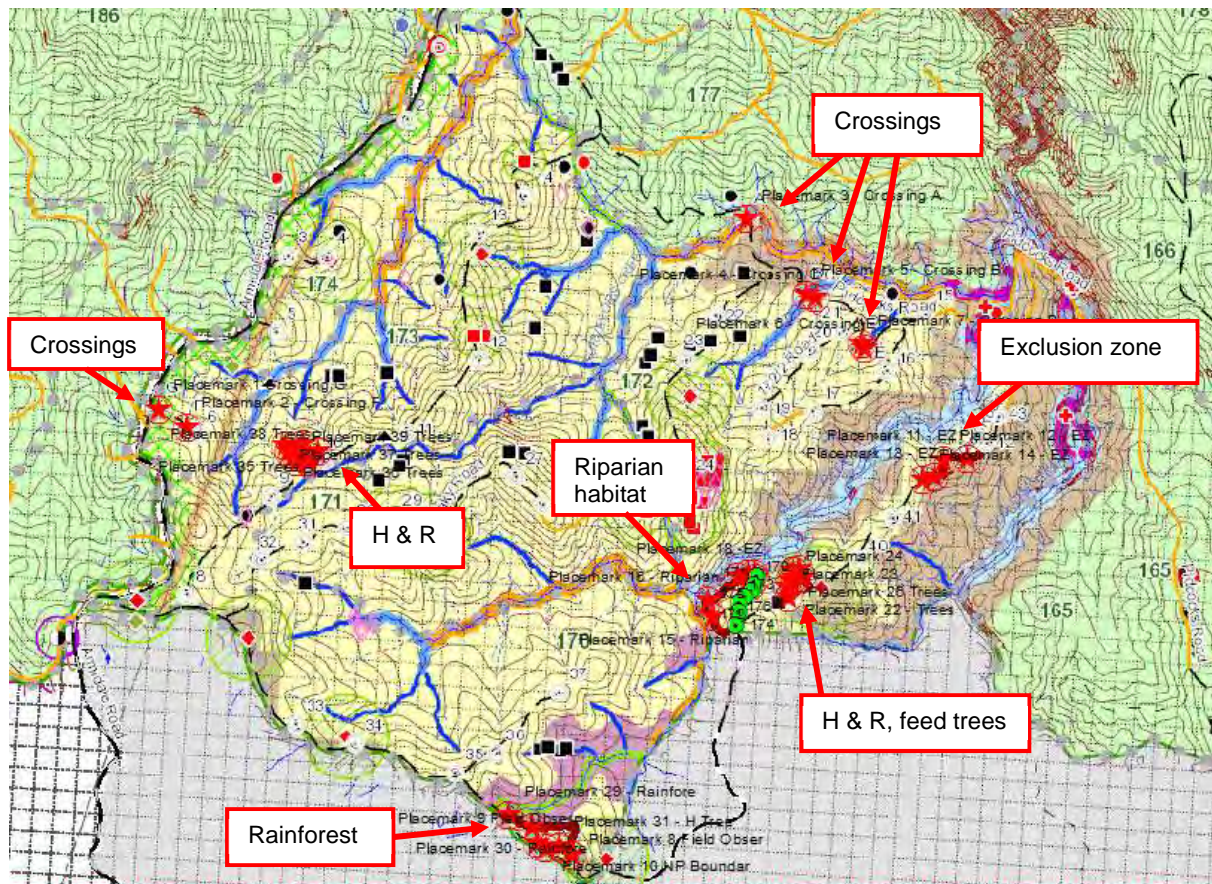


# EPA AUDIT REPORT – CROWN FOREST CLOUDS CREEK STATE FOREST, COMPARTMENT(S) 167-168 & 170-174

<b>Auditee:</b>	Forestry Corporation NSW
<b>Audit scope:</b>	Clouds Creek State Forest, Compartments 167-168 and 170-174 (Figure 1). The field audit was undertaken over 2 days, and a follow up inspection was undertaken on a separate day the following week.
<b>Region:</b>	Upper North East
<b>Date/Audit timing:</b>	29-30 November and 4 December 2017
<b>Lead EPA auditor:</b>	Alison Matheson
<b>Assisting EPA auditors:</b>	Kelvin Christiansen and Leigh Henderson
<b>Justification of audit:</b>	This was a proactive audit focusing on EPA compliance priority areas.
<b>Audit objectives:</b>	<ol style="list-style-type: none"> <li>1. Assess compliance against audit criteria that reflect EPA compliance priorities.</li> <li>2. Assess and categorise risk of any identified non-compliance or appropriate further observations.</li> <li>3. Request action plans against key audit findings so that auditee can use risk categorisation to inform timeliness and level of risk reduction control.</li> <li>4. Promote continuous improvement of the environmental performance of forestry operations.</li> </ol>
<b>Audit criteria:</b>	<p>Threatened Species Licence (TSL):</p> <ul style="list-style-type: none"> <li>• Cond. 5.6 – Retention, selection and protection of retained trees</li> <li>• Cond. 5.4 – Rainforest exclusion zone mark-up and protection</li> <li>• Cond. 5.1 (f) – Mark-up of exclusion and buffer zones</li> <li>• Cond. 5.7 – Riparian habitat protection</li> <li>• Cond. 5.6(g)(i) – Glossy Black-Cockatoo feed trees</li> <li>• Cond. 6.17 – Yellow-bellied Glider Modified Harvest Area</li> </ul> <p>Environment Protection Licence (EPL):</p> <ul style="list-style-type: none"> <li>• Schedule 5, cl. 37 – Road Crossing Drainage</li> <li>• Schedule 4, cl. 6-20 – Drainage Feature Protection</li> </ul> <p><i>Protection of the Environment Operations Act 1997 (POEO Act)</i></p> <ul style="list-style-type: none"> <li>• Section 120 - 'A person must not pollute waters'</li> </ul>
<b>Summary of Operations</b>	<p><b>Harvesting Objectives and Stand Condition</b></p> <p>In stands dominated by mixed age spotted gum forest type, the objective is to harvest the mature cohort within the stand and to open up the canopy and mechanically disturb the soil to encourage vigorous regeneration.</p> <p>In the Coastal Blackbutt/mixed age moist hardwood stand, the objective is to harvest the merchantable component of the mature aged crop and retain the vigorous younger age class trees for a future cut.</p>

**ASSESSED: H & R Retention and Protection, Exclusion zone mark up and protection, Riparian Habitat Protection, Road crossings, Feed tree retention and protection**



**Figure 1.** FCNSW HPOM for compartments 167-168 and 170-174 in Clouds Creek State Forest. Red markers (placemarks) indicate areas inspected during the EPA audit on 29-30 November 2017, and green markers (waypoints) indicate area inspected during EPA follow up inspection 4 December 2017. Note: Waypoints and placemarks are both GPS points but were recorded using separate systems, hence the different terms.

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## **AUDIT FINDINGS - OVERVIEW**

A summary of EPAs findings is shown in the table below.

