EPA AUDIT REPORT – CROWN FOREST NORTH BROOMAN STATE FOREST, COMPARTMENT 42

Auditee:	Forestry Corporation of NSW				
Audit scope:	North Brooman State Forest, compartment 42 (see Map 1, below). The field audit took 1 day to complete.				
Region:	Southern Region				
Date/Audit timing:	12 July 2017				
Justification of audit:	Post-harvest audit focussing on EPA compliance priority areas				
Audit objectives:	 Determine compliance with Southern Region IFOA conditions 				
	Determine compliance with relevant planning conditions that relate to threatened species surveys				
	 Communicate compliance and non-compliances to FCNSW. 				
	4. Outline requirements for any necessary follow-up action.				
Audit criteria:	 Condition 5.1E TSL (Marking-up of boundaries of environmentally sensitive areas – rainforest) 				
	 Condition 5.6 TSL (H&R retention, selection and protection) 				
	Part 5(11) IFOA (Basal Area Retention)				
Summary of Operations	From the harvesting plan:				
	"Harvesting of Hardwood forest, using Single Tree Selection Silviculture subject to the Southern IFOA requirements will be undertaken within this planning unit. Timber harvesting and road construction will not be licensed under the EPL.				
	The primary product of the harvesting is high quality large sawlogs (quota logs), small high quality sawlogs, veneer logs, girders, poles & piles where timber markets are available. Parts of felled logs that do not meet high quality log specifications are segregated and graded into other classifications such as salvage sawlogs, pulp logs & miscellaneous timbers e.g. split & round posts, firewood, mining timbers & craftwood. The availability of miscellaneous timbers depends mainly on forest types, log defectiveness & market conditions at the time of harvesting."				

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MAPS OF AREAS ASSESSED: <u>H & R PLOTS, BASAL AREA PLOTS, RIDGE AND HEADWATER</u>



Map 1: Areas inspected during the EPA audit on 12 July 2017, compartment 42, North Brooman State Forest. The pink circles show waypoints recorded for the purposes of assessing boundaries and marking the locations of hollow-bearing and recruitment trees.



Map 2 (above): Audit area 1, located of Coconut Road in compartment 42, North Brooman State Forest. The descriptions for each of the waypoints labelled "T2, T3" etc, are provided in Table 1 and Table 2 attached to this report.



Map 3 (above): Audit area 2, located south of Coconut Road in compartment 42, North Brooman State Forest. The pink area shown is a rainforest exclusion and rainforest buffer (light pink), while the green is an FMZ3A overlaid by an owl exclusion zone (red cross hatching) and a ridge and headwater habitat. The details for each of the marked waypoints ("YBG, R Tree" etc) are provided in a table attached to this report.



Map 4 (above): Audit area 3, north of log dump 3 on Tumblebar Road. The details of the waypoints (T2, T3, etc) are provided in a table attached to this report.

AUDIT FINDINGS - OVERVIEW

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

IFOA condition	Non-compliances	Compliances	Not Determined
5.1E TSL - Marking-up of ridge and headwater habitat	1	0	0
5.6(b)(i) TSL – retention of H trees	0	1	0
5.6(c)(i) TSL – retention of R trees	0	1	0
5.6(h)(iii) TSL – mark-up of trees for retention	0	1	0
5.6(a)(i) and 5.6(b)(ii) TSL – selection of H trees	0	0	12
5.6(a)(ii) and 5.6(c)(ii) TSL – selection of R trees	6	0	5
5.6(h) TSL – protection of retained trees	0	23	0
5.8(g) – 5.8(I) TSL – protection of ridge and headwater habitat	3	0	0
TOTAL	10	26	17

AUDIT RECOMMENDATIONS

Action Details	Non-compliance Code*	Target/Action Date
5.6(a) – (c) Selection of hollow-	This non-compliance has a red risk	Action on this issue must
bearing and recruitment trees	category. The likelihood of environment	start immediately and
FCNSW continue to mark hollow-	harm is certain, because of the scarcity	must continue until the
bearing trees as recruitment trees,	of resources in North Brooman SF (i.e.	EPA is satisfied that
contrary to the requirements of the TSL.	smaller trees have far less potential to	there is no further risk of
The EPA notes that this is a recurring	form hollows than larger trees of the	non-compliance.
issue in FCNSW operations. No action	same species). The scale of harm is	
plan has been developed to date, to	moderate, based on the number of trees	
address the issue. FCNSW must train	affected.	
all staff, including new staff, and monitor		
staff progress, to ensure that		
recruitment trees are selected to be		
retained across the compartment having		
as many of the characteristics listed in		
the TSL.		

