

AUDIT REPORT - PILLIGA WEST STATE FOREST, COMPARTMENTS 80, 84 AND 90

Auditee:	FORESTRY CORPORATION OF NSW (FCNSW)
Audited State Forest & Cpts:	PILLIGA WEST STATE FOREST, COMPARTMENTS 80, 84 AND 90
Region:	Brigalow – Nandewar Integrated Forestry Operations Approval (IFOA)
Date/Audit timing:	18 September 2014. Audit debrief with FCNSW staff held on 18 September 2014.
Type of audit:	Compliance
Purpose of audit:	Report on the level of compliance with conditions and environmental performance in line EPA compliance priorities.
Audit objectives:	<ol style="list-style-type: none"> 1. Assess compliance against audit criteria that reflect EPA compliance priorities. 2. Assess and categorise risk of identified non-compliance or appropriate further observations. 3. Request action plans against key audit findings so that auditee can use risk categorisation to inform timeliness and level of risk reduction control 4. Promote continuous improvement of the environmental performance of forestry operations.
Audit scope:	<ul style="list-style-type: none"> • White Cypress Trees retention and selection • Threatened species exclusion zones. <p>Physical scope: This audit was limited to the physical boundaries of compartments 80, 84 & 90.</p> <p>Temporal scope: The audit period adopted for assessment of compliance with operational conditions was on the days of the audit inspections (18 September 2014).</p>
Audit criteria:	<p>198 (1) (2) White cypress trees retention and selection</p> <p>246 Species protection zones for bird nests and roost sites</p>
Summary of Operations	<p>Silvicultural practice: compartment 90 – Release and vertical cut thinning, compartments 80 & 84 – Cypress release</p> <p>Stand age: Regeneration since the 1890s</p>

1. Audit Findings – Overview

The EPA identified 6 non-compliances and 1 compliant finding with the IFOA, including determinations of further observations.

A summary of EPAs findings are in the table below. Full details and evidence of audit findings can be found in the Audit Findings Table in Attachment 1 including further observations made from the audit.

EPA Compliance Priority 2014/15	Audit Scope	Non-complaint	Compliant	Not Determined	Not Applicable
Forest Structure	Retention of white cypress trees	0	0	0	1
	Selection of white cypress trees	4	0	0	0
Exclusion Zones	TS Exclusion Zone – Mark-up and protection	1	1	0	0
	Further observation	1*	0	0	0
TOTAL		6	1	0	1

* Note: subject to a separate investigation process.

2. Audit Recommendations

Condition No.	Number of non-compliances	Action Details	Non-compliance Code*	Target/Action Date
198 (2)	4	White Cypress Pine Selection – Forest Structure An action plan must be developed and implemented to ensure white cypress trees to be retained for the purposes of condition 198 are selected from the cohort of healthy, mature trees with the next largest diameters at breast height over bark	Orange	Immediate
246 (1)	1	Barking Owl nest site field marking FCNSW to ensure that species protection zones are marked up in the correct location.	Yellow	End of March 2015
28, 267	1	FMZ 3A field marking & protection* The EPA will be following up on this matter through a separate investigative process.	Orange	The EPA will be following up on this matter through a separate investigative process.
Total	6			

* Further observation of audit

3. Audit Conclusions

This audit achieved its audit objective by determining compliance with the specified criteria of the audit. The EPA issued FCNSW with the draft audit findings and FCNSW submitted actions to mitigate the non-compliances (Attachment 3). The EPA will follow up on the outcomes of these audits to ensure levels of compliance are enhanced for criteria that relate to this audit.

