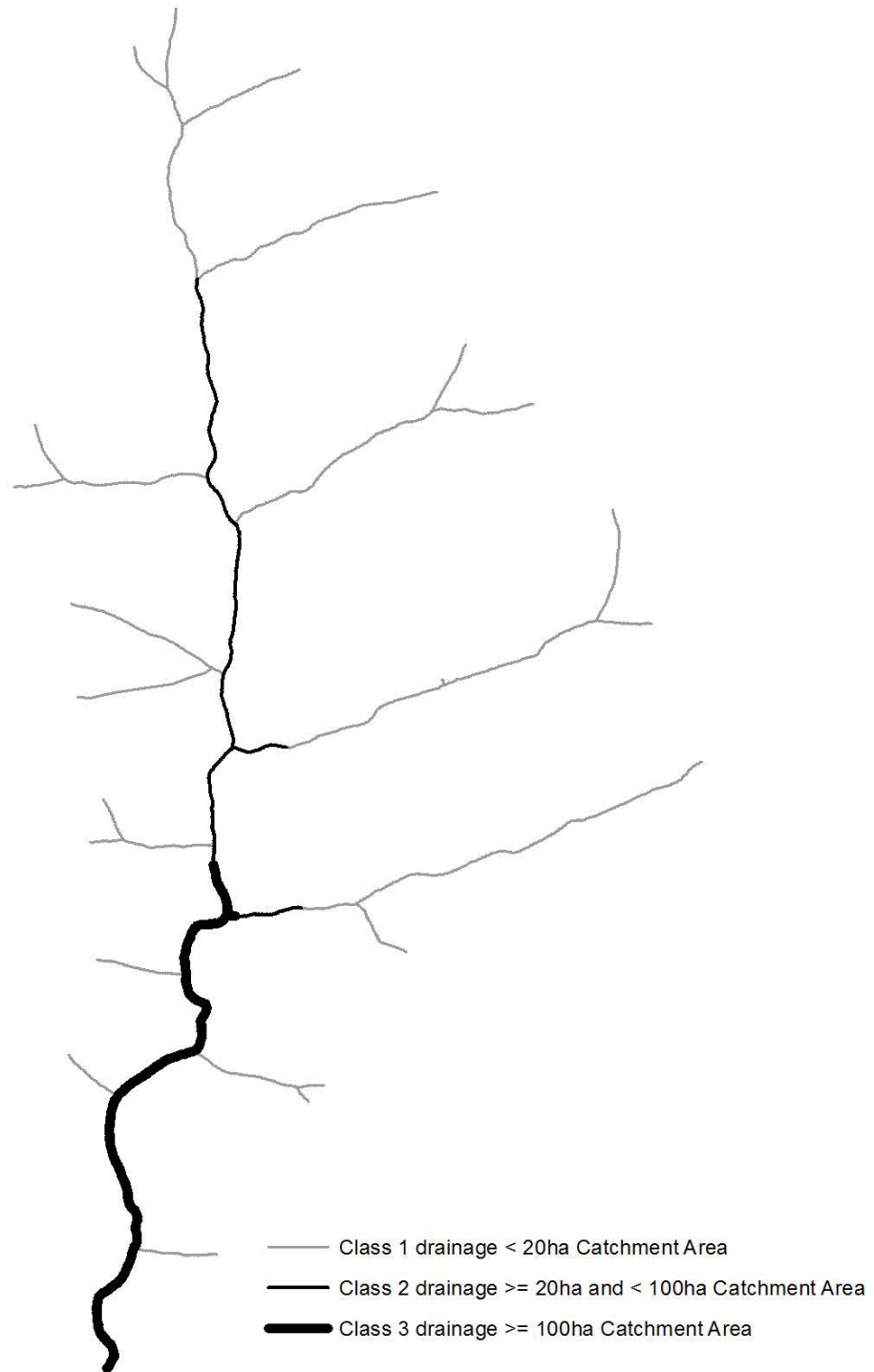
19.1 Introduction

- (1) This **protocol** supports the requirements in Chapter 5, Division 3 of the **approval** relating to **drainage class** and the identification of **drainage order**.
- (2) **Drainage class** applies to all areas covered by the **approval** where **LiDAR data** exists, and is determined by calculating the size (in hectares) of the catchment. **Drainage order** applies to all other areas and is determined from where **drainage lines** intersect to form larger **drainage lines**.

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 **classified 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 **classified drainage line** may extend beyond or fall short of the **mapped drainage line** and must be verified in the field.
 - (b) A class 2 **classified 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 **classified drainage line** is a **mapped drainage line** that is greater than 100 hectares and less than 400 hectares in catchment size.
 - (d) A class 4 **classified drainage line** is 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

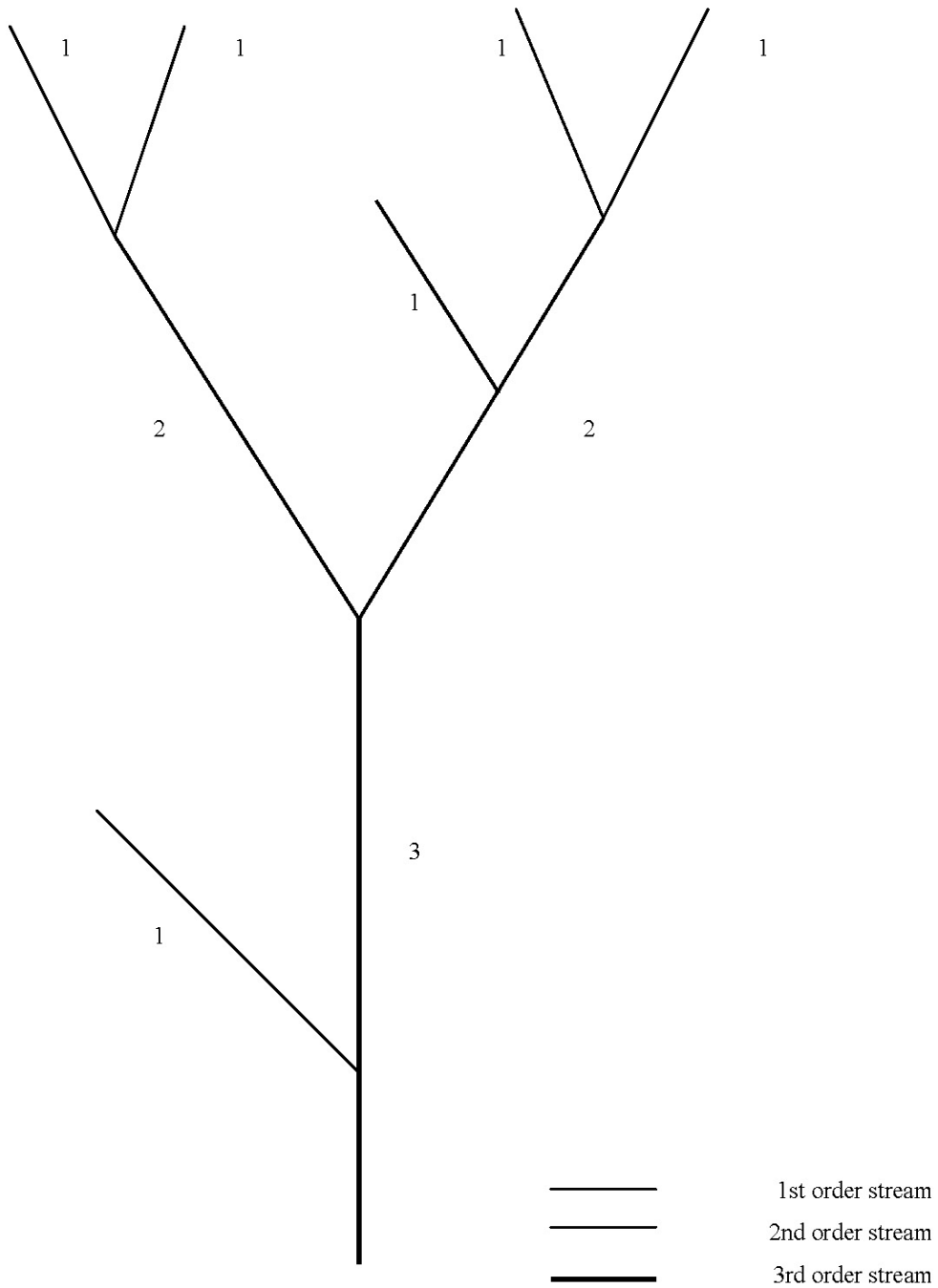


19.3 Where no LiDAR data exists

- (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' **ordered 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' **ordered drainage feature** commences at the junction of two first order **ordered drainage features**;

- (c) a 'third order' **ordered drainage feature** commences at the junction of two second order **ordered drainage features**;
 - (d) a 'fourth order' **ordered drainage feature** commences at the junction of two third order **ordered drainage features**;
 - (e) downstream from the junction of two streams of different stream order, the higher stream order must be applied;
 - (f) the determination of stream order must commence from the catchment boundary, even if that boundary is outside the **operational area**; and
 - (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 NSW Land Registry Services; or
 - (ii) if a 1:25,000 topographic map sheet is not available for the **operational area**, the best available scale map sheet produced by NSW Land Registry Services.
- (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

Version 2: Approved by the EPA Chair and CEO on 31 October 2018

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, targeted flora surveys** and **targeted 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: Operational plans** requires information obtained pursuant to this **protocol** to be included in the **operational plan** for proposed **forestry operations**.
- (3) In this **protocol**:
 - (a) any reference to a **broad area habitat search, targeted flora survey** or **targeted 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 'Tree_Retention_Clump' **spatial dataset** or 'Wildlife_Clump' **spatial dataset** 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) A **broad area habitat search** must:
 - (a) cover the **base net area** of each **patch**;
 - (b) cover areas 100m outside the **base net area** where habitat suitable for a **subject species**, or a **habitat feature** listed in Table 2 of the **approval**, is known or likely to exist;
 - (c) cover tracks or roads where habitat suitable for a **subject species**, or a **habitat feature** listed in Table 2 of the **approval**, is known or likely to occur adjacent to tracks and roads; and
 - (d) record all **habitat features** and **subject species** listed in Table 2 of the **approval**.
- (2) Where a **patch** subject to a **broad area habitat search** contains areas of **impenetrable understorey** which means that the requirements of condition 20.2(1) of this **protocol** cannot be met:
 - (a) all areas of the **patch** that do not have **impenetrable understorey** are required to be subject to a **broad area habitat search**; and
 - (b) the presence of **impenetrable understorey** must be recorded in the operational tracking records required by condition 39 of the **approval** and mapped in accordance with condition 117 of the **approval**.

20.3 Targeted flora surveys

- (1) A **targeted flora survey** 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: Matters covered by the approval** if there is a **record** within five kilometres of the boundary of the **operational area**.
- (2) Condition 20.3(1) does not apply to *Rhizanthella slateri* (species) and *Rhizanthella slateri* (endangered population).
- (3) Prior to commencing a **targeted flora survey**, **FCNSW** must:
 - (a) document each **species** requiring survey under condition 20.3(1) above;
 - (b) record the apparent location and extent of **potential habitat** for each of those **species**; and
 - (c) document the relevant survey season for each of those **species**.
- (4) A **targeted flora survey**:
 - (a) must consist of a traverse searching for the **species** requiring survey under condition 20.3(1), at a maximum speed of one kilometre per hour;
 - (b) 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: Matters covered by the approval** for the applicable **species** requiring survey under condition 20.3(1).
 - (c) must be carried out in areas of **potential habitat** for the **species** requiring survey under condition 20.3(1) that are in the **base net area** and in areas up to 20 metres outside the **base net area**;
 - (d) where areas up to 10 hectares of **potential habitat** for one or more species for which the timing of the survey season coincide a minimum of a one-kilometre traverse is required; and
 - (e) for each additional 10 hectares of **potential habitat**, or part thereof above the initial 10 hectares, and additional 350 metres of traverse is required in addition to the survey effort set out in 20.3(4)(d) above.
- (5) Notwithstanding condition 20.3(4)(c) above, a **targeted flora survey** is not required in areas more than 20 metres inside the boundary of any **ESA** that was in place at the time of the **targeted flora survey**.
- (6) Where there is a **record** of a **species** in the **base net area** or within 20 metres outside the **base net area**, including a **record** made subsequent to a **targeted flora survey** set out in this **protocol**, a minimum of 10 minutes additional search effort is required to be undertaken in surrounding areas of **potential habitat** for that **species**.
- (7) Where there are areas of **impenetrable understorey** which mean that the requirements of condition 20.3(4) and (6) cannot be met:
 - (a) the maximum safe distance must be traversed; and
 - (b) any allocated survey effort that was not able to be applied because of **impenetrable understorey** must be reallocated to additional traverses on the periphery of those **impenetrable understorey** areas; and
 - (c) the presence of **impenetrable understorey** and the reallocated search effort required by condition 20.3(7)(b) must be recorded in the operational tracking records required by condition 39 of the **approval**.

- (8) Where consideration in 20.3(3) does not identify areas of **potential habitat** for a **species**, **FCNSW** must either:
- (a) document why the **operational area** has no capacity to support the **species** and therefore **survey** is not required; or
 - (b) spend a minimum of 15 minutes searching in the most suitable **habitat** areas for the **species**.

20.4 Targeted fauna surveys

- (1) The following requirements apply to conducting a **targeted fauna survey** for each of the following fauna **species**.
- (2) Rufous Scrub-bird
- (a) A **targeted fauna survey** 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 the boundary of an **operational area**,
 - (b) Surveys for Rufous Scrub-birds must be conducted:
 - (i) in the **base net area** 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 between one hectare and 50 hectares of **Rufous Scrub-bird micro-habitat** occurs in that area; and
 - (iii) within or adjacent to areas of suitable **Rufous Scrub-bird micro-habitat**.

*Note: The **Rufous Scrub-bird micro-habitat** definition specifies these areas are one hectare or greater in size and so the requirement to survey only applies if at least one hectare of such **habitat** occurs in or within 100 metres of the **base net 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), survey must be conducted at a rate of eight sites per 50 hectares of **Rufous Scrub-bird micro-habitat** in the **base net area** with a minimum number of eight survey sites where between one and 50 hectares of **Rufous Scrub-bird micro-habitat** occurs in that area.
 - (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) A **targeted fauna survey** 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 the boundary of an **operational area**.
- (b) Surveys for Albert's Lyrebird must be:
 - (i) conducted in the **base net area** 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 **base net area**, or within 100 metres of the **base net area**, surveys must be 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 **base net area**, or within 100 metres of the **base net area**, surveys must be 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) A **targeted fauna survey** 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 the boundary 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 the **base net area** in and within 100 metres of the **base net area**;
 - (iii) where there is Marbled Frogmouth **modelled habitat** in the **base net area**, or within 100 metres of the **base net area**, surveys must be conducted at the rate of:
 - (iv) 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
 - (v) 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;
 - (vi) where there is no **modelled habitat** in the **base net area**, 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) *Assa darlingtoni* (Southern meta-population)

- (a) A **targeted fauna survey** for *Assa darlingtoni* 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 *Assa darlingtoni* in or within two kilometres of the boundary of the **operational area**.
 - (b) Surveys for *Assa darlingtoni* must be:
 - (i) conducted in and within 50 metres of the **base net area**;
 - (ii) where there is *Assa darlingtoni* **modelled habitat** in the **base net area**, 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 the **base net area**, or within 50 metres of the **base net area**, surveys must be 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) A **targeted fauna survey** 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 boundary 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 the **base net area**, or within 50 metres of the **base net area**, surveys must be 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 the **base net area**, or within 50 metres of the **base net area**, surveys must be 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 *Philoria* 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) A **targeted fauna survey** for Northern Corroboree Frog must be conducted in each **operational area** with Northern Corroboree Frog **modelled habitat** in Bondo and Micalong **State Forests** and:
 - (b) A **targeted fauna survey** 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 between 14 February and 15 March 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 the **base net area**, 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 must be established and the assessment identified in condition 20.4(8)(c) made along each transect.
 - (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.
- (c) A 'microhabitat transect' as referred to in condition 20.4(8)(b)(viii) of this **protocol** means a survey comprising of the assessment of the following:
- (i) sedge, rush, grass, heath and fern cover (GSRC), must be determined by:
 - (A) calculating the percentage cover of these vegetation types in a 3-metre radius plot;
 - (B) sampling plots at 10 metre intervals along a 100 metre long transect; and
 - (C) calculating the average percentage of cover of these vegetation types of the 11 plots sampled.
 - (ii) Vegetation cover (VC), must be determined by:
 - (A) calculating the average number of times vegetation contacts a one-centimetre diameter pole between the height of 10 and 75 centimetres above ground orientated vertical;
 - (B) sampling at one point in each of the plots described in 20.4(8)(c)(i); and
 - (C) calculating the average number of contacts across the 11 plots sampled.
 - (iii) Heath cover (HC), must be determined by:
 - (A) recording the presence of heath **plants** of the genera *Leucopogon*, *Epacris*, *Oxylobium*, *Pultenaea*, *Daviesia*, *Dillwynia*, *Hakea*, *Baeckea* and *Callistemon* along the length of the transect described in 20.4(8)(c)(i)(B).
 - (iv) Shelter index (SI) must be determined by counting the following within 20 metres each side of the transect described in 20.4(8)(c)(i)(B):
 - (A) the number of natural burrows (being individual holes four centimetres or greater in diameter and 30 centimetres or greater deep) up to a maximum of 40;
 - (B) the number of large trees with basal cavities being (holes in the base of trees that are four centimetres or greater in diameter and 30 centimetres or greater deep);
 - (C) the number of rock cavities (being individual holes four centimetres or greater in diameter and 30 centimetres or greater deep) up to a maximum of 40;

- (D) the number of logs that are 30 centimetres or greater in diameter; and
 - (E) calculating the sum of (A), (B), (C) and (D) and dividing that by four.
- (v) The presence of any outcropping rock cover that is more than 100 in length and within 500 metres of the transect;
- (d) Other than for a rapid **habitat** assessment, information collected in microhabitat transects for Hastings River Mouse referred to in 20.4(8)(c) above must be applied to Table 2 below, and using the models that follow it, the suitability of **habitat** must be determined as either:
- (i) unsuitable, moderate or high suitability using model 1; or
 - (ii) unsuitable, moderate or high suitability using model 2.

Table 2

	Score		
	Low 0	Moderate 1	High 2
Sedge/rush/grass/fern cover (GSRC)	<10 per cent	>10 per cent or <30 per cent	>30 per cent
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).

- (e) 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.
- (f) 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**.
- (g) Where **habitat** is assessed as of moderate or high suitability, the targeted surveys in condition 20.4(8)(h) below must be implemented within such **habitat**.
- (h) 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**, a **targeted fauna survey** for Koalas consistent with either condition 20.4(9)(c) or 20.4(9)(d) below must be undertaken across **local landscape areas** that include parts of the following areas in the **Southern Subregion** or **Eden Subregion**:
 - (i) Tallaganda, Badja, Dampier, Moruya, Wandella and Bodalla **State Forests** in the **Southern Subregion**; and
 - (ii) Glenbog and Glen Allen **State Forests** in the **Eden Subregion**; and
 - (iii) outside of the **State Forests** listed in conditions 20.4(9)(a)(i) and 20.4(9)(a)(ii) above, any **local landscape areas** in the **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 may be conducted as either a Koala RGbSAT survey as set out in condition 20.4(9)(c) below, or a quality acoustic recording device survey as set out in condition 20.4(9)(d) below.
 - (c) Where FCNSW elect to undertake a Koala RGbSAT survey, the survey must:

- (i) be 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;
 - (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; and
 - (C) the detail of the search effort is recorded to demonstrate compliance with condition 20.4(9)(v).
- (vi) at each survey grid point, assess and record the following:
 - (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.
- (d) Where **FCNSW** have elected to carry out a quality acoustic recording devices Koala survey, it must be conducted as follows:
 - (i) survey sites are undertaken at semi-regular intervals at a rate of one site for each 100 hectares of the **local landscape area** arranged so that the sites are located:
 - (A) at least 750 metres apart and no more than 1.25 kilometres apart; and,

- (B) in the vicinity of known **koala browse tree species** where they occur;
- (ii) at each survey site, a quality acoustic recording device is deployed to record for a minimum of five nights with less than 2 mm of overnight rainfall per night;
- (iii) the quality acoustic recording device are deployed in the period from mid-October to mid-December; and
- (iv) recordings obtained are scanned by acoustic software and a Koala recogniser with computer identified Koala bellows being verified by manual checking of recording.

20.5 Recording of surveys

- (1) A tracklog of all **broad area habitat searches** and **targeted flora surveys** and **targeted fauna surveys** must be mapped in accordance with condition 117 of the **approval**.
- (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;
 - (d) any **threatened species** or **subject species** detected;
 - (e) any **habitat features** detected; and
 - (f) searches in and around **impenetrable understorey** areas.
- (3) All recorded **threatened species**, **subject species** and **habitat features** must be mapped in accordance with condition 117 of the **approval**.
- (4) For flora or fauna **threatened species**, **subject species** and **habitat features** 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** are immediately subject to any relevant requirements relating to those **threatened species**, **subject species** and **habitat features** in the **approval**.
- (6) All recorded **threatened species**, **subject species** and **habitat features** that trigger an **ESA** or protection under the **approval** must be displayed on an **operational map**.
- (7) When **FCNSW** is required to make a **record** of a **habitat feature** relating to a **threatened species** or **subject species** that requires protection under the **approval**, this **record** must include documentation of the nature of the **record** such as it being a nest, roost, den, camp, burrow or other observation type.

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Protocol 21: Species management plans

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

21.1 Introduction

- (1) Condition 84 in Chapter 4, Division 6 of the **approval** requires **FCNSW** to prepare **species management plans** in accordance with this **protocol** for **species** referred to in condition 84 of the **approval** for the **EPA's** approval.

21.2 Flora and fauna species management plans

- (1) 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 actions to be undertaken to protect and conserve 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 actions 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 be mapped and included in the 'Other_SMP' **spatial dataset** 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**, including all monitoring actions, management actions, research requirements or actions specific to the conduct of a **forestry operation**:
 - (a) the Species Management Plan (South Eastern NSW) for the Southern Brown Bandicoot (*Isodon 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. Including the requirement for **FCNSW** to assist in carrying out the cross-tenure 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 1 September 2013; and
 - (e) the Species Management Plan (Northern Rivers Region) for the Eastern Bristle Bird (*Dasyornis brachypterus monoides*), being *IFOA Species Management Plan No. 5*, 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 83 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: Matters 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 one metre 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

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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 clumps 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, nectar 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) ***rocky outcrops, cliffs, heath and scrub, wetlands*** and their associated **exclusion zones** located within the ***base net area***;
 - (g) areas subject to a ***species-specific condition*** or a ***species management plan exclusion zone***;
 - (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 forest ***patches*** (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 ***threatened 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, nectar 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) ***nest, roost or den*** and associated ***exclusion zones*** as described by condition 76 of the **approval**;
 - (ii) ***bat roost trees, potential subterranean bat roost*** and associated ***exclusion zones*** as described by condition 78 or 80 of the **approval**;
 - (iii) ***plants*** requiring the protection of all individuals and associated ***exclusion zones*** as described by condition 81 of the **approval**; or
 - (iv) ***plants*** requiring protection of mature individuals as described by condition 82 of the **approval**.
- (3) **FCNSW** must give priority to:
- (a) establishing ***wildlife habitat clumps*** that include valuable **habitat**; and
 - (b) establishing ***tree retention clumps*** that provide protection for ***hollow-bearing trees***.
- (4) The following factors must be considered when identifying and establishing ***wildlife habitat clumps*** and ***tree retention clumps***:
- (a) the ***wildlife habitat clumps*** and ***tree retention clumps*** must maximise 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 area*** context, in particular, an assessment of the environmental features available and priorities for inclusion in protection areas;
 - (c) ***wildlife habitat 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***; and
 - (d) ***tree retention clumps*** must be dispersed through the range of **habitat** types and topographic positions that occur within the ***base net area*** of the ***compartment***.