AUDIT FINDINGS - FIELD COMPONENT

1. Tree Retention / Mark-up in regrowth zone

Condition No.	Compliant? Yes/No/Not determined/Not applicable	Number of non- compliances / total (total = 1 possible compliance for each condition)	Area assessed	Risk Code	Action required by licensee
<u>TSL 5.6(b)(i)</u> (retention of H trees)	Compliant	0	0 7h2	N/A	Nil
<u>TSL 5.6(c)(i)</u> (retention of R trees)	Compliant	0	(3 separate meanders)	N/A	Nil
TSL 5.6(h)(iii) (tree mark-up)	Compliant	0		N/A	Nil

Comment and Evidence

The EPA found that FCNSW was **compliant** with the above conditions in the areas assessed. This finding is based on the following:

- 1. data provided by FCNSW, showing all of the marked H and R trees in the compartment. The data shows 556 H trees and 562 R trees were retained inside a 182ha net harvest area (as stated in the FCNSW harvest plan). This equates to 3 H trees and 3 R trees per hectare.
- 2. EPA field assessment, consisting of three separate meander surveys within the harvested areas (see chart below). The total area surveyed was 2.7 hectares. Within this area, the EPA counted twelve (12) marked H trees and eleven (11) marked R trees. This equates to 4 H trees and 4 R trees per hectare, on average, within the areas surveyed. More detail is provided in the chart below.

The EPA notes that in a regrowth zone, the TSL requires five H trees per hectare to be retained *where available*.

How the EPA calculates non-compliances for tree retention

The EPA assesses retention rates across the whole of the harvested area to determine compliance. This is in line with the TSL condition which requires a rate of retention per hectare (in other words, averaged over the available logging area). The total available number of compliances is therefore one (1) for the whole of the compartment.



2. Hollow-bearing Trees: Selection

Condition No.	Compliant? Yes/No/Not determined/Not applicable	Number of non- compliances / total (total = number of marked H trees assessed)	Risk Code	Action required by licensee
<u>TSL 5.6(a)(i) and (b)(ii) (</u> selection of H trees)	Not determined	0/12	N/A	Nil

Comment and Evidence

The EPA did not make a formal finding of compliance with regard to the selection of hollow-bearing trees. The EPAs sample size of trees was large enough. Additionally, not all of the trees were measured at the time of the audit (see **Table 2** in the Appendix).

How the EPA calculates non-compliances for tree selection

When assessing trees for selection criteria, the EPA records a separate fin ding of compliance / non-compliance for each tree assessed. This is in line with the TSL conditions that refer to individual trees.

3. Recruitment Trees: Selection

Condition No.	Compliant? Yes/No/Not determined/Not applicable	Number of non- compliances / total (total = number of marked R trees assessed)	Risk Code	Action required by licensee
TSL 5.6(a)(ii) and (c)(ii) (selection of R trees)	Not Compliant	6/11	Red	Systematic change needed

Comment and Evidence

The EPA did not make a formal finding of compliance with regard to the selection of recruitment trees, except where marked R trees were found with obvious hollows (see **Table 2** and **Table 3** in the Appendix). Out of the eleven marked recruitment trees, the EPA recorded a total of six (6) R trees with obvious hollows. These trees should have been marked as H (hollow-bearing) trees and additional trees should have been marked as recruitment trees to match the number of H trees.

The EPA recorded a total of six (6) non-compliances in relation to the marked R trees with hollows.

How the EPA calculates non-compliances for tree selection

When assessing trees for selection criteria, the EPA records a separate finding of compliance / noncompliance for each tree assessed. Additional non-compliances are recorded in relation to candidate trees that should have been marked for retention. This is in line with the TSL conditions that refer to individual trees (see attachment at the end of this report).

Why is it important?

The EPA considers it important that the required quantity <u>and quality</u> of recruitment trees are retained. Retention of recruitment 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, so as to ensure biodiversity values are maintained.





