



**Bungabee State Forest
Preliminary Assessment**

North East Forest Alliance

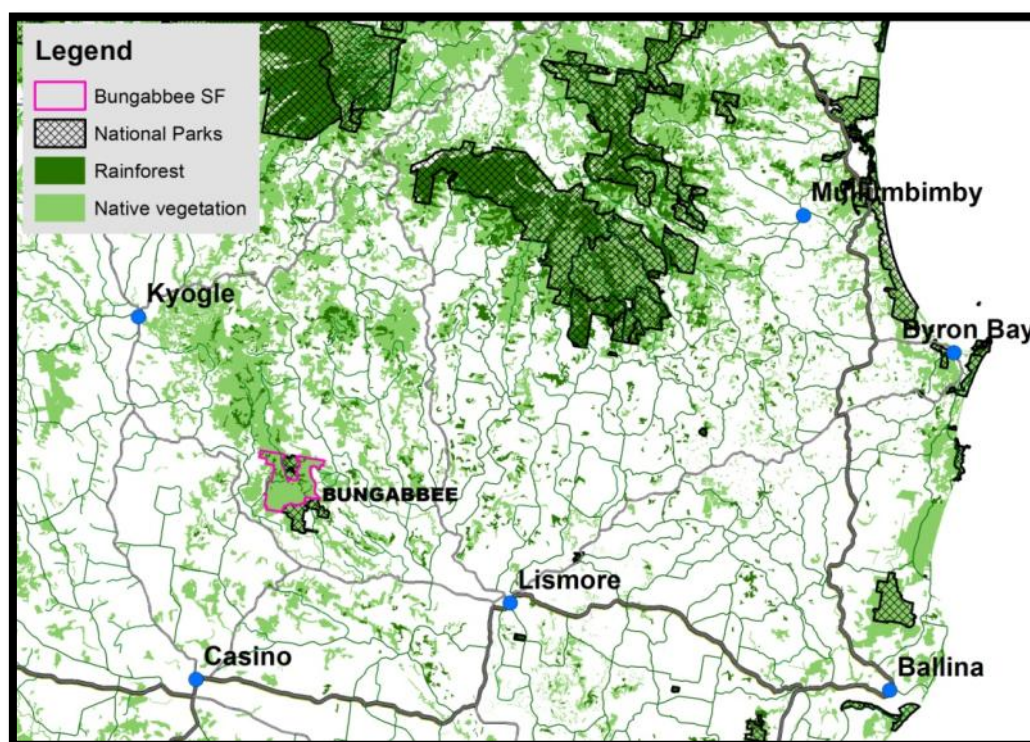
BUNGABBEE STATE FOREST, PRELIMINARY ASSESSMENT

Dailan Pugh, North East Forest Alliance Inc. November 2020

The Forestry Corporation is proposing to log compartments 3 and 4 of Bungabbee State Forest. Their website stated logging was due to start on 2 November though this has been put back to next April. The Harvesting Plan hasn't been released yet.

With a number of botanists and zoologists NEFA undertook a preliminary assessment of Bungabbee State Forest on the weekend of 24 and 25 of October, with the primary aims of identify localities of threatened species and priority habitat areas for protection.

We were impressed that Bungabbee State Forest is still in reasonable condition. There is a scattering of large forest giants and some patches of oldgrowth that indicate the past grandeur of this forest, though most of the forest is reduced to regrowth, with some trees left in the last logging 20 years ago beginning to mature. It will take over a century for these trees to develop the hollows essential to restore populations of possums and gliders. There was some lovely rainforest along Oaky Creek and the forest was generally easy to walk through with limited patches of lantana, though worryingly these patches were beginning to be affected by Bell Miner Associated Dieback. Erosion problems due to 4 wheel drives and trail bike riders are widespread.



The 1092 ha Bungabbee State Forest is situated between the small Bungabbee and Mucklewee Mountain Nature Reserves, in the Richmond River valley, 15km to the west of Lismore.

Being an outlier of the Border Ranges, Bungabbee is an area of outstanding biodiversity value with many species reaching their southern limits. Threatened species previously recorded from this vicinity included 8 plants, 9 birds, 9 mammals, and one beetle. Our brief visit revealed the additional presence of the Vulnerable Long-nosed Potoroo and Marbled Frogmouth, as well as the Critically Endangered Native Guava. We expect others to occur.

The finding of a large unknown outlying population of the regionally endemic Marbled Frogmouth is exciting. This is one of only a handful of species that the Forestry Corporation is still required to look for ahead of logging and protect additional habitat for, in this case wider stream buffers. Though as their model did not predict its occurrence in Bungabbee, they didn't have to look there. Luckily we did.

It was particularly disturbing to find significant populations of the Critically Endangered Scrub Turpentine and Native Guava. The very survival of these species is in doubt because of the introduced fungus Myrtle Rust. This was first discovered in Australia in 2010 and has since spread throughout east coast forests. Many of the other myrtle species in these forests, particularly seedlings, are also vulnerable. There is something fundamentally wrong when we allow logging amongst species teetering on the brink of extinction, with low prospects of regeneration, rather than doing all we can to save them.

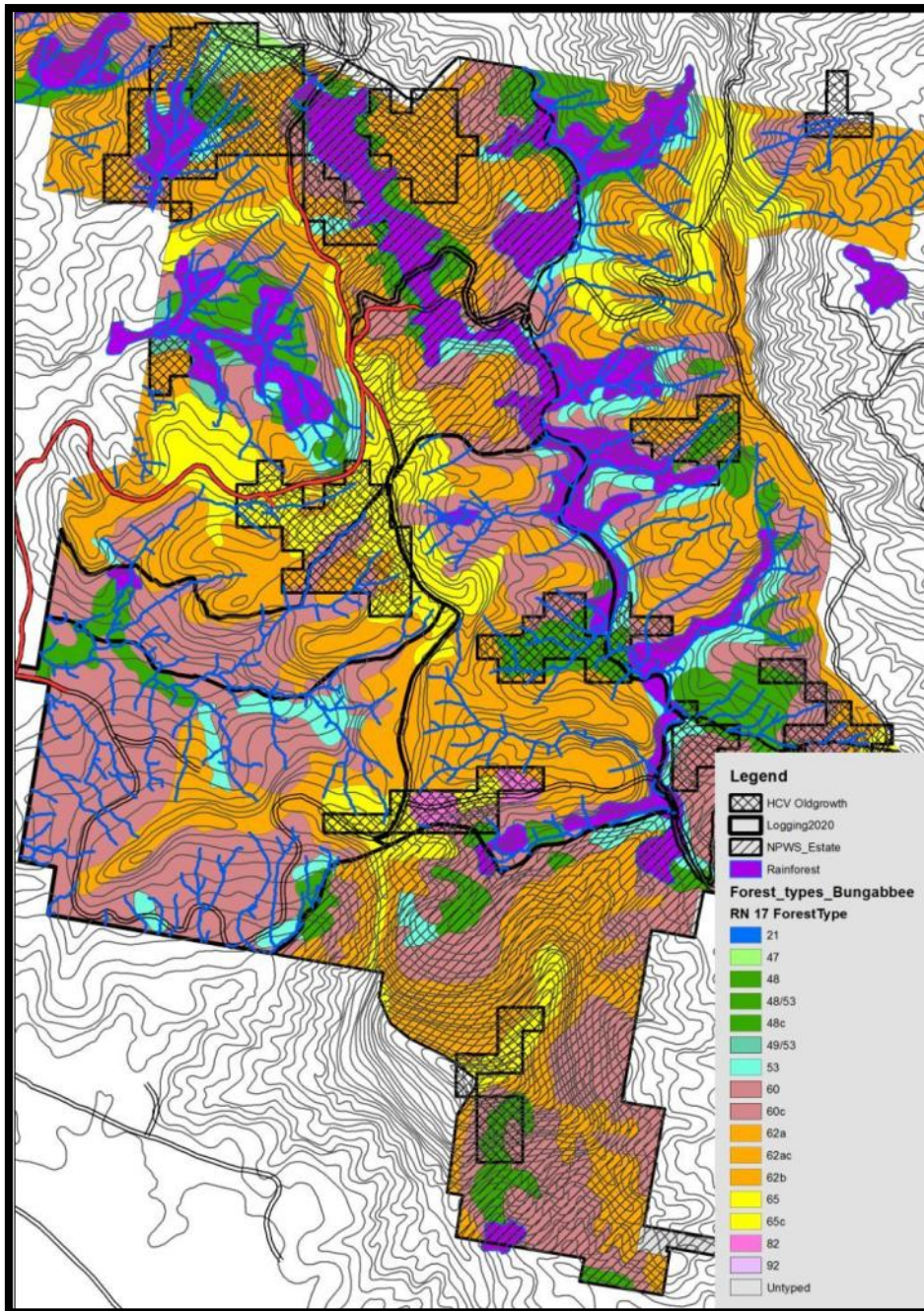
By documenting the distribution of a variety threatened species we have highlighted some of the most important parts of Bungabbee State Forest that most need to be protected from logging and therefore included in the 10% of the logging area Forestry Corporation are required to protect. We will provide our results to the forestry corporation in the hope they will heed them.