22.3 Mapping obligations

- (1) For each ***wildlife habitat clump*** identified under this **protocol**, **FCNSW** must:
- (a) create a **GIS** record in the 'Wildlife_Clump' ***spatial dataset*** that includes:
 - (i) the boundary of the ***wildlife habitat clump***; and

- (ii) a description of the primary environmental feature listed in condition 22.2(1) of this **protocol**, that informed the design and establishment of the **wildlife habitat clump**;
- (b) identify the location of the **wildlife habitat clump** on an **operational map**.
- (2) **FCNSW** must map the location of each **tree retention clump** in accordance with condition 124 of the **approval**.
- (3) For each **tree retention clump**, **FCNSW** must record in the 'Tree_Retention_Clump' **spatial dataset** the primary environmental feature listed in condition 22.2(2) of this **protocol**, that informed the design and establishment of the **tree retention clump**.

Protocol 23: Tree retention

Version 2: Approved by the EPA Chief Executive Officer on 15 November 2019

23.1 Introduction

- (1) Chapter 4, Division 3 of the **approval** requires the selection and protection of **retained trees** in accordance with this **protocol**.

23.2 Identification and recording of retained trees

- (1) At least 100 metres in advance of any **forestry operation** (aside from **road maintenance**) occurring in any part of the **operational area**, the **base net area** must be broken up into **patches** that are no more than 10 hectares in size.
- (2) In advance of any **forestry operation** (aside from **road maintenance**) occurring in any **patch**, **FCNSW** must search for and identify **retained trees** in that **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 **retained trees** to be retained to make up for a **patch** that has less than eight **hollow-bearing trees** per hectare available.*

- (3) Where more than the minimum number of **hollow-bearing trees** are available for retention in a **patch**, trees must be scattered across the **patch**.
- (4) In the **Upper North East Subregion** and the **Lower North East Subregion**:
 - (a) 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**;
 - (b) where a **patch** includes areas of **Koala browse prescription 1** and areas that have no mapped koala browse prescription, then **Koala browse prescription 1** must apply across the **patch**;
 - (c) Tallowood (*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 per cent of the retained **Koala browse trees** where these are available; and
 - (d) 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**.
- (5) **FCNSW** must map the following in accordance with condition 117 of the **approval**:
 - (a) the boundary of **patches**; and
 - (b) the location of **retained trees** including identification of the purpose for which they have been retained.

23.3 Protection of retained trees

- (1) **Retained trees** must not be **damaged** 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 that is not **damaged**.
- (4) **FCNSW** must ensure that each **retained tree** does not have **harvesting debris** accumulated within five metres of its base.
- (5) Where debris has accumulated around a **retained tree**, as described in condition 23.3(4) above, **FCNSW** must:
 - (a) remove the **harvesting debris** from areas within five metres of the base of the **retained tree**; or
 - (b) flatten the **harvesting debris** so it is 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** or will result in a lesser environmental outcome; and
 - (b) the location of the specific tree has been mapped and **FCNSW** provides justification to the **EPA's** satisfaction for not removing or flattening the **harvesting debris**.
- (7) A **pre-harvest burn** or **post-harvest burn** must be undertaken in a manner that:
 - (a) does not **damage** a **hollow-bearing tree** retained under condition 64 of the **approval**; and
 - (b) retains shelter and refuge **habitats** provided by large fallen logs within the **operational area**.

Note: The impact described by condition 23.3(7) relates to where the ecological features and functions are substantially destroyed or removed. FCNSW must consider associated guidelines to support the implementation of this condition.

Protocol 24: Identification of old growth on unassessed land

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

*Note: this **protocol** may be updated following the completion of work being undertaken by the Natural Resources Commission and the Office of Environment and Heritage to reassess old growth forestry on select **State Forest** sites. The method developed may be considered for unassessed **Crown-timbered land** in the future.*

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 **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) This **protocol** only applies to **unassessed Crown-timber land**.
- (3) **Protocol 4: 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 requirements set out in condition 92 of the **approval** applies to such areas.
- (2) As part of an **operational plan** for a **forestry operation**, **FCNSW** must notify the **EPA** where the **CRAFTI old growth map** areas have been:
 - (a) accepted as **high conservation value old growth** under condition 24.2(1) of this **protocol**, or
 - (b) if the **operational area** has been subject to a re-evaluation in accordance with conditions 24.3 and 24.4 of this **protocol**.

24.3 Re-evaluation and evaluation of old growth on unassessed crown-timbered land

- (1) **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**.
- (2) **Forestry operations** must not occur in an **operational area** that includes any area that is mapped as 'unassessed old growth' in the 'Unassessed_OGRF' **spatial dataset**, or where **FCNSW** has elected to apply condition 24.3(1) of this **protocol** until the presence of **high conservation value old growth** in that area is evaluated or re-evaluated in accordance with this **protocol**.

- (3) Where a proposed **operational area** is not fully covered by **CRAFTI structural mapping**, **FCNSW** must apply to the **EPA** for a re-evaluation of the whole **operational area** and no **forestry operations** can be carried out until the re-evaluation is complete.
- (4) 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* provided at https://www.ils.nsw.gov.au/_data/assets/pdf_file/0003/807420/Protocol-for-re-evaluating-old-growth-forest-on-private-property.pdf, or any other successor document/s approved in writing by the **EPA**.
- (2) After evaluation or re-evaluation is completed:
 - (a) the **EPA** will add the extent of areas of mapped **high conservation value old growth** identified in accordance with condition 24.4 of this **protocol** to the ‘Assessed_HCVOG’ **spatial dataset**; and
 - (b) **FCNSW** must add any area identified as **high conservation value old growth** to the **operational map**; and
 - (c) the **EPA** will periodically remove assessed areas from the ‘Unassessed_OGRF’ **spatial dataset**.

Protocol 25: Identification of rainforest on unassessed land

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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 **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) This **protocol** only applies to **unassessed Crown-timber land**.
- (3) **Protocol 4: Operational plans** requires an **operational map** to identify all **ESAs**.

25.2 Certain mapped areas taken to be rainforest

- (1) Where **CRAFTI rainforest mapping** covers the entire extent of the **operational area**, all areas identified in the **CRAFTI rainforest** are taken to be **rainforest** and, therefore, the requirements set out in condition 91 of the **approval** applies to such areas.
- (2) As part of an **operational plan** for a **forestry operation**, **FCNSW** must notify the **EPA** where the **CRAFTI rainforest** areas have been:
 - (a) accepted as **rainforest** under condition 25.2(1) of this **protocol**; or
 - (b) if the **operational area** has been subject to a re-evaluation in accordance with conditions 25.3 and 25.4 of this **protocol**.

25.3 Unassessed rainforest

- (1) **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: 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.*

- (2) **Forestry operations** must not occur in an **operational area** that includes any area that is mapped as 'unassessed rainforest' in the 'Unassessed_OGRF' **spatial dataset**, or where **FCNSW** has elected to apply condition 25.3(1) of this **protocol** until the presence of **rainforest** in that area is evaluated or re-evaluated in accordance with this **protocol**.
- (3) 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.
- (4) 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* (https://www.lis.nsw.gov.au/_data/assets/pdf_file/0004/807421/Protocol-for-re-evaluating-rainforest-on-private-property.pdf) or any other successor document/s approved in writing by the **EPA**.
- (2) After evaluation or revaluation is completed:
 - (a) the **EPA** will add the extent of areas of mapped **rainforest** identified in accordance with condition 25.4 of this **protocol** to the 'Assessed_Rainforest' **spatial dataset**;
 - (b) 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'; and
 - (c) **FCNSW** must add any area identified as **rainforest** to the **operational map** and protect any area identified as **rainforest** in accordance with condition 91 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 **Southern 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) The **EPA** will periodically remove assessed areas from the 'Unassessed_OGRF' **spatial dataset**.

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

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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 **ESA** unless otherwise specified in the **approval**.
- (2) This **protocol** only applies to **unassessed Crown-timber land**.
- (3) **Protocol 4: Operational plans** requires an **operational map** to identify all **ESAs**.
- (4) 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 as 'Large Forest Owl Landscape Approach' in the **relevant IFOA** in place prior to the **commencement of the approval**; or
 - (b) where a planning area of less than 1,000 hectares is available to apply condition 26.1(1)(a), a minimum of 20 per cent of the **operational area** must be identified as **large forest owl exclusion zones** as set out in condition 26.3.

26.3 Composition of large forest owl exclusion zones

- (1) The areas identified as **large forest owl exclusion zones** in condition 26.2(1) above 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 per cent 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 per cent of the **operational area** has been identified by conditions 26.3(1) and 26.3(2) above, 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 'Large_Forest_Owl' **spatial dataset**.

Protocol 27: Threatened ecological communities

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

27.1 Introduction

- (1) Condition 61.1 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 61.2 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** and any associated **exclusion zones** required by this **protocol** are a **category 2 ESA**. Under Chapter 5, Division 2 of the **approval**, **forestry operations** are prohibited in a **ESA** unless otherwise specified in the **approval**.

27.2 Identifying the location of TECs

- (1) Within the **TEC assessed areas** for each **TEC** listed in Table 1 and 2 below, **FCNSW**:
 - (a) must identify the **TECs** listed in Table 1 of this **protocol** in accordance with the corresponding **TEC** mapped in the **TEC (certified) spatial dataset** and identified in the field in accordance with condition 115 of the **approval**;
 - (b) must identify the location of **TECs** listed in Table 2 of this **protocol** within the areas mapped for the **TEC** in the corresponding **TEC (indicative) spatial dataset**, and conditions 27.2(2), 27.2(3) and 27.2(4) below; and
 - (c) are not required to search for or field identify the **TECs** listed in Table 1 below, where Table 1 records the **TEC** as being absent within the **TEC assessed area**;
- (2) In relation to **TECs** listed in Table 2, **FCNSW** may:
 - (a) protect the **TEC** to the full extent of the relevant **TEC (indicative) spatial dataset**, or
 - (b) perform a survey within the land mapped in the relevant **TEC (indicative) spatial dataset** to confirm the actual presence, location, extent and boundary of the **TEC**.
- (3) Where **FCNSW** elects to apply condition 27.2(2)(b) of this **protocol**, **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 condition 124 of the **approval**.
- (4) When **FCNSW** has mapped the **TEC** in accordance with condition 27.2(3) above:
 - (a) no additional surveys are required for that **TEC** in the relevant **operational area**;
 - (b) the **EPA** may amend the **TEC (indicative)** map to remove these areas from time to time; and
 - (c) the **EPA** may verify and add any areas identified as a **TEC** to the relevant **TEC (certified) spatial dataset**.

*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.*

- (5) For land not within a **TEC assessed area** for each of the **TECs** listed in Table 1 and 2 below, **FCNSW** must search for and protect the **TEC** in accordance with the **BC Act**.

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

- (1) For the purposes of condition 61.2 of the **approval**, 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 (whichever is larger)*	04.11.16
Swamp oak floodplain forest	20 m or relevant wetland buffer (whichever is larger)*	04.11.16
Swamp sclerophyll forest on coastal floodplains	20 m or relevant wetland buffer (whichever is larger)*	04.11.16
Montane peats and swamps	20 m or relevant wetland buffer (whichever 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

*Note: The **TECs** listed in Table 1 are protected as an **ESA** under condition 49 of the **approval**. For some **TECs** that are sensitive to disturbance, additional **exclusion zones** apply around the **TEC**.*

- (2) Where the **TEC** overlaps with any area meeting the definition of a **wetland**, the **exclusion zone** for the feature must:
- (a) reflect the greatest extent of either the **wetland** or the **TEC**; and

- (b) have a width that reflects the widest **exclusion zone** triggered by the **wetland** or the **TECs** listed in Table 1 or Table 2.

*Note: A review of potential gross errors identified by FCNSW in **TEC (certified)** may be considered by the EPA through the application of **Protocol 34: Spatial datasets**.*

Table 2: TECs (indicative)

TEC (indicative)	TEC exclusion zone width*	Date certified
Lowland grassy woodland	0 m	04.11.16
White gum moist forest	20	04.11.06
Littoral rainforest	20 m	04.11.16

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

27.4 TEC field keys

- (1) For the purpose of determining the outer edge of the **TEC** as required by condition 61.2 of the **approval**, 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 regarding a **TEC** listed in this **protocol** is amended or, if the **BC Act** is amended so that a **TEC** is no longer listed in that Act after the date of certification in column 3 of Table 1 of this **protocol**, column 3 of Table 2 of this **protocol**, or column 2 of Table 3 of this **protocol**:
- (a) any relevant **TEC (certified)** map, **TEC (indicative)** map or **TEC field key** relating to that **TEC** is void; unless
 - (b) the **EPA** issues a new or amended **TEC (certified)** map, **TEC (indicative)** map or **TEC field key** following review of the mapping in respect to any amendments of the determination by the NSW Scientific Committee.
- (2) Where condition 27.5(1)(a) of this **protocol** applies, condition 16 of the **approval** ceases to apply to the **TEC**.

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Protocol 28: Rocky outcrops and cliffs

Version 2: Approved by the EPA Chair and CEO on 31 October 2018

28.1 Introduction

- (1) Condition 60.1 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:
 - (a) 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; and
 - (b) the measurement does not need to be a straight line but must follow the rock face.
- (2) To determine the height or slope of a rock face to decide whether it is a **cliff**, the measurement:
 - (a) must be made between the lowest point and the highest point of the identified section of rock face for which the vertical height exceeds three metres and slope exceeds 70 degrees (being 20 degrees either way from vertical); and,
 - (b) the height and slope of the rock face must be measured to be greater than three metres high with a slope greater than 70 degrees (being 20 degrees either way from vertical) at three or more points which are at least two metres apart in the horizontal plain.
- (3) Measurements in condition 28.2(1) and (2) above may be made by either direct measurement of the length, height and slope where it is safe to do so, or by indirect methods that may include calculation from measurements of relevant distances and slopes using trigonometric functions or the use of relevant **spatial data**.

28.3 Measuring an area of rocky outcrop

- (1) To determine the boundaries of a **rocky outcrop** for the purpose of measuring its area, where there is either a continuous area which displays the characteristics of a **rocky outcrop** or numerous contiguous areas which display the characteristics of a **rocky outcrop**, the whole area concerned must be considered as one **rocky outcrop**.
- (2) For the purpose of 28.3(1) above areas will be considered contiguous if areas of exposed rock are separated by:
 - (a) at less than three metres (at any point), or
 - (b) skeletal soils.

*Note: an example of how a **cliff** may be measured, is in Diagram 1 below.*

Diagram 1 – Measuring the rock face, height and slope

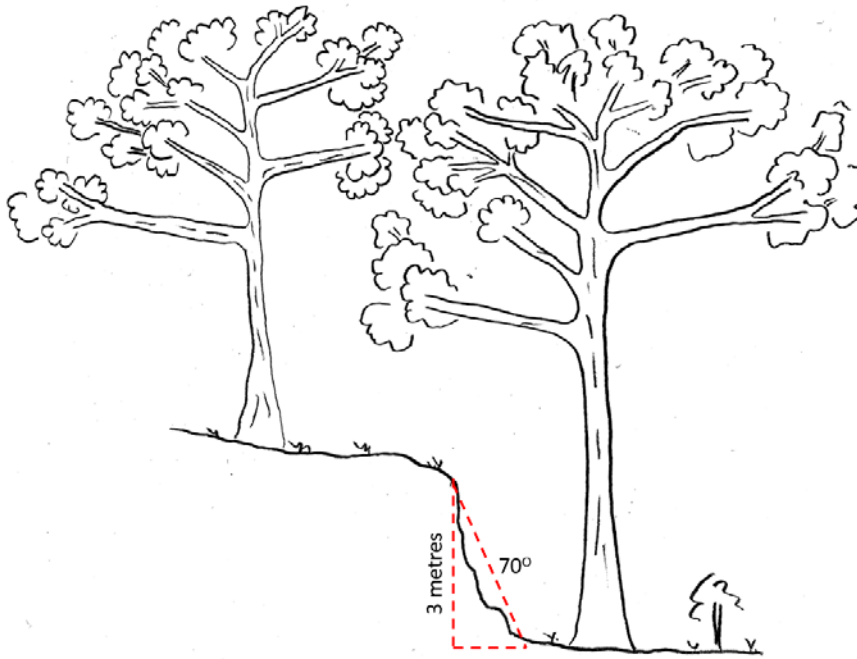
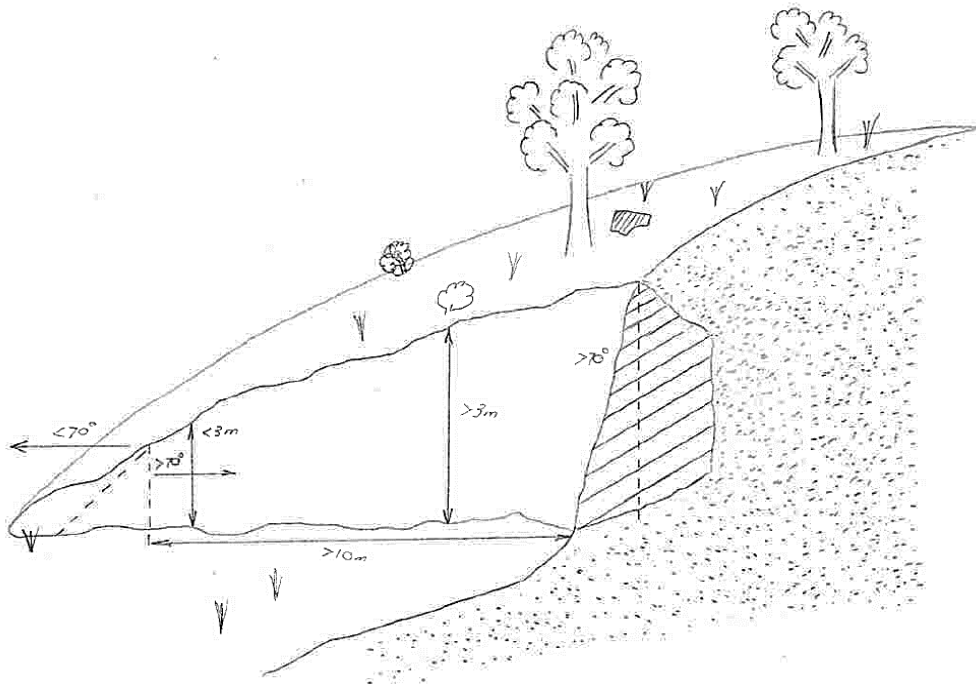


Diagram 2 – Measuring a cliff width that tapers



Note: an example of how a **rocky outcrop** may be measured is provided in Diagrams 3 and 4 below.

Diagram 3 – Boulders and skeletal soils

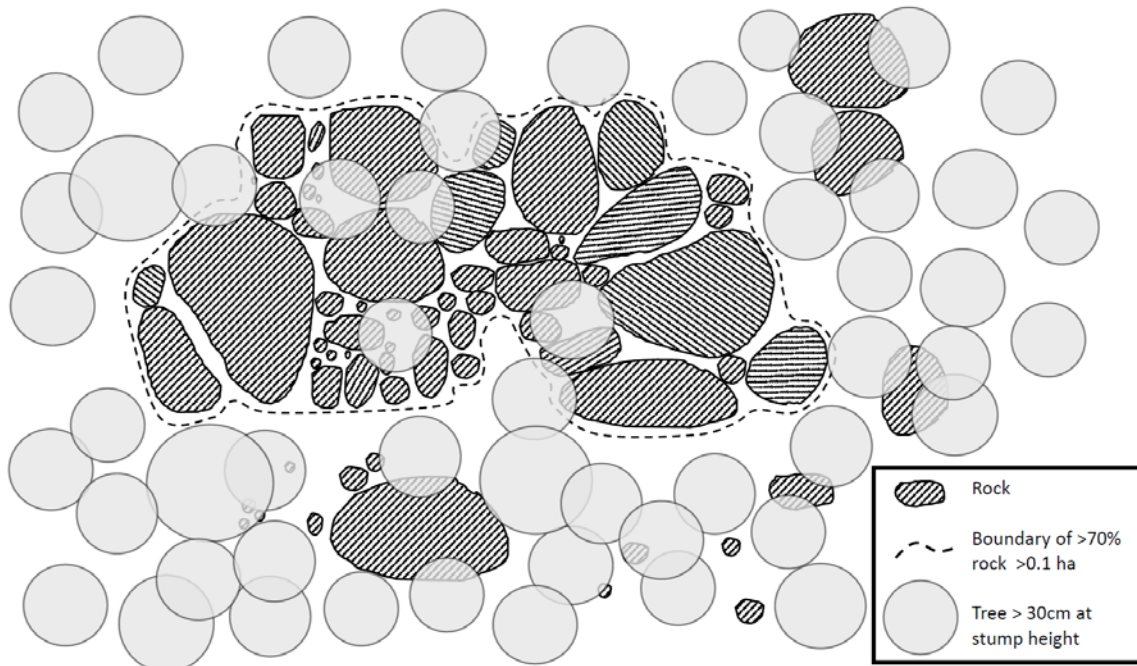
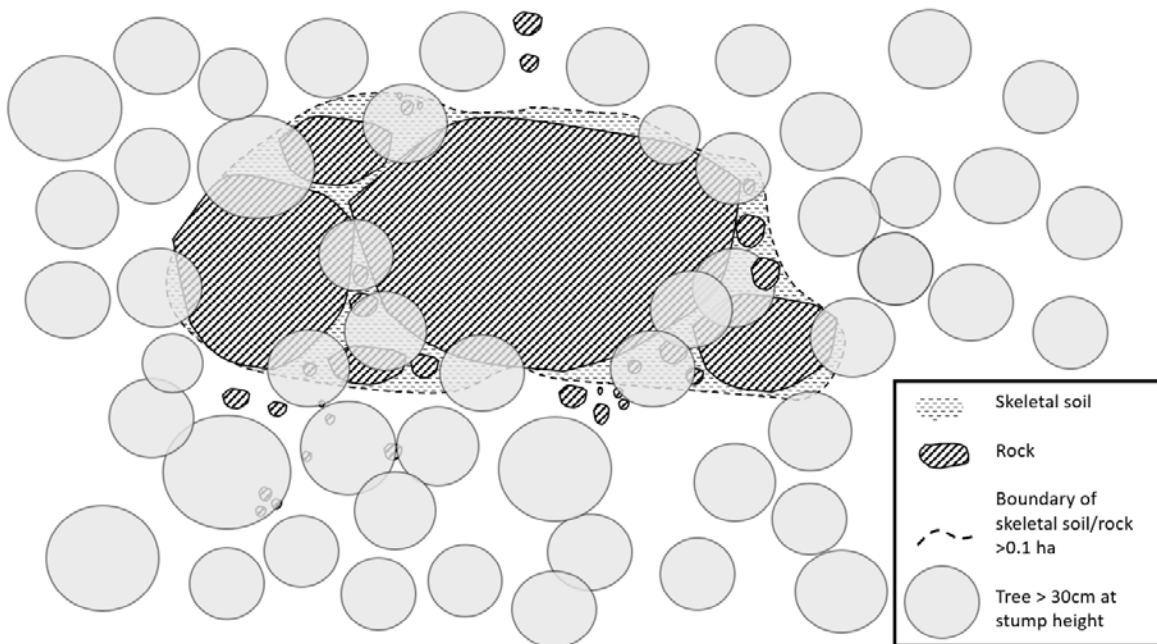


Diagram 4 – Rock sheets and skeletal soils



Protocol 29: Ridge and headwater habitat

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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 **ESA** unless otherwise specified in the **approval**.
- (2) **Protocol 4: 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**.
- (4) Further, condition 52.1 of the **approval** prevents changing the location of **ridge and headwater habitat** unless undertaken in accordance with **Protocol 34: Spatial datasets**.