<b>IFOA condition</b>	<b>Non-compliances</b>	<b>Compliances</b>	<b>Not Determined</b>
TSL 5.6 – Retention, Selection and Protection of Retained Trees	0	1 (Retention) 16 (Selection H) 16 (Selection R) 33 (Protection)	0
TSL 5.4 – Rainforest exclusion zone protection	0	1	0
TSL 5.1f – Exclusion zone mark-up	3 (1 Rainforest, 1 Riparian, 1 Mapped Limited Falling)	0	0
TSL 5.7 – Riparian habitat protection	0	1	0
EPL cl 6-20 – Drainage feature protection (Unmapped drainage line)	1	0	0
TSL 5.6(g)(i) – Glossy Black-Cockatoo feed trees	0	0	1
TSL 6.17 – Yellow-bellied Glider Modified Harvest Area	0	1	0
EPL cl37 – Crossing Drainage	0	8	0
POEO S120 – ‘pollute waters’	1	7	0
<b>TOTAL</b>	<b>5</b>	<b>84</b>	<b>1</b>

## **AUDIT RECOMMENDATIONS**

<b>Action Details</b>	<b>Non-compliance Code*</b>	<b>Target/Action Date</b>
Mark-up of exclusion zones	Orange: Riparian Habitat, Rainforest, Mapped Limited Falling not marked up.	At future operations, to avoid incursions of forestry activities into exclusion zones, ensure all boundaries are marked up as per the TSL.
Drainage feature Protection	Orange: Snig track within operational zone of unmapped drainage line.	At future operations, avoid construction of snig tracks within operational zones of riparian habitat.
Selection and Protection of retained trees	Yellow: Marked H tree with logging debris within 5m of base.	At future operations take all measures to ensure greater care is taken in the protection of retained trees.  Remove logging debris that is within 5m of the base of H tree.

Action Details	Non-compliance Code*	Target/Action Date
Crossing drainage and stability	Yellow: Causeway raised above natural surface and stabilisation of downstream edge of crossing B.	Rectify structure of crossing B.

\*\*Please refer to Page 22 for explanation of non-compliance codes

## **AUDIT FINDINGS - FIELD COMPONENT**

### **1. Tree Retention / Mark-up**

This part of the audit focuses on retained hollow-bearing (habitat) and recruitment trees. The Upper North East Threatened Species Licence ("TSL") sets out the minimum number of habitat and recruitment trees that must be retained per hectare of a net logging area, as well as the criteria for selecting individual trees in Non-regrowth and Regrowth Zones. Clouds Creek State Forest is within the Regrowth Zone, and as such the criteria are set out in [Condition 5.6\(d\)](#) and (e). All retained trees must be marked in the field for protection ([Condition 5.6\(h\)\(iii\)](#)). Therefore, the EPA assesses each tree for three different criteria, namely:

1. Retention
2. Selection
3. Protection

#### *Comment and evidence*

The EPA found that FCNSW was **compliant** with the relevant retention conditions in the areas assessed.

This finding is based on two transect assessments for the retention of hollow-bearing (H trees) and recruitment trees (R trees) in the regrowth zone. Each transect consisted of a walk through transect noting mark-up 25m either side, Transect 1 was about 280m in Compartment 167 near dump 39 and Transect 2 was about 380m in Compartment 173 near dump 10 (approximately 3.3 hectares).

In transect 1, EPA officers recorded 10 marked H trees and 11 marked R trees. In transect 2, EPA officers recorded 6 marked H trees and 5 marked R trees. This translates to an average of about 4.8 H trees per hectare and 4.8 R trees per hectare. In the regrowth zone, the TSL requires a minimum 5 H trees per hectare, but where this density is not available all H trees within the net logging area must be retained, and 1 R tree per H tree retained. The EPA officers noted that the retained trees were representative of the available H and R trees, given the stumps within the area were of equivalent or smaller size. The EPA recorded a single compliance relating to tree retention.

#### *Retention rates for hollow-bearing and recruitment trees: regrowth zone*

In a regrowth zone, the TSL provides that a minimum of five (5) H trees must be retained per hectare of net logging area. Where there are fewer than five H trees per hectare, all the available H trees must be retained ([Condition 5.6d](#)). For each H tree retained, a single R trees must be retained ([Condition 5.6e](#)).

#### *Calculating compliances / non-compliances: tree retention*

Within the Upper North East Region, the EPA makes a single finding of compliance or non-compliance for tree retention in relation to the entire net harvest area. This is in line with the TSL Condition 5.6, which requires certain numbers of trees to be retained per hectare. In other



words, there is no requirement for a certain number of H and R trees to be retained *in each hectare*. Rather, the requirement is for a minimum number of trees *per hectare* of net logging area. To determine compliance with this requirement, the EPA surveys a minimum of two hectares within net logging area and calculates an average number of retained trees per hectare of survey area. While this does not capture all the net logging area, the EPA considers it sufficient for the purposes of an audit (see also the definition of an audit at the start of this report).

#### *Why is it important?*

The EPA considers it important that the required quantity of H and R trees are retained, as required under the TSL. The number of R trees retained must equal the number of H trees, to provide for future hollow-bearing resources.

## **2. Hollow-bearing Trees: Selection**

This part of the audit focused on selection of H trees that must be retained under [Condition 5.6](#) of the TSL. Condition 5.6(a)(i) defines a H tree as:

*“a live tree in the net logging area where the base, trunk or limbs contain hollows, holes and cavities that have formed as a result of decay, injury or other damage. Such hollows may not be visible from the ground; but may be apparent from the presence of deformities such as burls, protuberances or broken limbs, or where it is apparent the head of the tree has been lost or broken off.”*

Further to this, Condition 5.6(d) states that within the Regrowth Zone “priority must be given to any hollow-bearing trees which exhibit evidence of occupancy by hollow dependent fauna and trees which contain multiple hollows or hollows of various sizes.” The remainder of the H trees selected must have “as many of the following characteristics as possible:

- belonging to a cohort of trees with the largest dbhob,
- good crown development, (Note: this does not restrict the selection of trees with broken limbs consistent with the hollow-bearing tree definition).
- minimal butt damage,
- represent the range of hollow-bearing species that occur in the area,
- located such that they result in retained trees being evenly scattered throughout the net logging area.

#### *Comment and Evidence*

The EPA recorded 16 **compliant** findings with the relevant selection conditions in the areas assessed.

This finding is based on two transect assessments for the retention of H trees and R trees in the regrowth zone. Each transect consisted of a walk through transect noting mark-up 25m either side, Transect 1 was about 280m in Compartment 167 near dump 39 and Transect 2 was about 380m in Compartment 173 near dump 10 (approximately 3.3 hectares).

16 candidate H trees were retained across both transects, of these:

- 16 belonged to the largest cohort of trees. The EPA recorded a single compliance for each of these, resulting in a total of 16 compliances relating to H tree selection. Calculating compliances / non-compliances: H tree selection

When assessing retained H trees against selection criteria, the EPA records a separate finding of compliance / non-compliance for each tree assessed. This is in line with Condition 5.6(d) of

the TSL, which provides that each tree selected “must have as many of the following characteristics as possible.”