Our results clearly demonstrate the need for pre-logging assessments to identify those parts of forests most in need of permanent protection, rather than allowing the Forestry Corporation to pick those areas with the lowest timber values.

Most importantly we have reaffirmed the outstanding significance of Bungabbee as an outlier of the Border Ranges in an extensively cleared landscape. Most of the threatened species occurring there are known to be adversely affected by logging. Logging will also spread lantana and dieback, while worsening Myrtle Rust.

Rather than being further degraded by logging, Bungabbee would make a very worthy addition to the reserve system.





This is Forestry Corporation Research Note 17 Forest Types. 21 is dry rainforest and incorporated into the revised rainforest mapping, 47 is Tallowwood/Blue Gum, 48 is Flooded Gum, 53 is Brush Box, 60 is Narrowleaved White Mahogany-Red Mahogany-Grey Ironbark-Grey Gum, 62 is Grey Gum-Grey Ironbark-White Mahogany, 65 is Forest Red Gum-Grey Gum/Grey Ironbark Roughbarked Apple 82 is Grey Box and 92 is Forest Red Gum.

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1. Animals

There are records of 20 NSW listed threatened fauna in Bungabbee State Forest and Bungabbee Nature Reserve These include 10 Vulnerable birds, 9 Vulnerable mammals and the Endangered Shorter Rainforest Ground-beetle. The nationally vulnerable Greater Glider and Queensland Vulnerable Richmond Birdwing Butterfly also occur.

Logging is specifically identified by DPIE as a threat to 11 of these species, the loss of hollow-bearing and recruitment trees as a threat to 7 of these species and lantana proliferation a threat to 3 species.

NEFA's assessment of fauna was limited by the time available and access difficulties. We identified two new fauna species records for Bungabbee; one Long-nosed Potoroo and 6 Marbled Frogmouths (see 1.1).

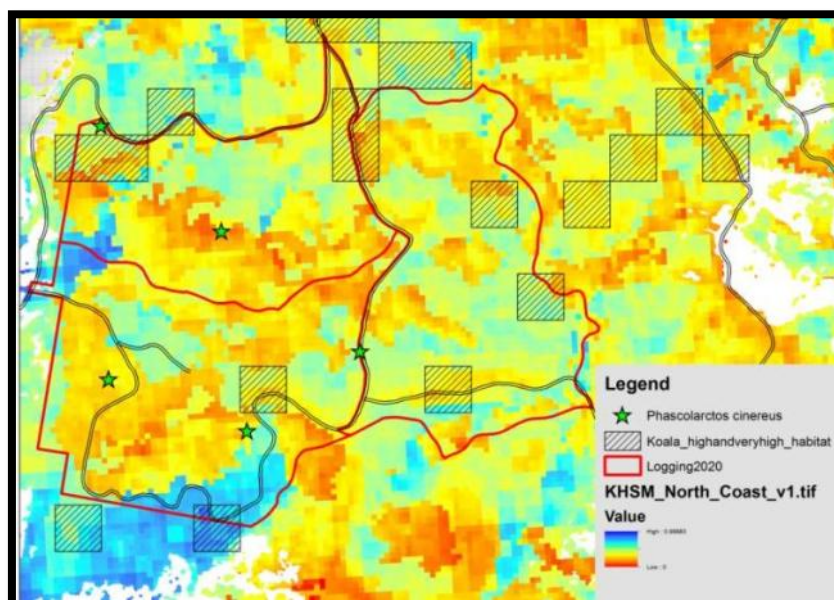
Species		Status	Broad Habitat	Relevant DPIE Threats
BIRDS				
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	Vulnerable	Open sclerophyll, forest	Logging, Loss hollow bearing & recruitment trees
<i>Glossopsitta pusilla</i>	Little-Lorikeet	Vulnerable	Open sclerophyll, forest	Loss hollow bearing & recruitment trees
<i>Ptilinopus magnificus</i>	Wompoo Fruit Dove	Vulnerable	Rainforest, wet sclerophyll	Logging, lantana
<i>Ninox strenua</i>	Powerful Owl	Vulnerable	Open sclerophyll, forest, Rainforest, wet sclerophyll	Logging, Loss hollow bearing & recruitment trees
<i>Tyto novaehollandiae</i>	Masked Owl	Vulnerable	Open sclerophyll, forest,	Logging, Loss hollow bearing & recruitment trees
<i>Tyto tenebricosa</i>	Sooty Owl	Vulnerable	Rainforest, wet sclerophyll	Logging, Loss hollow bearing & recruitment trees
<i>Podargus ocellatus</i>	Marbled Frogmouth	Vulnerable	Rainforest, wet sclerophyll	Logging
<i>Coracina lineata</i>	Barred-Cuckoo-Shrike	Vulnerable	Rainforest, wet sclerophyll, Open sclerophyll, forest,	Logging
<i>Carterornis leucotis</i>	White-Eared Monarch	Vulnerable	Rainforest, wet sclerophyll, Open sclerophyll, forest,	Logging, grazing, lantana
<i>Daphoenositta chrysoptera</i>	Varied Sittella	Vulnerable	wet sclerophyll, Open sclerophyll, forest	grazing, lantana
MAMMALS				
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	Vulnerable	Rainforest, wet sclerophyll, Open sclerophyll, forest,	
<i>Phascolarctos cinereus</i>	Koala	Vulnerable	Open sclerophyll, forest, wet sclerophyll	
<i>Petaurus australis</i>	Yellow Bellied-Glider	Vulnerable	Open sclerophyll, forest, wet sclerophyll	Loss hollow bearing & recruitment trees
<i>Petaurus norfolcensis</i>	Squirrel Glider	Vulnerable	Open sclerophyll, forest	Loss hollow bearing & recruitment trees
<i>Petauroides volans</i>	Greater Glider	Vulnerable (CW only)	Open sclerophyll, forest, wet sclerophyll	
<i>Macropus parma</i>	Parma Wallaby	Vulnerable	wet sclerophyll, rainforest ecotone	Logging, grazing
<i>Thylogale stigmatica</i>	Red-legged Pademelon	Vulnerable	Rainforest, wet sclerophyll,	Logging, grazing,
<i>Potorous tridactylus</i>	Long-nosed Potoroo	Vulnerable	Open sclerophyll, forest, wet sclerophyll	Logging,
<i>Pteropus poliocephalus</i>	Grey-Headed Flying Fox	Vulnerable	Rainforest, wet sclerophyll, Open sclerophyll, forest,	
<i>Miniopterus australis</i>	Little Bent Winged Bat	Vulnerable	Rainforest, wet sclerophyll, Open sclerophyll, forest	
INVERTEBRATES				
<i>Nurus brevis</i>	Shorter Rainforest Ground-beetle		Rainforest,	

NEFA's assessment was limited to a day and a half, and was hampered by the poor condition of the roads and therefore limited access. The focus being on recording localities of threatened fauna. The nighttime survey specifically targeted Marbled Frogmouth using call playback, with other species recorded opportunistically. Six Marbled Frogmouth and a pair of Sooty Owls were detected by call playback on Saturday night, along with a Long-nosed potoroo crossing the track, Grey-headed Flying Foxes feeding, and a pair of Greater Gliders in a bloodwood. During the day Wompoo Fruit Dove and Richmond Birdwing Butterfly were found to be widespread, with 2 Little Lorikeets observed and Koala scats found under one tree. Threatened species found are documented in Appendix 1.

The sighting of a Long-nosed Potoroo *Potorous tridactylus* adjacent to Oaky Creek is a significant new record. There is also a record to the north outside the State Forest. The Long-nosed Potoroo is listed as Vulnerable, with DPIE identifying as a threat "*Logging or other disturbances that reduce the availability and abundance food resources, particularly hypogeous fungi, and ground cover*". Though there is no species specific requirement for it.

