

# Review of 2022 Private Native Forestry Code of Practice for Northern NSW

Dailan Pugh, North East Forest Alliance, May 2022

The NSW North Coast has around 2.8 million hectares of private native forests spread across over eighty thousand individual holdings. As of 13 January 2020 there was 467,341 ha approved for Private Native Forestry (PNF) in NSW, with 95% of this on the north coast. Reputedly, some 18,260 hectares is logged annually (Jamax 2017). This is thus a significant activity with major environmental impacts.

This review of the 2022 Private Native Forestry Code of Practice for Northern NSW (**2022 PNF Code**) focuses on biodiversity impacts. Comparisons are made with the previous 2008 PNF Code of Practice for Northern NSW (**2008 PNF Code**). The Natural Resources Commission's 'Advice on finalising Draft Private Native Forestry Codes of Practice' was considered (**NRC 2022**). It has been informed by responses to questions from the **NSW agencies**, being the Environment Protection Authority (**EPA**), Local Land Services (**LLS**) and Natural Resources Commission (**NRC**).

The revised 2022 PNF Code applies to all PNF plans already approved as well as future plans. The changes made will thus have immediate effect across half a million hectares of north-east NSW's forests. With the exception that transitional provisions allow logging under approved plans to continue in identified core Koala habitat until they expire.

This review focuses on the four principal means of mitigating the impacts of logging on fauna, being logging intensity, exclusion areas (including stream buffers) identified at the PNF Plan stage, the retention of habitat trees within the logging area, and the application of species-specific conditions. It is emphasised that the prescriptions relating to mitigating erosion have not been assessed.

The proposals to change the Local Land Services Act to extend approvals from 15 to 30 years, and to allow logging to over-ride requirements in Local Environment Plans (**LEPs**) have not yet surfaced. For the north coast DPI (2018) identify that local Council LEPs prohibit logging of 167,217 ha (6%), and require development consent for 602,597 ha (25%), of private native forests. Over-riding logging prohibitions on 167,217 ha of the highest conservation value lands in environmental zones will greatly compound impacts.

## CONCLUSIONS

### PNF Plans

The preparation of a PNF Plan is the assessment underpinning the PNF process. It maps the areas to be excluded from logging (Threatened Ecological Communities, rainforest, oldgrowth, wetlands, heathland, caves, rocky outcrops, Aboriginal sites, riparian buffers, slopes over 30°) and records of threatened species. The PNF Plan process is basically just a simplistic desk-top approval that does little to review or assess environmental constraints. It relies on basic mapped data and requires no ground truthing, except where the land-owner challenges the mapping of rainforest, oldgrowth or 'high koala habitat suitability'. There are no on-ground environmental assessment or surveys required to identify the location of boundaries of Threatened Ecological Communities or records of threatened species. LLS will maintain a public register of PNF Plans, though the plans will not be exhibited for public comment or be made available for the public, or even Councils, even once approved.

There are now three logging plan types, with 'Small scale harvesting' and a 'Forest Management Plan' required to abide by the 2022 PNF Code. More intensive logging will be allowed under a Forest Stewardship Plan, which will also be able to change habitat tree and threatened species prescriptions, though the requirements haven't been finalised and will not be released for comment.

## Logging Intensity

The intensity of logging is principally governed by the average basal area (in m<sup>2</sup>) of trees retained per hectare, with the additional allowance that up 20% of the logging area may be clearfelled in patches under 0.5ha. The 2008 PNF Codes required retention of basal areas of 12-14 m<sup>2</sup>/ha in stands <25m height and 16-18 m<sup>2</sup>/ha for stands ≥25m height. The 2022 PNF Code adopts a flat rate of 14m<sup>2</sup>/hectare which represents a significant increased logging intensity in higher quality stands.

## Habitat Trees

The 2008 PNF Code required the retention of 10 live hollow-bearing trees, 10 recruitment trees and 6 feed trees per 2 hectares, within the net logging area.

There has been a concerted attack on habitat trees under the 2022 PNF Codes. The requirement for the retention of 10 live hollow bearing trees per 2 hectares has been reduced down to 8 per 2 hectares, and they have been redefined to remove the emphasis on protecting the oldest and largest trees, instead allowing small trees with burnt out bases to replace them.

Regardless of reduced retention of hollow-bearing trees, and their redefinition, the Government has removed the requirement that they “*be evenly distributed throughout the area of harvesting operations and within the net logging area*”, meaning that trees already requiring retention in exclusion areas can now be counted as habitat trees. The NSW agencies still deny the effects of this change, though the habitat tree retention requirements are now mostly a pretence. This change will result in the logging of hundreds of habitat trees in each operation that would have previously required retention, thereby greatly amplify logging impacts on threatened animals. To add to the problem, the prohibition on damaging habitat trees only has to be “*as far as practicable*”, making this “*difficult to enforce*”.

## Stream Protection

The 2022 PNF Code significantly improves the width of exclusion zones on headwater “drainage lines” (from 5 to 10m), and adds them for unmapped “drainage lines” which may represent half of upper headwater streams. Though there is sleight of hand involved, as by adopting a very narrow definition of “stream” in the 2022 PNF Code, it effectively reduces exclusion zones for 2nd and 3rd order streams from 20-30m down to 10m where they do not comply.