4. Protection of Retained Trees

Condition No.	Compliant? Yes/No/Not determined/Not applicable	Number of non- compliances / total (total = number of marked trees assessed)	Risk Code	Action required by licensee
TSL 5.6(h) (protection of marked and retained trees)	Not Compliant	0/23	N/A	Nil.

Comment and Evidence

The EPA found that FCNSW was *compliant* with the above conditions in all areas assessed. As seen from tables 1 and 2 in the Attachment to this report, the EPA recorded no instances of damage to marked trees, debris >1m within 5m, or soil disturbance within 5m.

How the EPA calculates non-compliances for tree protection

When assessing trees for selection criteria, the EPA records a separate finding of compliance / noncompliance for each tree assessed. This is in line with the TSL condition which requires that every retained tree is adequately protected from the effects of logging.

Why is it important?

The EPA considers it important that hollow-bearing and recruitment 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 hollow-bearing or recruitment 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 hollow-bearing and recruitment resources as key forestry structural values.

5. Ridge and Headwater Habitat

Condition No.	Compliant? Yes/No/Not determined/Not applicable	Number of non- compliances / total (total = 1 possible compliance for each condition)	Area assessed	Risk Code	Action required by licensee
TSL 5.8(g) (amendment to the location of ridge and headwater habitat)	Not compliant	1		Orange	Notify the EPA regarding all amendments to ridge and headwater boundaries, immediately.
<u>TSL 5.8(h) – (l)</u> (protection of ridge and headwater habitat)	Not Compliant	1	Single 150m transect	Orange	As above.
TSL 5.1E (marking-up of exclusion zones)	Not Compliant	1		Orange	As above.

Comment and Evidence

The EPA found that FCNSW was *not compliant* with the above conditions in all areas assessed.

During the field audit, the EPA assessed a ridge and headwater boundary south of Coconut Road, between log dumps 17 and 18 (**Map 3** at the start of this report). The harvest plan operational map produced by FCNSW shows a different boundary for the ridge and headwater than the official IFOA layer used by the EPA. However, to date the EPA has received no notification regarding such an amendment, and no justification for the amendment, contrary to condition 5.8(g) of the Southern Region TSL.

A single non-compliance was recorded in relation to this breach, for each of the relevant TSL conditions.

How the EPA calculates non-compliances in relation to ridge and headwater 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 ridge and headwater exclusion zone. For instance, EPA officers may walk away from the boundary in order 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.

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.

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

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.

RELEVANT LICENCE PROVISIONS

Tree Retention / Mark-up

This part of the audit focused on retention of hollow-bearing trees (H trees), recruitment trees (R trees), feed trees and any other trees that must be retained under the relevant IFOA / TSL conditions. Only marked trees are considered by the EPA when assessing retention rates in logged areas. Accordingly, where insufficient numbers of trees have been retained, this results in a non-compliance for tree mark-up.

Compartment 42 North Brooman State Forest is located within a **non-regrowth zone** as defined in the IFOA. For the purposes of this audit, the following requirements apply:

- At least five hollow-bearing trees must be retained per hectare of net logging area. Where this density is not available, the existing hollow-bearing trees must be retained **plus** additional trees must be retained as hollow-bearing trees, to meet the required rate (Condition 5.6(b)(i) of the Southern Region TSL);
- A **minimum of five recruitment trees** must be retained per hectare of net logging area. (Condition 5.6(c)(i) of the TSL);
- Retained H and R trees **must be marked** for retention (Condition 5.6(h)(iii) of the TSL).

Hollow-bearing trees: selection

This part of the audit focused on selection of hollow-bearing trees (H trees) that must be retained under <u>Conditions 5.6(a) and 5.6(b)(ii) – (iii) of the Southern Region TSL</u>. For the purposes of this audit, the following requirements apply:

- "Hollow-bearing tree" means 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 (Condition 5.6(a)(i));
- In selecting hollow-bearing trees, priority must be given to those trees which exhibit evidence of occupancy by hollow dependent fauna and trees which contain multiple hollows or hollows of various sizes (Condition 5.6(b)(ii));
- Hollow-bearing trees must have as many of the following characteristics as possible:
 - o Belonging to a cohort of trees with the largest dbhob
 - o Good crown development
 - o Minimal butt damage
 - o 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 (Condition 5.6(b)(iii)).