Given the degraded nature of this forest, and the limited number of hollow-bearing trees, it is expected that there will be patches with relatively larger numbers of hollow-bearing trees that qualify as core habitat for the hollow-dependent Yellow Bellied-Glider, Squirrel Glider and Greater Glider. Such patches provide the multiple hollows required by some family groups, as well as providing for groups of Greater Gliders.

Access and time limitations did not enable the identification of such patches, though this is considered a high priority for the identification of habitat tree retention clumps. Using Aerial Photographic Interpretation to identify concentrations of hollow-bearing and mature trees on the more productive sites would be a worthwhile measure to assist objective identification of priority areas.



The area doesn't come up high on the DPIE Koala Habitat Suitability Model for Koalas, though there are a few records and suitable food trees indicating there will be patches of core Koala habitat.

In the areas visited on the weekend, potential Koala feed trees were rare, with relatively low numbers of the preferred feed tree Tallowwood. Six Koala scats were found under one Tallowwood (47 cm dbh). Given the scattering of records, there are likely to be patches with

relatively high varieties and densities of feed trees that represent core Koala habitat. The identification and protection of such patches are vital to maintain Koalas in this forest.



6 Koala scats found under 47 cm dbh Tallowwood, further surveys are required to locate patches of core Koala habitat.

Koala Prescription 2 applies to these compartments which requires the retention of 5 small (20 cm dbh) feed trees per hectare. Given the low numbers of Koala feed trees in many areas this may be of some benefit, except for in any patches of core habitat where such tokenistic retentions will be inadequate to maintain their functioning.

It is significant that the Vulnerable Powerful, Masked and Sooty owls have all been recorded. The owls only require protection of existing 'Large forest owl exclusion zones'. The then State Forests assessment of these (see section 4 below) identified 1,615 ha of modelled Powerful Owl habitat in the Bungabbee area, of which existing exclusions (reserves and FMZ exclusions) covered 890ha (classes 2&3), and 1040 of modelled Masked Owl habitat of which 439 ha (mostly classes 2&3) was within existing exclusions. Given the isolation of Bungabbee, and therefore is outstanding importance in providing a potential breeding refuge for these species of landscape-scale importance, the protection of enough habitat for at best one pair of Powerful Owls and one pair of masked Owls is considered inadequate. Really the whole of this forest needs to be protected to maximise the owl's survival chances.

The spectacular Richmond Birdwing Butterfly *Ornithoptera richmondia* was widespread at the time of the assessment. While not listed as threatened in NSW, it is listed as Vulnerable in Queensland. At this elevation it is dependent upon the food plant Birdwing butterfly vine (*Pararistolochia praevenosa*).

[Gynther et. al.](#) recommend:

Protect habitats of P. praevenosa by securing tenure(adding key public lands to State-protected areas and other reserves, and establishing nature refuges or other conservation covenants on privately-owned land.

As it is not listed as Vulnerable in NSW nothing is required to mitigate impacts upon it.

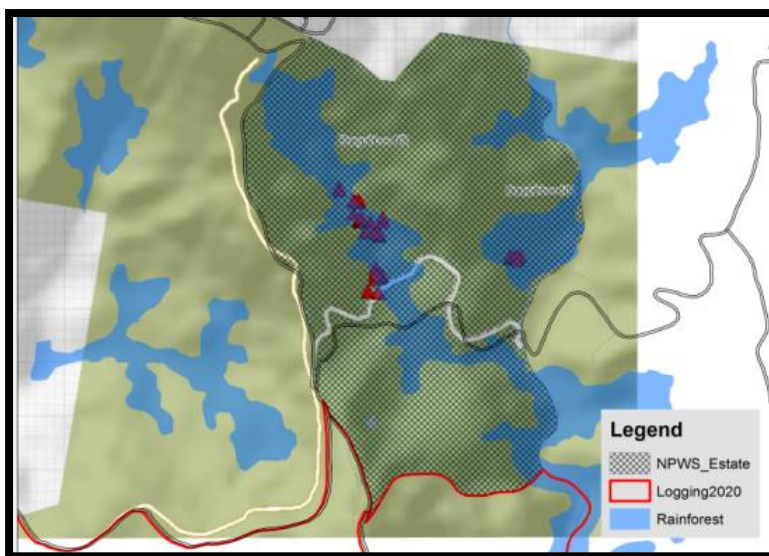
There are numerous records of Shorter Rainforest Ground-beetle *Nurus brevis* in Bungabbee Nature Reserve, and thus it is highly likely to be within the State forest. Shorter Rainforest Ground-beetle is a flightless carabid up to 5cm in length that lives in small

burrows of up to about 50cm, that it excavates with its powerful mandibles. Burrows are characteristically beneath roots, rocks or logs in Subtropical and warm temperate rainforest. They construct distinctive burrows with a clear platform or 'stage' at the entrance, on which they ambush their prey.

It was listed by the Scientific Committee in 2001 who note:

Prior to the clearing of the "Big Scrub" rainforest, Nurus brevis is thought to have been relatively common.

Nurus brevis had not been collected for many years and was thought to be extinct until 1972, when Nurus brevis was re-discovered by G. Monteith at Rotary Park, Lismore. However, by the early 1990s this population had declined and latest data indicate that Nurus brevis is extinct in Rotary Park (G. Williams, G. Carruthers, pers. comms)



Shorter Rainforest Ground-beetle records in Bungabbee Nature Reserve overlaid with mapped rainforest. These indicate that this Endangered species is likely to occur in Bungabbee State Forest, and is likely to occur outside mapped rainforest where it will be directly affected by logging, as well as in ecotone situations where it will be affected by microclimate changes due to logging.

This species is not mentioned in the CIFOA so it is one of those covered by Condition 21 "any threatened species other than those listed in Part 1, 2 or 3 of Protocol 31: Matters covered by the approval". If these species are recorded within 100m of the logging area then the Forestry Corporation are required to stop work until they obtain "a site-specific biodiversity condition" from the EPA. This is one of those species which the Forestry Corporation are not required to look for and thus can bulldoze the habitat of until someone else looks for it, and its not until someone else finds it that the EPA will do anything.

In Bungabbee Nature Reserve most records are within mapped rainforest, though it has also been found in mapped Flooded Gum/Brush Box. Given the habitat similarities and the proximity it appears highly likely that this species will occur in Bungabbee State Forest, including outside exclusion zones in areas likely to be affected by forestry operations. Until a full survey is undertaken, a precautionary approach would require that all Flooded Gum and Brush Box forests be excluded from logging along with rainforest, and a 50m buffer be applied to reduce potential impacts.

1.1. Marbled Frogmouth

This subspecies of the Marbled (Plumed) Frogmouth *Podargus ocellatus* inhabits rainforest and wet *Eucalyptus* forests in south-eastern Queensland and north-eastern NSW, from around Gladstone to Lismore.

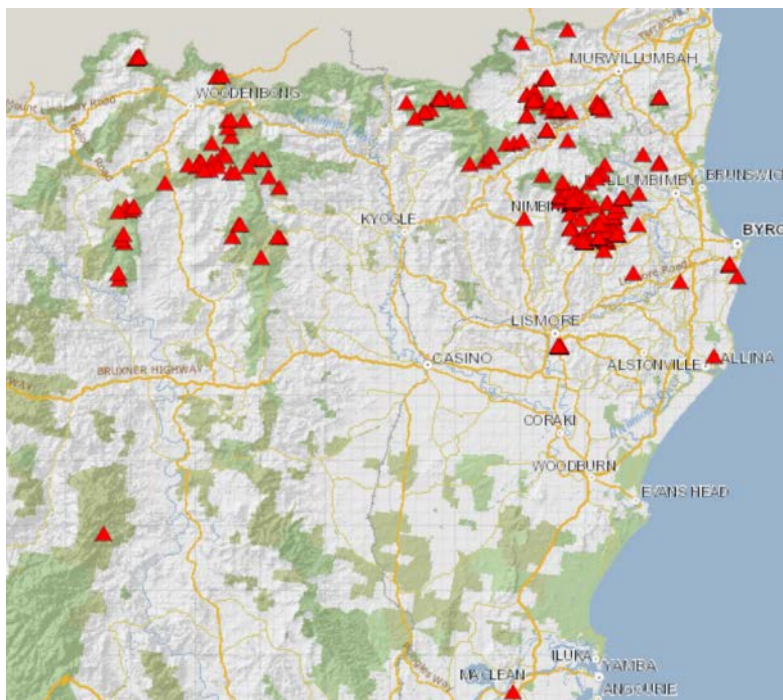
From their assessment of Marbled Frogmouths in the Conodale Ranges Smith *et. al.* (1998) found:

Radio-tracked adults associated primarily with rainforest and wet sclerophyll along drainage lines, although gullies containing rainforest species within dry sclerophyll were also utilized.