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 **ordered drainage features** and third order **ordered 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 **classified drainage lines** or second order **ordered 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 **ordered 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 **ordered 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 **ordered drainage features** and third order **ordered 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**, unless it can't otherwise be avoided, and with the approval of the **EPA**.

29.3 Amendment to the location of ridge and headwater habitat

*Note: **ridge and headwater habitat** as designed and implemented under the **relevant IFOA** in place prior to the commencement of the **approval**, has been adopted under the **approval**. It is noted that at times, the existing **spatial dataset** may not meet the design requirements of this **protocol**.*

- (1) The location of any **ridge and headwater habitat** must not be changed unless in accordance with **Protocol 34: Spatial datasets**.

29.4 Mapping of ridge and headwater amendments

- (1) Where the field application of a **ridge and headwater habitat** is not consistent with the 'Ridge_Headwater_Habitat' **spatial dataset**, **FCNSW** must map the boundary applied in the field in accordance with condition 124 of the **approval**.

Protocol 30: Subterranean bat roosts and flying-fox camps

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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 **ESA** unless otherwise specified in the **approval**.
- (2) Condition 79.3 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 80.2 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: 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 57.3 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 **suitably qualified person** with 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;
 - (b) consist of an ultrasonic call recording of a minimum duration of 60 minutes;
 - (c) commence from 30 minutes prior to sunset;
 - (d) place detection units at the entrance to the **subterranean site**;
 - (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 **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 in accordance with **Protocol 36: Field mapping**.

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 **flying-fox camp**.

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Protocol 31: Matters covered by the approval

Version 4: Approved by the EPA on 27 September 2024, with immediate effect.

31.1 Species covered by the approval

- (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 the **approval** applies for the purposes of:
 - (a) identifying **exclusion zones** under Division 4 and Division 5 of Chapter 4 of the **approval**;
 - (b) identifying specific protection requirements under condition 81 of the **approval**;
 - (c) identifying **plant species** for which a **flora road management plan** must be prepared under condition 83 of the **approval**;
 - (d) identifying the **species** in respect of which **species management plans** must be prepared under condition 84 of the **approval**.
- (3) Condition 31.3 of this **protocol** also supports condition 21 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) A reference to a **species** listed in a Table in this **protocol** is a reference to that **species** located:
 - (a) anywhere within the **Coastal IFOA Region**, if a particular **Coastal IFOA Subregion** is not noted for that **species** in the Table; or
 - (b) if a particular **Coastal IFOA Subregion** is noted for that **species** in the Table, only within that **Coastal IFOA Subregion**; or
 - (c) if an area is specified by reference to one or more **spatial datasets**, only within that area.
- (3) If in addition to noting a particular **Coastal IFOA Subregion** for a **species** a Table also states '(SMP Area)', then the reference is to that **species** located only within the SMP Area within that **Coastal IFOA Subregion**.
- (4) If a Table states '(outside SMP area)' in relation to a **species**, then the reference is to that

species located outside the SMP Area:

- (a) but only within the particular **Coastal IFOA Subregion** noted for that **species**, where one or more **Coastal IFOA Subregion** is noted; or
 - (b) anywhere else within the **Coastal IFOA Region**, where no **Coastal IFOA Subregion** is noted.
- (5) For the purposes of conditions 31.2(3) and 31.2(4), 'SMP Area' means the planning area specified in the relevant **Species Management Plan** for the relevant **species**.
- (6) A **threatened species** located:
- (a) outside the area defined by application of condition 31.2(3), but within another part of the **Coastal IFOA Subregion**; or
 - (b) within the SMP Area referred to in condition 31.2(4),

is taken to be listed in the Table in Part 4 of this **protocol**, to which the **site-specific biodiversity conditions** in condition 21 of the **approval** apply.

Part 1: Threatened species and endangered populations considered adequately protected by the approval

Part 1: Threatened Species and endangered populations considered adequately protected by the approval		
Table 1: Fauna threatened species considered adequately protected by the approval		
Scientific name	Common name	Coastal IFOA subregion
<i>Adelotus brevis</i> EP	Tusked Frog population in the Nandewar and New England Tableland Bioregions	Upper North East Subregion and Lower North East Subregion
<i>Aepyprymnus rufescens</i>	Rufous Bettong	Upper North East Subregion and Lower North East Subregion
<i>Amaurornis moluccana</i>	Pale-vented Bush-hen	Upper North East Subregion and Lower North East Subregion
<i>Assa darlingtoni</i>	Pouched Frog	Upper North East Subregion and Lower North East Subregion (outside of Southern meta-population)
<i>Cacophis harriettae</i>	White-crowned Snake	Upper North East Subregion and Lower North East Subregion

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 1: Fauna threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA subregion
<i>Calamanthus fuliginosus</i>	Striated Fieldwren	Southern Subregion and Eden Subregion
<i>Carterornis leucotis</i>	White-eared Monarch	All
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	All
<i>Chalinolobus nigrogriseus</i>	Hoary Wattled Bat	Upper North East Subregion and Lower North East Subregion
<i>Coeranoscincus reticulatus</i>	Three-toed Snake-tooth Skink	Upper North East Subregion and Lower North East Subregion
<i>Coracina lineata</i>	Barred Cuckoo-shrike	Upper North East Subregion and Lower North East Subregion NorthUpper North East Subregion and Lower North East Subregion
<i>Crinia tinnula</i>	Wallum Froglet	All
<i>Cyclopsitta diophthalma coxeni</i>	Coxen's Fig-parrot	Upper North East Subregion and Lower North East Subregion
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	Southern Subregion and Eden Subregion
<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	Upper North East Subregion and Lower North East Subregion
<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	All
<i>Irediparra gallinacea</i>	Comb-crested Jacana	Upper North East Subregion and Lower North East Subregion

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 1: Fauna threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA subregion
<i>Ixobrychus flavicollis</i>	Black Bittern	All
<i>Kerivoula papuensis</i>	Golden-tipped Bat	All
<i>Lathamus discolor</i>	Swift Parrot	All
<i>Lichenostomus fasciocularis</i>	Mangrove Honeyeater	Upper North East Subregion and Lower North East Subregion
<i>Litoria aurea</i>	Green and Golden Bell Frog	All
<i>Litoria brevipalmata</i>	Green-thighed Frog	Upper North East Subregion and Lower North East Subregion
<i>Litoria daviesae</i>	Davies Tree Frog	Upper North East Subregion and Lower North East Subregion
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog, Heath Frog	Upper North East Subregion and Lower North East Subregion
<i>Litoria olongburensis</i>	Olongburra Frog	Upper North East Subregion and Lower North East Subregion
<i>Litoria subglandulosa</i>	Glandular Frog	Upper North East Subregion and Lower North East Subregion
<i>Macropus dorsalis</i>	Black-striped Wallaby	Upper North East Subregion and Lower North East Subregion
<i>Macropus parma</i>	Parma Wallaby	Upper North East Subregion and Lower North East Subregion
<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	Lower North East Subregion

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 1: Fauna threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA subregion
<i>Mixophyes balbus</i>	Stuttering Frog (north)	Upper North East Subregion and Lower North East Subregion
<i>Mixophyes fleayi</i>	Fleay's Frog/Fleay's Barred Frog	Upper North East Subregion and Lower North East Subregion
<i>Mixophyes iteratus</i>	Giant Barred Frog	All
<i>Mormopterus lumsdenae</i>	Northern Free-tailed Bat	Upper North East Subregion and Lower North East Subregion
<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	All
<i>Myuchelys bellii</i>	Western Sawshelled Turtle	Upper North East Subregion and Lower North East Subregion
<i>Myuchelys georgesi</i>	Bellinger River Snapping Turtle	Upper North East Subregion and Lower North East Subregion
<i>Myuchelys purvisi</i>	Manning River Helmeted Turtle	Upper North East Subregion and Lower North East Subregion
<i>Myotis macropus</i>	Southern Myotis	All
<i>Nyctimene robinsoni</i>	Eastern Tube-nosed Bat	Upper North East Subregion and Lower North East Subregion
<i>Nyctophilus bifax</i>	Eastern Long-eared Bat	Upper North East Subregion and Lower North East Subregion
<i>Pachycephala olivacea</i>	Olive whistler	All
<i>Petauroides volans</i>	Greater Glider population at Seven Mile Beach	Southern Subregion and Eden Subregion
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	All
<i>Planigale maculata</i>	Common Planigale	Upper North East Subregion and Lower North East Subregion

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 1: Fauna threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA subregion
<i>Potorous tridactylus</i>	Long-nosed Potoroo	All
<i>Pseudomys gracilicaudatus</i>	Eastern Chestnut Mouse	Upper North East Subregion and Lower North East Subregion
<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>Pycnoptilus floccosus</i>	Pilotbird	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	Southern Subregion and Eden Subregion
<i>Syconycteris australis</i>	Common Blossom Bat	Upper North East Subregion and Lower North East Subregion
<i>Thylogale stigmatica</i>	Red-legged Pademelon	Upper North East Subregion and Lower North East Subregion
<i>Todiramphus chloris</i>	Collared Kingfisher	Upper North East Subregion and Lower North East Subregion
<i>Turnix melanogaster</i>	Black-breasted Button-quail	Upper North East Subregion and Lower North East Subregion
<i>Uvidicolus sphyurus</i>	Border Thick-tailed Gecko	Upper North East Subregion and Lower North East Subregion
<i>Uperoleia mahonyi</i>	Mahony's Toadlet	Upper North East Subregion and Lower North East Subregion
<i>Varanus rosenbergi</i>	Rosenberg's Monitor (goanna)	All

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 2: Flora threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA Subregion
<i>Acacia chrysotricha</i>	Newry Golden Wattle	Upper North East Subregion and Lower North East Subregion
<i>Acacia constablei</i>	Narrabarba Wattle	Southern Subregion and Eden Subregion
<i>Acacia courtii</i>	North Brother Wattle	Upper North East Subregion and Lower North East Subregion
<i>Acacia georgensis</i>	Bega Wattle	Southern Subregion and Eden Subregion
<i>Acacia macnuttiana</i>	MacNutt's Wattle	Upper North East Subregion and Lower North East Subregion
<i>Aldrovanda vesiculosa</i>	Waterwheel Plant	All
<i>Alexfloydia repens</i>	Floyd's Grass	Upper North East Subregion and Lower North East Subregion
<i>Allocasuarina defungens</i>	Dwarf Heath Casuarina	Upper North East Subregion and Lower North East Subregion
<i>Allocasuarina simulans</i>	Nabiac Casuarina	Upper North East Subregion and Lower North East Subregion
<i>Almaleea cambagei</i>		Upper North East Subregion and Lower North East Subregion
<i>Ammobium craspedioides</i>	Yass Daisy	Southern Subregion and Eden Subregion

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 2: Flora threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA subregion
<i>Ancistrachne maidenii</i>		Upper North East Subregion and Lower North East Subregion
<i>Angophora robur</i>	Sandstone Rough-barked Apple	Upper North East Subregion and Lower North East Subregion
<i>Arthraxon hispidus</i>	Hairy Jointgrass	Upper North East Subregion and Lower North East Subregion
<i>Arthropteris palisotii</i>	Lesser Creeping Fern	Upper North East Subregion and Lower North East Subregion
<i>Asperula asthenes</i>	Trailing Woodruff	Upper North East Subregion and Lower North East Subregion
<i>Astrotricha cordata</i>	Heart-leaved Star Hair	Upper North East Subregion and Lower North East Subregion
<i>Astrotricha</i> sp. Wallagaraugh		Southern Subregion and Eden Subregion
<i>Bertya</i> sp. Chambigne NR		Upper North East Subregion and Lower North East Subregion
<i>Bertya</i> sp. Clouds Creek		Upper North East Subregion and Lower North East Subregion
<i>Boronia deanei</i>	Deane's Boronia	Southern Subregion and Eden Subregion
<i>Boronia umbellata</i>	Orara Boronia	Upper North East Subregion and Lower North East Subregion
<i>Bossiaea oligosperma</i>	Few-seeded Bossiaea	Southern Subregion and Eden Subregion

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 2: Flora threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA subregion
<i>Budawangia gnidioides</i>	Budawang Cliff-heath	<i>Southern Subregion</i> and <i>Eden Subregion</i>
<i>Bulbophyllum globuliforme</i>	Hoop Pine Orchid	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Caesalpinia bonduc</i>	Knicker Nut	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Callistemon linearifolius</i>	Netted Bottlebrush	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Callitris oblonga</i>	Pygmy Cypress Pine	All
<i>Calotis glandulosa</i>	Mauve Burr-daisy	<i>Southern Subregion</i> and <i>Eden Subregion</i>
<i>Carex klaphakei</i>	Klaphake's Ssedge	<i>Southern Subregion</i> and <i>Eden Subregion</i>
<i>Chamaesyce psammogeton</i>	Sand Spurge	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Chiloglottis platyptera</i>	Barrington Tops Ant Orchid	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Clematis fawcettii</i>	Northern Clematis	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Commersonia rosea</i>		<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Cynanchum elegans</i>	White-flowered Wax Plant	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Dendrobium melaleucaphilum</i>	Spider Orchid	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 2: Flora threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA subregion
<i>Distichlis distichophylla</i>	Australian Saltgrass	Southern Subregion and Eden Subregion
<i>Doryanthes palmeri</i>	Giant Spear Lily	Upper North East Subregion and Lower North East Subregion
<i>Eleocharis tetraquetra</i>	Square-stemmed Spike-rush	Upper North East Subregion and Lower North East Subregion
<i>Eucalyptus aquatica</i>	Broad-leaved Sally	Southern Subregion and Eden Subregion
<i>Eucalyptus caleyi</i> subsp. <i>ovendenii</i>	Ovenden's Ironbark	Upper North East Subregion and Lower North East Subregion
<i>Eucalyptus castrensis</i>	Singleton Mallee	Upper North East Subregion and Lower North East Subregion
<i>Eucalyptus glaucina</i>	Slaty Gum	Upper North East Subregion and Lower North East Subregion
<i>Eucalyptus fracta</i>	Broken Back Ironbark	Upper North East Subregion and Lower North East Subregion
<i>Eucalyptus langleyi</i>		Southern Subregion and Eden Subregion
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	Upper North East Subregion and Lower North East Subregion
<i>Eucalyptus oresbia</i>	Small-fruited Mountain Gum	Upper North East Subregion and Lower North East Subregion
<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>		Upper North East Subregion and Lower North East Subregion

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 2: Flora threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA subregion
<i>Eucalyptus pumila</i>	Pokolbin Mallee	Upper North East Subregion and Lower North East Subregion
<i>Eucalyptus scoparia</i>	Wallangarra White Gum	Upper North East Subregion and Lower North East Subregion
<i>Eucalyptus tetrapleura</i>	Square-fruited Ironbark	Upper North East Subregion and Lower North East Subregion
<i>Euphrasia orthocheila</i> subsp. <i>peraspera</i>	Tenterfield Eyebright	Upper North East Subregion and Lower North East Subregion
<i>Euphrasia scabra</i>	Rough Eyebright	Southern Subregion and Eden Subregion
<i>Genoplesium rhyoliticum</i>	Rhyolite Midge Orchid	Southern Subregion and Eden Subregion
<i>Gentiana wissmannii</i>	New England Gentian	Upper North East Subregion and Lower North East Subregion
<i>Grevillea acanthifolia</i> subsp. <i>paludosa</i>	Bog Grevillea	Southern Subregion and Eden Subregion
<i>Grevillea banyabba</i>	Banyabba Grevillea	Upper North East Subregion and Lower North East Subregion
<i>Grevillea iaspicula</i>	Wee Jasper Grevillea	Southern Subregion and Eden Subregion
<i>Grevillea molyneuxii</i>	Wingello Grevillea	Southern Subregion and Eden Subregion
<i>Grevillea parviflora</i>		Upper North East Subregion and Lower North East Subregion
<i>Grevillea renwickiana</i>		Southern Subregion and Eden Subregion

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 2: Flora threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA subregion
<i>Grevillea scortechinii</i> subsp. <i>sarmentosa</i>		Upper North East Subregion and Lower North East Subregion
<i>Hakea fraseri</i>	Gorge Hakea	Upper North East Subregion and Lower North East Subregion
<i>Haloragis exalata</i> subsp. <i>exalata</i>	Square Raspwort	Southern Subregion and Eden Subregion
<i>Haloragis exalata</i> subsp. <i>velutina</i>	Tall Velvet Sea-berry	Upper North East Subregion and Lower North East Subregion
<i>Hibbertia hexandra</i>	Tree Guinea Flower	Upper North East Subregion and Lower North East Subregion
<i>Hibbertia superans</i>		Upper North East Subregion and Lower North East Subregion
<i>Irenepharsus magicus</i>	Elusive Cress	Southern Subregion and Eden Subregion
<i>Kardomia prominens</i>		Upper North East Subregion and Lower North East Subregion
<i>Kardomia silvestris</i>		Upper North East Subregion and Lower North East Subregion
<i>Lepidium foliosum</i>	Leafy Peppergrass	All
<i>Lepidium pseudopapillosum</i>	Formbe Peppergrass	All
<i>Lindernia alsinoides</i>	Noah's False Chickweed	Upper North East Subregion and Lower North East Subregion
<i>Lysimachia vulgaris</i> var. <i>davurica</i>		Southern Subregion and Eden Subregion

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 2: Flora threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA subregion
<i>Maundia triglochinos</i>		Upper North East Subregion and Lower North East Subregion
<i>Melaleuca groveana</i>	Grove's Paperbark	Upper North East Subregion and Lower North East Subregion
<i>Muehlenbeckia costata</i>	Scrambling Lignum	Upper North East Subregion and Lower North East Subregion
<i>Muellerina myrtifolia</i>	Myrtle-leaf Mistletoe	Upper North East Subregion and Lower North East Subregion
<i>Oldenlandia galioides</i>		Upper North East Subregion and Lower North East Subregion
<i>Ozothamnus vagans</i>		Upper North East Subregion and Lower North East Subregion
<i>Paspalidium grandispiculatum</i>		Upper North East Subregion and Lower North East Subregion
<i>Persoonia glaucescens</i>	Mittagong Geebung	Southern Subregion and Eden Subregion
<i>Phaius australis</i>	Southern Swamp Orchid	Upper North East Subregion and Lower North East Subregion
<i>Philothea obovatifolia</i>		Upper North East Subregion and Lower North East Subregion
<i>Philothea ericifolia</i>		Upper North East Subregion and Lower North East Subregion
<i>Pimelea axiflora</i>	Bungonia Rice-flower	Southern Subregion and Eden Subregion

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 2: Flora threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA subregion
<i>Plectranthus alloplectus</i>	Narrow-leaved Plectranthus	Upper North East Subregion and Lower North East Subregion
<i>Plectranthus nitidus</i>	Nightcap Plectranthus	Upper North East Subregion and Lower North East Subregion
<i>Plinthanthesis rodwayi</i>	Budawangs Wallaby Grass	Southern Subregion and Eden Subregion
<i>Pomaderris delicata</i>	Delicate Pomaderris	Southern Subregion and Eden Subregion
<i>Pomaderris notata</i>	McPherson Range Pomaderris	Upper North East Subregion and Lower North East Subregion
<i>Prasophyllum canaliculatum</i>	Summer Leek Orchid	Southern Subregion and Eden Subregion
<i>Prasophyllum affine</i>	Jervis Bay Leek Orchid	Southern Subregion and Eden Subregion
<i>Prasophyllum bagoensis</i>	Bago Leek Orchid	Southern Subregion and Eden Subregion
<i>Prasophyllum fuscum</i>	Slaty Leek Orchid	Southern Subregion and Eden Subregion
<i>Prasophyllum innubum</i>	Brandy Mary's Leek Orchid	Southern Subregion and Eden Subregion
<i>Prasophyllum keltonii</i>	Kelton's Leek Orchid	Southern Subregion and Eden Subregion
<i>Prostanthera palustris</i>		Upper North East Subregion and Lower North East Subregion
<i>Pterostylis oreophila</i>	Blue-tongued Greenhood	Southern Subregion and Eden Subregion
<i>Pultenaea baeuerlenii</i>	Budawangs Bush-pea	Southern Subregion and Eden Subregion

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 2: Flora threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA subregion
<i>Pultenaea elusa</i>	Elusive Bush-pea	<i>Southern Subregion</i> and <i>Eden Subregion</i>
<i>Rotala tripartita</i>		<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Rutidosis leptorrhynchoides</i>	Button Wrinklewort	<i>Southern Subregion</i> and <i>Eden Subregion</i>
<i>Sarcochilus dilatatus</i>	Brown Butterfly Orchid	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Sarcochilus fitzgeraldii</i>		<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Sarcochilus hartmannii</i>	Hartman's Sarcochilus	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Sarcochilus weinthalii</i>	Blotched Sarcochilus	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Tasmannia purpurascens</i>	Broad-leafed Pepperbush	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Tasmannia glaucifolia</i>	Fragrant Pepperbush	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Tephrosia filipes</i>	A shrub	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>
<i>Tetradlea glandulosa</i>		<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>

Part 1: Threatened Species and endangered populations considered adequately protected by the approval

Table 2: Flora threatened species considered adequately protected by the approval

Scientific name	Common name	Coastal IFOA subregion
<i>Tinospora smilacina</i>	Tinospora Vine	Upper North East Subregion and Lower North East Subregion
<i>Tinospora tinoporoides</i>	Arrow-head Vine	Upper North East Subregion and Lower North East Subregion
<i>Triflorensia cameronii</i>	Cameron's Tarenna	Upper North East Subregion and Lower North East Subregion
<i>Triplarina imbricata</i>		Upper North East Subregion and Lower North East Subregion
<i>Velleia perfoliata</i>		Upper North East Subregion and Lower North East Subregion
<i>Viola cleistogamoides</i>	Hidden Violet	Southern Subregion and Eden Subregion
<i>Wilsonia backhousei</i>	Narrow-leafed Wilsonia	Southern Subregion and Eden Subregion
<i>Wilsonia rotundifolia</i>	Round-leafed Wilsonia	Southern Subregion and Eden Subregion
<i>Xerochrysum palustre</i>		Southern Subregion and Eden Subregion
<i>Zieria baeuerlenii</i>		Southern Subregion and Eden Subregion
<i>Zieria buxijugum</i>	Bow range Zieria	Southern Subregion and Eden Subregion
<i>Zieria formosa</i>	Shapely Zieria	Southern Subregion and Eden Subregion
<i>Zieria granulata</i>	Illawarra Zieria	Southern Subregion and Eden Subregion
<i>Zieria murphyi</i>	Velvet Zieria	Southern Subregion and Eden Subregion

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 and large forest owl exclusion zones

Scientific name	Common name	Coastal IFOA Subregion
<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>Circus assimilis</i>	Spotted Harrier	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	Upper North East Subregion and Lower North East Subregion
<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

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 and large forest owl exclusion zones

Scientific name	Common name	Coastal IFOA Subregion
<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
<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>Petaurus australis</i>	Yellow-bellied Glider	All
<i>Petaurus norfolcensis</i>	Squirrel Glider	All
<i>Petroica phoenicea</i>	Flame Robin	All
<i>Petroica rodinogaster</i>	Pink Robin	All
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	Upper North East Subregion and Lower North East Subregion
<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 trougtoni</i>	Eastern Cave Bat	Upper North East Subregion and Lower North East Subregion