4. List of Attachments

Attachment 1) Audit Findings Table

Attachment 2) EPA Risk Matrix for Non-compliances

Attachment 3) FCNSW Submission on draft audit findings

ATTACHMENT 1: AUDIT FINDINGS TABLE – PILLIGA WEST STATE FOREST, COMPARTMENTS 80, 84 AND 90

Assessment of Compliance with the <i>Brigalow-Nandewar Region Integrated Forestry Operations Approval</i>				
Condition No.	Compliant? (Yes/No/ Not-determined)	Comment and Evidence	Number of non-compliance (sample size)	Action required by licensee
CONDITIONS RELATED TO RETENTION OF LARGE WHITE CYPRESS TREES – FOREST STRUCTURE				
198. Retention of large white cypress trees <i>(1) Forests NSW must ensure that, at the completion of any logging operation in which white cypress trees are felled, at least six large white cypress trees remain, within the net mapped operation area, in each hectare of land surrounding a stump of any white cypress tree that is felled in the operation concerned.</i>	Not-applicable	<p>The EPA found that this condition was not applicable as white cypress pine (WCP) trees with a diameter of 550 mm or greater (Clause 198 (2) (1) Brigalow-Nandewar IFOA) did not occur within any of the areas assessed.</p> <ul style="list-style-type: none"> EPA officers assessed four one hectare plots (figure 1 Appendix) throughout the net harvest area. Officers measured all retained WCP with a diameter at breast height over bark (DBHOB) (cm) greater than 10 cm, and all WCP stumps within each one hectare plot. There were no trees recorded (removed or retained) that had a DBHOB of greater than 550mm. 	0 (4)	No action
198. Retention of large white cypress trees <i>(2) Only living trees may be selected for the purpose of subclause (1). If possible, the trees selected for retention are each to have a dbhob of more than 550 mm. If there are not enough trees having such a dbhob, surrounding the tree that is or is</i>	No Code: Orange	<p>The EPA found FCNSW not compliant with this condition in all four (4) areas assessed.</p> <p>EPA officers established four, randomly located, one hectare plots to assess compliance with this criterion, one in compartment 84 and three in compartment 90. The total area of assessment was four hectares.</p> <ul style="list-style-type: none"> Within each plot the nearest stump to plot centre was located and a one hectare circular plot was established. All standing WCP trees and all WCP stumps within the plot were assessed. Stump diameter and stump height of each felled tree were recorded. DBHOB (cm) of each felled tree was then estimated in accordance with Clause 232 of the Brigalow-Nandewar Region IFOA. Retained trees were assessed, including trees that were marked for retention and those 	4 (4)	An action plan must be developed and implemented to ensure white cypress trees to be retained for the purposes of condition 198 are selected from the cohort of healthy, mature trees with the next largest

<p><i>proposed to be felled and within the net mapped operation area, then trees are to be selected from the cohort of healthy, mature trees with the next largest diameters at breast height over bark to make up the shortfall.</i></p>		<p>left unmarked. DBHOB (cm), was recorded for comparison of retained versus removed trees.</p> <p>The mean DBHOB and standard deviation was calculated for each plot.</p> <ul style="list-style-type: none"> • trees with a DBHOB greater than two standard deviations (2SD) above the mean were considered to be large trees under the IFOA. • trees with a DBHOB greater than, or equal to, one standard deviation from the mean (1SD), but less than two standard deviations (2SD), were considered to be in the next largest cohort for compartments 216 and 217. <p>Plot 1 – Way point 1201 – Compartment 90</p> <p>The EPA finds FCNSW not compliant with condition 198 (2) (1) at this location as they did not select retained trees from the cohort of healthy mature trees with the next largest DBHOB.</p> <ul style="list-style-type: none"> • FCNSW retained zero large trees (greater than 2SD) and one tree from the next largest cohort. • FCNSW removed the two largest trees and one tree from the next largest cohort (i.e. larger than 1SD and smaller than 2SD) in the plot. • FCNSW retained the next two largest trees i.e. from the cohort of trees less than one standard deviation and greater than the mean in diameter. <p>Three of the removed largest trees (one large and two from the next largest cohort) were required to be retained to comply with Clause 198 (2) (1) of the Brigalow-Nandewar IFOA.</p>		<p>diameters at breast height over bark</p>
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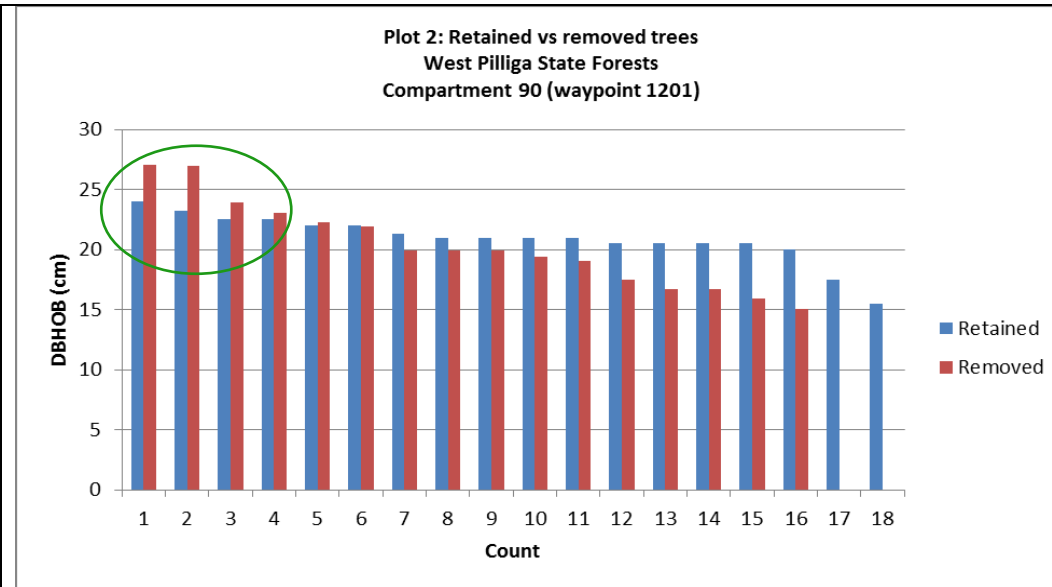