Individuals radio-tracked in the Conodale Ranges occupied home ranges from 5 to 18 ha. Estimates of the combined home ranges of pairs ranged from 12 to 19 ha. Home range overlap between pairs was minimal.

In NSW it is listed as Vulnerable. DPIE identified principal threats include:

- *Clearing, fragmentation and isolation of rainforest and associated wet eucalypt forests for agriculture and forestry has been the main cause of past declines and continue to operate as a threat for the species.*
- *Opening of the canopy and promotion of dense understorey growth caused by timber harvesting.*
- *Invasion of habitat by weeds following disturbance.*

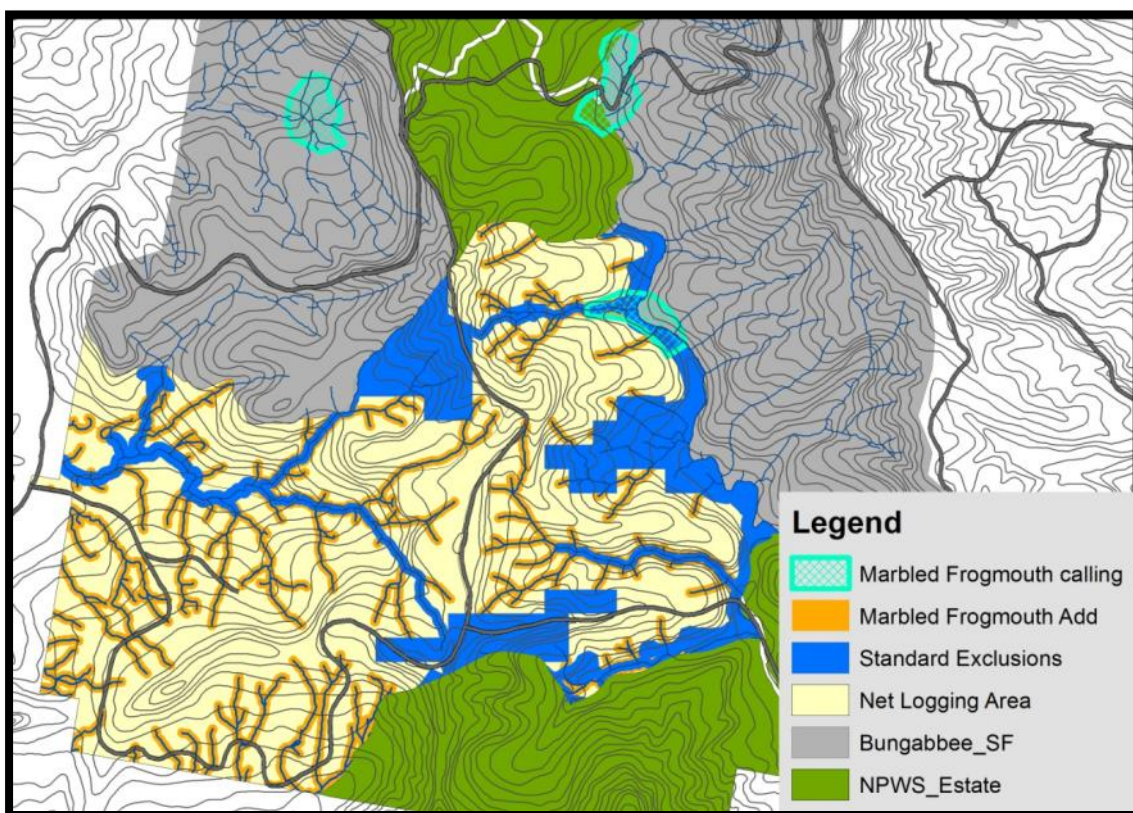


NSW Bionet records of Marbled Frogmouth. Note its concentration in the Border Ranges, with only scattered records elsewhere. Also note the isolation of Bungabbee and the lack of any records in its vicinity. There was a long established pair in Wilson's Park in Lismore, though these are no longer extant.

There are only 6 fauna species left in north-east NSW that require species-specific surveys and the application of prescriptions for any found. The Marbled Frogmouth *Podargus ocellatus* is one of those 6. The CIFOA Protocol 20.4 requires

- (a) A **targeted fauna survey** for Marbled Frogmouth must be conducted as set out in this condition 20.4(4):
- (i) where there is 10 hectares or more of Marbled Frogmouth **modelled habitat** in an **operational area**; or
 - (ii) there is a **record** of Marbled Frogmouth in or within two kilometres of the boundary of an **operational area**,

As there is no modelled habitat for Marbled Frogmouth in Bungabbee State Forest, or records within 2 kilometres, there is no requirement for Forestry Corporation to survey for it. NEFA specifically targeted it in surveys because it was apparent that it was likely to occur. NEFA located 6 calling at the 3 sites where call-playback was used to test for responses in Bungabbee State Forest. One of the sites was within the proposed operational area. It is emphasised that these were the only 3 sites assessed, with the strong responses indicating that there is a good population widespread within wetter forests in Bungabbee State Forest.



Map showing the 3 vicinities where Marbled Frogmouths were heard calling on 24 October. From this small sample it is evident that Marbled Frogmouths are widespread in the wetter Bungabbee forests. These indicate an isolated and highly significant population of Marbled Frogmouths. The orange indicates the additional stream buffers now required to be protected specifically for Marbled Frogmouth.

The Bungabbee public lands (Bungabbee State Forest, Bungabbee Nature Reserve and Mucklewee Mountain Nature Reserve) encompass a total of 515 ha of rainforest and wet sclerophyll forest types. If Smith *et. al.* (1998)'s density of one pair per 12-19 ha is applied, this gives a potential total population on these isolated public lands of 27 to 43 Marbled Frogmouth pairs.

The dispersal ability of Marbled Frogmouth's is unknown, so the degree of isolation of this small population is unknown. It appears likely that Bungabbee was the source area for the Lismore records in Wilson's Park.

It is unknown whether it is linked to the Border Ranges population by dispersals along the McKellar Range, or to the Nightcap by occasional vagrants crossing the intervening 20 kilometres, or whether it is a stepping stone in maintaining regional dispersals (ie between the Nightcap and Richmond Range), or indeed whether it should be treated as an isolated population highly vulnerable to elimination by climate change induced drought and wildfire (fuelled by logging debris). Ignorance is no excuse for reducing the viability of what is a highly significant outlying population of Marbled Frogmouths which must be given a precautionary high level of protection.

It is apparent that if NEFA had not looked this population would not have been found before logging commenced.

Now that it has been found the CIFOA Conditions require:

*Where there is a **record** of Marbled Frogmouth within an **operational area** or within 300 metres outside the boundary of the **operational area**, FCNSW must retain:*

- (a) an **exclusion zone** of at least 20 metres in width on both sides of all class 1 **classified drainage lines** in the **operational area**; and*
- (b) an **exclusion zone** of at least 30 metres in width on both sides of all class 2 **classified drainage lines** in the **operational area**. For Marbled Frogmouth the increase applies to the whole compartment.*

A **classified drainage line** is defined by Protocol 19 which specifies:

Where **LiDAR data** exists, the applicable **drainage class** for a **mapped drainage line** must be determined as follows:

- (a) A class 1 **classified drainage line** is a **mapped drainage line** that is less than 20 hectares in catchment size. The headwater or point of origin of a class 1 **classified drainage line** may extend beyond or fall short of the **mapped drainage line** and must be verified in the field.*
- (b) A class 2 **classified drainage line** is a **mapped drainage line** that is greater than 20 hectares and less than 100 hectares in catchment size.*

The CIFOA defines '**operational area**' as "*An area defined in the **operational plan** and **operations register** in which a **forestry operation** ... is occurring or will occur*". It is thus taken to encompass both compartments 3 and 4. The clause referring to 'compartments' for class 2 drainage lines is confusing (it seems to be a carryover from the IFOA), though is taken to refer to the whole operational area.