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	Coastal IFOA Subregion
<i>Atrichornis rufescens</i>	Rufous Scrub-bird	Upper North East Subregion and Lower North East Subregion
<i>Menura alberti</i>	Albert's Lyrebird	Upper North East Subregion and Lower North East Subregion
<i>Podargus ocellatus</i>	Marbled Frogmouth	Upper North East Subregion and Lower North East Subregion
<i>Assa darlingtoni</i>	Pouched Frog	Southern meta-population
<i>Litoria booroolongensis</i>	Booroolong Frog	Southern Subregion and Eden Subregion
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	All
<i>Phascolarctos cinereus</i>	Koala (outside of koala hubs in the Provisional GKNP assessment area)	Upper North East Subregion and Lower North East Subregion
<i>Philoria kundagungan</i>	Mountain Frog	Upper North East Subregion and Lower North East Subregion
<i>Philoria loveridgei</i>	Loveridge's Frog	Upper North East Subregion and Lower North East Subregion
<i>Philoria pughi</i>		Upper North East Subregion and Lower North East Subregion
<i>Philoria richmondensis</i>		Upper North East Subregion and Lower North East Subregion

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 and large forest owl exclusion zones

Scientific name	Common name	Coastal IFOA Subregion
<i>Philoria sphagnicolus</i>	Sphagnum Frog	Upper North East Subregion and Lower North East Subregion
<i>Pseudomys oralis</i>	Hastings River Mouse	Upper North East Subregion and Lower North East Subregion
<i>Pseudophryne pengilleyi</i>	Northern Corroboree Frog	Bondo and Micalong State Forests
<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	Coastal IFOA Subregion
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	Eden Subregion (SMP area)
<i>Dasyornis brachypterus monoides</i>	Eastern Bristle Bird	Upper North East Subregion (SMP area)
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot	Eden Subregion (SMP area)
<i>Petaurus australis</i>	Yellow-bellied Glider on the Bago Plateau Endangered Population	Tumut Area (SMP area)
<i>Pseudomys fumeus</i>	Smoky Mouse	Eden Subregion (SMP Area)

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

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	Coastal IFOA Subregion	Season (anytime unless noted)
<i>Acacia acrionastes</i>	Pindarri Wattle	Upper North East Subregion and Lower North East Subregion	
<i>Acacia bynoeana</i>	Bynoe's Wattle	Upper North East Subregion and Lower North East Subregion	
<i>Archidendron hendersonii</i>	White Lace Flower	Upper North East Subregion and Lower North East Subregion	
<i>Asterolasia beckersii</i>	Dungowan Starbush	Upper North East Subregion and Lower North East Subregion	
<i>Belvisia mucronata</i>	A fern	Upper North East Subregion and Lower North East Subregion	
<i>Bertya</i> sp. (Clouds Creek, <i>M. fatemi</i>)	A shrub	Upper North East Subregion and Lower North East Subregion	
<i>Callitris baileyi</i>	Bailey's Cypress Pine	Upper North East Subregion and Lower North East Subregion	
<i>Centranthera cochinchinensis</i>	Swamp Foxglove	Upper North East Subregion and Lower North East Subregion	
<i>Chiloglottis anaticeps</i>	Bird Orchid	Upper North East Subregion and Lower North East Subregion	Dec–March
<i>Correa baeuerlenii</i>	Chef's Cap Correa	Southern Subregion and Eden Subregion	
<i>Corybas dowlingii</i>	Red Helmet Orchid	Upper North East Subregion and Lower North East Subregion	
<i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid	All	Dec–Feb inclusive, when flowering

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	Coastal IFOA Subregion	Season (anytime unless noted)
<i>Cyperus semifertilis</i>	Missionary Nutgrass	Upper North East Subregion and Lower North East Subregion	
<i>Desmodium acanthocladum</i>	Thorny Pea	Upper North East Subregion and Lower North East Subregion	
<i>Dichanthium setosum</i>	Bluegrass	Upper North East Subregion and Lower North East Subregion	Summer when flowering
<i>Dillwynia glaucula</i>	Michelago Parrot-pea	Southern Subregion and Eden Subregion	Flowers Oct–Feb
<i>Dipodium atropurpureum</i>		Upper North East Subregion and Lower North East Subregion	Flowers Dec–May
<i>Diuris aequalis</i>	Buttercup Doubletail	Southern Subregion and Eden Subregion	South: flowers mid-Oct–mid-Nov North of Abercrombie River: flowers mid-Nov–early Dec
<i>Diuris disposita</i>	Willawarrin Doubletail	Upper North East Subregion and Lower North East Subregion	Flowers Sep–Oct
<i>Diuris eborensis</i>	An orchid	Upper North East Subregion and Lower North East Subregion	Flowering latter half of spring to very early summer
<i>Diuris flavescens</i>	Pale yellow Doubletail	Upper North East Subregion and Lower North East Subregion	Flowers Sep–Oct
<i>Diurus praecox</i>	Newcastle Doubletail	Upper North East Subregion and Lower North East Subregion	Flowers July–early Sep
<i>Diuris venosa</i>	Veined Doubletail	Upper North East Subregion and Lower North East Subregion	Flowers Nov–Jan inclusive
<i>Drynaria rigidula</i>	Basket Fern	Upper North East Subregion and Lower North East Subregion	

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	Coastal IFOA Subregion	Season (anytime unless noted)
<i>Galium australe</i>	Tangled Bedstraws	Southern Subregion and Eden Subregion	
<i>Genoplesium insigne</i>	Variable Midge Orchid	Upper North East Subregion and Lower North East Subregion	Flowers Sep–Oct
<i>Genoplesium superbum</i>	Superb Midge Orchid	Upper North East Subregion and Lower North East Subregion	Flowers Dec–Mar
<i>Geodorum densiflorum</i>	An orchid	Upper North East Subregion and Lower North East Subregion	Flowers Sep–May
<i>Grammitis stenophylla</i>	Narrow-leaf Finger Fern	Upper North East Subregion and Lower North East Subregion	
<i>Grevillea beadleana</i>	Beadle’s Grevillea	Upper North East Subregion and Lower North East Subregion	
<i>Grevillea guthrieana</i>	Guthrie’s Grevillea	Upper North East Subregion and Lower North East Subregion	
<i>Grevillea masonii</i>	Mason’s Grevillea	Upper North East Subregion and Lower North East Subregion	
<i>Grevillea rhizomatosa</i>	Gibraltar Grevillea	Upper North East Subregion and Lower North East Subregion	
<i>Grevillea quadricauda</i>	Four-tailed Grevillea	Upper North East Subregion and Lower North East Subregion	
<i>Hakea archaeoides</i>	Big Nellie Hakea	Upper North East Subregion and Lower North East Subregion	
<i>Harnieria hygrophiloides</i>	Native Justicia	Upper North East Subregion and Lower North East Subregion	
<i>Hibbertia marginata</i>	Bordered Guinea Flower	Upper North East Subregion and Lower North East Subregion	

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	Coastal IFOA Subregion	Season (anytime unless noted)
		Subregion	
<i>Hicksbeachia pinnatifolia</i>	Red Boppel Nut	Upper North East Subregion and Lower North East Subregion	
<i>Indigofera baileyi</i>	Bailey's Indigo	Upper North East Subregion and Lower North East Subregion	
<i>Leionema ralstonii</i>	Ralston's Leionema	Southern Subregion and Eden Subregion	
<i>Lindsaea incisa</i>	Slender Screw Fern	Upper North East Subregion and Lower North East Subregion	
<i>Marsdenia longiloba</i>	Slender Marsdenia	Upper North East Subregion and Lower North East Subregion	
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	Upper North East Subregion and Lower North East Subregion	
<i>Melaleuca irbyana</i>	Weeping Paperbark	Upper North East Subregion and Lower North East Subregion	
<i>Melichrus hirsutus</i>	A shrub	Upper North East Subregion and Lower North East Subregion	
<i>Melichrus sp. Gibberagee</i>	A shrub	Upper North East Subregion and Lower North East Subregion	
<i>Monotoca rotundifolia</i>	Trailing Monotoca	Southern Subregion and Eden Subregion	
<i>Myrsine richmondensis</i>	Ripple-leafed Muttonwood	Upper North East Subregion and Lower North East Subregion	
<i>Neoastelia spectabilis</i>	Silver Sword Lily	Upper North East Subregion and Lower North East Subregion	
<i>Oberonia</i>	Yellow-flowered	Upper North East Subregion	

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	Coastal IFOA Subregion	Season (anytime unless noted)
<i>complanata</i>	King Orchid	and Lower North East Subregion	
<i>Oberonia titania</i>	Soldier's Crest Orchid	Upper North East Subregion and Lower North East Subregion	
<i>Ochrosia moorei</i>	Southern Ochrosia	Upper North East Subregion and Lower North East Subregion	
<i>Olearia cordata</i>		Upper North East Subregion and Lower North East Subregion	
<i>Owenia cepiodora</i>	Onion Cedar	Upper North East Subregion and Lower North East Subregion	
<i>Phebalium speciosum</i>	A shrub	Upper North East Subregion and Lower North East Subregion	
<i>Phyllanthus microcladus</i>	A shrub	Upper North East Subregion and Lower North East Subregion	
<i>Polygala linariifolia</i>	Native Milkwort	Upper North East Subregion and Lower North East Subregion	
<i>Pomaderris bodalla</i>	Bodalla Pomaderris	Southern Subregion and Eden Subregion	
<i>Pomaderris brunnea</i>	Brown Pomaderris	All	
<i>Pomaderris cotoneaster</i>	Cotoneaster Pomaderris	Southern Subregion and Eden Subregion	
<i>Pomaderris elachophylla</i>	Lacy Pomaderris	Southern Subregion and Eden Subregion	
<i>Pomaderris parrisiae</i>	Parris' Pomaderris	Southern Subregion and Eden Subregion	
<i>Pomaderris queenslandica</i>	Scant Pomaderris	Upper North East Subregion and Lower North East Subregion	

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	Coastal IFOA Subregion	Season (anytime unless noted)
<i>Pomaderris sericea</i>	Silky Pomaderris	<i>Southern Subregion</i> and <i>Eden Subregion</i>	
<i>Prostanthera junonis</i>	Somersby Mintbush	<i>Southern Subregion</i> and <i>Eden Subregion</i>	Flowering Oct–mid-Dec
<i>Prostanthera rugosa</i>	Mintbush	<i>Southern Subregion</i> and <i>Eden Subregion</i>	
<i>Pterostylis chaetophora</i>	Tall Rustyhood	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>	Flowers Sep–Nov
<i>Pterostylis elegans</i>	Elegant Greenhood	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>	Flowers Jan–April
<i>Pterostylis foliata</i>	Slender Greenhood	<i>Southern Subregion</i> and <i>Eden Subregion</i>	Flowers Aug–Jan
<i>Pterostylis gibbosa</i>	Illawarra Greenhood	<i>Southern Subregion</i> and <i>Eden Subregion</i>	Flowers in spring
<i>Pterostylis riparia</i>	A greenhood	<i>Southern Subregion</i> and <i>Eden Subregion</i>	Flowers in Oct or Nov
<i>Pterostylis ventricosa</i>	Greenhood	<i>Southern Subregion</i> and <i>Eden Subregion</i>	
<i>Pultenaea parrisiae</i>	Parris' Bush-pea	<i>Southern Subregion</i> and <i>Eden Subregion</i>	
<i>Pultenaea pedunculata</i>	Matted Bush-pea	<i>Southern Subregion</i> and <i>Eden Subregion</i>	
Quassia sp. Moonee Creek	Moonee Guassia	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>	
<i>Rhynchosia acuminatissima</i>	Pointed Trefoil	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>	
<i>Spyridium burragorang</i> EP	<i>Spyridium burragorang</i> population in Cessnock LGA	<i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>	

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	Coastal IFOA Subregion	Season (anytime unless noted)
<i>Styphelia perileuca</i>	Montane Green Five-corners	Upper North East Subregion and Lower North East Subregion	
<i>Swainsona sericea</i>	Silky Swainson-pea	Southern Subregion and Eden Subregion	
<i>Tetraloche juncea</i>	Black-eyed Susan	Upper North East Subregion and Lower North East Subregion	
<i>Thelymitra atronitida</i>	Black-hooded Sun Orchid	Southern Subregion and Eden Subregion	Aug–Dec
<i>Tylophora woollsii</i>	Cryptic Forest Twiner	Upper North East Subregion and Lower North East Subregion	
<i>Westringia davidii</i>	David's Westringia	Southern Subregion and Eden Subregion	
<i>Zieria lasiocaulis</i>	Willi Willi Zieria	Upper North East Subregion and Lower North East Subregion	
<i>Zieria tuberculata</i>	Warty Zieria	Southern Subregion and Eden Subregion	

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	Coastal IFOA Subregion	Season (anytime unless noted)
<i>Angophora inopina</i>	Charmhaven Apple	10 cm	Upper North East Subregion and Lower North East Subregion	
<i>Eucalyptus aggregata</i>	Black Gum	30 cm	Southern Subregion and Eden Subregion	

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	Coastal IFOA Subregion	Season (anytime unless noted)
<i>Eucalyptus camfieldii</i>	Camfield's Stringybark	10 cm	Upper North East Subregion and Lower North East Subregion	
<i>Eucalyptus glaucina</i> ¹	Slaty Red Gum	30 cm	Upper North East Subregion and Lower North East Subregion	
<i>Eucalyptus kartzoffiana</i>	Araluen Gum	30 cm	Southern Subregion and Eden Subregion	
<i>Eucalyptus largeana</i> ²	Craven Grey Box	30 cm	Upper North East Subregion and Lower North East Subregion	
<i>Eucalyptus magnificata</i>	Northern Blue Box	10 cm	Upper North East Subregion and Lower North East Subregion	
<i>Eucalyptus mckieana</i>	McKie's Stringybark	30 cm	Upper North East Subregion and Lower North East Subregion	
<i>Eucalyptus parvula</i>	Small-fruited Gum	10 cm	Southern Subregion and Eden Subregion	
<i>Eucalyptus rubida</i> subsp. <i>barbigerorum</i>	Blackbutt Candlebark	30 cm	Upper North East Subregion and Lower North East Subregion	

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 metres 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	Coastal IFOA Subregion	Season (anytime unless noted)
<i>Euphrasia arguta</i>		Upper North East Subregion and Lower North East Subregion	Jan–April
<i>Corchorus cunninghamii</i>	Native Jute	Upper North East Subregion and Lower North East Subregion	
<i>Genoplesium vernale</i>	East Lynne Midge Orchid	Southern Subregion and Eden Subregion	Flowers Nov–late Dec
<i>Macrozamia johnsonii</i>	Johnson’s Cycad	Upper North East Subregion and Lower North East Subregion	
<i>Niemeyera whitei</i>	Rusty Plum	Upper North East Subregion and Lower North East Subregion	
<i>Parsonsia dorrigoensis</i>	Milky Silkpod	Upper North East Subregion and Lower North East Subregion	
<i>Typhonium</i> sp. aff. <i>brownii</i>	Stinky Lily	Upper North East Subregion and Lower North East Subregion	

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

Table 4: Flora species requiring a flora road management plan

Species name	Common name	Applicable condition – Protocol 21.4(2)	Coastal IFOA Subregion	Season (anytime unless noted)
<i>Allocasuarina dimunuta</i> subsp. <i>annectans</i>	She Oak	a + d	Southern Subregion and Eden Subregion	
<i>Callistemon foresterae</i>	Forresters Bottlebrush	a + d	Southern Subregion and Eden Subregion	

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

Table 4: Flora species requiring a flora road management plan

Species name	Common name	Applicable condition – Protocol 21.4(2)	Coastal IFOA Subregion	Season (anytime unless noted)
<i>Commersonia prostrata</i>	Dwarf Kerrawang	a + c	All	
<i>Cyperus aquatilis</i>	Water Nutgrass	a + b	Upper North East Subregion and Lower North East Subregion	
<i>Dampiera fusca</i>	Kydra Dampiera	a + c	Southern Subregion and Eden Subregion	Flowers Oct–Feb
<i>Diuris ochroma</i>	Pale Golden Moths	a + c	Southern Subregion and Eden Subregion	Flowers Nov–Dec
<i>Dodonaea procumbens</i>	Creeping Hop-bush	a + c	Southern Subregion and Eden Subregion	
<i>Dracophyllum macranthum</i>		a + d	Upper North East Subregion and Lower North East Subregion	
<i>Euphrasia ciliolata</i>	Polblue Eyebright	a + b	Upper North East Subregion and Lower North East Subregion	Dec–May
<i>Fontainea australis</i>	Southern Fontainea	a + d	Upper North East Subregion and Lower North East Subregion	
<i>Monotaxis macrophylla</i>	Large-leafed Monotaxis	a + b	Southern Subregion and Eden Subregion	
<i>Olearia flocktoniae</i>	Dorrigo Daisy Bush	a + c	Upper North East Subregion and Lower North East Subregion	
<i>Persicaria elatior</i>	Tall knotweed	a + b	All	
<i>Senna acclinis</i>	Rainforest Cassia	a + c	Upper North East Subregion and Lower North East Subregion	Spring–summer when flowering and fruiting

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

Table 4: Flora species requiring a flora road management plan

Species name	Common name	Applicable condition – Protocol 21.4(2)	Coastal IFOA Subregion	Season (anytime unless noted)
<i>Solanum limitare</i>	Border Ranges Nightshade	a + c	Upper North East Subregion and Lower North East Subregion	Flowers winter to spring
<i>Solanum sulphureum</i>	A nightshade	a + c	Upper North East Subregion and Lower North East Subregion	
<i>Sophora fraseri</i>	Brush Sophora	a + c	Upper North East Subregion and Lower North East Subregion	

Part 4: Threatened species requiring the development of a site-specific biodiversity condition

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

Table 1: Fauna species

Species name	Common name	Season (anytime unless noted)
<i>Calyptorhynchus banksia</i>	Red-tailed Black-Cockatoo	
<i>Erythrotriorchis radiatus</i>	Red Goshawk	
<i>Poephila cincta</i>	Black-throated Finch	
<i>Litoria castanea</i>	Yellow-spotted Tree Frog	
<i>Litoria littlejohni</i> in Southern Subregion and Eden Subregion	Littlejohn's Tree Frog, Heath Frog in Southern Subregion and Eden Subregion	
<i>Litoria piperata</i>	Peppered Frog	
<i>Litoria raniformis</i>	Southern Bell Frog	
<i>Isodon obesulus obesulus</i>	Southern Brown Bandicoot (outside SMP area)	

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

Table 1: Fauna species

Species name	Common name	Season (anytime unless noted)
<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>Petauroides volans</i>	Greater Glider	
<i>Potorous longipes</i>	Long-footed Potoroo	
<i>Pseudomys fumeus</i>	Smoky Mouse (outside SMP area)	
<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake	
<i>Phascolarctos cinereus</i> in Southern Subregion and Eden Subregion	Koala in Southern subregion and Eden Subregion	
<i>Phascolarctos cinereus</i> in koala hubs in the Provisional GKNP assessment area	Koala (in koala hubs in the Provisional GKNP assessment area)	

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	
<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>		

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

Table 2: Flora species

Species name	Common name	Season (anytime unless noted)
<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
<i>Rhizanthella slateri</i> EP	Eastern Underground Orchid population in the Great Lakes LGA	Survey not required
<i>Rhizanthella slateri</i>	Eastern Underground Orchid	Survey not required

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

- (1) When a **site-specific biodiversity condition** is required by condition 21 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) **FCNSW** must provide the **EPA** with the following information to inform the consultation on and development of the **site-specific biodiversity condition**, unless otherwise specified by the EPA:
 - (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;
- (c) the **site-specific biodiversity condition** may include requirements for **FCNSW** to survey for that **species**; and
- (d) **FCNSW** must not undertake any **forestry operations** in the **operational area** unless the **EPA** has provided **FCNSW**:
 - (i) a preliminary determination on whether **forestry operations** may commence or recommence in all or part of the **local landscape area**; or
 - (ii) a final **site-specific biodiversity condition**.
- (e) the **site-specific biodiversity condition** referred to in condition 31.3(1)(d)(i) and (ii) above 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.

Note: The **EPA** will consult with the **FCNSW** to identify any timing constraints for **forestry operations** impacted by a **species** requiring the development of a **site-specific biodiversity condition**, and work collaboratively with **FCNSW** to minimise any impacts where possible.

Part 5: Timber product requirements

31.4 Timber product requirements

- (1) The **approval** includes various requirements relating to **timber product** specifications and volumes in this **protocol**.
- (2) A **harvesting operation** must only be conducted with the purpose of producing **high quality large sawlogs, high quality small sawlogs, veneer logs or piles, poles or girder logs**.
- (3) A **harvesting operation** must not be conducted for the primary purpose of producing **low quality logs** (including salvage and firewood), **pulpwood logs** or **heads and offcuts**.
- (4) Condition 31.4(3) above does not apply to thinning operations for the purpose of timber production. In this **protocol**, thinning is:
 - (a) a type of **selective harvesting** resulting in the cutting and removal of trees to increase the distance between trees that have potential to yield high quality timber, for the purpose of promoting their growth by:
 - (i) removing poor quality trees; and
 - (ii) if removing poor quality trees does not result in sufficient distance between trees, removing other trees permitted by the **approval**.
 - (b) may only be carried out in regrowth forest and early mature stands of forest where:
 - (i) most of the trees in the stand are approximately the same age; and
 - (ii) no more than 60 per cent of the sum of the **basal area** of trees in the stand immediately prior to thinning is removed in any one **harvesting operation**. **Basal area** must be scattered across the **operational area**.
- (5) Each log that is cut and removed in a **harvesting operation** must be categorised into one of the following categories:

- (a) **high quality large sawlog**, or
 - (b) if the timber cannot be categorised as a **high quality large sawlog**, as any:
 - (i) **high quality small sawlog**;
 - (ii) **veneer log**;
 - (iii) **as a pile, pole or girder log**; or
 - (c) if the **timber product** cannot be categorised as a **high quality large sawlog, high quality small sawlog, veneer log, pile, pole or girder log**, then it must be categorised as a **pulpwood log, low quality log or heads and offcuts**.
- (6) Timber volume limits contained in Table 1 (below) must be reviewed and updated within 12 months of the commencement of the **approval**, to align with **sustainable yield**, calculated and independently verified in accordance with the **NSW Regional Forest Agreements**.
- (7) Timber volume limits contained in Table 1 (below) must be maintained to align with **sustainable yield**, calculated and independently verified in accordance with the **NSW Regional Forest Agreements** (as current from time to time).