#### *Why is it important?*

The EPA considers it important that the required quantity **and quality** of H trees are retained. Retention of H trees is an important aspect of Ecologically Sustainable Forestry Management (ESFM). In a regrowth zone in particular, the principal aim of ESFM is to maintain an adequate level of forest structure and form, so as to ensure biodiversity values are maintained.

### **3. Recruitment Trees: Selection**

This part of the audit focused on selection of R trees that must be retained under [Condition 5.6](#) of the TSL. Condition 5.6(a)(ii) defines a R tree as:

*“a live tree of a mature or late mature growth stage (using the modified Jacobs growth stage assessment as depicted in schedule 3) within the net logging area that is not suppressed prior to harvesting and appears to have good potential for hollow development and long term survival.”*

In addition to this, Condition 5.6(e) provides that R trees must have as many of the following characteristics as possible:

- belong to a cohort of trees with the largest dbhob,
- located such that they result in retained trees being evenly scattered throughout the net logging area,
- good crown development,
- minimal butt damage,
- represent the range of hollow-bearing species that occur in the area.

#### *Comment and Evidence*

The EPA recorded 16 **compliant** findings with the relevant selection conditions in the areas assessed.

This finding is based on two transect assessments for the retention of H trees and R trees in the regrowth zone. Each transect consisted of a walk through transect noting mark-up 25m either side, Transect 1 was about 280m in Compartment 167 near dump 39 and Transect 2 was about 380m in Compartment 173 near dump 10 (approximately 3.3 hectares).

Sixteen candidate R trees were retained across both transects. The R trees were considered to meet all the requirements, or as many as possible, of the TSL. The R trees selected were of larger or equivalent size to the stumps. The EPA recorded a single compliance for each of these, resulting in a total of 16 compliances relating to R tree selection.

#### *Calculating compliances / non-compliances: R tree selection*

When assessing retained R trees against selection criteria, the EPA records a separate finding of compliance / non-compliance for each tree assessed. This is in line with Condition 5.6(e) of the TSL, which provides that each tree selected “must have as many of the following characteristics as possible.”

#### *Why is it important?*

The EPA considers it important that the required quantity **and quality** of R trees are retained. Retention of R trees – being the largest trees with the greatest potential to develop hollows, as stipulated in the TSL – is an important aspect of Ecologically Sustainable Forestry

Management (ESFM). In a regrowth zone in particular, the principal aim of ESFM is to maintain an adequate level of forest structure and form, to ensure biodiversity values are maintained.

#### 4. Protection of Retained Trees

Retained trees must be protected from logging operations to the greatest extent practicable, as per [Condition 5.6\(h\)](#) of the licence. In particular:

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

##### *Comment and Evidence*

The EPA found that FCNSW was **compliant** with the relevant condition in the areas assessed.

This finding is based on two transect assessments for the retention of H trees and R trees in the regrowth zone. Each transect consisted of a walk through transect noting mark-up 25m either side, Transect 1 was about 280m in Compartment 167 near dump 39 and Transect 2 was about 380m in Compartment 173 near dump 10 (approximately 3.3 hectares).

There were no instances of damage to retained trees, or significant debris surrounding retained trees in either of these transects. The EPA recorded a single compliance for each of the 32 marked H and R trees assessed, resulting in a total of 32 compliances.

However, at dump 38, the EPA officers noticed logging debris stacked at a height greater than 1m within 5m of the base of a marked H tree (Placemark 31, Figure 4). The debris was 3.5m from the base. The EPA recorded a single non-compliance for this marked H tree.

##### *Calculating compliances / non-compliances: protection of retained trees*

When assessing trees against the protection criteria, the EPA records a separate finding of compliance / non-compliance for each tree assessed. This is in line with the Condition 5.6(h) of the TSL, which requires each retained tree to be protected.

##### *Why is it important?*

The EPA considers it important that H and R trees are adequately protected from both logging operations and post-logging risks, such as hazard reduction burns and wild fires. Excessive logging debris in the immediate proximity of H or R trees increases the risk of damage to the retained trees – or tree death if the fire is very hot – in the occurrence of a fire. This has a flow on effect on the long-term availability of H and R tree resources as key forestry structural values.





**Figure 4.** Logging debris of height greater than 1m within 5m from base of marked H tree, at Placemark 31.

## 5. Rainforest exclusion zone mark-up and protection

This part of the audit focuses on the marking-up and protection of Rainforest exclusion zones. The TSL sets out the rules aimed at protecting Rainforest exclusion zones in Condition 5.4. The rules can be summarised as follows:

- Specified forestry activities (i.e. timber felling, road re-opening, commercial collection of firewood, harvesting of tea tree oil, bush fire hazard reduction work, grazing activities, thinning) are prohibited in Rainforest exclusion zones. However, snig track and road construction, in accordance with condition 5.4(e), and road re-opening are permitted.

To maximise compliance with the above, the TSL requires all rainforest exclusions to be marked in the field prior to harvesting, road construction or road re-opening taking place (Conditions 5.1(f) and 5.1(h) of the TSL). The only circumstance when boundaries are not required to be marked is “where specified forestry activities will not come within 50 metres of such boundaries” (Condition 5.1(f) of the TSL).

### *Comment and Evidence*

The EPA found that FCNSW was **compliant** with the relevant protection conditions in the area assessed.

This finding is based on assessment of an area of Rainforest exclusion zone in compartment 170. A 345m segment of Rainforest boundary was assessed near dump 38 (Figure 5). There were no incursions into the rainforest exclusion zone. The EPA recorded a single compliance for this boundary assessment.

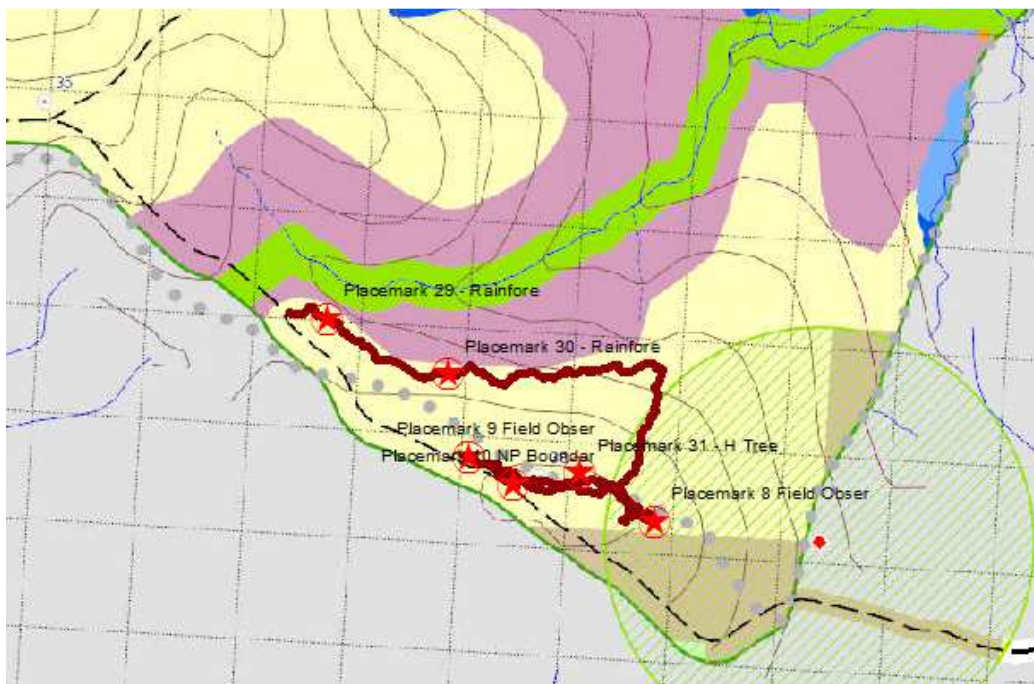
The EPA recorded one **non-compliance** finding with the relevant mark-up condition in the area assessed.