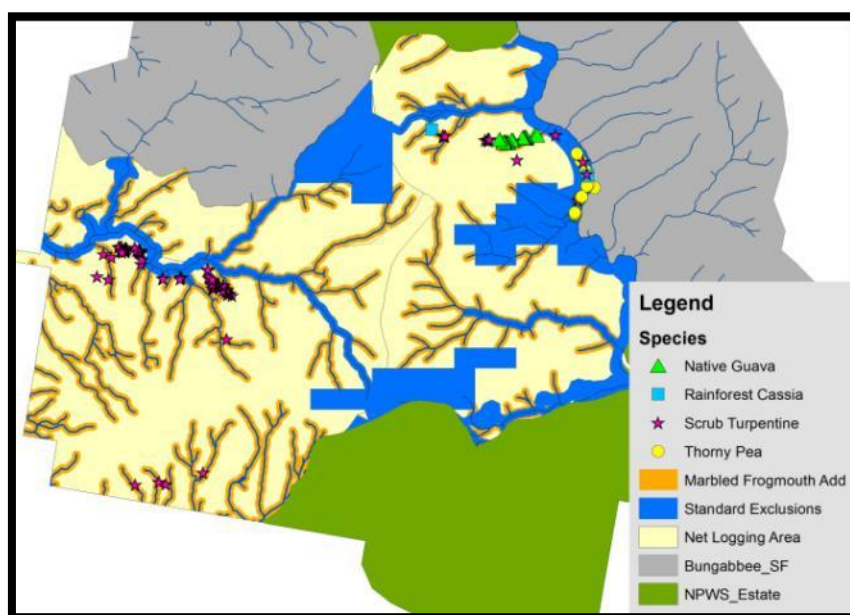
As shown on the above map, the added riparian exclusions require protection of an additional total of 70ha be excluded from logging outside existing base exclusions. Given the isolation of this population it is considered that merely increasing stream buffers is grossly inadequate. It is considered that all potential wet forest habitat, along with an adequate buffer should be protected.

2. Threatened Plants

Bionet has 20 recorded localities of 8 threatened plants in Bungabbee State Forest. Our survey added the Critically Endangered Native Guava to these. Logging is specifically identified as a threat to 5 of these species, and lantana as a threat to 8 species.

Of particular note is the occurrence of the Critically Endangered Native Guava and Scrub Turpentine which were once common species whose survival is now threatened by Myrtle Rust.

Species		Status	Broad Habitat	Relevant DPIE Threats
<i>Senna acclinis</i>	Rainforest Cassia	Endangered	Rainforest ecotone	Logging, grazing, lantana
<i>Desmodium acanthocladum</i>	Thorny Pea	Vulnerable	Rainforest and ecotone	grazing, lantana
<i>Rhynchosia acuminatissima</i>	Pointed Trefoil	Vulnerable	Rainforest and ecotone	Logging, lantana
<i>Sophora fraseri</i>	Brush Sophora	Vulnerable	Wet sclerophyll, Rainforest ecotone	Logging, grazing, lantana
<i>Owenia cepiodora</i>	Onion Cedar	Vulnerable	Rainforest	grazing, lantana
<i>Tinospora smilacina</i>	Tinospora Vine	Endangered	Rainforest and ecotone	Logging, grazing, lantana, BMAD
<i>Rhodamnia rubescens</i>	Scrub Turpentine	Critically Endangered	Wet sclerophyll, Rainforest	Myrtle Rust, Logging,
<i>Corchorus cunninghamii</i>	Native Jute	Endangered	Rainforest ecotone, Wet sclerophyll	lantana,
<i>Rhodomyrtus psidioides</i>	Native Guava	Critically Endangered	Rainforest, Wet sclerophyll	Myrtle Rust, Logging, Lanana



Map showing localities of the 4 threatened plant species identified by NEFA, localities are provided in Appendix 1.



Three Endangered Rainforest Cassia were identified, 2 near Oaky Creek and 1 near the road which had not been identified.



27 records of Thorny Pea were recorded along the 360 m inspected on one side of Oaky Creek, indicating that it is likely to be widespread along the length of this creek.



29 seedlings of Native Guava were found at one vicinity, which appeared to be root suckers from a number of dead plants. None looked healthy and the suckers appeared to be struggling to grow.



114 Scrub Turpentine were recorded during the survey showing that it is widespread across the logging area with over a thousand individuals likely. While some were dead, most trees appeared to be healthy, though this may belie reproductive problems.

Under the CIFOA:

- Neither Tinospora Vine nor Arrow-head Vine require any protection.

- Rainforest Cassia, and Brush Sophora require roadside management plan (Protocol 21.4(2)).
- Native Jute requires a management plan.
- Thorny Pea, Pointed Trefoil, and Onion Cedar require 20m buffer around all individuals.

Scrub Turpentine and Native Guava are not covered by the CIFOA but, as both are Critically Endangered due to Myrtle Rust, a species specific management plan is required. Plans are needed.

2.1. Myrtle Rust

In 2011 the NSW Threatened Species Scientific Committee identified as a Key Threatening Process 'Introduction and establishment of exotic rust fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae'.

In 2018 the NSW Threatened Species Scientific Committee listed as Critically Endangered Scrub Turpentine *Rhodamnia rubescens*, noting:

The effect of Austropuccinia psidii (Myrtle Rust) infection on Rhodamnia rubescens is severe across the species entire range based on quantitative evidence from field surveys. All age classes of R. rubescens have been documented to be affected by A. psidii (Carnegie et al. 2016) which severely reduces the capacity of infected populations to recover through time. Populations of R. rubescens are projected to continue to decline rapidly as a consequence of infection by A. psidii. Within three generations, assuming a generation time of 30-40 years, a quantitative estimate of decline of 96-99% has been made based on documented rates of mortality across the range.

[DPIE](#) identify threatening processes for Scrub Turpentine as including:

Decline in health/loss of mature plants and a lack of seed based recruitment due to infection by Austropuccinia psidii (Myrtle Rust).

Habitat degradation and clearing due to forestry operations.

Scrub Turpentine is common, with 114 recorded during the survey (likely numbering in their thousands in Bungabbee alone), and while most of the shrubs we saw looked reasonably healthy, apparently the rust primarily attacks their flowers and stops them reproducing. There needs to be a comprehensive assessment to assess the health and viability of this large population. Given that it appears likely that Scrub Turpentine appear likely not to reproduce they have no ability to recover from logging. The question is why would you bulldoze the survivors if they and may be the last of their kind?.

They are only putting tape on some of Scrub Turpentine near roads (and missing a lot), while not identifying any away from roads.

In 2019 the NSW Threatened Species Scientific Committee listed as Critically Endangered Native Guava *Rhodomyrtus psidioides*, finding that because of Myrtle Rust "*in the opinion of the NSW Threatened Species Scientific Committee, it is facing an extremely high risk of extinction in Australia in the immediate future*".

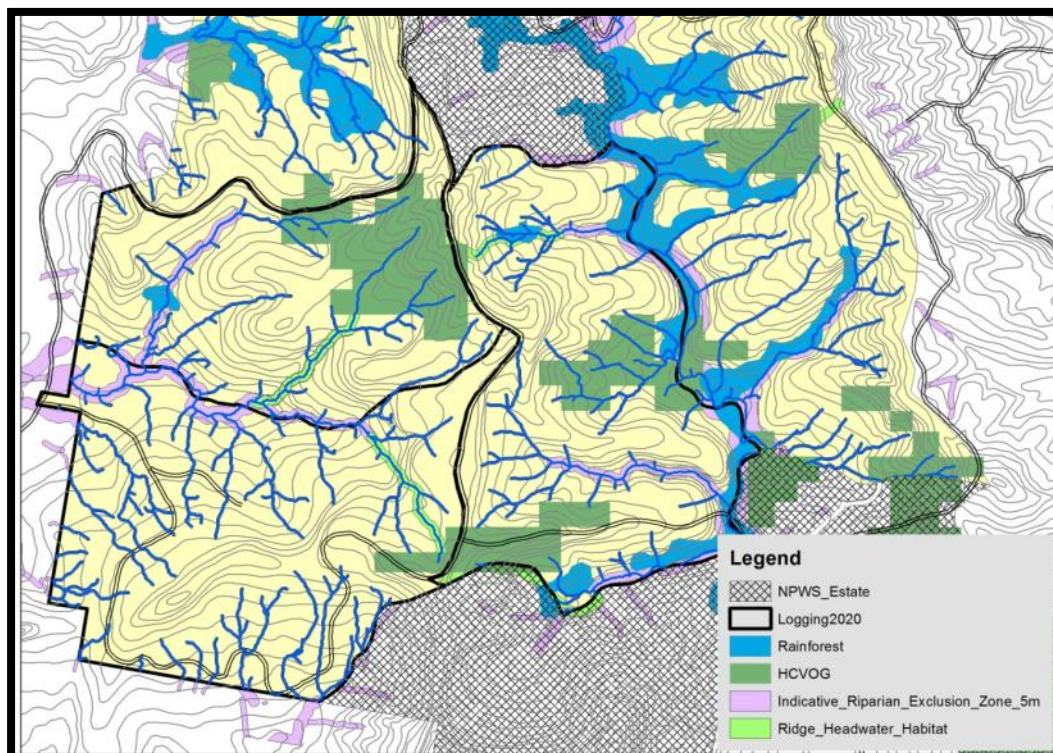
In Bungabbee we found one extensive patch that had been reduced to numerous small sickly root suckers with apparently poor prospects of survival. Without a thorough search, we counted 29 small plants in a 200m band covering over half a hectare.