Chart 1: Retained vs removed trees within plot 1. Note: the two largest trees were removed and one of the next largest, a non-compliance with the Brigalow-Nandewar IFOA.

Plot 2 – Way point 1203 – Compartment 90

The EPA finds FCNSW **not compliant** with condition 198 (2) (1) at this location as they did not select retained trees from the cohort of healthy mature trees with the next largest DBHOB.

- FCNSW retained one large tree (greater than 2SD) and two trees from the next largest cohort (Image 1).
- FCNSW removed one large tree, and six trees from the next largest (i.e. trees larger than 1SD and smaller than 2SD) cohort in the plot.

One removed large tree, and two from the next largest cohort, were required to be retained to comply with Clause 198 (2) (1) of the Brigalow-Nandewar IFOA.

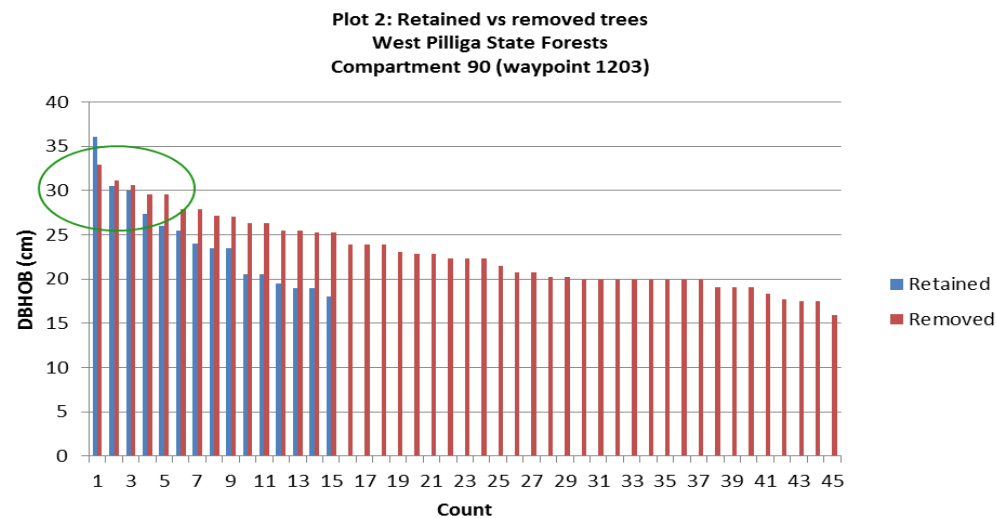


Chart 2: Retained vs removed trees within plot 2. Note: One large tree and two from the next largest cohort within the plot were removed; a non-compliance with the Brigalow-Nandewar IFOA.

Plot 3 – Way point 1204 – Compartment 90

The EPA finds FCNSW **not compliant** with condition 198 (2) (1) at this location as they did not select retained trees from the cohort of healthy mature trees with the next largest DBHOB.