This finding is based on the abovementioned Rainforest exclusion zone assessment. The exclusion zone assessed did not have field mark-up and was within 50 metres of forestry activities. The EPA recorded a single non-compliance relating to mark-up for this area.

#### *Calculating compliances / non-compliances: Rainforest exclusion zones*

The EPA records a single finding of compliance in relation to each continuous (un-interrupted) segment of boundary assessed, where no breaches are recorded. The length of a segment may vary depending on the size of the exclusion, location within logging area, topography and accessibility. Multiple segments may be assessed along the boundary of a single Rainforest exclusion zone. For instance, EPA officers may walk away from the boundary to assess other areas nearby, and then return to assess another section of the rainforest boundary.

For each breach of the exclusion zone boundary the EPA records a single non-compliance. In other words, there can be multiple non-compliances associated with a single segment of boundary.



**Figure 5.** FCNSW HPOM for Clouds Creek State Forest. The red Waypoints 29-30, and corresponding track indicate the boundary assessment of rainforest exclusion zone (pink area) conducted by EPA officers.

## **6. Exclusion zone mark-up**

This part of the audit focuses on the marking-up and protection of exclusion zones, namely the “Mapped Limited Falling EZ” identified in the FCNSW HPOM. The TSL requires all exclusions to be marked in the field prior to harvesting, road construction or road re-opening taking place (Conditions 5.1(f) and 5.1(h) of the TSL). The only circumstance when boundaries are not required to be marked is “where specified forestry activities will not come within 50 metres of such boundaries” (Condition 5.1(f) of the TSL).

#### *Comment and Evidence*

The EPA found that FCNSW was **not compliant** with the relevant conditions in the area assessed.



This finding is based on assessment of an area of exclusion zone in compartment 167. A 360m segment of exclusion boundary was assessed near dump 42 (Figure 6). EPA officers were aware of a FCNSW note in the FCMapReg regarding an incursion into the exclusion zone. EPA officers recorded a stump in the exclusion zone at Waypoint 14 (Figure 7). The EPA recorded a single non-compliance for this boundary assessment.

This finding is based on the abovementioned exclusion zone assessment. The exclusion zone assessed did not have field mark-up and was within 50 metres of forestry activities. As described above, EPA officers noted incursions in this area.

Note: Exclusion zone mark-up was also assessed in relation to Rainforest and Riparian Protection. The results of those assessments are contained in the relevant sections of this report, but have been combined with the findings of this section, in Audit Findings – Overview.

#### *Calculating compliances / non-compliances: HCVOG exclusion zones*

The EPA records a single finding of compliance in relation to each continuous (un-interrupted) segment of boundary assessed, where no breaches are recorded. The length of a segment may vary depending on the size of the exclusion, location within logging area, topography and accessibility. Multiple segments may be assessed along the boundary of a single exclusion zone. For instance, EPA officers may walk away from the boundary to assess other areas nearby, and then return to assess another section of the rainforest boundary.

For each breach of the exclusion zone boundary the EPA records a single non-compliance. In other words, there can be multiple non-compliances associated with a single segment of boundary.



**Figure 6.** FCNSW HPOM for Clouds Creek State Forest. The red Waypoints 11-14, and corresponding track indicate the boundary assessment of exclusion zone (brown area) conducted by EPA officers. Placemark 14 correlates to the FCNSW note (Question mark) that an incursion had occurred.



**Figure 7.** Trees felled in exclusion zone in compartment 167. Photo taken at Placemark 14, looking towards track.



**Figure 8.** Tree felled in exclusion zone in compartment 167, marked date corresponds with FCNSW note in FCMapReg. Photo taken at Placemark 14.

## 7. Riparian Habitat Protection / Stream Exclusion Zones / Drainage Feature Protection

This part of the audit focuses on the protection of riparian habitat (streams) as required by [Condition 5.7](#) of the TSL and Environment Protection Licence (EPL) Schedule 4, Clause 6.

The TSL sets out two different levels of protection for streams in the Upper North East Region:

1. A hard protection zone 5m wide along the entire length of all streams, measured from the bank of the incised channel. Where there is no incised channel, the protection zone must be measured from the centreline of the drainage feature.
2. A soft protection zone immediately along the boundary of the hard protection zone. The width of a protection zone (soft) must be measured from the edge of the hard protection zone furthest from the stream. Soft protection zone width varies according to stream order, from 5m (first order streams), 15m (second order streams), 25m (third order streams) to 45m (fourth order streams or greater).

Specified forestry activities, except road and snig track construction in accordance with conditions 5.7 (r to u) and road re-opening, are prohibited within both hard and soft protection zones (Condition 5.7d). However, trees must not be felled into hard protection zones (Condition 5.7e), whereas they may be felled into soft protection zones (Condition 5.7k). Where a tree is felled into a soft protection zone, the crown must not be removed unless the whole of the tree is lifted out – to minimise ground disturbance.

Harvesting machinery is not permitted within hard protection zones, but may enter within 5m of a soft protection zone for the purpose of felling a tree within the net logging area (Condition 5.7p). The entry of machinery for this purpose is permitted only where necessary, i.e. where directional felling could not be used to fell a tree so that it falls outside the protection zone, and where the only practicable method of felling the tree is to enter the protection zone. Walkover techniques must be used to minimise disturbance to the ground.

To maximise compliance with the above, the TSL requires all riparian habitat protection zones to be marked in the field prior to harvesting, road construction or road re-opening taking place (Conditions 5.1(f) and 5.1(h) of the licence). The only circumstance when boundaries are not required to be marked is “where specified forestry activities will not come within 50 metres of such boundaries” (Condition 5.1(f) of the licence).

EPL Schedule 4, Clauses 6-20 requires protection to be implemented on mapped and unmapped drainage lines, prescribed streams and watercourses. In relation to unmapped drainage lines a 5m filter strip, 5m protection strip and 10 operational zone must be implemented.

### *Comment and Evidence*

The EPA recorded one **compliance** and one **non-compliance** with the relevant protection conditions in the areas assessed.