The other worry is that the seedlings of species such as Flooded Gum and Turpentine (both of which are common canopy trees) may also be susceptible to Myrtle Rust, so how this may affect regeneration following logging needs consideration.

3. Logging Exclusions

There are a variety of features that are required to be excluded from logging. For compartments 3 and 4 of Bungabbee State Forest these baseline exclusions include rainforest, oldgrowth forest, riparian buffers and wildlife corridors (ridge and headwater habitat). These are identified as Forest Management Zones 2 and 3A, and represent 30% of the logging area.

While there used to be requirements under the previous IFOA to undertake fauna surveys and establish exclusion areas around records of a variety of species, the new CIFOA no longer requires surveys for most threatened species beyond the general CIFOA prescriptions. There is instead a requirement to retain 5% of the net logging area as Wildlife Habitat clumps and 5% as Tree Retention Clumps. While these are meant to be good habitat, it is up to FC to decide what areas to protect. These have not been released yet for these compartments.



The current known base exclusions have been identified herein to show the net logging area (yellow on the above map), 10% of this has to be subsequently protected as wildlife and tree habitat exclusions.

The EPA's propaganda 'FAQ: Commencement of the Coastal IFOA, November 2018' claimed:

For the first time ever, the Coastal IFOA prescribes minimum thresholds for the permanent protection of threatened species across the landscape, as well as in each harvesting site. These permanent protections provide improved protection for native plants, animals and their habitat, streams and aquatic habitat,

This approach ensures the maintenance of multi-aged forests across the landscape and the permanent retention of undisturbed habitat, providing areas of refuge, as well as connectivity and dispersal opportunities for native species.

The Coastal IFOA moves away from survey driven approaches to koala protection, which have been shown to have limitations. Instead it will identify and protect places in the landscape where koalas are more likely to occur.

Areas with important koala habitat will be prioritised for inclusion in new wildlife habitat and tree retention clumps – providing permanent protection for important koala habitat.

The Coastal Integrated Forestry Operations Approval's 'Protocol 22: Wildlife habitat and tree retention clumps' identifies the range of features that should be considered when selecting appropriate clumps, including:

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

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

This clause also identifies that FCNSW "must maximise landscape connections between other retained patches of vegetation or as habitat islands within a large cutover area (for example, as either corridors or islands)", and that FCNSW must give priority to "establishing wildlife habitat clumps that include valuable habitat".

There are still 6 animal species in north east NSW that require pre-logging surveys and the protection of additional habitat where they are found. In Bungabbee State Forests none of the triggers for surveys were realised, though as NEFA expected Marbled Frogmouth to occur we targeted it in our surveys, revealing the presence of a large population (see Section 1.1). Our records triggered the need to protect an additional 70ha of expanded riparian buffers on headwater streams.

Breakdown of compartments 3 and 4 of Bungabbee State Forest

	Area (ha)	
Total area	448	
Base exclusions (Oldgrowth, rainforest, wildlife corridors, FMZ 1,2&3)	136	30%
Marbled Frogmouth additional exclusions	70	16%
Net logging area	242	54%
Area required for Wildlife and Tree Retention Clumps	24	5.4%

As the Harvesting Plan has not been released yet, NEFA has assessed the likely exclusions based on available data and NEFA's identification of a population of Marbled Frogmouth.

The Forestry Corporation now have to select 5% of the net logging area across the whole State Forest area, and 5% across the logging area, to be protected in perpetuity. These are meant to be important wildlife areas, though are likely to be areas with no timber value. This means that any areas of exceptional wildlife value across the whole State Forest are worth identifying, and asking for them to be protected.

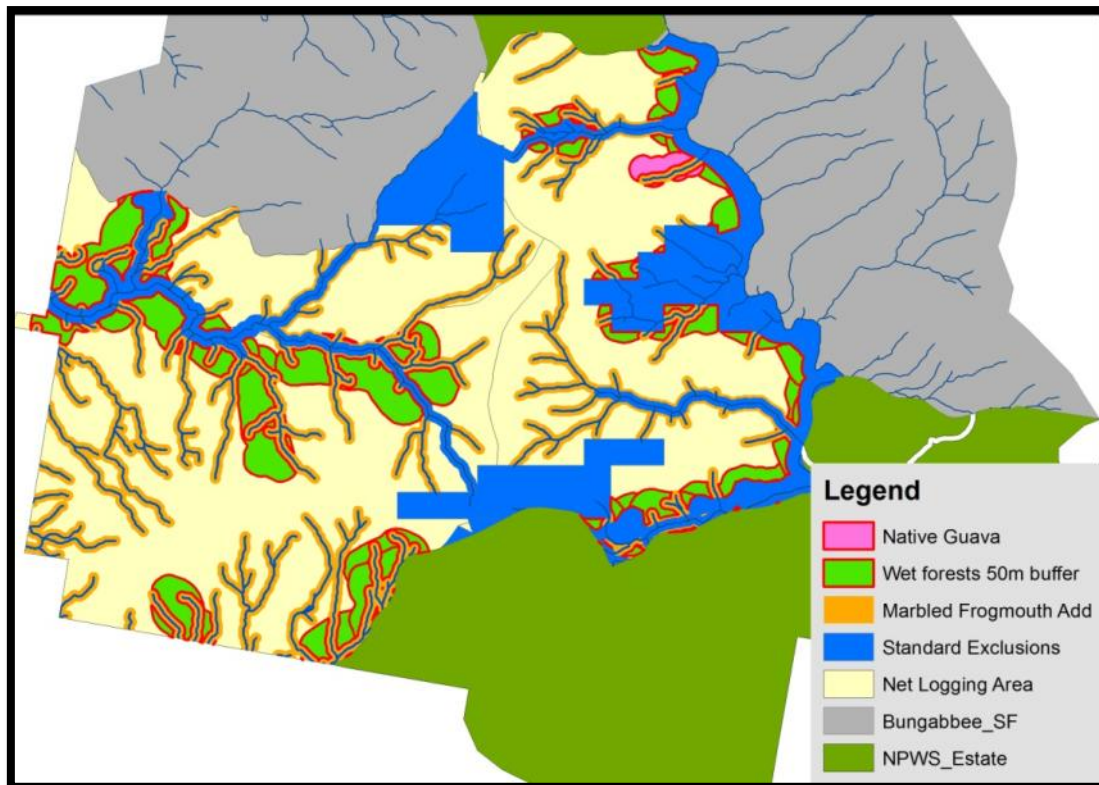
There remains a requirement for the Forestry Corporation to protection of an additional 24 ha as Wildlife Habitat clumps and Tree Retention Clumps. Part of NEFA's intent was to identify priority areas for inclusion in these required exclusions. Our brief survey was only able to identify some priority areas.

Given the isolation of Bungabbee and the fragmented nature of rainforest in the vicinity it is considered particularly important to protect all wet forests in this vicinity as the rainforest species also utilise adjoining forest with rainforest understories, with a variety of species reaching their greatest abundance in the wet sclerophyll forests or in the rainforest ecotone.

In addition to mapped rainforest, it is considered that the Forestry Corporation forest types Tallowwood/Blue Gum (47), Flooded Gum (48), Turpentine (49) and Brush Box (53) encompass the bulk of the wet forest types within the area. A 50m buffer is proposed to be included to better incorporate ecotones and provide a buffer from adjacent disturbances,

Outside existing exclusions, these wet forests and buffers encompass an additional 57 ha. Combined with existing exclusions these forests are considered to maximise protection for the 9 wet forest threatened plant species and 7 wet forest animal species. This protection will also directly benefit an additional 10 threatened animal species.

It is apparent that the population of Critically Endangered Native Guava found by NEFA is not encompassed by these exclusions, so an additional 1.6ha encompassing the Native Guava records with a 50m buffer is identified.