Recruitment trees: selection

This part of the audit focused on selection of recruitment trees (R trees) that must be retained under <u>Conditions 5.6(a)(ii) and 5.6(c)(ii) of the Southern Region TSL</u>. For the purposes of this audit, the following requirements apply:

- The TSL defines a Recruitment tree as "a live tree of a mature or late mature growth stage within the net logging area that is not suppressed prior to harvesting and has **good potential for hollow development** and long term survival." (Condition 5.6(a)(ii)). This definition implies that recruitment trees should not have hollows, merely the potential for hollows;
- Recruitment trees must have as many of the following characteristics as possible:
 - o Belonging to a cohort of trees with the largest dbhob
 - Good crown development
 - Minimal butt damage
 - o 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 (Condition 5.6(c)(ii)).

Protection of retained trees

This part of the audit focuses on protection of hollow-bearing trees (H trees) and recruitment trees (R trees) that have been marked for retention. <u>Condition 5.6(h) of the Southern Region Threatened</u> <u>Species</u> Licence (TSL) requires damage to trees to be minimised using directional felling. Further to this:

- Debris must not be accumulated higher than 1m within 5m radius of the retained trees,
- Mechanical disturbance to ground and understorey must be minimised to the greatest extent practicable within this five metre radius, and
- Retained trees must not be used as bumper trees during harvesting.

Ridge and Headwater Habitat

This part of the audited focuses on the marking-up and protection of ridge and headwater habitat areas (<u>Condition 5.8</u> of the Upper North East TSL). The TSL sets out the precise conditions regarding the location of ridge and headwater habitat (Condition 5.8a - g). Relevantly, condition 5.8(g) provides:

g) Amendment to the location of Ridge and Headwater Habitat exclusion zones may not be made unless approved by EPA. When applying for an amendment, FCNSW must provide reasons for the proposed amendment and options considered and must address the following matters:

i. the continuity with exclusion zones applied in any preceding logging operations;

ii. the habitat values and forest types of areas linked by the proposed exclusion zones compared to those previously in place;

iii. the tenure of the land linked by the proposed exclusion zones compared to those previously in place; and

iv. the landuse of areas linked by the proposed exclusion zones compared to those previously in place.

During the field audit, EPA officers assess conditions 5.8(h) - (I), which provide as follows:

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

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

j) A tree that is accidentally felled into a Ridge and Headwater Habitat exclusion zone may be removed from the zone, but only if the tree contains a timber log.

k) A tree that is felled into a Ridge and Headwater Habitat exclusion zone may be removed only in accordance with the following rules:

- the crown must be cut off from the trunk and left where it has fallen, except where the whole of the tree is lifted out of, or lifted and moved within, the zone using a mechanical harvester; and
- in removing the tree (or any logs into which it is cut), any disturbance to the ground and soil must be minimised as far as practicable.

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

Note that the above conditions do not permit the construction of snig tracks through ridge and headwater habitat.

DATA TABLES

Table 1: Descriptions and lat/long information accompanying the waypoints shown on maps 2, 3 and 4 at the start of this report.

Title	Latitude	Longitude	Easting	Northing	Description
From 2 Rainforest	-	150.3011681	9599551	4250360	Rf boundary marked in the field. No
waypoint 2	35.4593				incursions up to this point
Hollow Bearing	-	150.3008491	9599530	4250604	Large spotty hollow beating head on
Head On Ground	35.4571				ground see video
Hollow Limb On	-	150.3003242	9599479	4250504	Large size tree with hollow on the
The Ground	35.4581				ground. Stump was not found
Placemark 12	-	150.2857576	9598159	4250584	H tree with nice hollow
	35.4577				
R Tree	- 35.4597	150.3004777	9599487	4250325	R tree with large butt hollow.
RF 1	-	150.3017216	9599602	4250387	Edge of harvesting. No incursion at
	35.4591				this point. Boundary was marked in
					the field with pink tape.
Rf 3	-	150.300823	9599518	4250302	Edge of harvesting. Possible error in
	35.4599				marking. Harvesting right up to the
					marked boundary. Pink flag used to
Rf 4		150 3007798	9599513	4250270	End of rf assessment. No incursions at
	35.4602	130.3007730	5555515	4230270	this point. Edge of unmapped
					drainage line.
Rf Stump	-	150.3008435	9599520	4250308	Blue gum stump taken hard up against
	35.4598				the marked boundary. Stump was 77.5
					cm. directionally felled away from rf
					exclusion zone. Possibly marking
Rhw 1		150 3005629	9599/93	4250271	Ridge and head water start. No
	35.4602	150.5005025	5555455	4230271	incursion. Logging stopped 20+meters
					from this point. Not marked in the
					field.
Rhw 2	-35.46	150.3006082	9599498	4250291	Edge of harvesting adjacent to rhw.
					No incursion rhw is approximately 10
	25.450	450 2002620	0500400	4250544	m away
51	-35.458	150.3003638	9599483	4250511	
53	-	150.3004614	9599492	4250517	
56	-35 457	150 300762	9599523	4250623	
<u>50</u> 52	-33.437	150 3004063	9599487	4250520	
52	35.4579	130.3004003	5555407	4230320	
S4	-	150.3006361	9599510	4250588	
	35.4573				
S5	-	150.3007955	9599525	4250612	
	35.4571				
S7	-	150.3008678	9599532	4250625	
	35.4569				