This finding is based on assessments of one area of riparian habitat protection zone in compartments 168 and 170. A 610m segment of riparian habitat protection boundary was assessed near the boundary of compartments 168 and 170, following the soft protection zone of 3<sup>rd</sup> and 4<sup>th</sup> order streams, and an unmapped drainage line (Figure 9). There were no incursions of logging activities into the mapped riparian habitat protection zone, however, there



was some logging debris into the soft protection zone of the 4<sup>th</sup> order stream (Figure 10). The EPA recorded a single compliance for each of these, resulting in a total of one compliance.

A follow up inspection was undertaken by the EPA officers in relation to the operational zone of the unmapped drainage line. The EPA officers recorded three incursions of a snig track into the operational zone (Figure 11). The EPA recorded a single non-compliance for this section of operational zone.

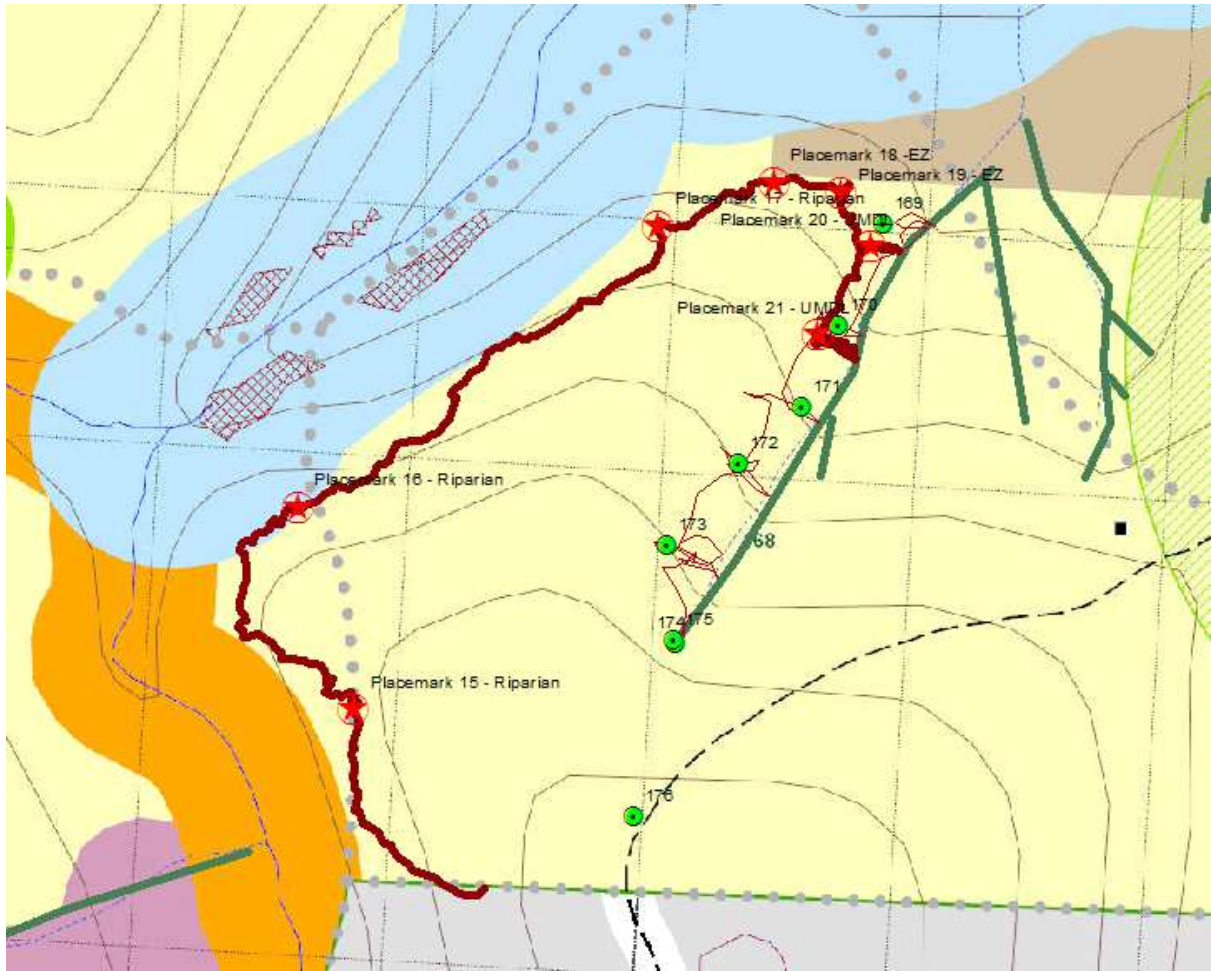
The EPA recorded one **non-compliance** and one **compliance** with the relevant mark-up condition in the areas assessed.

This finding is based on the abovementioned riparian habitat protection zone assessment. The protection zone assessed had no mark-up for the 3<sup>rd</sup> and 4<sup>th</sup> order stream, and it is noted that the Harvest Plan identifies that “the crew will locate and protect all 2<sup>nd</sup> order and above streams with GPS”. The segment of protection zone that didn’t have mark-up was within 50 metres of forestry activities. The EPA recorded a single non-compliance relating to mark-up for this area. The protection zone for the unmapped drainage line was marked in the field (Figure 12). The EPA recorded a single compliance relating to mark-up for this area.

#### *Calculating compliances / non-compliances: riparian habitat protection zones*

The EPA records a single finding of compliance in relation to each continuous (un-interrupted) segment of boundary assessed, where no breaches are recorded. The length of a segment may vary depending on the size of the exclusion, location within logging area, topography and accessibility. Multiple segments may be assessed along the boundary of a single riparian protection zone. For instance, EPA officers may walk away from the boundary to assess other areas nearby, and then return to assess another section of the rainforest boundary.

For each breach of the exclusion zone boundary the EPA records a single non-compliance. In other words, there can be multiple non-compliances associated with a single segment of boundary.



**Figure 9.** FCNSW HPOM for Clouds Creek State Forest. The red Placemarks 15-21, and corresponding track indicate the boundary assessment of Riparian Habitat protection zone conducted by EPA officers on 30 November 2017; and the green Waypoints 169-175 indicate the boundary assessment of the protection zone for the unmapped drainage line conducted by EPA officers on 4 December 2017.





**Figure 10.** Logging debris in 4<sup>th</sup> order soft protection zone. Photo taken at Placemark 16.



**Figure 11.** Snig Track within operational zone of unmapped drainage line. Photo taken from Waypoint 173.





**Figure 12.** Field mark-up of unmapped drainage line protection zone.

## 8. Threatened Species Prescriptions: Glossy Black-Cockatoo and Yellow-bellied Glider

This part of the audit focuses on the protection of threatened species, namely Glossy Black-Cockatoo feed trees and Yellow-bellied Glider prescriptions ([Conditions 5.6\(g\) and 6.17](#) of the TSL). The TSL has specific provisions relating to each species, with a set of general conditions that apply to all threatened species. The TSL provides as follows:

- ([Condition 5.6g](#)) *Allocasuarina* or *Casuarina* species trees or shrubs must be retained where there is evidence that Glossy Black-Cockatoos have been feeding on them, such as chewed cones at the base of the trees. Other *Allocasuarina* trees or shrubs should also be retained as far as possible.
- (Condition 6.17) Where there are records of Yellow-bellied Glider in a compartment or within 100 metres of the compartment boundary, within a 100m radius of a retained sap tree, observation or den site or within a 200m radius of a call detection site record, 15 feed trees must be retained.