NEFA's priority areas for wet forest fauna that it considers should be priorities for protection. This includes wet forest types and the locality of the Critically Endangered Native Guava with a 50m buffer.

Those threatened species considered to be likely to have most of their habitat protected by the exclusion of logging from the moist forest types and a buffer include: Rainforest Cassia, Thorny Pea, Pointed Trefoil, Brush Sophora, Onion Cedar, Tinospora Vine, Scrub Turpentine, Native Jute, Native Guava, Parma Wallaby, Long-nosed Potoroo, Red-legged Pademelon, Wompoo Fruit Dove, Sooty Owl, Marbled Frogmouth, and Shorter Rainforest Ground-beetle. Those species that will significantly benefit include Spotted-tailed Quoll, Yellow Bellied-Glider, Greater Glider, Koala, Grey-Headed Flying Fox, Little Bent Winged Bat, Powerful Owl, Varied Sittella, Barred-Cuckoo-Shrike, and White-Eared Monarch.

It is well recognised that logging of moist forests increases their vulnerability to burning (i.e. Lindenmayer *et. al.* 2009, Price and Bradstock 2012, Taylor *et. al.* 2014, Zylstra 2018). Overall some 172,000 hectares (35%) of north-east NSW's 462,000 ha of rainforests were burnt last fire season. Based on NSW data, of the rainforest mapped as burnt some 20% had 'Canopy Fully Affected', 53% had 'Canopy Partially Affected', and 27% had 'Canopy Unburnt'. It is also evident that the smaller isolated stands were the most severely affected. Bungabbee's narrow riparian rainforests, and their inhabitants, are more becoming increasing vulnerable to burning as climate change progresses. Buffers around rainforest are needed more now than ever before.

With limited time and access NEFA was not able to identify areas with large numbers of hollow-bearing and mature recruitment trees which would be priority areas for hollow dependent species, notably as dens and nests for the threatened Yellow Bellied-Glider, Greater Glider, Squirrel Glider, Sooty Owl, Powerful Owl, Masked Owl, Glossy Black-Cockatoo, and Little-Lorikeet. Nor priority areas for Koalas with large numbers and a variety of mature feed trees. Further surveys are required to identify these.

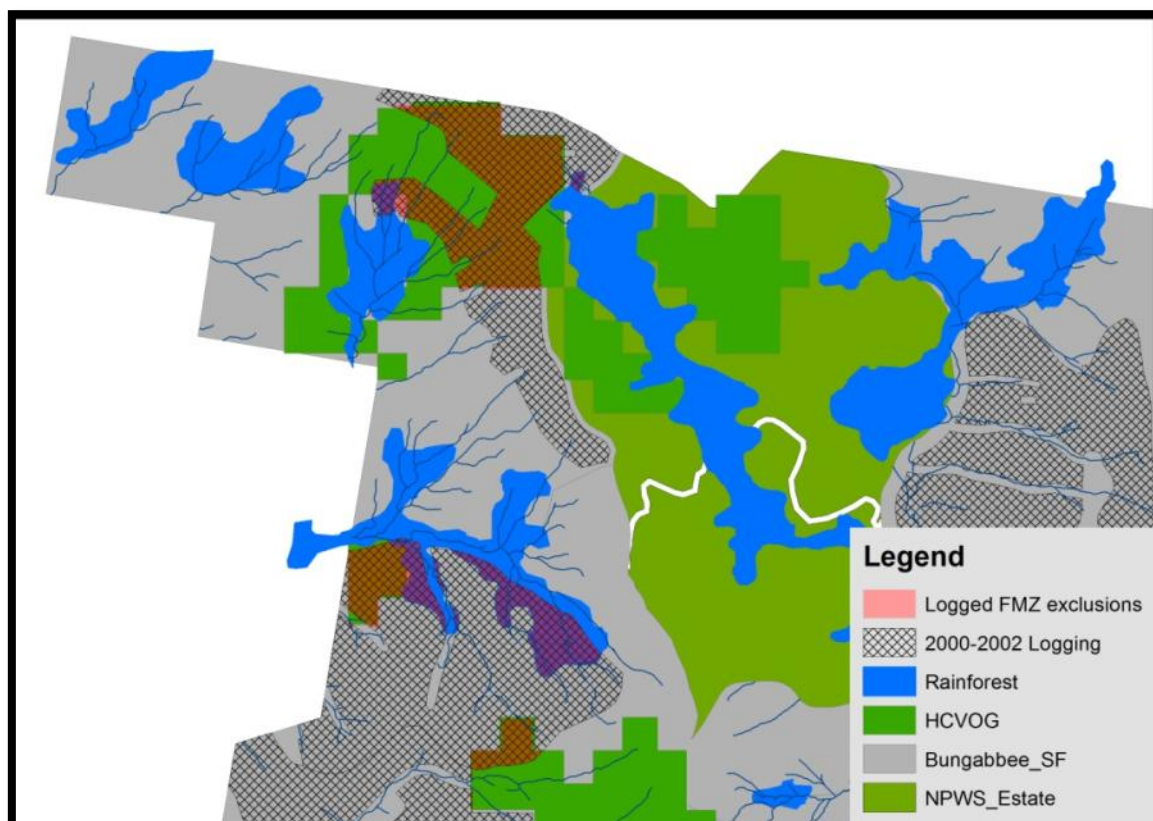
The inverse of this is identifying degraded areas that should be rehabilitated, and are not suitable choices for protected wildlife areas - such as Bell Miner Associated Dieback areas, of which there are a few.

While NEFA considers that the whole of Bungabbee State Forest should be protected, we will do follow up surveys once the Forestry Corporation release their proposed Wildlife Habitat Clumps and Tree Retention Clumps to assess how effectively they have encompassed the highest priority wildlife habitat.

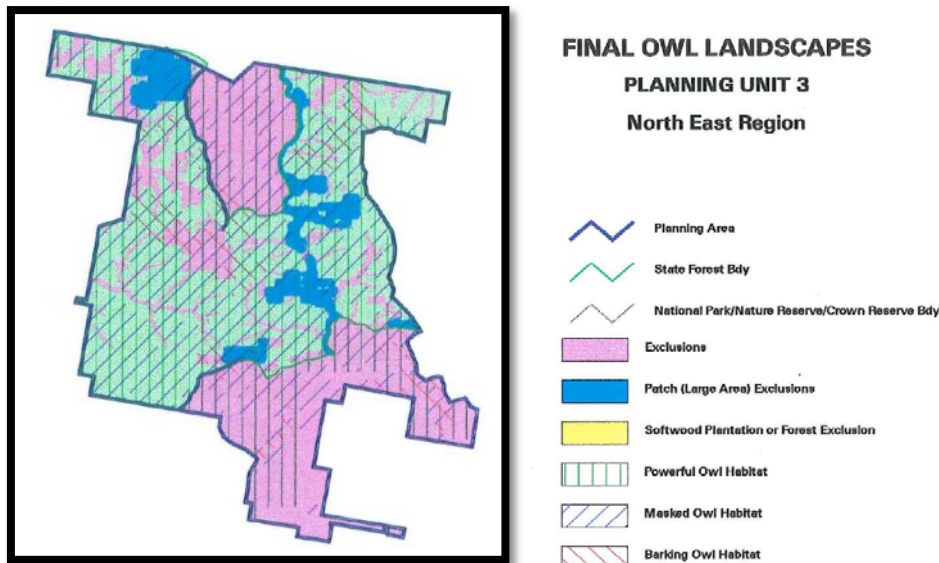
4. Past Illegal Logging?

During the course of this assessment it became apparent that there was a significant conflict between the protected Forest Management Zone (FMZ) 3A and the Forestry Corporation's logging history data (FRED), which shows 33ha of FMZ 3A being logged in an STS/AGS logging event of 30 June 2000. This logging was predominately of mapped HCV Oldgrowth and rainforest and represents a major breach.

This has not yet been assessed on the ground, though it is identified by using the Forestry Corporation's own data. Either their data is inaccurate or indeed rainforest and HCV Oldgrowth was illegally logged. By their own data, there is a prima-facie case that the Forestry Corporation committed a significant legal breach of the IFOA. It is emphasised that this is potentially a major breach and deserving of prosecution if found to have occurred.



Forestry Corporation's mapping of logging in 2000 overlaid on HCV Oldgrowth and Rainforest identified for protection as FMZ 3A in 1998.