Т2	-	150.2851697	9598102	4250478	R tree with hollows. Should have been
	35.4587				marked as an H tree
Т3	- 35.4585	150.285221	9598108	4250500	H tree
T4	- 35.4581	150.2853145	9598117	4250537	R tree
Т5	- 35.4578	150.2852417	9598112	4250572	H tree with hollows in the trunk
Т6	- 35.4578	150.2851024	9598099	4250579	R tree. Good tree
Τ7	- 35.4579	150.2851533	9598103	4250563	R tree with hollows
Т8	- 35.4578	150.2850631	9598096	4250580	H tree
Т9	- 35.4579	150.2850694	9598096	4250562	
T10	- 35.4578	150.285537	9598139	4250570	H tree 123 dbhob
T11	- 35.4576	150.2857424	9598158	4250593	R tree
T 13	- 35.4579	150.2858314	9598165	4250558	R tree
T14	۔ 35.4584	150.2856729	9598149	4250506	R tree very large with hollows
T 15	- 35.4585	150.2857612	9598157	4250498	H tree with the only half a trunk
T16	-35.459	150.2855593	9598137	4250445	R tree. Good tree
Т 17	- 35.4591	150.285591	9598139	4250429	H tree
Т 18	- 35.4584	150.3011644	9599554	4250460	H tree. Debris removed from around the tree.
T19	- 35.4584	150.3010375	9599543	4250466	R tree.
Т 20	- 35.4581	150.3005462	9599499	4250493	H tree. Small tree compared to the r tree down the hill. See photos. However there was a small hollow in the tree trunk
Т 21	۔ 35.4583	150.3004477	9599489	4250476	H tree
T 22	۔ 35.4582	150.3002666	9599473	4250484	R tree
Т 23	- 35.4581	150.3001675	9599465	4250497	H tree.
T24	- 35.4579	150.3004197	9599489	4250526	Large R tree with hollows
T25	- 35.4576	150.3004171	9599489	4250559	R tree. With hollows.
Т 26	-35.457	150.3007887	9599525	4250616	H tree. No hollows very small crown poor selection compared to other trees that were taken.

Tree1	-	150.2848363	9598071	4250451	R tree ahead of operations. Slightly
	35.4589				larger R tree beside it
YBG	-	150.3003267	9599476	4250382	Yellow belly glider feed tree identified
	35.4592				by FC. 15 primary browse trees
					marked and retained. End of rhw
					assessment no incursions along the
					assessment.

Table 2: Descriptions and photos accompanying placemarks (waypoints) shown on Map 2 of this report.