- FCNSW retained two large trees (greater than 2SD) and one tree from the next largest cohort.
- FCNSW removed two trees larger than 2SD and three of the next largest cohort in the plot (i.e. trees larger than 1SD and smaller than 2SD).

Two removed large trees, and two from the next largest cohort, were required to be retained to comply with Clause 198 (2) (1) of the Brigalow-Nandewar IFOA

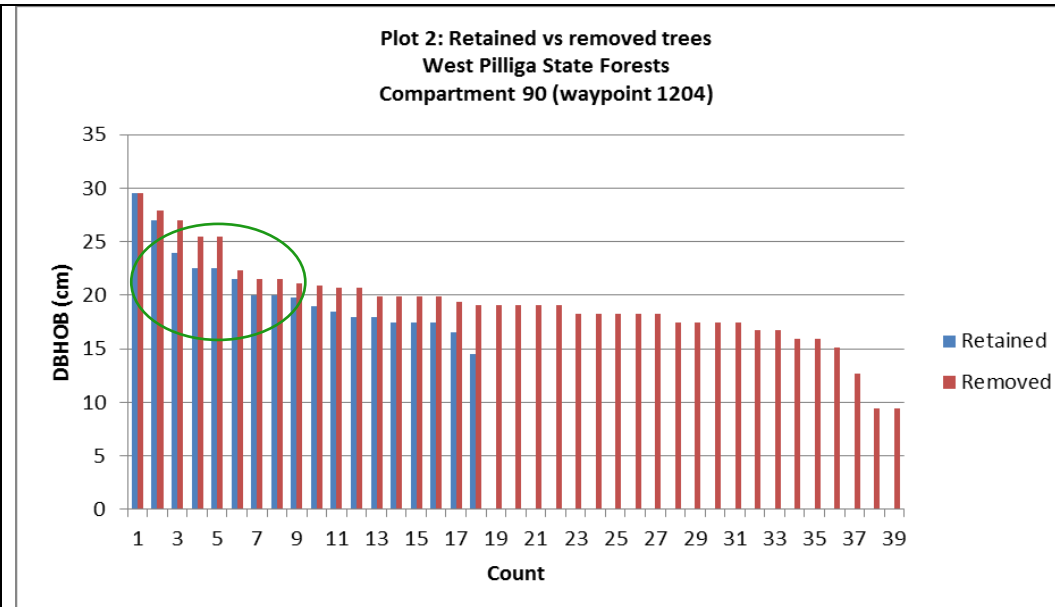


Chart 3: Retained vs removed trees within plot 3. Note: the two large trees were retained and two were removed. The next two largest trees were removed; a non-compliance with the Brigalow-Nandewar IFOA.

Plot 4 – Way point 1229 – Compartment 84

The EPA finds FCNSW **not compliant** with condition 198 (2) (1) at this location as they did not select retained trees from the cohort of healthy mature trees with the next largest DBHOB.

- FCNSW retained zero large trees (greater than 2SD) and one tree from the next largest cohort.
- FCNSW removed one tree larger than 2SD and zero of the next largest cohort in the plot (i.e. trees larger than 1SD and smaller than 2SD).

The one removed large tree, and the three largest from the cohort of trees, less than one standard deviation and greater than the mean in diameter, were required to be retained to comply with Clause 198 (2) (1) of the Brigalow-Nandewar IFOA