### *Comment and Evidence*

#### **Glossy Black-Cockatoo**

The EPA recorded a single **not determined** with the relevant conditions in the area assessed.

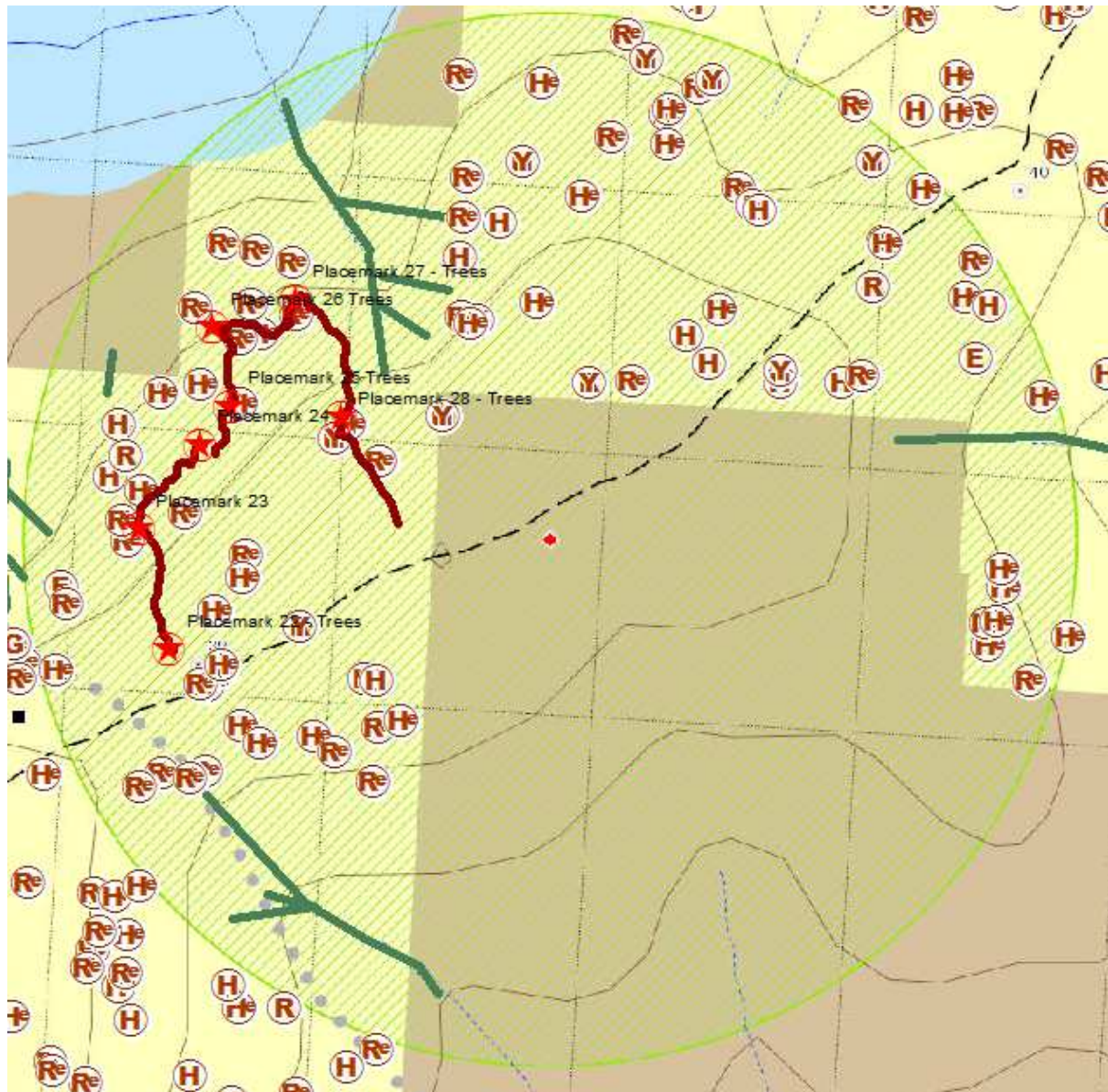
Within the areas assessed, there were no marked feed trees for Glossy Black-Cockatoos. The FCMapReg data identifies retained Glossy Black-Cockatoos.



### Yellow-bellied Glider

The EPA recorded a single **compliance** finding with the relevant condition in the area assessed.

This finding is based on the assessment of the FCMapReg data for the Yellow-bellied Glider Modified Harvest Area in compartment 167 (Figure 13). The data includes 11 identified Yellow-bellied Glider feed trees within the area. Whilst this is less than the required retention rate, it is also noted that part of the modified harvest area is Mapped Limited Falling exclusion zone. One Yellow-bellied Glider feed tree was noted by the EPA officers during the tree retention assessment, and was also marked as a H tree. The EPA recorded a single compliance.



**Figure 13.** FCNSW HPOM and FCMapReg data for the Yellow-bellied Glider Modified Harvest Area (200m radius from record) in compartment 167 of Clouds Creek State Forest.

## 9. Roads and Crossings

This part of the audit focuses on the assessment of roads and crossings in the compartment or logging area. In particular, the EPA assesses compliance with [section 120](#) (pollution of waters) of the *Protection of the Environment Operations Act 1997* (POEO Act), and the operating conditions set out in Schedule 5 of the [Environment Protection Licence](#) (EPL).



The EPL conditions regarding **crossings** include the following:

- Between 5m and 30m of any crossings, roads must be drained using a crossbank, relief pipe, spoon drain or mitre drain (Condition 37 EPL). Where this cannot be achieved, the road surface must be armoured, and a drainage structure installed at the first opportunity from the drainage crossing (Condition 38 EPL).
- Drainage features must only be crossed using stable structures, namely causeways, culverts or bridges (Condition 41 EPL). Existing log dams and gully stuffers may be used only where stability can be ensured for the duration of logging activity (Condition 42 EPL).
- Soil stabilisation measures must be used to protect bridge embankments from table drain discharge (Condition 54 EPL).
- Where soil or gravel is used as pavement for the bridge surface, structures must be installed to prevent soil or gravel from entering the drainage feature (Condition 55 EPL).
- Disturbed areas resulting from the removal of soil or gravel from the drainage feature must be re-shaped and soil stabilisation measures put in place to achieve a stable cross-section (Condition 56 EPL).
- Culvert recovery must be undertaken so as to minimise disturbance to the bed and banks of the drainage feature (Condition 57 EPL).
- Fill material, including soil or gravel, placed on pipes and used as the crossing surface must not be placed upstream of the culvert inlet or in the downstream flow path of the culvert outlet (Condition 58 EPL).
- Soil stabilisation measures must be used to protect upstream and downstream fill batters surrounding the culvert (Condition 59 EPL).
- Pipe outlets must discharge onto stable surfaces capable of handling concentrated water flow (Condition 60 EPL).
- The bed and banks of causeways must consist of a stable natural surface or be constructed of an erosion resistant material (Condition 61 EPL).
- Construction and maintenance of crossings must restrict disturbance of vegetation to a maximum length of 3 metres upstream or downstream of the crossing (Condition 47 EPL).
- State Forests must comply with section 120 of the POEO Act 1997 (Condition 5.1 EPL).