Table 1: Timber product requirements for each Coastal IFOA Subregion

IFOA subregion	Upper North East Subregion	Lower North East Subregion	Eden Subregion	Southern Subregion	
IFOA area (where applicable)	N/A	N/A	N/A	South Coast Area	Tumut Area
High quality large sawlogs and large veneer logs	<p>High quality large sawlogs and large veneer logs, produced in the following quantities:</p> <ul style="list-style-type: none"> (i) no more than 136,250 m³ (that is, 109,000 m³ + 25 per cent of 109,000 m³) per financial year; and (ii) no more than 572,250 m³ (that is, 109,000 m³ x 5 + 5 per cent of that total) in each 5-year period commencing 1 July 2018; and (iii) no more than 2,180,000 m³ (that is, 109,000 m³ x 20) over the duration of the approval. 	<p>High quality large sawlogs and large veneer logs, produced in the following quantities:</p> <ul style="list-style-type: none"> (i) no more than 200,000 m³ (that is, 160,000 m³ + 25 per cent of 160,000 m³) per financial year; and (ii) no more than 840,000 m³ (that is, 160,000 m³ x 5 + 5 per cent of that total) in each 5-year period commencing 1 July 2018; and (iii) no more than 3,200,000 m³ (that is, 160,000 m³ x 20) over the duration of the approval. 	<p>High quality large sawlogs produced in the following quantities:</p> <ul style="list-style-type: none"> (i) no more than 28,750 m³ (that is, 23,000 m³ + 25 per cent of 23,000 m³) per financial year; and (ii) no more than 120,750 m³ (that is, 23,000 m³ x 5 + 5 per cent of that total) in each 5-year period commencing 1 July 2018; and (iii) no more than 460,000 m³ (that is, 23,000 m³ x 20) over the duration of the approval. 	<p>High quality large sawlogs produced in the following quantities:</p> <ul style="list-style-type: none"> (i) no more than 60,625 m³ (that is, 48,500 m³ + 25 per cent of 48,500 per financial year); and (ii) no more than 254,625 m³ (that is, 48,500 m³ x 5 + 5 per cent of that total) in each 5-year period commencing 1 July 2018; and (iii) no more than 970,000 m³ (that is, 48,500 m³ x 20) over the duration of the approval. 	<p>High quality large sawlogs produced in the following quantities in</p> <p>a) the Tumut Area (other than Ingebirah State Forest):</p> <ul style="list-style-type: none"> (i) no more than 60,000 m³ (that is, 48,000 m³ + 25 per cent of 48,000 m³ per financial year); and (ii) no more than 252,000 m³ (that is, 48,000 m³ x 5 + 5 per cent of that total) in each 5-year period commencing 1 July 2018; and (iii) no more than 960,000 m³ (that is, 48,000 m³ x 20) over the duration of the approval. <p>b) the Ingebirah State Forest and Crown-timber lands within the Tumut Area east of Kosciuszko National</p>

IFOA subregion	Upper North East Subregion	Lower North East Subregion	Eden Subregion	Southern Subregion	
IFOA area (where applicable)	N/A	N/A	N/A	South Coast Area	Tumut Area
					Park): (iv) no more than 20,000 m ³ over the duration of the approval .
Pulpwood logs	Any pulpwood logs arising from harvesting operations producing the volumes of high quality large sawlogs above.	Any pulpwood logs arising from harvesting operations producing the volumes of high quality large sawlogs above.	Any pulpwood logs produced so long as it is no more than 345,000 tonnes per year.	Any pulpwood logs arising from harvesting operations producing the volumes of high quality large sawlogs above.	Any pulpwood logs arising from harvesting operations producing the volumes of high quality large sawlogs above.
Other timber products	Any high quality small sawlogs, small veneer logs, piles, poles, girder logs , and low quality logs arising from harvesting operations producing the volumes of high quality large sawlogs above.	Any high quality small sawlogs, small veneer logs, piles, poles, girder logs , and low quality logs arising from harvesting operations producing the volumes of high quality large sawlogs above.	Any high quality small sawlogs, veneer logs, piles, poles, girder logs , and low quality logs arising from harvesting operations producing the volumes of high quality large sawlogs above.	Any high quality small sawlogs, veneer logs, piles, poles, girder logs , and low quality logs arising from harvesting operations producing the volumes of high quality large sawlogs above.	Any high quality small sawlogs, veneer logs, piles, poles, girder logs , and low quality logs arising from harvesting operations producing the volumes of high quality large sawlogs above.
Heads and offcuts (as defined under the POEO Act (General) Regulation 2009)	Any heads and offcuts arising from harvesting operations producing the volumes of high quality large sawlogs above.	Any heads and offcuts arising from harvesting operations producing the volumes of high quality large sawlogs above.	Any heads and offcuts arising from harvesting operations producing the volumes of high quality large sawlogs above.	Any heads and offcuts arising from harvesting operations producing the volumes of high quality large sawlogs above.	Any heads and offcuts arising from harvesting operations producing the volumes of high quality large sawlogs above.

CHAPTER 5: OPERATIONAL PROTOCOLS

Protocol 32: Temporary log crossings

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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 **ordered drainage feature**, second order **ordered 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 98 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

Version 2: Approved by the EPA Chair and CEO on 31 October 2018

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 24 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 93.1(c) of the **approval** relating to recording of accidentally felled trees.
- (3) Chapter 4, Division 3, condition 64.4 of the **approval** states that **retained trees** must not be deliberately felled unless it is in accordance with this **protocol** (and the **retained tree** is replaced with a **comparable 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 24 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 and mapped in accordance with condition 117 of the **approval**;
 - (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 93.1(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 and mapped in accordance with condition 117 of the **approval**;
 - (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 64.4 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;
 - (b) and mapped in accordance with condition 117 of the **approval**;
 - (c) the date on which the tree was felled;
 - (d) the diameter of the remaining tree stump;
 - (e) the **species** of the tree felled;
 - (f) details of why the tree was deliberately felled;
 - (g) whether remedial works were required;
 - (h) the date that any required remedial works were completed; and
 - (i) 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

Version 3: Approved by the EPA CEO on 19 September 2023

34.1 Introduction

- (1) This **protocol** supports provisions in the **approval** relating to the updating of **spatial datasets**, by:
 - (a) guiding updates to **spatial dataset** to incorporate field mapped features and **field-verified indicatively mapped ESA** features;
 - (b) guiding updates to a **spatial dataset** to realign a boundary (e.g. to realign a boundary to updated road or drainage line mapping);
 - (c) guiding general updates to a **spatial dataset** to incorporate ad-hoc amendments requested by **FCNSW**;
 - (d) guiding specific updates to a **spatial dataset**;
 - (e) guiding replacement of a **spatial dataset**; and
 - (f) identifying **spatial datasets** relevant to condition 115.3 of the **approval**.

34.2 Updates to a spatial dataset to incorporate field mapped features and field-verified features

- (1) For each feature mapped under condition 117 of the **approval** and each **indicatively mapped ESA** feature that **FCNSW** verify to be correctly mapped, **FCNSW** must quality-assure the record to ensure that it:
 - (a) identifies the location or boundary of the feature;
 - (b) is not duplicated;
 - (c) contains complete attribute field information detailing the feature type, capture date, capture methodology and any other attributes that may be requested by the **EPA**; and
 - (d) is free from topological overlap errors and geometry problems.
- (2) A quality-assured record and any associated **exclusion zone** must be incorporated by **FCNSW** into an **assessed dataset** as soon as practicable, but at least once every quarter.
- (3) The **EPA** may incorporate into an **ESA spatial dataset** from time to time:
 - (a) records contained in an **assessed dataset**; and
 - (b) quality-assured records contained within an **EPA field dataset**.

34.3 Updates to a spatial dataset to realign a boundary

- (1) Any update to an **ESA spatial dataset** must not result in reduced environmental outcomes in respect of the **ESA** it was intending to protect.
- (2) Prior to or during a **forestry operation**, **FCNSW** may update the boundary of an **ESA spatial dataset** to realign the boundary of a feature to a:

- (a) **classified drainage line;**
 - (b) **road;** or
 - (c) **State Forest** boundary.
- (3) For each feature updated under condition 34.3(2) above, **FCNSW** must:
- (a) submit a report to the **EPA** that includes:
 - (i) the reasons for the realignment; and
 - (ii) any other information as requested by the **EPA**; and
 - (b) display any updated mapped area on:
 - (i) the **operational map** for an **operational area** where the realignment occurs prior to the commencement of the **forestry operation** in that area; or
 - (ii) the relevant **FCNSW field dataset** where the realignment occurs during the **forestry operation** and recorded in the operational tracking records as set out in condition 39 of the **approval**.
- (4) **FCNSW** may submit a single report for multiple features reported on under condition 34.3 if those features were updated in the same re-mapping exercise or in the same work area.
- (5) Each feature updated in the field during a **forestry operation** must be mapped in accordance with condition 117 of the **approval**.
- (6) Each feature updated prior to a **forestry operation** must be incorporated into a **FCNSW field dataset** if it has not been quality-assured and incorporated into an **assessed dataset**.
- (7) Each updated feature contained in an **FCNSW field dataset** must be quality-assured by **FCNSW** to ensure that the record:
- (a) identifies the boundary of the feature;
 - (b) is not duplicated;
 - (c) contains complete attribute field information detailing the feature type, capture date, capture methodology and any other attributes that may be requested by the **EPA**; and
 - (d) is free from topological overlap errors and geometry problems.
- (8) **FCNSW** must incorporate a quality-assured feature into an **assessed dataset** and update its **metadata** as soon as practicable, but at least once every quarter.
- (9) The **EPA** may incorporate records contained in an **assessed dataset** into an **ESA spatial dataset** from time to time.
- 34.4 Updates to a spatial dataset – general updates
- (1) Any update to an **ESA spatial dataset** must not result in reduced environmental outcomes in respect of the **ESA** it was intending to protect.
 - (2) **FCNSW** may only update a **spatial dataset**, other than an update made under condition 34.2 or 34.3 above, with the prior written approval of the **EPA** in accordance with this condition.

- (3) **FCNSW** must submit a written request to the **EPA** if it proposes to update a **spatial dataset** which includes:
 - (a) the reasons for the proposed addition, variation or exception;
 - (b) a response to any specific requirements listed in the relevant conditions for that **spatial dataset**;
 - (c) other alternative locations considered in the instance of a feature relocation; and
 - (d) a **GIS dataset**:
 - (i) containing any existing mapped area that is proposed to be added to, varied or excepted;
 - (ii) containing the proposed area that includes the addition, variation or exception that is to be included in the **spatial dataset**; and
 - (iii) provided to the **EPA** or **DPI** in accordance with **Protocol 35: Data and information management**.
- (4) The **EPA** 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.
- (5) The **EPA** will advise **FCNSW** in writing of the determination of the request to update a **spatial dataset**.
- (6) Following **EPA** approval in condition 34.4 (5) above, **FCNSW** must:
 - (a) display any updated mapped area on the **operational map** for an **operational area** before commencing or continuing the **forestry operation** in that area; and
 - (b) update the **metadata** for the approved updated **spatial dataset** and provide it to the **EPA** within two weeks of the date of the approval.
- (7) The **EPA** will incorporate any approved addition, variation or exception into a **spatial dataset** and update its **metadata**.
- (8) The **EPA** may make any addition, variation or exception to an **ESA spatial dataset** at any time. The **EPA** will notify **FCNSW** of any updates. Upon its update, the **spatial dataset** will become immediately enforceable.
- (9) The **EPA** may incorporate records contained in an **assessed dataset** into an **ESA spatial dataset** from time to time.

34.5 Updates to a spatial dataset – specific updates

- (1) **Compartment** and **State Forest** boundaries
 - (a) **FCNSW** must provide the **EPA** with a monthly report identifying any updates that have been made to **compartment** or **State Forest** boundaries that month.
- (2) Coupe boundaries
 - (a) **FCNSW** must incorporate any newly mapped **coupe** into the 'Assessed_Coupe' **spatial dataset** prior to commencement of a **forestry operation**.
- (3) Tract map

- (a) Where the harvesting intent changes for land mapped in the 'Tract' **spatial dataset** or 'Assessed_Tract' **spatial dataset** prepared in accordance with condition 47.1 of the **approval, FCNSW** must provide:
 - (i) a report to the **EPA** seeking approval to change the 'Tract' **spatial dataset** or 'Assessed_Tract' **spatial dataset**, that:
 - (A) outlines the reasons for the proposed change;
 - (B) alternative options considered;
 - (C) whether **intensive harvesting** had previously occurred in the area to be recategorised as **selective harvesting**; and
 - (D) the extent of **intensive harvesting** applied in its related **local landscape area**.
 - (ii) a **GIS dataset** containing the relevant segment of the change to the 'Tract' **spatial dataset** or 'Assessed_Tract' **spatial dataset**; and
 - (b) the **EPA** will advise **FCNSW** in writing of the determination and will require **FCNSW** to incorporate any newly mapped **tract** into the 'Assessed_Tract' **spatial dataset** prior to commencement of a **forestry operation**.
 - (c) The **EPA** may incorporate any updates into the 'Tract' **spatial dataset** and update its **metadata** from time to time.
- (4) Forest management zones
- (a) **FCNSW** may only update the 'Forest_Management_Zone' **spatial dataset** in accordance with the documents titled:
 - (i) *Managing our Forests Sustainably: Forest Management Zoning in NSW State Forests* (State Forests of NSW, December 1999); and
 - (ii) FCNSW Forest Practices Circular No 2005/03 Guidelines for Using the Forest Management Zoning System (as updated from time to time).
- (5) Local landscape areas
- (a) **FCNSW** must incorporate any newly mapped **local landscape area** developed under **Protocol 8: Local landscape areas** into the 'Assessed_Local_Landscape_Area' **spatial dataset** prior to commencement of a **forestry operation**.
 - (b) **FCNSW** must not update the location of a **local landscape area** unless approved by the **EPA** in accordance with this condition.
 - (c) When applying for an update under this condition, **FCNSW** must provide the **EPA** with the following:
 - (i) a report that provides:
 - (A) the reasons for the proposed update;
 - (B) evidence which clearly demonstrates that the proposed update in the mapped **local landscape area** will not result in a loss of environmental values;
 - (C) alternative options considered;

- (D) the extent of **intensive harvesting** that has occurred in the **local landscape area**, including the completion date of each **intensive harvesting** operation;
 - (E) how the **intensive harvesting** limits set by condition 45 of the **approval** will continue to be satisfied;
 - (F) the continuity with adjacent **local landscape area** and **wildlife habitat clumps** applied in any preceding **forestry operations**;
 - (G) how **wildlife habitat clumps** as identified and protected in condition 50 of the **approval** are not reduced below the threshold set by that condition; and
- (ii) a **GIS dataset** containing:
- (A) the relevant segment of the existing **local landscape area**; and
 - (B) the proposed location for the new segments of **local landscape area**.
- (d) The **EPA** will advise **FCNSW** in writing of the determination of the request to update a **local landscape area**.
- (e) Following **EPA** approval **FCNSW** must update the **metadata** for the approved update and provide it to the **EPA** within two weeks of the date of the approval.
- (f) The **EPA** will incorporate:
- (i) any updates into to the 'Local_Landscape_Area' **spatial dataset** and update its **metadata** from time to time; and
 - (ii) areas contained in the 'Assessed_Local_Landscape_Area' **spatial dataset** into the 'Local_Landscape_Area' **spatial dataset** from time to time.
- (6) Wildlife habitat clumps and tree retention clumps
- (a) **FCNSW** must incorporate any newly mapped **wildlife habitat clumps** developed under **Protocol 22: Wildlife habitat and tree retention clumps** into the 'Assessed_Wildlife_Clump' **spatial dataset** prior to commencement of a **forestry operation**.
 - (b) **FCNSW** must incorporate any newly mapped **tree retention clumps** developed under **Protocol 22: Wildlife habitat and tree retention clumps** into the 'Assessed_Tree_Retention_Clump' **spatial dataset** prior to commencement of a **forestry operation**.
 - (c) **FCNSW** must not update the location of a **wildlife habitat clump** or a **tree retention clump** that was implemented in a previous **forestry operation** without the prior approval of the **EPA**.
 - (d) **FCNSW** may update the location of a **wildlife habitat clump** or a **tree retention clump** that has not been implemented in a previous **forestry operation**, **however** the change must be approved by a **FCNSW planning supervisor** or **FCNSW operations supervisor** prior to the commencement of the **forestry operation** in accordance with the following conditions.
 - (e) For any proposed changes to location of a **wildlife habitat clump** or **tree retention clump**, **FCNSW** must:

- (i) clearly demonstrate the change will result in an equivalent or improved environmental outcome; and
 - (ii) will continue to meet the requirements of conditions 50 and 63 of the **approval** and **Protocol 22: Wildlife habitat and tree retention clumps**.
- (f) When applying for an update under condition 35.5(6)(c) or 35.5(6)(d) of this **protocol**, **FCNSW** must prepare the following:
- (i) a report that provides:
 - (A) the reasons for the proposed update;
 - (B) evidence which clearly demonstrates that the proposed update in the mapped **wildlife habitat clump** or **tree retention clump** will result in an equivalent or improved environmental outcome;
 - (C) alternative options considered;
 - (D) whether the **wildlife habitat clump** or **tree retention clump** has been applied in a previous **forestry operation**;
 - (E) a comparison of the **habitat** values and **forest types** of the existing and proposed **wildlife habitat clump** or **tree retention clump**;
 - (F) a comparison of the disturbance history of the existing and proposed **wildlife habitat clumps** or **tree retention clump**, including any previous harvesting, wildfire and hazard reduction burning, and the existence and length of existing **roads** and **tracks**; and
 - (G) what **ESAs** will be included in the proposed **wildlife habitat clump** or **tree retention clump**; and
 - (ii) a **GIS dataset** containing:
 - (A) the relevant segment of the existing **wildlife habitat clump** or **tree retention clump**; and
 - (B) the proposed location for the new segment of **wildlife habitat clump** or **tree retention clump**.
- (g) The **EPA** will advise **FCNSW** in writing of the determination of the request to update a **wildlife habitat clump** or **tree retention clump** that was implemented in a previous **forestry operation**.
- (h) Following **EPA** or **FCNSW** approval of any change to a **wildlife habitat clump** or **tree retention clump**, **FCNSW** must update the **metadata** for the 'Wildlife_Clump' **spatial dataset** or 'Tree_Retention_Clump' **spatial dataset** and provide it to the **EPA** within two weeks of the date of the approval.
- (i) The **EPA** will incorporate any updates into the 'Wildlife_Clump' **spatial dataset** or 'Tree_Retention_Clump' **spatial dataset** and update its **metadata** from time to time.
- (7) Ridge and headwater habitat
- (a) In areas where **classified drainage lines** apply under the **approval** and **ridge and headwater habitat** corridor a previously applied under the **relevant IFOA** in place prior to the commencement of the **approval** does not extend to the relevant **classified drainage line** as would be determined under **Protocol 29: Identification of ridge and**

headwater habitat, the **ridge and headwater habitat** corridor that is mapped and applied must be updated so that it extends sufficiently to make the connection to the relevant **classified drainage line**.

- (b) Where a **ridge and headwater habitat** designed and implemented under the **relevant IFOA** in place prior to the commencement of the **approval** is not currently aligned with the location of a **drainage line** (or part thereof), **FCNSW** must:
 - (i) apply the **ridge and headwater habitat** to the **drainage line** that was selected and implemented in the previous **forestry operation**, or
 - (ii) seek advice on the correct placement of the **ridge and headwater habitat** corridor from the **EPA**.
- (c) **FCNSW** must make any updates to **ridge and headwater habitat** as set out in conditions 34.5(7)(a) or (b) above to realign the boundary to a **classified drainage line** in accordance with condition 34.3 of this **protocol**.
- (d) **FCNSW** must not make any other updates to **ridge and headwater habitat** other than those changes as set out in conditions 34.5(6)(a) or (b) above unless:
 - (i) a change to the location of a **ridge and headwater habitat** corridor can clearly demonstrate an equivalent or improved environmental outcome; and
 - (ii) it has been approved by the **EPA**.
- (e) When applying for an update under condition 34.5(6)(d) above, **FCNSW** must provide the **EPA** with the following:
 - (i) a report that provides:
 - (A) the reasons for the proposed update;
 - (B) alternative options considered;
 - (C) whether the **ridge and headwater habitat** corridor has been applied in a previous **forestry operation**;
 - (D) 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;
 - (E) 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;
 - (F) 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;
 - (G) 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
 - (H) 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 **ordered drainage features** of different catchments as required above; and

- (ii) a **GIS dataset** containing:
 - (A) the relevant segment of the existing **ridge and headwater habitat**; and
 - (B) the proposed location for the new segment of **ridge and headwater habitat**.
 - (f) The **EPA** will advise **FCNSW** in writing of the determination of the request to update **ridge and headwater habitat**.
 - (g) Following **EPA** approval, **FCNSW** must update the **metadata** for the 'Ridge_Headwater_Habitat' **spatial dataset** and provide it to the **EPA** within two weeks of the date of the approval.
 - (h) The **EPA** will incorporate any updates into the 'Ridge_Headwater_Habitat' **spatial dataset** and update its **metadata** from time to time.
- (8) Inherent hazard level 4
- (a) **FCNSW** may only amend the data sources described in condition 15.2 (1) of **Protocol 15: Inherent soil erosion and water pollution hazard assessment** in accordance with conditions 34.5(8).
 - (b) **FCNSW** can only amend the table of **rainfall erosivity** for a **compartment** with the **EPA's** written approval.
 - (c) If **FCNSW** amends the **compartment** or **ground slope class spatial dataset**, **FCNSW** must provide the amended spatial dataset to the **EPA** within 21 days of making the amendment.
 - (d) If as a result of the **soil regolith** assessment process the **field-verified soil regolith** is found to differ from the mapped **soil regolith**, **FCNSW** must:
 - (i) amend the 'Soil_Regolith' **spatial dataset**; and
 - (ii) submit the amended **spatial dataset** to the **EPA** by the end of the financial year.

34.6 Replacing a spatial dataset

- (1) A replacement to an **ESA spatial dataset** must not result in reduced environmental outcomes in respect of the **ESA** it was intending to protect.
- (2) **FCNSW** may only replace a **spatial dataset** with the prior written approval of the **EPA** in accordance with this condition.
- (3) **FCNSW** must submit a written request to the **EPA** if it proposes to replace a **spatial dataset** which includes:
 - (a) the reasons why the existing **spatial dataset** is no longer considered appropriate;
 - (b) the reasons supporting the proposed replacement **spatial dataset**;
 - (c) background information on the proposed replacement **spatial dataset** including information about:
 - (i) the history and origin of the development of the proposed replacement **spatial dataset** including information about any source data used to construct the proposed replacement **spatial dataset**;

- (ii) the spatial and temporal extent of the proposed replacement **spatial dataset**;
 - (iii) any specific limitations for use of the proposed replacement **spatial dataset**;
 - (iv) the completeness and accuracy of the proposed replacement **spatial dataset**;
 - (v) any other relevant information to support the request; and
- (d) either:
- (i) a report on the **field-verification** of the proposed replacement **spatial dataset** which at a minimum includes:
 - (A) dates of **field-verification**;
 - (B) name of **FCNSW** officers conducting the **field-verification**;
 - (C) spatial location and mapped extent of the **field-verification** sites;
 - (D) method used to **field-verify** the proposed replacement **spatial dataset**;
 - (E) results or findings from the **field-verification**; and
 - (F) any other relevant information; or
 - (ii) the reasons why **field-verification** of the proposed replacement **spatial dataset** would not be relevant; and
- (e) a **GIS dataset** of the proposed replacement **spatial dataset** and updated **metadata** provided to the **EPA** in accordance with **Protocol 35: Data and information management**.
- (4) The **EPA** 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** 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** and updated **metadata** available to the **EPA** in accordance with **Protocol 35: Data and information management**.
- (7) The **EPA** will consult with **FCNSW** if **EPA** proposes to replace a **spatial dataset**. The **EPA** will notify **FCNSW** prior to the replacement of any **spatial dataset**. Upon its replacement, the **spatial dataset** will become immediately enforceable.