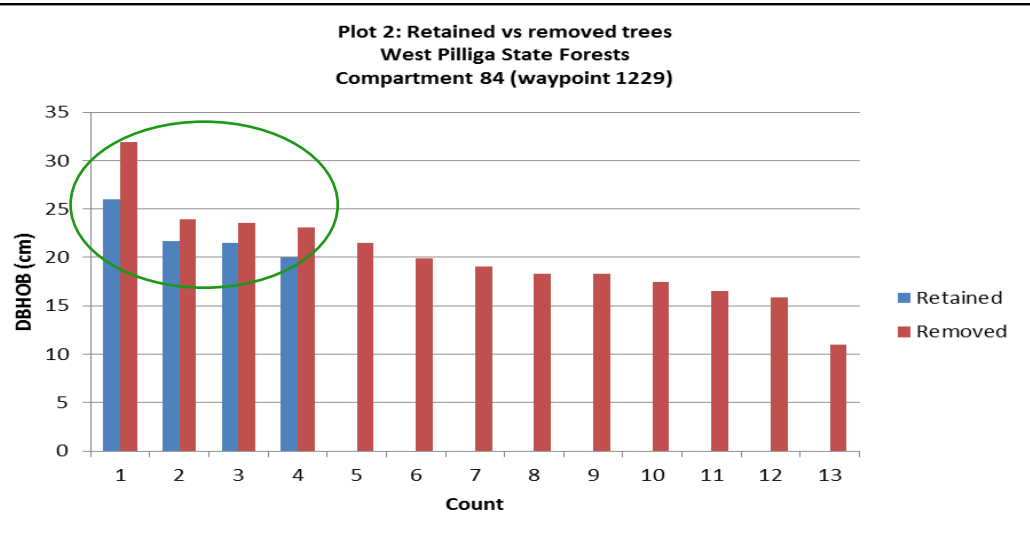


Chart 4: Retained vs removed trees within plot 3. Note: Zero large trees were retained and one was removed. The next three largest trees were removed; a non-compliance with the Brigalow-Nandewar IFOA.

Risk assessment of non-compliance

The EPA made a risk assessment of activities found to be non-compliant by the audit. These were assessed against two criteria:

- the likelihood of environmental harm occurring, and
- the level of environmental impact.

These results were used to decide the level of risk for each non-compliant activity. The risk assessment due to the removal of large trees from within the net harvest area is assessed as Code Orange because:

- it is likely that environmental harm has occurred, and
- the level of environmental impact is moderate as the scale of impact is moderate to high and the receiving environment is relatively low.

Why is it important?

The EPA considers that the retention of the *cohort of healthy, mature trees with the next largest*

		<p><i>diameter</i> to be important because of the crucial role larger size class trees play for the maintenance of biodiversity, health and the productive capacity of these forest ecosystems. The EPA notes that forests of mixed age classes provide the greatest structural and habitat diversity for maintenance of biodiversity values.</p> <p>Further, given that White cypress does not coppice and is an obligate seeder, the maintenance of a viable seed source is crucial for regeneration purposes and the long term sustainability. Crucially, healthy larger size trees are considered suitable founder trees which supply seed for regeneration. Failing to ensure that the next largest size trees are retained threaten the capacity of this forest ecosystem to function normally and its long term sustainability, including regenerating successful following a harvest event.</p>		
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Condition No.	Compliant? (Yes/No/Not-determined)	Comment and Evidence	Number of non-compliance and (sample size & unit)	Action required by licensee						
CONDITION RELATED TO BARKING OWL IDENTIFICATION AND PROTECTION										
<p>246. Species protection zones for bird nests and roost sites</p> <p><i>(1) Any area of land within the distance specified in column 2 of the table below from a nest or roost of a bird or birds of the species described (on the same row) in column 1 of that table is a species protection zone. This subclause applies only to a nest or roost of which there is a record.</i></p> <table><tr><td>Column 1</td><td>Column 2</td></tr><tr><td>Barking owl major roost</td><td>100 metres</td></tr><tr><td>Barking owl nest</td><td>200 metres</td></tr></table>	Column 1	Column 2	Barking owl major roost	100 metres	Barking owl nest	200 metres	<p>No</p> <p>Code:</p> <p>Yellow</p>	<p>Barking Owl nest site 1.</p> <p>The EPA found FCNSW not compliant with this condition at this location.</p> <p>The EPA found that a species protection zone (SPZ) was installed around the Barking Owl nest located within the FMZ 3A exclusion at approximately 681876E, 6604565N.</p> <p>EPA officers found that the Barking Owl SPZ was not compliant with clause 246 (1) of the Brigalow-Nandewar IFOA as it was marked within the 200 m radius circle in parts of its length (Figure 1).</p> <p>EPA officers found that approximately 20 per cent of the SPZ boundary was incorrectly marked inside the 200 metre radius of the SPZ. EPA officers also found field marking up to 15m within the SPZ boundary.</p> <p>Figure 1 illustrates the difference between the FMZ boundary, the SPZ and the marked-up boundary. This record occurs on A-Line Road within</p>	1 (2)	
Column 1	Column 2									
Barking owl major roost	100 metres									
Barking owl nest	200 metres									

compartment 84, Pilliga West State Forest.



Figure 1. Barking owl nest site location map within FMZ 3A (harvesting exclusion zone), Barking Owl species protection zone and marked buffer boundary.