Then State Forests' legal owl exclusions adopted in June 2000, just before they record some of these exclusions as being logged by them. These owl exclusions, along with the oldgrowth and rainforest they encompassed were all legally required to be protected.

What is equally astounding is that the then State Forests logged these areas after identifying them as owl exclusion areas in accordance with the IFOA **6.9.2 Large Forest Owls: Landscape Approach** in June 2000.

While there is a statute of limitations of 2 years on the EPA being able to mount prosecutions, this is taken to be from when the EPA become aware of the breach. That this breach occurred 20 years ago should be irrelevant, as aside from the Forestry Corporation's own records and mapping of logging extent, evidence of the breach should be discernible from logging disturbance on the ground and from contemporary aerial photos. The EPA are therefore requested to investigate this apparent breach, and if substantiated to prosecute the Forestry Corporation for it.

References

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- Taylor, C., McCarthy, M.A. and Lindenmayer, D.B., 2014. Nonlinear effects of stand age on fire severity. *Conservation Letters*, 7(4), pp.355-370.
- Zylstra, P.J., 2018. Flammability dynamics in the Australian Alps. *Austral Ecology*, 43(5), pp.578-591.

APPENDIX 1: Significant Species Records, Bungabbee State Forest 24&25 October 2020.

N (y_proj)	E (x_proj)	Species		No
VERTEBRATES				
6822608	511820	Podargus ocellatus	Marbled Frogmouth	2
6821656	511933	Podargus ocellatus	Marbled Frogmouth	3
6822479	511004	Podargus ocellatus	Marbled Frogmouth	1
6821656	511933	Tyto tenebricosa	Sooty Owl	2
6821228	512189	Ptilinopus magnificus	Wompoo Fruit Dove	
6821676	511687	Ptilinopus magnificus	Wompoo Fruit Dove	
6821143	512164	Ptilinopus magnificus	Wompoo Fruit Dove	
6821669	511501	Ptilinopus magnificus	Wompoo Fruit Dove	
6821517	511945	Glossopsitta pusilla	Little Lorikeet	2
6820816	510564	Phascolarctos cinereus	Koala	6 scats
6822720	511885	Petauroides volans	Greater Glider	2
6822608	511820	Potorous tridactylus	Long-nosed Potoroo	
6822479	511004	Tyto tenebricosa	Grey-headed Flying Fox	10+
INVERTEBRATES				
6820925	510124	Ornithoptera richmondia	Richmond Birdwing Butterfly	
6821074	510053	Ornithoptera richmondia	Richmond Birdwing Butterfly	
6821360	512279	Ornithoptera richmondia	Richmond Birdwing Butterfly	
PLANTS				
6821620	511995	Rhodomyrtus psidioides	Native Guava	
6821623	511997	Rhodomyrtus psidioides	Native Guava	
6821619	512006	Rhodomyrtus psidioides	Native Guava	
6821603	511953	Rhodomyrtus psidioides	Native Guava	
6821605	511953	Rhodomyrtus psidioides	Native Guava	
6821612	511951	Rhodomyrtus psidioides	Native Guava	
6821608	511950	Rhodomyrtus psidioides	Native Guava	
6821606	511952	Rhodomyrtus psidioides	Native Guava	
6821607	511952	Rhodomyrtus psidioides	Native Guava	
6821612	511950	Rhodomyrtus psidioides	Native Guava	
6821608	511941	Rhodomyrtus psidioides	Native Guava	
6821609	511943	Rhodomyrtus psidioides	Native Guava	
6821610	511943	Rhodomyrtus psidioides	Native Guava	
6821607	511941	Rhodomyrtus psidioides	Native Guava	
6821608	511940	Rhodomyrtus psidioides	Native Guava	
6821608	511938	Rhodomyrtus psidioides	Native Guava	
6821606	511935	Rhodomyrtus psidioides	Native Guava	
6821595	511889	Rhodomyrtus psidioides	Native Guava	
6821596	511883	Rhodomyrtus psidioides	Native Guava	
6821596	511882	Rhodomyrtus psidioides	Native Guava	
6821588	511862	Rhodomyrtus psidioides	Native Guava	

6821585	511864	Rhodomyrtus psidioides	Native Guava	
6821580	511864	Rhodomyrtus psidioides	Native Guava	
6821585	511852	Rhodomyrtus psidioides	Native Guava	
6821589	511847	Rhodomyrtus psidioides	Native Guava	
6821586	511845	Rhodomyrtus psidioides	Native Guava	
6821584	511845	Rhodomyrtus psidioides	Native Guava	
6821599	511825	Rhodomyrtus psidioides	Native Guava	
6821598	511823	Rhodomyrtus psidioides	Native Guava	
6821646	511496	Senna acclinis	Rainforest Cassia	
6821441	512245	Senna acclinis	Rainforest Cassia	
6821423	512253	Senna acclinis	Rainforest Cassia	
6820919	509926	Rhodamnia rubescens	Scrub Turpentine	
6820628	510500	Rhodamnia rubescens	Scrub Turpentine	
6820840	510527	Rhodamnia rubescens	Scrub Turpentine	
6820851	510514	Rhodamnia rubescens	Scrub Turpentine	
6820850	510513	Rhodamnia rubescens	Scrub Turpentine	
6820850	510513	Rhodamnia rubescens	Scrub Turpentine	
6820848	510509	Rhodamnia rubescens	Scrub Turpentine	
6820847	510504	Rhodamnia rubescens	Scrub Turpentine	
6820845	510504	Rhodamnia rubescens	Scrub Turpentine	
6820854	510493	Rhodamnia rubescens	Scrub Turpentine	
6820862	510497	Rhodamnia rubescens	Scrub Turpentine	
6820868	510500	Rhodamnia rubescens	Scrub Turpentine	
6820870	510502	Rhodamnia rubescens	Scrub Turpentine	
6820873	510487	Rhodamnia rubescens	Scrub Turpentine	
6820872	510487	Rhodamnia rubescens	Scrub Turpentine	
6820871	510486	Rhodamnia rubescens	Scrub Turpentine	
6820867	510483	Rhodamnia rubescens	Scrub Turpentine	
6820863	510480	Rhodamnia rubescens	Scrub Turpentine	
6820885	510485	Rhodamnia rubescens	Scrub Turpentine	
6820885	510485	Rhodamnia rubescens	Scrub Turpentine	
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6820891	510483	Rhodamnia rubescens	Scrub Turpentine	
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6820893	510459	Rhodamnia rubescens	Scrub Turpentine	
6820886	510443	Rhodamnia rubescens	Scrub Turpentine	
6820877	510436	Rhodamnia rubescens	Scrub Turpentine	
6820875	510435	Rhodamnia rubescens	Scrub Turpentine	
6820872	510435	Rhodamnia rubescens	Scrub Turpentine	
6820877	510429	Rhodamnia rubescens	Scrub Turpentine	
6820884	510437	Rhodamnia rubescens	Scrub Turpentine	
6820887	510441	Rhodamnia rubescens	Scrub Turpentine	
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6820900	510433	Rhodamnia rubescens	Scrub Turpentine	

6820895	510425	Rhodamnia rubescens	Scrub Turpentine	
6820895	510425	Rhodamnia rubescens	Scrub Turpentine	
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6821059	510077	Rhodamnia rubescens	Scrub Turpentine	
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6821057	510075	Rhodamnia rubescens	Scrub Turpentine	
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6819924	510204	Rhodamnia rubescens	Scrub Turpentine	
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6821490	512231	Rhodamnia rubescens	Scrub Turpentine	
6821621	512096	Rhodamnia rubescens	Scrub Turpentine	
6820918	510431	Rhodamnia rubescens	Scrub Turpentine	
6821074	510053	Rhodamnia rubescens	Scrub Turpentine	
6821233	512189	Desmodium acanthocladum	Thorny Pea	
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6821234	512190	Desmodium acanthocladum	Thorny Pea	
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6821307	512212	Desmodium acanthocladum	Thorny Pea	
6821308	512213	Desmodium acanthocladum	Thorny Pea	
6821311	512215	Desmodium acanthocladum	Thorny Pea	
6821311	512214	Desmodium acanthocladum	Thorny Pea	
6821320	512221	Desmodium acanthocladum	Thorny Pea	
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6821322	512220	Desmodium acanthocladum	Thorny Pea	
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6821365	512285	Desmodium acanthocladum	Thorny Pea	
6821373	512253	Desmodium acanthocladum	Thorny Pea	
6821377	512257	Desmodium acanthocladum	Thorny Pea	
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6821530	512200	Desmodium acanthocladum	Thorny Pea	