Section 120 of the POEO Act applies to both roads and crossings, as well as logging operations in general. It provides:

(1) A person who pollutes any waters is guilty of an offence.

**Note:** An offence against subsection (1) committed by a corporation is an offence attracting special executive liability for a director or other person involved in the management of the corporation-see section 169.

(2) In this section: "**pollute**" waters includes cause or permit any waters to be polluted.

#### *Comment and Evidence*

The EPA recorded eight **compliances** with the relevant conditions in the area assessed.

This finding is based on the assessment of crossings A-E in compartment 172 and crossings F-G in compartment 174 (a total of 8 crossings). EPA officers set 5-30m drainage and S120 of the POEO Act as the audit criteria for crossings but also noted other information. The

crossings had effective 5-30m drainage on both approaches. The EPA recorded eight compliances.

The EPA recorded seven **compliances** and one **non-compliance** with the relevant conditions in the area assessed.

Where water was present, it was clear on either side of the crossings, with no evidence of sediment entering the drainage feature, so it was compliant with s120 of the POEO Act. However, at crossing B the EPA officers noted that the causeway appeared to be raised above the natural surface and the downstream side did not have adequate stabilisation and containment of gravel and rock fill, and therefore may not be stable during a high flow event (Figure 14 and 15). The EPA recorded seven compliances and one non-compliance.

EPA officers also noted the crossings were as per the FCNSW Roding Plan, except crossing C did not have rocks installed as per the plan. The EPA officers noted that all seven crossings had stable surfaces, and Crossing B was not adequately stable as outlined above.

*Calculating compliances / non-compliances: crossings*

Crossings: the EPA records a single compliance or non-compliance in relation to each condition that applies. This means that a single crossing can have multiple compliances and non-compliances.



**Figure 14.** Upstream approach of Crossing B, raised above channel.





**Figure 15.** Downstream edge of Crossing B, smaller rocks exposed along edge and causeway raised above channel. Inadequate containment of crossing surface reducing ability to withstand high stream flows.

## **RISK ASSESSMENT OF NON-COMPLIANCE**

The significance of any non-compliances identified during the audit process are categorised. Following risk assessment of non-compliances, an escalating response relative to the seriousness of the non-compliance is determined to ensure the non-compliance is addressed by the enterprise.

The risk assessment of non-compliances involves assessment of the non-compliance against two criteria; the likelihood of environmental harm occurring and the level of environmental impact as a result of the non-compliance. After these assessments have been made, information is transferred into the risk analysis matrix below.

		<b>Likelihood of Environmental Harm Occurring</b>		
<b>Level of Environmental Impact</b>		<b>Certain</b>	<b>Likely</b>	<b>Less Likely</b>
	<b>High</b>	<b>Code Red</b>	<b>Code Red</b>	<b>Code Orange</b>
	<b>Moderate</b>	<b>Code Red</b>	<b>Code Orange</b>	<b>Code Yellow</b>
	<b>Low</b>	<b>Code Orange</b>	<b>Code Yellow</b>	<b>Code Yellow</b>

The assessment of the likelihood of environmental harm occurring and the level of environmental impact allows for the risk assessment of the non-compliance via a colour coding system. A red risk assessment for non-compliance denotes that the non-compliance is of considerable environmental significance and therefore must be dealt with as a matter of priority. An orange risk assessment for non-compliance is still a significant risk of harm to the environment however can be given a lower priority than a red risk assessment. A yellow risk assessment for non-compliance indicates that the non-compliance could receive a lower priority but must be addressed.

There are also a number of licence conditions that do not have a direct environmental significance, but are still important to the integrity of the regulatory system. These conditions relate to administrative, monitoring and reporting requirements. Non-compliance of these conditions is given a blue colour code.

The colour code is used as the basis for deciding on the priority of remedial action required by the licensee and the timeframe within which the non-compliance needs to be addressed. This information is presented in the action program alongside the target/action date for the noncompliance to be addressed.

While the risk assessment of non-compliances is used to prioritise actions to be taken, the EPA considers all non-compliances are important and licensees must ensure that all non-compliances are addressed as soon as possible.

## **APPENDIX: DATA TABLES**

<b>Title</b>	<b>Northing</b>	<b>Easting</b>	<b>Date/time created</b>	<b>Description</b>
Placemark 1 Crossing G	6675303.28	465057.39	29/11/2017 11:34	<ul style="list-style-type: none"> <li>• Crossing as per FCNSW Roothing Plan</li> <li>• Crossing surface is stable</li> </ul>
Placemark 2 - Crossing F	6675227.26	465196.64	29/11/2017 11:48	<ul style="list-style-type: none"> <li>• Crossing as per FCNSW Roothing Plan</li> <li>• Crossing surface is stable</li> <li>• Roll overs in place</li> </ul>
Placemark 3 - Crossing A	6676366.12	467805.01	29/11/2017 12:41	<ul style="list-style-type: none"> <li>• Crossing as per FCNSW Roothing Plan</li> <li>• Crossing surface is stable</li> <li>• Roll overs in place – 30m and 24.5m</li> </ul>
Placemark 4 - Crossing C	6676006.98	468146.56	29/11/2017 12:53	<ul style="list-style-type: none"> <li>• No rocks installed, as per Roothing Plan, but surface stable</li> <li>• Roll overs in place – 27.5m and 10m</li> </ul>
Placemark 5 - Crossing B	6676025.36	468105.05	29/11/2017 13:01	<ul style="list-style-type: none"> <li>• Crossing as per FCNSW Roothing Plan</li> <li>• Roll overs in place – 27.5m and 12m</li> <li>• Causeway may be raised above natural surface, may not be stable during a high flow event</li> </ul>
Placemark 6 - Crossing E	6675784.97	468397.85	29/11/2017 13:21	<ul style="list-style-type: none"> <li>• Roll over in place – 11m uphill side</li> <li>• Surface stable</li> </ul>
Placemark 7 - Crossing D	6675801.55	468383.34	29/11/2017 13:22	<ul style="list-style-type: none"> <li>• Crossing as per FCNSW Roothing Plan</li> <li>• Roll overs in place – 15m and 25.5m</li> <li>• Vehicle damage on Roll overs</li> </ul>
Placemark 8 Field Obser	6673298.05	467150.49	29/11/2017 14:30	
Placemark 9 Field Obser	6673348.28	466975.21	29/11/2017 14:35	
Placemark 10 NP Boundar	6673325.13	467016.92	29/11/2017 14:38	
Placemark 11 - EZ	6675287.02	468916.45	29/11/2017 15:14	<ul style="list-style-type: none"> <li>• Start of EZ check</li> </ul>
Placemark 12 - EZ	6675277.72	468802.05	29/11/2017 15:23	<ul style="list-style-type: none"> <li>• EZ boundary</li> </ul>
Placemark 13 - EZ	6675191.74	468764.31	29/11/2017 15:27	<ul style="list-style-type: none"> <li>• EZ boundary</li> </ul>
Placemark 14 - EZ	6675177.84	468710.76	29/11/2017 15:32	<ul style="list-style-type: none"> <li>• EZ incursion – stumps between placemark and road</li> <li>• Noted in FCMapReg</li> </ul>
Placemark 15 - Riparian	6674466.78	467751.08	30/11/2017 9:56	<ul style="list-style-type: none"> <li>• 3rd order stream</li> </ul>
Placemark 16 - Riparian	6674545.48	467724.64	30/11/2017 10:10	<ul style="list-style-type: none"> <li>• 4th order stream</li> <li>• Some logging debris (tree heads) into protection zone</li> </ul>
Placemark 17 - Riparian	6674665.23	467860.87	30/11/2017 10:22	<ul style="list-style-type: none"> <li>• 4th order stream</li> </ul>
Placemark 18 -EZ	6674685.08	467905.83	30/11/2017 10:33	<ul style="list-style-type: none"> <li>• Outside protection zone</li> </ul>
Placemark 19 - EZ	6674682.39	467932.92	30/11/2017 10:36	<ul style="list-style-type: none"> <li>• Edge of Mapped Limited Falling EZ</li> </ul>
Placemark 20 - UMDL	6674661.93	467945.52	30/11/2017 10:42	<ul style="list-style-type: none"> <li>• UMDL</li> <li>• Protection zone marked in field (12.5m from centre of drainage line)</li> <li>• Snig track along edge of operations</li> </ul>
Placemark 21 - UMDL	6674625.53	467927.02	30/11/2017 10:42	<ul style="list-style-type: none"> <li>• UMDL</li> <li>• Protection zone marked in field (11.5m from centre of drainage line)</li> <li>• Snig track along edge of operations</li> </ul>
Placemark 22 - Trees	6674584.49	468106.91	30/11/2017 11:11	<ul style="list-style-type: none"> <li>• H tree: marked, larger tree, hollows visible, over mature tree, no crown damage, no debris at base, on edge of log dump, slight butt damage</li> </ul>
Placemark 23	6674629.55	468092.99	30/11/2017 11:18	<ul style="list-style-type: none"> <li>• H and R clump: 3 x H and 3 x R</li> <li>• No debris at base greater than 1m</li> <li>• Hollows visible in 3 H trees</li> </ul>
Placemark 24	6674662.53	468114.2	30/11/2017 11:22	<ul style="list-style-type: none"> <li>• 2 x R</li> </ul>