EPA officers found a WCP stump within the marked boundary. The stump

		diameter was 45 cm which equates to a DBHOB of approximately 35.1 cm (using the Brigalow Nandewar IFOA WCP look up table). This was from the cohort of larger size class trees.		
		<p>Risk assessment of non-compliance</p> <p>The EPA has made a risk assessment of activities found to be non-compliant by the audit. These were assessed against two criteria:</p> <ul style="list-style-type: none"> the likelihood of environmental harm occurring, and the level of environmental impact. <p>These results were used to decide the level of risk for each non-compliant activity. The risk assessment due to the incorrect SPZ boundary mark-up is assessed as Code Yellow because:</p> <ul style="list-style-type: none"> it is likely that environmental harm has occurred, and the level of environmental impact is low as the scale of harm was relatively low and the sensitivity of the receiving environment moderate. <p>Why is it important?</p> <p>The EPA considers that species protection zones are environmentally significant areas under the Brigalow-Nandewar IFOA. The Barking Owl SPZ is important to the conservation of the Barking Owl by limiting disturbance near known nest trees frequented by the Barking Owl.</p>		
	Yes	<p>Barking Owl nest site 2.</p> <p>The EPA found FCNSW compliant with this condition at this location.</p> <p>The EPA found a SPZ installed around the Barking Owl nest located at approximately 6783380E, 6604340N. This record occurs on the Western Way in compartment 92, Pilliga West State Forest and requires a 200 m radius SPZ be installed when a harvesting operation is current.</p> <p>EPA officers found that the Barking Owl SPZ was compliant with Clause 246</p>		

		(1) of the Brigalow-Nandewar IFOA. EPA officers did not find evidence of the harvesting of trees from within the Barking Owl special protection zone.		
B-N IFOA Total Non-compliances			Total 5 (6)	

FURTHER OBSERVATIONS TABLE – PILLIGA WEST STATE FOREST, COMPARTMENTS 80, 84 and 90

These are matters that were recorded during the field investigation but relate to conditions outside the audit scope

Relevant Condition	Details of matter	Recommendation
<p><i>Clause 28. Forest Management Zoning System</i></p> <p><i>(1) In carrying out, or authorising the carrying out of, forestry operations in State forests, Forests NSW must give effect to the document entitled, "Forest Management Zoning in State Forest" (State Forests of New South Wales, December 1999).</i></p> <p><i>Zone 3A Harvesting Exclusions:</i> <i>1. Areas where harvesting is excluded but other management and production activities preclude Zone 1 or 2.</i></p>	<p>The Harvest Plan Operation Map (HPOM) clearly showed the location of the prescribed Forest Management Zones (FMZ) within compartment 84 in Pilliga West State Forest.</p> <p>EPA officers observed that the exclusion boundary for FMZ 3A was not marked according to condition 28 (1) (The FMZ Net Harvest Area exclusion boundaries should be taken 'as mapped' and marked in the field prior to operations commencing). As a result an incursion into the FMZ 3A buffer occurred with a large number of WCP trees harvested.</p> <p>FCNSW is not compliant with condition 28 of the B-N IFOA and "Forest Management Zoning in State Forests (State Forests of NSW, December 1999).</p>	<p>The EPA will be following up on this matter through a separate investigative process.</p>

ACTION PLAN – PILLIGA WEST STATE FORESTS, COMPARTMENTS 80, 84 AND 90

Condition No.	Number of non-compliances	Action Details	Non-compliance Code*	Target/Action Date
198 (2)	4	White Cypress Pine Selection – Forest Structure An action plan must be developed and implemented to ensure white cypress trees to be retained for the purposes of condition 198 are selected from the cohort of healthy, mature trees with the next largest diameters at breast height over bark	Orange	Immediate
246 (1)	1	Barking Owl nest site field marking FCNSW to ensure that species protection zones are marked up in the correct location.	Yellow	End of March 2015
28, 267	1	FMZ 3A field marking & protection* The EPA will be following up on this matter through a separate investigative process.	Orange	The EPA will be following up on this matter through a separate investigative process.
Total	6			

* Further observation of audit

ATTACHMENT 2: EPA 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			
Level of Environmental Impact		Certain	Likely	Less Likely
	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.