Placemarks

name	desc	Photos
Placemark 1	Marked H tree, spotted gum, 78.3dbh, no hollows. Stump next to it measuring 70cm diam at 80cm height. Other large stumps nearby measuring 70 and 85cm diameter.	images/Placemark 1.jpg, images/Placemark 1 (2).jpg, images/Placemark 1 (1).jpg
Placemark 2	85cm stump of spotted gum near a second order stream	images/Placemark 2.jpg
Placemark 3	Edge of incised channel for second order stream. Measured with tape to be 12.8m from the large 85cm stump. Stream is unmapped drainage line, see video.	images/Placemark 3.jpg, images/Placemark 3 (2).jpg, images/Placemark 3 (3).jpg, images/Placemark 3 (1).jpg
Placemark 4	Unmapped rainforest.	images/Placemark 4 (2).jpg, images/Placemark 4 jpg, images/Placemark 4 (1).jpg, images/Placemark 4 (3).jpg
Placemark 5	Unknown species. 87 cm	images/S8 .jpg
Placemark 6	R tree 80.5. No hollows. Other features. Mature Dom. No crown damage. No bumper disturbance or debris	images/T 3 (1).jpg, images/T 3.jpg
Placemark 7	Un marked tree with significant hollows. Spotty gum of 126.	images/T 4.jpg, images/T 4 (2).jpg, images/T 4 (1).jpg
Placemark 8	R tree. 74.3. No hollows other features. Mature dominant no crown damage. No debris bumper or disturbance.	images/T1.jpg, images/T1 (1).jpg
Placemark 9	H tree. Spotty 52.5 with hollow. Early mature co Dom. No other features or debris, disturbance or bumper	images/T2 (1).jpg, images/T2.jpg

AUDITEE SUBMISSIONS – NORTH BROOMAN STATE FOREST, COMPARTMENT 42

Condition / Audit finding reference / page No.	EPA draft finding / risk category	Location – description GPS	FCNSW evidence submission	EPA final finding / risk category	EPA response to FCNSW submission
TSL 5.8(g)	Amendment to the location of ridge and headwater habitat / ORANGE	P.13 of the report	A major benefit of the acquisition of LiDAR is that FCNSW are now able to accurately map the real-life location of drainage features. This has improved our ability to accurately apply the appropriate buffers/exclusions to drainage lines. Previous LIC drainage layers have been found inaccurate across much of the FCNSW estate, so the LiDAR derived drainage is now used when creating the Harvest Plan Operational Map (HPOM). A requirement of Ridge & Headwater Habitat exclusion zone network design is that exclusions follow 1 st or 2 nd order streams. The development of LiDAR derived drainage has also better enabled FCNSW to protect Ridge & Headwater Habitat. During harvest planning the location of the Ridge & Headwater Habitat exclusion is reviewed and amended based on the location of LiDAR derived drainage. This is done on a compartment by compartment basis as they come up for harvest. Prior to the acquisition of LiDAR drainage, operational outcomes would have been similar (although far less accurate) because the boundary would have been marked as found in the field rather than as mapped. There is no doubt that by amending the Ridge & Headwater Habitat exclusion zone for the HPOM we are better protecting for the intent of the TSL condition.	Not compliant/ ORANGE	The EPA upholds its findings. The audit identified that FCNSW failed to follow the correct procedure within the TSL. The TSL is clear under 5.8(g) which states that "Amendment to the location of Ridge and Headwater Habitat exclusion zones may not be made unless approved by EPA". The EPA did not approve these amendments. Consequently, the original exclusion zone is required to be protected as per the TSL requirements.

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			Where FCNSW encounter a compartment that has had a Ridge & Headwater Habitat exclusion zone applied to a previous harvesting event (i.e. since the commencement of the current TSL) we take steps to ensure that the proposed exclusion zone matches the previously applied exclusion. This is done using LiDAR canopy height models and aerial photography during harvest planning and during on-ground pre-harvest mark-up survey assessments.		
			In compartment 42, the actual Ridge & Headwater Habitat exclusion area that was protected totalled 24.1 hectares. This compares to the 21.5 hectares that would have been protected had the exclusion been applied exactly as per the mapping on the official layer. Figure 1 below shows the official exclusion zone extent and the LiDAR derived (actual) drainage line. Figure 2 shows the exclusion zone extent applied by FCNSW against the LiDAR derived drainage. From these images we can clearly see that the modified Ridge & Headwater Habitat exclusion is better protecting the riparian zones. FCNSW argue that environmental outcomes are improved after applying an exclusion zone that has been modified based on LiDAR drainage. FCNSW request that this not be considered a non-compliance and that this be recognised in the final audit report and during		
TSL 5 $8(b)$	Protection of	D 13 of the	Both the EPA audit $(12/07/2017)$ and a subsequent site		
(l)	ridge and headwater habitat / ORANGE	report	inspection by FCNSW on the 16 th of May found no evidence of specified forestry activities within the Ridge & Headwater Habitat as mapped on the HPOM. Therefore FCNSW assert that there has been no non- compliance and request that any reference is removed from the final audit report. The risk category should be downgraded from orange to N/A.	Not compliant/ ORANGE	The EPA upholds its findings. The audit identified that FCNSW failed to follow the correct procedure within the TSL. The TSL is clear under 5.8(g) which states that "Amendment to the location of Ridge and Headwater Habitat exclusion zones may not be made unless approved by EPA". The EPA did not approve these amendments. Consequently, the original exclusion zone is required to be protected as per the TSL requirements.