				<ul style="list-style-type: none"> <li>1 is a very good example – larger cohort, healthy crown</li> </ul>
Placemark 25 Trees	6674677.85	468124.76	30/11/2017 11:49	<ul style="list-style-type: none"> <li>3 x H</li> <li>Appear to be good examples</li> <li>Larger cohort, potential hollows</li> <li>No debris at base</li> </ul>
Placemark 26 Trees	6674707.52	468116.19	30/11/2017 11:51	<ul style="list-style-type: none"> <li>3 x R and 1 x H</li> <li>1 R – ironbark, small, crown?</li> <li>Hollows visible in H</li> <li>Hollows potentially in one of the R's</li> </ul>
Placemark 27 - Trees	6674719.47	468147.19	30/11/2017 12:01	<ul style="list-style-type: none"> <li>2 x R: larger or equivalent to nearby stumps, debris at the base is less than 1m</li> </ul>
Placemark 28 - Trees	6674675.87	468167.08	30/11/2017 12:06	<ul style="list-style-type: none"> <li>1 x H, 1 x H/YBG and 1 x R</li> </ul>
Placemark 29 - Rainfore	6673469.31	466835.67	30/11/2017 12:43	<ul style="list-style-type: none"> <li>No incursions</li> </ul>
Placemark 30 - Rainfore	6673424.33	466951.47	30/11/2017 12:51	<ul style="list-style-type: none"> <li>No incursions</li> </ul>
Placemark 31 - H Tree	6673339.61	467078.56	30/11/2017 13:05	<ul style="list-style-type: none"> <li>H tree: debris greater than 1m at 3.5m from the base of the tree</li> <li>Edge of log dump 38</li> </ul>
Placemark 32 - Snig Tra	6675143.92	465828.97	30/11/2017 13:42	<ul style="list-style-type: none"> <li>Snig track drainage – well constructed and effective drainage</li> </ul>
Placemark 33 - Trees	6675093.03	465787.3	30/11/2017 13:44	<ul style="list-style-type: none"> <li>2 x R: good size form and protection</li> </ul>
Placemark 34 Trees	6675110.15	465768.16	30/11/2017 13:44	<ul style="list-style-type: none"> <li>1 x H: very slight crown damage</li> </ul>
Placemark 35 Trees	6675175.71	465754.26	30/11/2017 13:51	<ul style="list-style-type: none"> <li>1 x H: hollow visible, protected</li> <li>1 x R: good size, form and protected</li> </ul>
Placemark 36 Trees	6675137.27	465688.06	30/11/2017 13:57	<ul style="list-style-type: none"> <li>2 x H good examples, protected</li> </ul>
Placemark 37 Trees	6675165.03	465670.91	30/11/2017 13:59	<ul style="list-style-type: none"> <li>1 x H: hollow visible, protected</li> <li>1 x R: equivalent size to stump</li> <li>Snig track drainage good</li> </ul>
Placemark 38 Trees	6675108.87	465711.96	30/11/2017 14:05	<ul style="list-style-type: none"> <li>1 x R good example</li> <li>1 x H good example</li> <li>Protected</li> </ul>
Placemark 39 Trees	6675094.3	465731.09	30/11/2017 14:04	<ul style="list-style-type: none"> <li>Clump of H trees near road and the end of the track</li> <li>Good examples of H tree selection</li> <li>Protected</li> </ul>
Waypoint 169	6674670.92	467950.309	4/12/2017 9:40	Field mark up of UDL and operations (snig track) in operational zone assessed.
Waypoint 170	6674629.76	467935.198	4/12/2017 9:45	Edge of snig track 9.4m from 2 bar marking.
Waypoint 171	6674596.15	467922.283	4/12/2017 9:50	Edge of snig track 4.8m from 2 bar, outside edge of snig 11.4m from 2 bar.
Waypoint 172	6674572.37	467898.929	4/12/2017 9:57	5.7m from 2 bar to edge of snig track. 10.8m from 2 bar to outside of snig track.
Waypoint 173	6674538.27	467872.135	4/12/2017 10:03	16.5m from top of bank to edge of snig. 24m from top of bank to outside edge of snig track.
Waypoint 174	6674499.95	467877.741	4/12/2017 10:16	20.4m from top of bank to edge of snig track.
Waypoint 175	6674500.94	467877.16	4/12/2017 10:18	11.4m from gully head to 2 bar markup on tree. No snig track within 20m of gully head.
Waypoint 176	6674430.1	467865.221	4/12/2017 10:23	Rubber flap road damage, poor condition, on verge of failing.