ATTACHMENT 3: FCNSW SUBMISSION ON DRAFT AUDIT FINDINGS

<p>Pilliga West SF 80, 84, 90 Clause 198 Retention of large white cypress trees</p> <p>Clause 198 (2) requires the following:</p> <ul style="list-style-type: none"> - Only living trees may be selected. - Tree diameters to be greater than 550 mm where available. - If not enough trees with diameters greater than 550 mm then trees are to be selected from the cohort of healthy, mature trees with the <u>next largest diameters</u> at breast height. 	<p>Non-compliant</p> <p>Code Orange</p>		<p>FCNSW disputes the draft findings of Non-compliance-No environmental harm</p> <p>A cohort of trees is a population of a species of a common age. A number of factors determine which trees are to be selected for retention. They do not need to be the six largest individuals as asserted by the audit report. Tree health is a major consideration.</p> <p>FC is of the view that audit report has wrongly interpreted cl 198 as:</p> <ol style="list-style-type: none"> 1. The IFOA does not define a cohort as 2 Standard Deviations above the mean DBHOB. IF FC were to apply EPA's methodology it would require FC to select and mark trees to be retained across the compartment prior to the commencement of operation, which is inconsistent with cl 194. 2. Tree health is taken into account when selecting trees for removal. If a large tree showing signs of dead branches, thin crown or sap crack is removed the next largest is retained in close proximity to the stump. 	<p>Non-compliant</p> <p>Code Orange</p> <p>FCNSW is non-compliant with clause 198 of the Brigalow-Nandewar IFOA.</p>	<p>The term cohort as used in clause 198 clearly refers directly to the size of the trees; it does not refer to age class.</p> <p>The EPA did not find White Cypress Pine (WCP) of 550 mm or greater diameter within the harvested compartments.</p> <p>The EPA utilises random samples and statistics to better understand the diameter distribution of retained and removed WCP.</p> <p>FCNSW was therefore required by the Brigalow-Nandewar IFOA to retain trees from the cohort of healthy, mature trees with the <u>next largest diameters</u> at breast height.</p> <p>EPA found that FCNSW removed trees from the largest diameter cohort, that were required to be retained, in each of the areas assessed by EPA</p>
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					<p>officers, a non-compliance with the Brigalow-Nandewar IFOA. Accordingly the draft audit finding and its risk code is retained.</p>
<p>Clause 246 Species protection zone for birds and roost sites.</p> <p>Clause 245 states that species protection zones are environmentally significant areas (ESA).</p> <p>Clause 246 establishes that the area of land within 200m of the Barking Owl nest site is a species protection zone.</p> <p>Clause 267 states that logging operations must not be carried out in environmentally</p>	<p>Non-compliant</p> <p>Code Orange</p>		<p>FCNSW disputes the draft findings on No-compliance-No environmental harm</p> <p>FC has undertaken an inspection of the marked buffer and its location:</p> <ol style="list-style-type: none"> 1. Any discrepancies with the location of the boundary are within the margins of error for use of hand held GPS's 2. The area marked and excluded from harvesting is larger than that prescribed by the IFOA 3. The nest site has been protected 4. With the exception of one stump that appeared to be on the line of the marked boundary all other stumps were outside the marked boundary. 	<p>Non-compliant</p> <p>Code Yellow</p> <p>The minimum buffer size (200 metre radius about the record) was not implemented as required by the Brigalow-Nandewar IFOA.</p>	<p>Harvesting in ESA</p> <p>A tree was harvested within the marked boundary of the ESA.</p> <p>Under the IFOA FCNSW is obligated to ensure that the minimum buffer sizes detailed in Clause 246 (1) of the Brigalow-Nandewar IFOA are implemented, and observed by harvesting crews.</p> <p>Accordingly the draft audit (Non-compliant) finding is retained.</p> <p>The EPA has amended the risk categorisation for this non-compliance.</p> <p>The risk categorisation is yellow as the scale of the environmental impact is considered relatively low.</p> <p>Field mark up of boundary Approximately 20% of the</p>

significant areas (ESA).					<p>boundary was incorrectly marked in the field that is within the species protection zone.</p> <p>The field marking was up to 15m within the species protection zone.</p> <p>The risk categorisation was changed from an orange risk code to yellow as the scale of the environmental impact is considered relatively low.</p>
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