TSL 5.1E Marking-up of ridge and headwater habitat /	P.13 of the report	FCNSW no longer physically marks all boundary types. The Exclusion Zone Management standard operating procedure (SOP) stipulates which boundaries require field mark-up. Ridge & Headwater Habitat exclusion	Not compliant/ ORANGE	The EPA upholds its findings. The audit identified that FCNSW failed to follow the correct procedure within the TSL. The TSL is clear under 5.8(g) which states that "Amendment to the location of Ridge and Headwater	
	URANGE		The introduction of iPads has enabled us to display the current approved HPOM in conjunction with the current GPS location. These have been mounted in contractor machines and boundary location (for certain exclusion types) is undertaken by the operator. Operators receive inductions and training into the use of the technology and must first demonstrate proficiency working around physically marked boundaries. Using the iPads to locate boundaries allows us to improve safety, gain operational efficiencies and apply the necessary exclusions more accurately. This technology has allowed ECNSW to shift affort from		 approved by EPA". The EPA did not approve these amendments. Consequently, the original exclusion zone is required to be protected as per the TSL requirements. The Exclusion Zone Management standard operating procedure (SOP) is a FCNSW document. It is not the IFOA which prescribes the regaultion. The IFOA stipulates that: "A part of the boundary of an environmentally sensitive area (being Ridge and headwater) must be marked in the field if: i. in the case of road construction, road re-opening, snig track construction and snig track re-opening, the route or
			 boundary marking to the monitoring of boundary compliance. Results from FCNSW boundary audits show that this is an effective way to manage certain boundaries. Both the EPA audit (12/07/2017) and a subsequent site inspection by FCNSW on the 16th of May found no evidence of specified forestry activities within the Ridge & Headwater Habitat as mapped on the HPOM. 		proposed route of the road or snig track will come within 100 metres of that part of the boundary; and ii. in the case of any other specified forestry activity (other than bush fire hazard reduction work), the activity will come within 50 metres of that part of the boundary. The EPA found that Specified forestry activities came within 50 metres of the boundary.
TSL 5.6(a)(ii) and (c)(ii)	Selection of R trees / ORANGE	See attached data tables / p.10 of the report	On the 16 th of May 2018, FCNSW assessed each of the 6 alleged non-compliances related to marked R trees with hollows. During this assessment 4 of the marked R trees were found to have hollows ("T7", "T14", "T24", "T25"). FCNSW agree that these are non-compliances. 1 of these trees ("R Tree") was found to have excessive butt damage (compromising long-term survival	Not compliant / ORANGE	The EPA upholds its original findings. The EPA notes the circumstances related to these non-compliances.

	potential) and should not have been marked as an R or H tree.	
	and was considered an excellent "R" tree choice.	
	FCNSW request that only 5 of the 6 trees be recorded as non-compliances in the final audit report.	
	During the FCNSW inspection we were surprised by the poor-quality R tree selection decisions identified in these areas. An FCNSW pre-harvest retained tree selection audit was conducted on the 17 th of May 2017 in compartment 42 and found 97% compliance.	
	After checking the retained tree records on the FCMapApp it was noticed that each of the 5 non- compliances were attributed to a staff member that was undergoing training as a Forest Technician at the time. This person is no longer employed with FCNSW.	
	FCNSW note that there has been a long delay between the date of the audit, and FCNSW receiving the draft audit report (>10 months). In the future FCNSW would appreciate more timely receipt of audit findings so that any issues can be investigated and rectified as quickly as possible.	



Figure 1 - Official Ridge & Headwater Habitat Exclusion layer and LiDAR derived drainage (compartment 42)



Figure 2 - Applied Ridge & Headwater Habitat Exclusion and LiDAR derived drainage (compartment 42)