34.7 Spatial datasets required to be used to identify operational boundaries

Table 1: ESA spatial datasets

a) ESA spatial datasets	b) Assessed datasets and field datasets
i. Bare_Nosed_Wombat_NthPopMngtArea	i. Assessed_Accidentally_Felled_Trees
ii. Bat_Roost_Tree	ii. Assessed_Bat_Roost_Tree
iii. Bird_Nest_Roost_Den	iii. Assessed_Bird_Nest_Roost

iv.	Booroolong_Frog	iv.	Assessed_Harvesting_Tracklog
v.	Carry_Over_Exclusion_Zones	v.	Assessed_HCVOG
vi.	Class1_Aquatic_Habitat_Area	vi.	Assessed_Heath_and_Scrub
vii.	Class1_Aquatic_Habitat_Line	vii.	Assessed_Inherent_Hazard_Level_4
viii.	Flyingfox_Camp	viii.	Assessed_Intensive_Harvesting
ix.	Giant_Burrowing_Frog	ix.	Assessed_Local_Landscape_Area
x.	HCVOG	x.	Assessed_Patch
xi.	Heath_and_Scrub	xi.	Assessed_Rainforest
xii.	Inherent_Hazard_Level_4	xii.	Assessed_Rare_Forest
xiii.	Koala_Browse_Tree_Prescriptions	xiii.	Assessed_Retained_Trees
xiv.	Large_Forest_Owl	xiv.	Assessed_Ridge_Headwater_Habitat
xv.	Rainforest	xv.	Assessed_Rock_Outcrop_Cliffs
xvi.	Rare_Forest	xvi.	Assessed_TEC
xvii.	Retained_Trees	xvii.	Assessed_Tree_Retention_Clump
xviii.	Ridge_Headwater_Habitat	xviii.	Assessed_Wetland
xix.	Rock_Outcrop_Cliffs	xix.	Assessed_Wildlife_Clump
xx.	Smoky_Mouse	xx.	Any FCNSW field dataset containing a field mapped ESA
xxi.	Southern_Brown_Bandicoot		
xxii.	Spotted_Tailed_Quoll		
xxiii.	Other_SMP		
xxiv.	TEC_Certified		
xxv.	Tree_Retention_Clump		
xxvi.	Wetland		
xxvii.	Wildlife_Clump		
xxviii.	Provisional_GKNP_Assessment_Area		
xxix.	Koala_Hub		

Table 2: Indicative ESA spatial datasets

Indicative ESA spatial dataset	
i.	Indicative_Heath_and_Scrub
ii.	Indicative_Riparian_Exclusion_Zone

iii.	Indicative_Rock_Outcrop_Cliff
iv.	Indicative_TEC
v.	Indicative_Wetland

Protocol 35: Data and information management

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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 41, which relates to public availability of documents
 - (ii) condition 116, which relates to **spatial datasets**;
 - (iii) condition 117, which relates to **field mapping**; and
 - (iv) condition 118, which relates to **species** data transfer to the **NSW BioNet**.
- (2) In this **protocol**, **register** means the **operations register**, **compliance register**, complaints register required under condition 31 of the **approval**, and the **annual plan** required under condition 32 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, electronic maps 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 **SEED portal** or an alternative approach as agreed to by the **EPA** in writing.

35.5 Spatial datasets

- (1) **FCNSW** must make all **spatial datasets** required to be submitted to the **EPA** under **Protocol 34: Spatial datasets** available to the **EPA** as real-time ESRI Feature Services or in an alternative format as agreed to by the **EPA**.
- (2) All records captured by **FCNSW** using an **FCNSW mobile application** and temporarily stored in an **FCNSW field dataset** must be made available to the **EPA** for real-time viewing via an **EPA** custom module of an **FCNSW mobile application** as soon as that data has been captured and synced by the **FCNSW** field officer.

35.6 Species data transfer to the NSW BioNet

- (1) For the purposes of the requirements under condition 118 of the **approval**, **FCNSW** must submit any identified **plants** or **animals** to the **NSW BioNet** by using BioNet data entry tools or other agreed electronic means.
- (2) All **records** of **plants** and **animals** must meet mandatory **NSW BioNet** data requirements.

Protocol 36: Field mapping

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

36.1 Introduction

- (1) Condition 117 of the **approval** requires field mapping in accordance with this **protocol**.

36.2 Identification and recording

- (1) For each feature required to be mapped under condition 117 of the approval:
- (a) the field location of the **ESA** or other feature must be:
 - (i) identified in accordance with the relevant condition or definition of the **approval**; and
 - (ii) mapped as a point, line or polygon feature record using a **GNSS**-enabled device or any other device that can accurately map the location or boundary of the feature; and
 - (b) **FCNSW** must create a **GIS dataset** that identifies the boundary of all associated **exclusion zones**.
- (2) Any feature or **exclusion zone** mapped under this condition must be stored in a **FCNSW field dataset** or **assessed dataset**.

CHAPTER 7: REGENERATION

Protocol 37: Regeneration and stocking

Version 2: Approved by the EPA Chair and CEO on 31 October 2018

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.
- (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 square metres per hectare.

37.2 Standard to be achieved for regeneration and stocking

- (1) For the purposes of compliance with condition 120.1 of the **approval**, the **regeneration** and stocking standard for **harvested areas** to which this **protocol** applies is met if at least 65 per cent 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 per cent of the regeneration and stocking standard is met

- (1) Where between 40 per cent and 65 per cent 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 35.5 or 35.7 below, as applicable.

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

- (1) Where less than 40 per cent 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 **regeneration remedial actions**;
 - (b) details of **regeneration remedial actions** to be applied and detail on which part of the mapped area that they will be applied;
 - (c) proposed timing for when **regeneration 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 **regeneration 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 of this **protocol** 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** 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 per cent of **harvested areas** with a **basal area** less than 14 square metres per hectare in each **management zone** must be randomly selected for stocking assessments.
- (3) A minimum of 40 per cent of **harvested areas** that have been identified as high **regeneration** risk under **Protocol 4: 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 below 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 is greater than or equal to 14 square metres per hectare.
- (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) above and dividing them by the total number of plots assessed in accordance with condition 37.9(1) above. 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) above 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: 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 of this **protocol** 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.

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CHAPTER 8: MONITORING

Protocol 38: Monitoring program

Version 1: Approved by the EPA Chair and CEO on 3 October 2018

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 participate in a monitoring steering committee, as required under condition 122.1 of the **approval**, with the following composition:
 - (a) a minimum of four 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**; 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 the 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;
 - (d) review and analyse the **monitoring program** data and provide expert scientific advice to the **EPA**, **DPI** and **FCNSW**; and
 - (e) engage with community, environment and industry stakeholders on the **monitoring program**.

*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) **The monitoring program** must be designed 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** (including, but not limited to, areas where Table 6a of the **approval** should apply);
 - (iv) **exclusion zones** for **Coastal SEPP wetlands**;
 - (v) the effectiveness of soil and water protection in **intensive harvesting forestry operations**;
 - (vi) protecting and recruiting **hollow-bearing trees**;
 - (vii) Koala conditions;
 - (viii) the effectiveness of **selective harvesting** limits in achieving **regeneration** and stocking standards as measures of longer term **regeneration**; and
 - (ix) the maintenance of sufficient levels of **coarse woody debris**;
- (b) establish a scientifically valid environmental and wood supply baseline to track and evaluate the effectiveness or impacts of the **approval** on the maintenance of environmental values and on wood supply;
- (c) 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; and
- (d) provide **species**-specific monitoring, including but not limited to those management plans listed in **Protocol 21: Species management plan**;
- (e) provide **species**-specific monitoring for other **species** which require monitoring under existing programs relating to the monitoring of threatened flora;
- (f) meet **Principles of Ecologically Sustainable Forest Management** under the **NSW Regional Forest Agreements**; and
- (g) provide linkages to other relevant NSW Government programs and/or reviews relating to the monitoring of **State Forest** management and the NSW forest estate, 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);
 - (iii) **DPI-Fisheries Strategic Research Plan 2014–2018 (DPI-Fisheries)**;
 - (iv) **NSW Regional Forest Agreements**;
 - (v) **AdaptNSW** (Office of Environment and Heritage); and
 - (vi) **DPI- Forest monitoring program (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 forum and review of the **monitoring program** must be provided by the monitoring steering committee to the **EPA** 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) recommendations of any necessary changes required to the **approval**.
- (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 will be published on the **EPA** website, or other locations as approved by the **EPA**.

CHAPTER 9: DEFINITIONS

Protocol 39: Definitions

Version 3: Approved by the EPA CEO on 19 September 2023

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 italic text have the meanings given to them in the following table.
- (2) If a term used in the **approval** or in a **protocol** is not listed in the following table but does not suit the common meaning of the term, then **FCNSW** must seek advice from the **EPA** on the correct application on the condition.

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 applies only in the Eden Subregion and is described by the limits set by condition 48 of the approval and Protocol 7: Harvesting limits .
animal	Has the same meaning as in the BC Act .
annual plan	The plan of forestry operations required to be prepared under condition 32 of the approval and mapped in the 'Plan_of_Forestry_Operations' spatial dataset .
annual timber and biomaterial report	A report required to be prepared under condition 34 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 1–125). In any other context, it takes the ordinary meaning.

Term	Meaning
approved soil assessor	Any person listed on the relevant list kept 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 .
archived spatial dataset	An archived spatial dataset is a previous version of a spatial dataset that has been replaced and is no longer current. An archived spatial dataset is kept for information purposes only. The EPA is the custodian of all archived spatial datasets unless otherwise stated in the approval .
armoured	A protective surface that is resistant to erosion or displacement by machinery or vehicles.
assessed dataset	A GIS dataset that contains the location or boundary of: 1. a quality-assured field dataset feature; or 2. any other feature required to be mapped in accordance with the approval that has not been incorporated into a spatial dataset . FCNSW is the custodian of all other assessed datasets unless otherwise stated in the approval . A list of all assessed datasets is included in Table 1 column (b) of condition 34.7 of Protocol 34: Spatial datasets .
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 the approval .
bankfull level	The point in a drainage line determined in accordance with Protocol 16: Riparian protection .
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 'Bare_Nosed_Wombat_NthPopMngtArea' spatial dataset .
basal area	The sum of cross-sectional area of trees that are greater than 10 centimetres 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	The greater of the following: 1. the area mapped in the 'Base_Net_Area_Map_Layer' spatial dataset (as current from time to time) and accompanying metadata ; or 2. the area of Forest Management Zone 3B, 4 and 8 in an operational area less rainforest, high conservation value

Term	Meaning
	<p>old growth forest, rare forest, threatened ecological communities, ridge and headwater habitat, large forest owl exclusion zones, Forest Management Zones 1, 2, 3A, 5, 6 and 7, land mapped as over 30 degrees slope in the 'Ground_Slope_Class' spatial dataset and land mapped in the 'Riparian_Exclusion_Zones' indicative spatial dataset.</p> <p>The base net area which is first applied under a condition of the approval or the protocols must be applied for the duration of the forestry operations in relation to that condition.</p>
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. mapped in the: <ol style="list-style-type: none"> a. 'Bat_Roost_Tree' spatial dataset; b. 'Assessed_Bat_Roost_Tree' spatial dataset; or c. a FCNSW field dataset.
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	Has the same meaning as in the BC Act .
biosecurity matter	Means the matters in clauses 10(d)-(h) of the <i>Biosecurity Act 2015</i> that have the potential to cause a biosecurity impact as defined under that same Act.
blading off	The removal of surface soil from a 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>

Term	Meaning
Booroolong Frog mapped layer	The area mapped in the 'Booroolong_Frog' spatial dataset .
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 57.2 of the approval .
burn	A pre-harvest burn or post-harvest burn or hazard reduction burn .
burn event	Any known fire to have occurred in an operational area , including a pre-harvest burn , post-harvest burn , a hazard reduction burn or wildfire.
burn plan	A plan required to be prepared under condition 85.1 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 under the relevant IFOA in place prior to the commencement of the approval ; and The areas mapped in the 'Carry_Over_Exclusion_Zones' spatial dataset .
category 1 ESA	An area listed in column (a) of the table in in condition 49.1 of the approval .
category 2 ESA	An area listed in column (b) of the table in in condition 49.1 of the approval .
causeway	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. The upper surface of a causeway must not vary by more than: 1. 10 centimetres from the bed of the drainage feature upstream of the causeway ; and 2. 50 centimetres from the bed of the drainage feature downstream of the causeway .

Term	Meaning
	<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 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 feature	A classified drainage line or drainage depression (mapped or unmapped) or an unmapped drainage line in areas where LiDAR mapping is available.
classified drainage line	<p>A drainage line classified according to Protocol 19: Determination of drainage class and stream order and mapped in the 'Classified_Drainage_Line' spatial dataset derived using LiDAR data.</p> <p><i>Note: a drainage line mapped in the 'Classified_Drainage_Line' spatial dataset provides the indicative location of a drainage line and does not indicate the centreline of that drainage line.</i></p>
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 of cliff mapped within: <ol style="list-style-type: none"> i. the 'Rock_Outcrop_Cliffs' spatial dataset; ii. the 'Assessed_Rock_Outcrop_Cliffs' spatial dataset; or iii. a FCNSW field dataset. <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. Cliff may include areas of cliff mapped within the 'Indicative_Rock_Outcrop_Cliffs' spatial dataset</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 timber has a minimum diameter of 10 centimetres or greater under bark; and 2. is greater than three metres long.

Term	Meaning
Coastal IFOA Region	State Forest and other Crown-timber lands to which the approval applies, and which is mapped in the 'Coastal_IFOA_Region' spatial dataset .
Coastal IFOA Subregion	Four subregions that stretch across the following areas: Upper North East Subregion , Lower North East Subregion , Southern Subregion and Eden Subregion ; and are mapped in the 'Coastal_IFOA_Subregion' spatial dataset .
coastal management SEPP wetlands	Wetlands identified in the <i>State Environment Planning Policy: Coastal Management</i> .
collapsed ecological community	Has the same meaning as in the BC Act .
comparable tree	A tree selected to replace a damaged retained tree that has the characteristics and physical attributes of which the damaged retained tree was retained for under the approval .
compartment	An area of forest designated for forestry operations located within a local landscape area and management zone that is identified by a unique compartment number and a State Forest name, as mapped in the 'Compartment' spatial dataset .
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/completed	A forestry operation is taken to be completed when field-based activities are complete across the operational area , no further work under the operational plan will be undertaken in the operational area and the date has been entered into the operations register to record the completion of the forestry operation . This is consistent with condition 1.2(4) of Protocol 1: Registers . In any other context, it takes the 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/construction	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.

Term	Meaning
	<p>In relation to a crossing, means the construction of a crossing where no previous crossing existed.</p> <p>In any other context, it takes the ordinary meaning.</p>
contemporary Koala record	A record of a Koala detected in the previous 10 years.
coupe	<p>A mapped area of contiguous native forest that has been or will be subject to:</p> <ol style="list-style-type: none"> 1. intensive harvesting in the intensive harvesting zone; or 2. alternate coupe logging in the Eden Subregion; and 3. mapped in the 'Coupe' spatial dataset.
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 'CRAFTI_Old_Growth' spatial dataset .
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 'CRAFTI_Rainforest' spatial dataset .
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 'CRAFTI_Structural' spatial dataset .
crossbank	A hump of earth constructed across a 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 .
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	<p>In the context of habitat, has the same meaning as in the BC Act.</p> <p>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, including where a tree is intentionally felled, pushed or removed to comply with the WHS Act.</p>

Term	Meaning
	In any other context, 'damage' has its ordinary meaning.
dead standing tree	A standing dead tree: <ol style="list-style-type: none"> 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.
declared area of outstanding biodiversity value	Has the same meaning as in the BC Act .
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.
drainage class	Any drainage line mapped in the 'Classified_Drainage_Line' spatial dataset 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 .

Term	Meaning
drainage line	<p>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:</p> <ol style="list-style-type: none"> 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. <p>A drainage line includes a gully.</p> <p>'Deposition' means the laying down of solid material which has been eroded and transported from a distant part of the land surface.</p>
drainage order	<p>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.</p>
drainage structure	<p>A road drainage structure or a track drainage structure.</p>
drainage structure outlet	<p>The point at which water discharges from a road drainage structure or track drainage structure.</p>
earthworks	<p>Mechanical soil movement and disturbance created using a machine blade or similar implement.</p>
Eden Subregion	<p>A subregion of the Coastal IFOA Region attributed as 'Eden Subregion' and mapped in the 'Coastal_IFOA_Subregion' spatial dataset.</p>
effective bank height	<p>The minimum height of a crossbank above the outlet.</p>
endangered population	<p>Has the same meaning as in the BC Act.</p> <p>For the purposes of fish, or marine habitat, has the same meaning as in Part 7A of the FM Act.</p>
energy dissipation	<p>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.</p>
Ecologically Sustainable Forest Management	<p>As per the Principles of Ecologically Sustainable Forest Management.</p>
EPA (Environment Protection Authority)	<p>The authority constituted by section 5 of the <i>Protection of the Environment Administration Act 1991</i> (NSW).</p>
erosion	<p>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.</p>

Term	Meaning
ESA (environmentally significant areas)	An area listed in Table 1 of condition 49.1 of the approval .
ESA spatial dataset	<p>A GIS dataset that contains a fixed location or boundary of an ESA and any associated exclusion zone.</p> <p>The EPA is the custodian of all ESA spatial datasets unless otherwise stated in the approval.</p> <p>A list of all ESA spatial datasets is included in Table 1 column (a) of condition 34.7 of Protocol 34: Spatial datasets</p>
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	The area around a protected feature within which forestry operations are not allowed to be carried out.
extinct species	A species listed in Schedule 3 of the BC Act .
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 mobile application	<p>Means a mobile device application:</p> <ol style="list-style-type: none"> 1. developed by FCNSW for an FCNSW officer; and 2. used by an officer of FCNSW or the EPA to capture point, line, and polygon and attribute data in a GIS format.
FCNSW operations supervisor	A FCNSW employee who is responsible for routine monitoring of a forestry operation and compliance with the conditions of the approval .
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 dataset	<p>A GIS dataset kept and maintained by:</p> <ol style="list-style-type: none"> 1. FCNSW to temporarily store field mapped point, line and polygon features that are required to be mapped under the approval or any other features that have been mapped under the approval that have not been incorporated into an assessed dataset; or

Term	Meaning
	<p>2. EPA to temporarily store field mapped point, line and polygon features or other features that have not been incorporated into an assessed dataset.</p> <p>FCNSW is the custodian of all FCNSW field datasets and the EPA is the custodian of all EPA field datasets unless otherwise stated in the approval.</p>
field-verified	A feature that is verified in the field by an officer of FCNSW or EPA .
fill	Previously excavated material that is used to raise the surface of an area to a specified level.
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 83 of the approval .
flying-fox camp	<p>1. 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</p> <p>2. '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.</p>
flying-fox camp database	<p>Means:</p> <p>1. 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 mapped and included in the flying-fox camp database; or</p> <p>2. the area mapped in the 'Flyingfox_Camp' spatial dataset.</p>
FM Act	<i>Fisheries Management Act 1994</i> (NSW).
Forest Management Zone (FMZ)	<p>Areas determined to be a Forest Management Zone:</p> <p>1. in accordance with the document <i>Forest Management Zoning in State Forests</i> (State Forests of NSW, December 1999); and</p> <p>2. mapped in the 'Forest_Management_Zone' spatial dataset.</p>
forest products	The products of trees and other vegetation (other than timber) that are of economic value.

Term	Meaning
forest products operations	The harvesting or removal of forest products from an operational area .
Forestry Act	<i>Forestry Act 2012</i> (NSW).
forestry operations	Means the operations and activities authorised under the approval as set out in condition 13 of the approval .
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 mapped 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”.
forwarder or forwarding	The practice of hauling or dragging a log to a log dump , landing or stockpile using a forwarder (machine).
giant tree	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. 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.
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 <i>Petaurus</i> species 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 .

Term	Meaning
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.
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.
ground slope class	A ground slope mapped in the 'Ground_Slope_Class' spatial dataset derived using LiDAR data.
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 the approval , a gully is a type of drainage line .
gully stuffer	A type of crossing for a road , or 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	Has the same meaning as in the BC Act . For the purposes of fish, or marine vegetation, has the same meaning as in the FM Act . In any other context, 'habitat' has its ordinary meaning.
habitat feature	A feature listed in Table 2 in condition 57.3 of the approval .
harm	In relation to any animal, threatened species, threatened population or threatened ecological community , has the same meaning as the BC Act . In relation to any plant , means the picking of a plant as described in section 2.2 of the BC Act . In relation to fish or marine vegetation, has the same meaning as Part 7A of the FM Act . In relation to the environment has the same meaning as harm to the environment .
harm to the environment	Has the same meaning as the POEO Act .
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 .

Term	Meaning
harvesting debris	Tree heads, tree offcuts or bark that have resulted from: <ol style="list-style-type: none"> 1. the current forestry operation in the case of an active forestry operation; or 2. most recent completed forestry operation in the case of a suspended or completed forestry operation.
harvesting/ harvesting operation	The cutting and removal of timber or forest products .
harvesting zone	The areas mapped in the spatial datasets described under: <ol style="list-style-type: none"> 1. intensive harvesting zone; and 2. selective harvesting 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 .
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"> 1. any part of a sawlog, pulpwood log or tree stump; and 2. any part of a dead tree.
heath and scrub	Any of the following areas: <ol style="list-style-type: none"> 1. areas with greater than 50 per cent 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 2. land mapped in: <ol style="list-style-type: none"> a. the 'Heath_and_Scrub' spatial dataset; b. the 'Assessed_Heath_and_Scrub' spatial dataset; or c. a FCNSW field dataset. <p><i>Note: Heath and scrub may include areas of Forest Type identified as 'heath' (FT no. 223) or 'scrub' (FT no. 224) or areas within the 'Indicative_Heath_and_Scrub' spatial dataset.</i></p>
high conservation value old growth forest or HCVOG	Land mapped in the: <ol style="list-style-type: none"> 1. 'HCVOG' spatial dataset; and

Term	Meaning
	2. 'Assessed_HCVOG' <i>spatial dataset</i> .
high quality large sawlog	<p>A log that is of a high quality and:</p> <ol style="list-style-type: none"> 1. in the Upper North East Subregion, Lower North East Subregion and Southern Subregion: <ol style="list-style-type: none"> (a) is at least 2.4 metres long; and (b) has a centre diameter under bark of 40 centimetres or more. 2. in the Eden Subregion and Ingebirah State Forest and other Crown-timber lands within the Tumut Area east of Kosciuszko National Park: <ol style="list-style-type: none"> (a) is at least 2.4 metres long; (b) is between 2.4 metres and 4 metres in length and has a butt diameter under bark of 40 centimetres or greater; or (c) is longer than 4 metres and has a butt diameter under bark of 36 centimetres or greater.
high quality small sawlog	<p>A log that is of a high quality and:</p> <ol style="list-style-type: none"> 1. in the Upper North East Subregion, Lower North East Subregion and Southern Subregion: <ol style="list-style-type: none"> (a) is at least 2.4 metres long; and (b) has a centre diameter under bark of less than 40 centimetres; and 2. in the Eden Subregion and Ingebirah State Forest and other Crown-timber lands within the Tumut Area east of Kosciuszko National Park: <ol style="list-style-type: none"> (a) is at least 2.4 metres long; or (b) has a butt diameter smaller than that specified for high quality large sawlogs in the area.
hollow-bearing tree	<p>A tree that is alive and has:</p> <ol style="list-style-type: none"> 1. visible hollows, holes or cavities that have likely formed because of decay, injury or other damage as the tree has aged; or 2. clearly inferred hollows as it is an older growth stage tree (in particular in a senescent tree) with one or more obvious deformities such as a burl, large protuberance or broken limb. <p><i>Note: Guidance will support the application of this definition.</i></p>
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.

Term	Meaning
<i>indicative ESA spatial dataset</i>	<p>A GIS dataset that contains an indicative location or boundary of an ESA.</p> <p>The EPA is the custodian of all indicative ESA spatial datasets unless otherwise stated in the approval.</p> <p>A list of all indicative ESA spatial datasets is included in Table 2 of condition 34.7 of Protocol 34: Spatial datasets.</p>
<i>indicatively mapped ESA</i>	An ESA that is contained in an indicative ESA spatial dataset .
<i>inflexion point</i>	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.
<i>inherent hazard level (IHL)</i>	<p>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.</p> <p>For mapped inherent hazard level 4, means an area of land mapped in the:</p> <ol style="list-style-type: none"> 1. 'Inherent_Hazard_Level_4' spatial dataset; or 2. 'Assessed_Inherent_Hazard_Level_4' spatial dataset; or 3. a FCNSW field dataset.
<i>integrated conditions</i>	<p>The conditions of the approval that satisfy Section 69P of the Forestry Act 2012, and include conditions that would otherwise be imposed under:</p> <ol style="list-style-type: none"> 1. a biodiversity conservation licence under the BC Act; 2. a licence under Part 7A of the FM Act; and 3. a environment protection licence under the POEO Act.
<i>intensive harvesting</i>	<p>A type of harvesting operation with high levels of tree removal and ground disturbance undertaken to promote regeneration, including:</p> <ol style="list-style-type: none"> 1. forestry operations described by the limits set by condition 45 of the approval; 2. land mapped in the 'Intensive_Harvesting' spatial dataset; or 3. land mapped in the 'Assessed_Intensive_Harvesting' spatial dataset. <p><i>Note: this includes areas meeting this definition that occurred prior to the commencement of the approval.</i></p>
<i>intensive harvesting coupe</i>	Means a coupe in an intensive harvesting zone .
<i>intensive harvesting cycle</i>	One cycle in a series of three cycles in which intensive harvesting may occur over the timeframes and areas specified in condition 45.2 of the approval .

Term	Meaning
<i>intensive harvesting tract</i>	An area within the <i>intensive harvesting zone</i> where the long-term intent is for <i>intensive harvesting</i> to occur and labelled 'intensive harvesting tract' and mapped in the 'Tract' <i>spatial dataset</i> .
<i>intensive harvesting zone</i>	The area attributed as 'intensive harvesting' and mapped in the 'Harvesting_Zone' <i>spatial dataset</i> .
<i>known habitat</i>	In relation to a flora <i>record</i> , means the area within five kilometres of the <i>record</i> . In relation to a fauna <i>record</i> , means the area within two kilometres of the <i>record</i> ; other than for Spotted-tailed Quoll in which case it means the area within five kilometres of the <i>record</i> .
<i>Koala browse prescription 1</i>	An area where <i>Koala browse tree</i> retention in accordance with condition 65.1(a) of the <i>approval</i> applies and is labelled 'Koala browse prescription 1' in the 'Koala_Browse_Tree_Prescriptions' <i>spatial dataset</i> .
<i>Koala browse prescription 2</i>	An area where <i>Koala browse tree</i> retention in accordance with condition 65.1(b) of the <i>approval</i> applies and which is labelled 'Koala browse prescription 2' in the 'Koala_Browse_Tree_Prescriptions' <i>spatial dataset</i> .
<i>Koala browse tree</i>	<p>1. In the <i>Upper North East Subregion</i> and <i>Lower North East Subregion</i>, means a live tree which may be selected for retention under condition 65 of the <i>approval</i> that is:</p> <p>(a) greater than 20 centimetres <i>DBH</i> or 22 centimetres at <i>DSHOB</i>;</p> <p>(b) live and healthy; and</p> <p>(c) of the following tree <i>species</i>:</p> <p>(i) primary browse trees –</p> <p style="padding-left: 40px;">Tallowwood (<i>E. microcorys</i>);</p> <p style="padding-left: 40px;">Swamp Mahogany (<i>E. robusta</i>); or</p> <p style="padding-left: 40px;">Red Gums (<i>E. tereticornis, glaucina, seeana</i> + hybrids); or</p> <p>(ii) secondary browse trees –</p> <p style="padding-left: 40px;">Grey Gums (<i>E. biturbinata, propinqua, punctata, canaliculata</i>);</p> <p style="padding-left: 40px;">Grey Box (<i>E. moluccana, largeana</i>);</p> <p style="padding-left: 40px;">Peppermints (<i>E. radiata, acaciaformis</i>);</p> <p style="padding-left: 40px;">Sydney Blue Gum (<i>E. saligna</i>);</p> <p style="padding-left: 40px;">Ribbon Gum (<i>E. nobilis, viminalis</i>);</p> <p style="padding-left: 40px;">Messmate (<i>E. obliqua</i>);</p> <p style="padding-left: 40px;">Snow Gum (<i>E. pauciflora</i>);</p>

Term	Meaning
	<p>Mountain Gum (<i>E. dalrympleana</i>); or</p> <p>New England Blackbutt (<i>E. andrewsii, campanulata</i>).</p> <p>2. In all other Coastal IFOA subregions, means a live healthy tree, greater than 30 centimetres DBH of the following tree species:</p> <p><i>Eucalyptus longifolia</i>;</p> <p><i>E. cypellocarpa</i>;</p> <p><i>E. globoidea</i>;</p> <p><i>E. mannifera</i>;</p> <p><i>E. rossii</i>;</p> <p><i>E. viminalis</i>;</p> <p><i>E tereticornis</i>;</p> <p><i>E amplifolia</i>;</p> <p><i>E. bosistoana</i>;</p> <p><i>E maidenii</i>;</p> <p><i>E. muelleriana</i>;</p> <p><i>E. tricarpa</i>;</p> <p><i>E. punctata</i>;</p> <p><i>E. nortonii</i>; or</p> <p><i>E eugenioides</i>.</p>
koala hub	The areas mapped in the 'Koala_Hub' spatial dataset , as updated by the EPA from time to time.
large forest owl exclusion zones	An ESA established for the Powerful Owl, Masked Owl, Sooty Owl or Barking Owl and is mapped in the 'Large_Forest_Owl' spatial dataset .
large veneer log	A veneer log with a centre diameter under bark of 40 centimetres 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.
LiDAR	Light Detection and Ranging, which is a remote-sensing technique that uses laser light. It is used to accurately identify the locations of drainage lines and potential areas of mass movement .
local landscape area	<p>Areas required to be developed in accordance with Protocol 8: Local landscape areas or which are mapped in the:</p> <ol style="list-style-type: none"> 1. 'Local_Landscape_Area' spatial dataset; or 2. 'Assessed_Local_Landscape_Area' spatial dataset.

Term	Meaning
location map	A map which is required to be prepared under condition 53.3(c) 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 mapped in the 'Coastal_IFOA_Subregion' spatial dataset .
maintain	<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 the approval. This may include work such as vegetation control (removal of trees < 20 centimetres 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 the 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 'Management_Zone' spatial dataset .
mapped drainage depression or mapped drainage line	<p>A feature that is mapped in the 'Classified_Drainage_Line' spatial dataset or the 'Ordered_Drainage' spatial dataset.</p> <p><i>Note: a drainage line mapped in the 'Classified_Drainage_Line' spatial dataset or 'Ordered_Drainage' spatial dataset provides the indicative location of a drainage line and does not indicate the centreline of that drainage line.</i></p>
mapped forest type	Areas depicting the forest types described by the document "Research Note 17 – Forest Types of NSW" in the 'Forest_Type' spatial dataset .

Term	Meaning
mass movement	<p>Means:</p> <ol style="list-style-type: none"> 1. 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 strength, vegetal cover and site drainage. This may include, but is not limited to, earth slumps, translational slides and earth flows; or 2. Areas mapped in the 'Mass_Movement' spatial dataset. <p>Mass movement is addressed in Protocol 13: Mass movement assessment.</p>
material harm to the environment	Has the same meaning as in the POEO Act .
mature tree	<p>A tree which exhibits the following structural characteristics: Crown opening up with crown limbs healthy; dead branches are few throughout the crown, and where present, are small; few branch hollows may occur, and where present, are very small.</p> <p><i>Note: the definition uses the description of a mature tree in the modified Jacobs growth stage assessment.</i></p>
maximum annual harvest area limit	Means 10 per cent 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 SEED 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 47 of the approval .
modelled habitat	<p>A habitat model for the following flora or fauna species as mapped in the corresponding spatial dataset:</p> <ol style="list-style-type: none"> 1. Albert's Lyrebird – the area mapped in 'Alberts_Lyrebird_Model' spatial dataset. 2. Marbled Frogmouth – the area mapped in the 'Marbled_Frogmouth_Model' spatial dataset. 3. Phyloria spp. – the area mapped in the 'Phyloria_spp_Model' spatial dataset. <p><i>Note: This layer may incorporate outputs from multiple models for each of the relevant Phyloria species.</i></p>

Term	Meaning
	<ol style="list-style-type: none"> 4. <i>Assa darlingtoni</i> (Pouched Frog) (Southern meta-population) – the area mapped the 'Pouched_Frog_Sthmetapop_Model' spatial dataset. 5. Rufous Scrub-bird – the area mapped in the 'Rufous_Scrub_Bird_Model' spatial dataset. 6. Northern Corroboree Frog – the area mapped in the 'Northern_Corroboree_Frog_Model' spatial dataset. 7. Hastings River Mouse – the area mapped in the 'Hastings_River_Mouse_Model' spatial dataset. 8. Powerful Owl – the area mapped in the 'Powerful_Owl_Model' spatial dataset. 9. Masked Owl – the area mapped in the 'Masked_Owl_Model' spatial dataset. 10. Sooty Owl – the area mapped in the 'Sooty_Owl_Model' spatial dataset. 11. Barking Owl – the area mapped in the 'Barking_Owl_Model' spatial dataset.
monitoring (in relation to Principles of ESFM)	<p>The monitoring of the Principles of ESFM 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 Subregion; 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 Subregion; 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 Subregion; 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 Subregion.
monitoring program	The program required to be designed and adopted pursuant to condition 121 of the approval .
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 .

Term	Meaning
natural floristic composition	For tree species , means trees 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 or for other vegetation, means the vegetation that naturally occur in the operational area as observed in the field.
nectar tree	<p>Means a live tree which may be selected for retention under condition 64 of the approval that is:</p> <ol style="list-style-type: none"> 1. mature or late mature; 2. is live and healthy; and 3. of the following tree species: <ol style="list-style-type: none"> (a) Alpine Ash <i>Eucalyptus delegatensis</i>; (b) Mountain Gum <i>E. dalrympleana</i>; (c) Manna Gum <i>E. viminalis</i>; (d) Black Sallee <i>E. stellulata</i>; (e) Snow Gum <i>E. pauciflora</i>; Eurabbie <i>E. bicostata</i>; (f) stringybark species <i>E. agglomerate</i>, <i>E. globoidea</i>, <i>E. muelleriana</i>; (g) red stringybark <i>E. macrorhyncha</i>; (h) needlebark stringybark <i>E. planchoniana</i>; Tyndale stringybark <i>E. tindaliae</i>; (i) white mahogany <i>E. acmenoides</i>, <i>E. umbra</i>, <i>E. carnea</i>; (j) ironbark species <i>E. siderophloia</i>, <i>E. paniculata</i>, <i>E. tricarpa</i>, <i>E. fetgusonii</i>, <i>E. placita</i>, <i>E. ancophila</i>, <i>E. fusiformis</i>, <i>E. caleyi</i>, <i>E. crebra</i>, <i>E. fibrosa</i>, <i>E. tetrapleura</i>, <i>E. sideroxylon</i>, <i>E. ophitica</i>; (k) River Peppermint <i>E. elata</i>; (l) Mountain Grey Gum <i>E. cypellocarpa</i>; (m) Maiden’s Gum <i>E. maidenii</i>; (n) Forest Red Gum <i>E. tereticornis</i>; Swamp Mahogany <i>E. robusta</i>; (o) Swamp Gum <i>E. ovata</i>; (p) spotted gum species <i>Corymbia</i> spp.; (q) bloodwood species <i>Corymbia</i> spp.; or (r) box species <i>E. rudderi</i>, <i>E. conica</i>, <i>E. molucanna</i>, <i>E. largeana</i>, <i>E. rummeryi</i>, <i>E. melliodora</i> and <i>E. albens</i>.

Term	Meaning
nest, roost or den	<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. A den (specifically in relation to <i>Petaurus australis</i>, <i>Petaurus norfolcensis</i> and <i>Petauroides volans</i>) that includes, but is not limited to, a tree-hollow or other hole, crevice or fissure in a tree, which the subject species is seen entering or leaving. The dens may be used by the animal for roosting, sleeping, resting, breeding, raising young and communal congregations sheltering and/or the rearing of young; 4. mapped as: <ol style="list-style-type: none"> a) Bird_Nest_Roost_Den' spatial dataset; or b) 'Assessed_Bird_Nest_Roost_Den spatial dataset; or 5. a record in the NSW BioNet that is attributed to a record type E which is 'nest/roost/den'.
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 'Non_Regrowth_Zone' spatial dataset .
NSW BioNet	The primary biodiversity data management system in NSW that is administered of the Office of Environment and Heritage.
NSW Regional Forest Agreements (RFA)	The agreement(s) made by the Prime Minister and Premier of NSW under the <i>Regional Forest Agreement Act 2002</i> (Cth.) that applies to NSW.
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 operations conducted under section 45 of the <i>Forestry Act 2012</i>) is occurring or will occur.

Term	Meaning
operational map	A map required to be prepared under condition 53.3(d) of the approval .
operational plan	A plan required to be prepared under condition 53 of the approval .
operations register	A register required to be kept and prepared under condition 28 of the approval .
ordered drainage feature	Any drainage line , drainage depression , stream or watercourse shown in the LPI -supplied and FCNSW -categorised 'Ordered_Drainage' spatial dataset . Drainage order must be determined in accordance with Protocol 19: Determination of drainage class and stream order .
ordered drainage line	Any drainage line , drainage depression , stream or watercourse shown in the LPI - supplied and FCNSW -categorised 'Ordered_Drainage' spatial dataset . Drainage order must be determined in accordance with Protocol 19: Determination of drainage class and stream order . <i>Note: a drainage line mapped in the 'Ordered_Drainage' spatial dataset provides the indicative location of a drainage line and does not indicate the centreline of that drainage line.</i>
other spatial dataset	A GIS dataset that contains the location or boundary of a feature relevant to the approval or an archived spatial dataset . The EPA is the custodian of all other spatial datasets unless otherwise stated in the approval .
outcome statement	Any section of the approval titled 'outcome statement'.
outfall	Where the road or track cross section is shaped to direct surface runoff to the downhill side of the road or track .
outlet	The point at which water discharges from a road drainage structure , a track drainage structure , a road crossing or a track crossing .
patch	An area of land: 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 64 of the approval and Protocol 23 ; and 2. mapped in the 'Patch' spatial dataset .
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 .

Term	Meaning
<i>pick/picking</i>	Has the same meaning as in the <i>BC Act</i> .
<i>pile</i>	A log suitable for use in the ground as foundation support.
<i>plant</i>	Has the same meaning as in the <i>BC Act</i> .
<i>POEO Act</i>	Means the <i>Protection of the Environment Operations Act 1997</i> (NSW).
<i>pole</i>	A log suitable for use as a support structure, typically for power and communications transmission.
<i>pollution</i>	Has the same meaning as in the <i>POEO Act</i> .
<i>pollution incident</i>	Has the same meaning as in the <i>POEO Act</i> .
<i>post-harvest burn</i>	A <i>burning operation</i> conducted after the <i>completion</i> of a <i>harvesting operation</i> , other than a <i>hazard reduction burn</i> .
<i>potential future hollow-bearing tree</i>	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.
<i>potential habitat</i>	<p>In the context of <i>flora</i>, means areas within the regions and vegetation formations, classes and types identified in the relevant <i>species</i> profile and locality descriptions published by the Office of Environment and Heritage or otherwise identified by relevant literature, other than <i>Cryptostylis hunteriana</i>, in which case <i>potential habitat</i> means areas within 200m of a <i>record</i>.</p> <p>In the context of <i>fauna</i>, means <i>modelled habitat</i> and <i>Rufous Scrub-bird micro-habitat</i> and <i>Hastings River Mouse micro-habitat</i>.</p>
<i>potential subterranean bat roost</i>	<p>A cave, disused mine shaft, mine or tunnel or rock overhang where:</p> <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; or 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

Term	Meaning
	<p>(c) it links to a horizontal shaft that is at least one metre long; or</p> <p>3. a mine or tunnel that meets the following description:</p> <p>(a) at least one entrance has a diameter of at least 0.5 metres;</p> <p>(b) the length of the mine or tunnel running horizontally is at least three metres; and</p> <p>(c) the cavity is at least one metre high at some point; or</p> <p>4. a rock overhang with holes or crevices (or both) in the roof or wall protected by the overhang.</p>
pre-harvest burn	A burning operation conducted prior to the commencement of a harvesting operation , other than a hazard reduction burn .
premises	The premises to which the approval applies.
Principles of Ecologically Sustainable Forest Management	As described in part 5B of the <i>Forestry Act 2012</i> (and the NSW Regional Forest Agreements for Eden, Southern and North East).
protected feature	Any habitat, habitat feature, record , or any other environmental feature identified for protection by the approval by means of an exclusion zone .
protected species	Is a protected plant or protected animal listed in Schedule 5 or Schedule 6 of the BC Act .
protocol	Any document entitled 'protocol' declared by either the Chief Executive Officer or Chief Environmental Regulator of the EPA to be in force for the purposes of section 69P(3) of the <i>Forestry Act 2012</i> , and which is applied or adopted by the approval and amended from time to time.
Provisional GKNP assessment area	The areas mapped in the 'Provisional_GKNP_Assessment_Area' spatial dataset , as updated by the EPA from time to time.
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 'Rainfall_Erosivity' spatial dataset .
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 .

Term	Meaning
rainforest	<p>Land mapped:</p> <ol style="list-style-type: none"> 1. in the 'Rainforest' spatial dataset; 2. in the 'Assessed_Rainforest' spatial dataset; and 3. as rainforest in an FCNSW field dataset. <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> <p><i>Note: The 'Rainforest' spatial dataset is inclusive of 20 metre exclusion zones for the rainforest types and IFOA Subregion as described in Protocol 25, condition 25.4(3)(b)(i)-(iii).</i></p>
rare forest	<p>Land mapped in the:</p> <ol style="list-style-type: none"> 1. 'Rare_Forest' spatial dataset; 2. 'Assessed_Rare_Forest' spatial dataset; or 3. a FCNSW field dataset.
record	<p>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:</p> <ol style="list-style-type: none"> 1. 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 (from the last date of the observation where one is registered) prior to the approval of the operational plan; 2. recorded by FCNSW or their agents during a targeted flora survey or a targeted fauna survey (as required in condition 56 of the approval) or broad area habitat search (as required by condition 57 of the approval) or at any other time during the planning or carrying out of a forestry operation; or 3. any other information about the location of a threatened species held by FCNSW, or <p>In relation to fauna in the Provisional GKNP assessment area, in addition to the above, record also includes a koala hub.</p> <p>Note: To avoid doubt, this additional definition of record to include a koala hub in the Provisional GKNP assessment area is not intended to trigger obligations under Condition 118.</p> <p>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:</p> <ol style="list-style-type: none"> 1. 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 (from

Term	Meaning
	<p>the last date of the observation where one is registered) prior to the approval of the operational plan;</p> <p>2. recorded by FCNSW or their agents during a targeted flora survey or a targeted fauna survey (as required in condition 56 of the approval) or broad area habitat search (as required by condition 57 of the approval) or at any other time during the planning or carrying out of a forestry operation; or</p> <p>3. any other information about the location of a threatened species held by FCNSW.</p> <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 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, or where the location accuracy of the record is greater than 1km, 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 and to its natural floristic composition .
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 ‘Regrowth_Zone’ spatial dataset .
rehabilitate	To return an area of land to a stable condition when stabilisation measures are inadequate and may include mulching, re- seeding or replanting .

Term	Meaning
relevant IFOA	The Integrated Forestry Operations Approval that was in place prior to the commencement of the approval , for each of the: <ol style="list-style-type: none"> 1. Upper North East Subregion; 2. Lower North East Subregion; 3. Southern Subregion; and 4. 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	Actual or potential harm to a threatened species or threatened ecological community that: <ol style="list-style-type: none"> 1. is not trivial; 2. could be considered an offence under the BC Act or FM Act (or could be considered such an offence if it were not otherwise permitted by the approval); 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	In reference to: <ol style="list-style-type: none"> 1. an annual plan, means the 12-month period over a financial year; and 2. an annual return, means the 12-month period from the date of issue anniversary date of the approval.
research activity	Research undertaken to gain an improved understanding of the environmental impacts of forestry operations or alternative forest or species management practices.
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 Protocol 5: Approvals for restricted activities .

Term	Meaning
retained tree	<ol style="list-style-type: none"> 1. A <i>hollow-bearing tree, nectar tree, giant tree, dead standing tree, Glossy Black-cockatoo feed tree, Glider sap feed tree</i> or <i>Koala browse tree</i> retained for the purpose of conditions 63 and 64 of the <i>approval</i>; <i>or</i> 2. A tree mapped on the: <ol style="list-style-type: none"> a. Retained_Trees' <i>spatial dataset</i>; b. Assessed_Retained_trees' <i>spatial dataset</i> or c. a <i>FCNSW field dataset</i>.
ridge and headwater habitat	<p>The area mapped in the:</p> <ol style="list-style-type: none"> 1. 'Ridge_Headwater_Habitat' <i>spatial dataset</i>; 2. 'Assessed_Ridge_Headwater_Habitat' <i>spatial dataset</i>; or 3. a <i>FCNSW field dataset</i>.
rill	<p>A form of <i>erosion</i> that is characterised by small channels up to 0.3 metres deep which have cut into the surface of a slope.</p>
riparian exclusion zone	<p>A protected area that applies to each side of a <i>drainage line</i> (measured from the <i>bankfull level</i>) as specified in condition 95 and 96 of the <i>approval</i>.</p> <p><i>Note: These areas are shown in the 'Indicative_Riparian_Exclusion_Zone' <i>spatial dataset</i>, however this dataset uses a proxy for stream width and is not measured from the <i>bankfull level</i>. Its use is purely for indicative purposes, and not taken to be the <i>ESA</i>.</i></p>
road	<p>Any route used for vehicular access to, and the transport of logs from, the point of loading within the <i>compartment</i>.</p>
road crossing	<p>A structure designed to allow the <i>crossing</i> of a <i>drainage feature</i> with a <i>road</i> comprising either:</p> <ol style="list-style-type: none"> 1. a <i>bridge</i>; 2. a <i>culvert</i>; 3. a <i>causeway</i>; 4. an existing <i>stable gully stuffer</i>; or 5. an existing <i>sidecut causeway</i>.
road drainage structure	<p>Any structure designed to direct water along, across or underneath a <i>road</i>, including a catch drain, mitre drain, <i>relief pipe</i>, rollover bank, spoon drain and <i>table drain</i>.</p>
road prism	<p>That part of the <i>road</i> from the <i>inflexion point</i> at the toe of the <i>fill batter</i> to the <i>inflexion point</i> at the top edge of the cut <i>batter</i> or, where there is no cut or <i>fill batter</i> as part of the <i>road</i>, that part of the <i>road</i> from the outside edge of the pavement on either side of the <i>road</i>.</p>

Term	Meaning
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	<ol style="list-style-type: none"> 1. Any area of 0.1 hectare (as measured in accordance with Protocol 28: Rocky outcrops and cliffs) or more where: <ol style="list-style-type: none"> (a) the land surface is: <ol style="list-style-type: none"> (i) greater than 70 per cent rock; (ii) skeletal soils (shallow soils where rocks are at times exposed); or (iii) a combination of these; and (b) in that area there are less than 50 trees per hectare (on average), which are greater than 30 centimetres at stump height; and 2. areas of rocky outcrop mapped within: <ol style="list-style-type: none"> (a) the 'Rock_Outcrop_Cliffs' spatial dataset; (b) the 'Assessed_Rock_Outcrop_Cliffs' spatial dataset; or (c) a FCNSW field dataset. <p><i>Note: Rocky outcrops can include but are not limited to, all areas of forest type 'rock' (FT no. 234) and areas within the 'Indicative_Rock_Outcrop_Cliffs' spatial dataset.</i></p>
Rufous Scrub-bird micro-habitat	<p>Areas of rainforest and/or wet sclerophyll forest that are:</p> <ol style="list-style-type: none"> 1. one hectare or greater in size; and 2. contain extremely dense cover between two and 50 centimetres above the ground; or 3. moderate cover between 50 and 100 centimetres 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.

Term	Meaning
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, pisle, pole, girder log or low quality log .
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 .
SEED portal	The NSW Government portal for Sharing and Enabling Environmental Data (SEED) or its replacement.
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 .
selective harvesting limits	The limits required by condition 46 of the approval and Protocol 7: Harvesting limits for selective harvesting .
selective harvesting tract	An area within the intensive harvesting zone where the long-term intent is for selective harvesting to occur which is labelled 'selective harvesting tract' and mapped in the 'Tract' spatial dataset .
selective harvesting zone	The area attributed as 'selective harvesting' and mapped in the 'Harvesting_Zone' spatial dataset .
side-cut snig tracks	A side-cut snig track is formed by cutting soil or rock material from a hillside to create a level track surface .
side-cut causeway	A type of crossing for a side-cut road or side-cut snig track across a drainage feature formed by filling the drainage feature 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 drainage feature .
site-specific biodiversity condition	A condition developed and applied for a species or record of a species at a specific site/location for its protection or management as approved by the EPA .

Term	Meaning
site-specific limit condition	A condition relating to mixed intensity harvesting in a specified local landscape area as approved by the EPA .
site-specific operating condition	A condition issued by the EPA or the Ministers to be applied in a specific area or in a specific circumstance, in lieu of the conditions of the approval .
site-specific research condition	A condition required to be implemented in a research activity area as approved by the EPA .
slaked	The partial breakdown of soil aggregates in water due to the swelling of clay and the expulsion of air from pore spaces.
slight dispersion	In relation to an aggregate , means the partial breakdown of the aggregate in water, with less than 50 per cent of the aggregate dispersed .
small veneer log	A veneer log having a centre diameter under bark of 40 centimetres or less.
SMP exclusion zones	An area of land shown in the: 1. 'Southern_Brown_Bandicoot' spatial dataset ; 2. 'Giant_Burrowing_Frog' spatial dataset ; 3. 'Smoky_Mouse' spatial dataset ; or 4. 'Other_SMP' spatial dataset .
snig and snigging	The practice of hauling or dragging a log to a log dump , landing or stockpile using a skidder (or similar machine).
soak and seepage	Where water: 1. percolates from or below the ground; or 2. collects on or below the surface; of an area of hill slope, road batter or other landscape feature. 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 'Soil_Regolith' spatial dataset .

Term	Meaning
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 'Tumut_SouthCoast_Subregion' spatial dataset .
Southern meta-population	The area mapped in the 'Pouched_Frog_Sthmetapop_Model' spatial dataset .
Southern Subregion	A subregion of the Coastal IFOA Region attributed as 'Southern Subregion' and mapped in the 'Coastal_IFOA_Subregion' spatial dataset .
spatial dataset	A GIS dataset that includes (but is not limited to) any of the following: <ol style="list-style-type: none"> 1. ESA spatial dataset; 2. indicative ESA spatial dataset; 3. field dataset; 4. assessed dataset; or 5. other spatial dataset.
species	Has the same meaning as in the BC Act . Note: in the GKNP provisional assessment area , as koala hubs are a threatened species , koala hubs are also taken to be a species .
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: Matters covered by the approval .
species extinct in the wild	A species extinct in nature listed in Schedule 3 of the BC Act .
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 a record of scats, have been detected within a five metres radius; or 2. a site where a Spotted-tailed Quoll scat has been observed, or recorded, on more than one occasion within a five metres radius.

Term	Meaning
	<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 there is a record of it 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 (or recorded) 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 is a record 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, gullying, 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> <p>In any other context, it takes the ordinary meaning.</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	<p>Has the same meaning as in the Forestry Act and is mapped in the 'State_Forest' spatial dataset.</p>

Term	Meaning
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 centimetres in diameter.
stream breeding threatened frog	Any of the following species : <ol style="list-style-type: none"> 1. <i>Litoria booroolongensis</i> (Booroolong Frog); 2. <i>Litoria castanea</i> (Yellow-spotted Tree Frog); 3. <i>Litoria piperata</i> (Peppered Tree Frog); 4. <i>Mixophyes iteratus</i> (Giant Barred Frog); 5. <i>Mixophyes fleayi</i> (Fleay's Frog); or 6. <i>Mixophyes balbus</i> (Stuttering Frog).
strong dispersion	In relation to an aggregate , means the partial breakdown of the aggregate in water, with more than 50 per cent (but less than 100 per cent) of the aggregate dispersed .
stump height	The point of a tree or a tree stump, measured at 30 centimetres 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 centimetres, the highest point of the tree stump.
subject species	Species (including populations) of plants or animals that require a protective measure to be taken under the approval as they are subject to Parts 2, 3 or 4 of Protocol 31: Matters covered by the approval . Note: in the GKNP provisional assessment area , as koala hubs are a threatened species that require a protective measure to be taken as they are subject to Part 4 of Protocol 31: Matters covered by the approval , koala hubs are also taken to be a subject species .
subterranean roosting bat species	A species of microchiropteran bat that is known to roost in subterranean sites .
subterranean site	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); or 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.
suitably qualified person	A person who has experience or qualifications, or both, which enable them to carry out the requirements of a described job or

Term	Meaning
	task in a competent and professional manner and, where relevant, comply with the specific requirements in Protocol 6: Suitably qualified persons – training and experience.
sustainable yield	The long term estimated wood yield from forests that can be maintained from a given region in perpetuity under a given management strategy and suite of sustainable use objectives, as determined using the processes described in NSW Regional Forest Agreements , and as amended from time to time.
targeted flora survey	A survey described in condition 56.2 of the approval.
targeted fauna survey	A survey described in condition 56.2 of the approval.
table drain	The side drain of a road adjacent to the shoulders of the road.
TEC assessed areas	The area identified in the 'TEC_Assessed_Areas' spatial dataset.
TEC (certified)	The area identified in the 'TEC_Certified' spatial dataset and listed in Table 1 or 2 of Protocol 27: Threatened ecological communities.
TEC field key	A field identification guideline prepared by the EPA for the specific TEC listed in condition 27.4 of Protocol 27: Threatened ecological communities and displayed on the EPA website.
TEC (indicative)	The area identified in the 'Indicative_TEC' spatial dataset and listed in Table 2 of Protocol 27: Threatened ecological communities.
temporary log crossing	A type of temporary track crossing where logs are temporarily placed in a drainage feature to enable the short-term passage of a machine or vehicle.
temporary track crossing	A type of track crossing or crossing structure that is removed at the completion of harvesting operation in the areas specified in the approval.
threatened ecological community (TEC)	Where it relates to a vegetation community or ecosystem listed in Table 1 or Table 2 of Protocol 27: Threatened ecological communities , means any land mapped as a TEC in a: <ol style="list-style-type: none"> 1. TEC_Certified' spatial dataset; 2. 'Assessed_TEC' spatial dataset; or 3. a FCNSW field dataset. <p>In any other context, has the same meaning as in the BC Act.</p>
threatened plant	A plant that is listed in Schedule 1 of the BC Act and Protocol 31: Matters covered by the approval.

Term	Meaning
threatened species, population or ecological community	<p>Has the same meaning as in the BC Act.</p> <p>In relation to fish, or marine habitat, has the same meaning as in Part 7A of the FM Act.</p> <p>In the GKNP provisional assessment area, threatened species is taken to include koala hubs. Note: this is relevant to Condition 21.1(a)(i).</p>
timber product	Any of sawlogs, pulpwood logs, heads and offcuts or any other part of a tree sold under the Forestry Act.
track	A snig track or an extraction track.
track crossing	<p>A structure designed to allow the crossing of a drainage feature with a track comprising:</p> <ol style="list-style-type: none"> 1. a bridge; 2. a culvert; 3. a causeway; 4. a temporary log crossing; or 5. an existing gully stuffer.
track drainage structure	Any structure designed to direct water across a track surface, including crossbanks , hay bales or sand bags.
tract	The 'Tract' spatial dataset .
transition period	The two-year period from the commencement of the approval .
tree retention clumps	<p>An area required to be mapped in accordance with condition 63.1 of the approval or the areas mapped in:</p> <ol style="list-style-type: none"> 1. the 'Tree_Retention_Clump' spatial dataset; 2. the 'Assessed_Tree_Retention_Clump' spatial dataset; or 3. FCNSW field dataset.
Tumut Area	The area of the Southern Subregion attributed as 'Tumut' and mapped in the 'Tumut_SouthCoast_Subregion' spatial dataset .
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	<p>In relation to a drainage depression and drainage line, means any drainage feature that is not mapped on the:</p> <ol style="list-style-type: none"> 1. 'Classified_Drainage_Line' spatial dataset; or 2. 'Ordered_Drainage' spatial dataset.

Term	Meaning
	<p>In relation to a ESA, means any ESA that is not mapped in:</p> <ol style="list-style-type: none"> 1. an ESA spatial dataset; 2. an assessed dataset; or 3. a field dataset.
upgrade	<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 centimetres 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 metres or greater.</p> <p>In relation to a crossing, means to improve or replace a crossing structure.</p> <p>In any other context, it takes the ordinary meaning.</p>
Upper North East Subregion	A subregion of the Coastal IFOA Region attributed as 'Upper North East Subregion' and mapped in the 'Coastal_IFOA_Subregion' spatial dataset .
veneer log	A log suitable for peeling or slicing thin sheets of timber, typically for the manufacture of plywood.
walkover techniques	<p>Snigging or forwarding where:</p> <ol style="list-style-type: none"> 1. no track construction or blading off of groundcover is performed; 2. at least 70 per cent existing natural groundcover is retained; and 3. the path of the snigging or forwarding remains stable.
waste	Has the same meaning as in the POEO Act .
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 POEO Act .
waters	Has the same meaning as in the POEO Act .
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; 2. land mapped in the <ol style="list-style-type: none"> a. 'Wetlands' spatial dataset; b. coastal management SEPP wetlands;

Term	Meaning
	<p>c. 'Assessed_Wetland' spatial dataset; or</p> <p>d. a FCNSW field dataset.</p> <p><i>Note: Wetlands may include, but are not limited to 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), and land mapped in the 'Indicative_Wetland' spatial dataset.</i></p>
WHS Act	<i>Work Health and Safety Act 2011 (NSW).</i>
wildlife habitat clumps	<p>Areas required to be identified in accordance with condition 50.1 of the approval and mapped in the</p> <ol style="list-style-type: none"> 1. 'Wildlife_Clump' spatial dataset; 2. 'Assessed_Habitat_Clump' spatial dataset; or 3. FCNSW field dataset.

CHAPTER 10: TRANSITIONAL ARRANGEMENTS

Protocol 40: Transitional arrangements

Version 5: Approved by the EPA Chief Executive Officer on 16 March 2020

40.1 Introduction

- (1) This **protocol** applies to the transition of **forestry operations** from the **relevant IFOA** in place prior to the commencement 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 of the **approval**, demonstrating the ongoing relevancy of each of the transitional arrangements set out in this **protocol**.

40.3 Annual plan of forestry operations

- (1) The first **annual plan of forestry operations** required under condition 32.1 of the **approval** must be prepared for the first full financial year after the commencement of the **approval**.

40.4 Local landscape areas

- (1) The establishment of **local landscape area** maps under condition 44 of the **approval** must be prepared prior to the commencement of the following in each **local landscape area**:
 - (a) the first **forestry operation** conducted under the **approval**, or
 - (b) the first **forestry operation** conducted under condition 40.6(1)(d) of this **protocol**.

40.5 Wildlife habitat clumps

- (1) The establishment of **wildlife habitat clumps** in each **local landscape area** as specified in condition 50 of the **approval** must be prepared prior to the commencement of the following in each **local landscape area**:
 - (a) the first **forestry operation** to be conducted under the **approval**; or
 - (b) the first **forestry operation** to be conducted under condition 40.6(1)(d) of this **protocol**.

40.6 Status of operational plans approved prior to or during the **transitional period**

- (1) For the purposes of condition 13.3 of the **approval**, where a plan of operations the equivalent of an **operational plan**:
 - (a) is listed in Table 2 to this **protocol**, or
 - (b) is specifically approved in writing by the EPA for the purposes of this **protocol**,

FCNSW may continue, commence or otherwise carry out the **forestry operation** outlined in that plan of operations during the **transitional period** in accordance with either:

- (c) the conditions of the **relevant IFOA** as amended by condition 40.6(6) of this **protocol** except in relation to:

- (i) **threatened species, population or ecological community** within the meaning of Part 7A of the **FM Act** (“**Fisheries Threatened Species Issues**”); and
- (ii) conditions 6 to 23, inclusive, of Schedule 4 to Appendix A of the **relevant IFOAs** referred to in items A, C and D of Table 1 below, and of Schedules 4 and 4A to Appendix A of the **relevant IFOA** referred to in item B of Table 1 below:
 - (A) only to the extent that those conditions would otherwise apply to “non-scheduled forestry activities” as defined by the environment protection licence referred to in condition 40.6(1)(c)(ii) above; and
 - (B) only if **FCNSW** elects in writing to the **EPA**, for all the conditions referred to in condition 40.6(1)(c)(ii) above not to apply to those “non-scheduled forestry activities”;

Note: Under condition 40.6(1)(c)(ii), **FCNSW** cannot elect for the environment protection licence conditions referred to in that condition not to apply in respect of “scheduled forestry activities”, as understood in the environment protection licence referred to above.

- (d) the conditions of the **approval**, with the exception of planning and survey requirements deemed to comply with the **approval** as set out in 40.9 or 40.10 of this **protocol**; or
 - (e) the conditions of the **approval**.
- (2) Before continuing, commencing or otherwise carrying out a **forestry operation** during the **transitional period**, **FCNSW** must inform the **EPA** in writing whether it proposes to continue, commence, or otherwise carry out the **forestry operation** under either condition 40.6(1)(c), (d) or (e) of this **protocol**.
- (3) Where **FCNSW** elects to proceed under condition 40.6(1)(c) of this **protocol**, **FCNSW** must, during the **transitional period**:
- (a) comply with the requirements of the **relevant IFOA** (as if it were in force) for that **forestry operation**, except in relation to the matters referred to in condition 40.6(1)(c)(i) and, where applicable, condition 40.6(1)(c)(ii) of this **protocol**; and
 - (b) comply with the **approval** and **protocols** in relation to Fisheries Threatened Species Issues, and update the plan of operations referred to in condition 40.6(1) of this **protocol** to state that **FCNSW** will carry out the **forestry operation** in accordance with the **approval** and **protocols** to the extent that they relate to Fisheries Threatened Species Issues.
- (4) Where **FCNSW** elects to proceed under condition 40.6(1)(c) of this **protocol**, the following sub-conditions apply and have effect for **operational plans** as indicated in Table 2:
- (a) **FCNSW** must, during the **transitional period**, comply with the **approval** and **protocols** in relation to **threatened ecological communities** (“**TECs**”), and update the plan of operations referred to in condition 40.6(1) of this **protocol** to state that **FCNSW** will carry out the **forestry operation** in accordance with the **approval** and **protocols** to the extent that they relate to **TECs**; and

Note: It is a defence to a prosecution under Part 2, Division 1 of the **BC Act** if the act that constituted the offence was the carrying out of a forestry operation to which an IFOA applies, and the forestry operation was carried out in accordance with the **approval** and **protocols**.

- (b) despite any provision to the contrary in a **relevant IFOA**, during the **transitional period**, references to ‘koala intermediate use areas’ in a **relevant IFOA** are taken to mean any compartments that contain any area labelled ‘Koala browse prescription 1’ or ‘Koala browse prescription 2’ in the ‘Koala_Browse_Tree_Prescriptions’ **spatial dataset**.

Note: Under amendments to the Forestry Act 2012 made by the Forestry Legislation Amendment Act 2018, **relevant IFOAs** were reviewed and consolidated, and terms of previous relevant licences were integrated as

terms of the **approval** rather than as terms of the relevant licence. For the avoidance of doubt, where **FCNSW** elects to rely on condition 40.6(1)(c) of this **protocol**, all of the conditions of the **relevant IFOAs**, including conditions of the threatened species licences and environment protection licences, applicable to that **Coastal IFOA Subregion** must be implemented and complied with – except for the fisheries management licence and conditions to which 40.6(1)(c)(ii) of this **protocol** applies.

- (5) If **FCNSW** makes an election under condition 40.6(1)(c)(ii), **FCNSW** must not cause or permit **water pollution** in undertaking the **forestry operation** to which the election applies.
- (6) The **relevant IFOAs** listed in Table 1 to this **protocol** are taken to be annexed to and incorporated into this **protocol**, with the word ‘may’ in condition 7.3 of Appendix A to each **relevant IFOA** deleted and replaced with the word ‘must’.

Table 1: Relevant IFOAs

Approvals for the carrying out of forestry operations under the <i>Forestry Act 2012</i> in the following coastal regions of New South Wales:	
A.	Eden Region – titled ‘Integrated Forestry Operations Approval for the Eden Region’ (including all licences and amendments) and available at the following website www.epa.nsw.gov.au/your-environment/native-forestry/integrated-forestry-operations-approvals/eden-ifo
B.	Southern Region – titled ‘Integrated Forestry Operations Approval for the Southern Region’ (including all licences and amendments) and available at the following website www.epa.nsw.gov.au/your-environment/native-forestry/integrated-forestry-operations-approvals/southern-ifo
C.	Upper North East Region – titled ‘Integrated Forestry Operations Approval for the Upper North East Region’ (including all licences amendments) and available at the following website www.epa.nsw.gov.au/your-environment/native-forestry/integrated-forestry-operations-approvals/upper-north-east-ifo
D.	Lower North East Region – titled ‘Integrated Forestry Operations Approval for the Lower North East Region’ (including all licences amendments) and available at the following website www.epa.nsw.gov.au/your-environment/native-forestry/integrated-forestry-operations-approvals/lower-north-east-ifo

Table 2: operational plans signed prior to the commencement of the approval

IFOA Sub Region	State Forest	Compartments	Does condition 40.6(4) of this <i>protocol</i> apply?
Upper North East	Clouds Creek	125, 126, 127	Yes
Upper North East	Ewingar	656, 657, 663, 664, 669	No
Upper North East	Gibraltar Range	24, 25, 26	Yes
Upper North East	Girard	456, 457	Yes
Upper North East	Kangaroo River	242, 243, 244, 245	Yes
Upper North East	Sheas Nob	182, 185, 186, 187, 188, 221, 232	Yes
Upper North East	Wild Cattle Creek	533, 551, 552	No
Upper North East	Richmond Range Profit a Prendre	Lots 101,104 DP 751077	No

IFOA Sub Region	State Forest	Compartments	Does condition 40.6(4) of this <i>protocol</i> apply?
Lower North East	Bulls Ground	59, 60, 61	No
Lower North East	Giro	19, 20	Yes
Lower North East	Gladstone	229, 230	Yes
Lower North East	Ballengarra	7, 8, 9	No
Lower North East	Ballengarra	83, 84, 85, 86, 87	No
Lower North East	Barrington Tops	63, 64, 65	No
Lower North East	Bulga	90, 94, 95, 96	No
Lower North East	Chichester	19	No
Lower North East	Chichester	26, 27	No
Lower North East	Comboyne	139, 144, 145	No
Lower North East	Gladstone	194, 211, 212, 213, 214	No
Lower North East	Gladstone	228, 231, 232, 233	No
Lower North East	Kerewong/Upsalls Creek	138, 140, 141, 142, 143, 260	No
Lower North East	Olney	66	No
Lower North East	Olney	80, 81 & 82	No
Lower North East	Ourimbah	141 & 142	No
Lower North East	Riamukka	81, 96	No
Lower North East	Styx River	540, 541, 542, 552	No
Lower North East	Wang Wauk/Bulahdelah	138, 139, 145	No
Lower North East	Olney	50, 52	Yes
Tumut area	Bago	10	No
Eden	Bondi	1206, 1207	No
Eden	Nadgee	59, 60, 63	No
Eden	Yambulla	362, 363, 365	No
Eden	Yambulla	415, 418, 423, 483, 484, 506, 507, 508	No
Southern	Benandarah	114, 116	No
Southern	Tallaganda	2451, 2455	No
Southern	Clyde	206, 467	No
Southern	Tallaganda	2451, 2455	No

Note: *Forestry operations* listed in Table 2 of this *protocol* may include areas that were subject to bushfires between 2019 and 2020. *Forestry operations* in these areas must consider condition 23.4 of the *approval* and not proceed under transition arrangements outlined in this *protocol* unless the *EPA* has first been consulted.

(7) [Deleted].

40.7 Register of plans amended to be carried out under the approval.

(1) **FCNSW** must maintain a register of **operational plans**, or include in the **operations register** required in condition 28 of the **approval**, during the **transitional period**, information that:

- (a) identifies for each **forestry operation**, what transitional arrangements specified in condition 40.6(1) apply to all **forestry operations** that will be undertaken that month;

- (b) identifies for each **forestry operation**, what transitional arrangements specified in condition 40.6(1) apply to all **forestry operations** that will be undertaken in the following month; and
 - (c) is published on **FCNSW** website.
- (2) **FCNSW** must provide a copy of this register to the **EPA**:
- (a) within one week of the commencement of the **approval**, and
 - (b) on the first day of each month for the duration of the **transitional period**, or as otherwise requested by the **EPA**.

40.8 Expiry of transitional arrangements

- (1) After the commencement of the **approval** all new **operational plans** must be developed and implemented in accordance with the conditions of the **approval**, unless otherwise approved under condition 40.6(1) of this **protocol**.
- (2) From the end of the **transitional period**, all **forestry operations** must be carried out in accordance with the conditions of the **approval**, and can no longer be carried out under the **relevant IFOAs**, unless otherwise approved in writing by the **EPA**.
- (3) [Deleted]

40.9 Pre-operational planning

- (1) Where **FCNSW** has undertaken **operational planning** for an **operational area** under the conditions of the **relevant IFOA** in place prior to the commencement of the **approval**, and that **operational planning** was undertaken prior to the commencement of the **approval**, that **operational planning** is taken to meet the requirements outlined in the following **protocols** and condition 53 of the **approval**, during the **transitional period**:
 - (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) Operational planning referred to in condition 40.9(1) of this **protocol** is only taken to meet the requirements of the **protocols** listed at 40.9(1) and condition 53 of the **approval** if:
 - (a) the **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 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.

40.10 Targeted flora and fauna surveys

- (1) Where **FCNSW** has undertaken 'pre-logging and pre-roading compartment traverse surveys' for an **operational area** under the conditions of the **relevant IFOA** in place prior to the commencement of the **approval**, and those 'pre-logging and pre-roading compartment traverse surveys' were undertaken prior to the commencement of the **approval**, the requirements of **targeted flora and fauna surveys** required for flora under condition 56 of the **approval** and **Protocol 20: Pre-operational surveys** in the relevant **operational area** are deemed to have been met, during the **transitional period**, if the 'pre-logging and pre-roading compartment traverse surveys' undertaken:
- (a) are less than five years old; and
 - (b) comply with the conditions of the **relevant IFOA** in place prior to the commencement of the **approval**.
- (2) In this **protocol**, 'pre-logging and pre-roading compartment traverse surveys' are the surveys of the same name, and their related requirements, as set out in the **relevant IFOA** in place prior to the commencement 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 forestry operations.

40.11 Intensive harvesting limits

- (1) In the first five years from the commencement of the **approval** or until the first formal review of the **approval**,
- (a) the maximum size of each **intensive harvesting coupe** established under condition 45.3 of the **approval** may be up to 60 hectares; and
 - (b) only one **intensive harvesting coupe** described in condition 40.11(1)(a) is permitted in each **local landscape area**.
- (2) In the first five years from the commencement 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 45.4 of the **approval** may be reduced to a minimum of seven years.
- (3) **FCNSW** must notify the **EPA** if and where the transitional arrangements set out in conditions 40.11(1)(a) or 40.11(1)(b) have been applied, including:
- (a) listing these arrangements in the **operational plan** set out in condition 53 of the **approval** and the record of the history of the **forestry operation** as set out in conditions 39.1 and 39.2 of the **approval**; and
 - (b) including where these arrangements have been applied in the 'Assessed_Intensive_Harvesting' **spatial dataset**.