## Threatened Species

The 2022 PNF Code identifies 55 threatened animal species and 174 threatened plant species that require site-specific prescriptions to reduce impacts on them, though for all but two, the prescriptions only apply around records of the species and there are no requirements or intent to undertake surveys to identify new records. Without surveys the prescriptions are a sham. Compared to the 2008 PNF Code, two species have been removed, two species have had requirements for 100-500m buffers removed, and 15 species have had requirements to apply prescriptions to adjacent records removed. On the positive side new prescriptions have been added for 11 recently listed species, though these only require exclusions around nests or dens which would require detailed surveys to locate, and the Barking Owl buffer has been increased from 500m up to 1000m.

## Koalas

The 2022 Code retains the exclusion from logging of core Koala habitat identified in a Council Koala Plan of Management (KPoM) before 2022, totalling 10,430 hectares of core koala habitat, while allowing a claimed 58 existing PNF Plan approvals covering 500 hectares of core Koala habitat to continue until they expire. There are concerns that there may be far more than 58 existing approvals

over core Koala habitat. The Code does not allow logging to be excluded from core Koala habitat identified in any future KPOMs.

The triggering of prescriptions for Koalas is no longer solely dependent on records, now also being triggered by a model of high quality habitat, which is an improvement. This model has not been verified. The concern is that landowners will be able to challenge the mapping using an unidentified methodology which hasn't been released, which may not even require a Koala survey. The record trigger has also been increased from one Koala scat to 10, still with no surveys, reducing the likelihood that this will apply.

Where the prescription applies the required retention rate for Koala feed species has been increased from 15 to 20 per hectare, while this sounds good, the tree size limit has been reduced from 30cm dbh down to 20cm dbh, which more than halves the volume of browse retained. In good Koala habitat this may allow 65% of Koala feed trees to be logged, including most of the larger trees Koalas prefer. It is good they have improved the criteria for identifying a tree used by Koalas, which require 20m exclusions, though without surveys they are unlikely to be identified. While the Koala feed tree species list has not been reviewed, the NSW agencies were unconcerned when we identified that the key primary feed tree Small-fruited grey gum was misidentified as a secondary feed species, thereby reducing its retention.

The NSW agencies claim there are “*requirements to search for koalas before logging*”, though the only requirement is to “*visually assess*” trees for koalas “*immediately prior to it being felled*” within identified habitat, which is not a search and can be satisfied by a machine operator having a look from inside a machine as they decide which way to fell it.

## Climate heating

The EPA have a legal duty to adapt their objectives, guidelines and policies to address emerging threats to the environment from climate change. There have been numerous studies and scientific papers that identify the increasing vulnerability of, and risk to, threatened species and ecosystems due to the accelerating impacts from climate change, including from the 2019/20 fires. The EPA have failed their legal obligations to take these into account in the revision of the 2022 PNF Code, particularly by adapting prescriptions to reflect the increasing vulnerability of threatened species and ecosystems.

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## 1.PNF PLANS

The preparation of a PNF Plan is the assessment underpinning the PNF process. It maps the areas to be excluded from logging (Threatened Ecological Communities, rainforest, oldgrowth, wetlands, heathland, caves, rocky outcrops, Aboriginal sites, riparian buffers, slopes over 30°) and records of threatened species. The PNF Plan process is basically just a simplistic desk-top approval that does little to review or assess environmental constraints. It relies on basic mapped data and requires no ground truthing, except where the land-owner challenges the mapping of rainforest, oldgrowth or 'high koala habitat suitability'. There are no on-ground environmental assessment or surveys required to identify the location of boundaries of Threatened Ecological Communities or records of threatened species. LLS will maintain a public register of PNF Plans, though the plans will not be exhibited for public comment or be made available for the public, or even Councils, even once approved.

There are now three logging plan types, with 'Small scale harvesting' and a 'Forest Management Plan' required to abide by the 2022 PNF Code. More intensive logging will be allowed under a Forest Stewardship Plan, which will also be able to change habitat tree and threatened species prescriptions, though the requirements haven't been finalised and will not be released for comment.

The PNF Plan will be prepared by the landholder, with LLS's role being to providing existing basic digital information:

*Local Land Services will provide relevant digital information on landscape features (as identified in Table B) and slope angles (where feasible), mapped drainage features (as identified in Table E) and Listed Species Ecological Prescriptions including areas mapped under the PNF koala prescription map*

While the LLS will undertake "a risk assessment", which may trigger "LLS extension activities", there are few of the assessments, obligations and accountability required for a Development Application (and no public consultation). The PNF Plan process is basically just a simplistic desk-top approval that does little to redress environmental constraints. These are basic mapped data requiring no ground truthing, except where the land-owner challenges the mapping of rainforest, oldgrowth or 'high koala habitat suitability'. The existing remapping processes for oldgrowth and rainforest apply limited criteria, and different methodologies, from when they were originally mapped, meaning many stands are wrongly deleted. The Koala habitat remapping criteria have not yet been released but are unlikely to be any better.

There are no on-ground environmental assessment or surveys required to identify the location of boundaries of Threatened Ecological Communities or records of threatened species. State and nationally listed Threatened Ecological Communities (TECs) on private lands have not been mapped and agencies responsible for overseeing their protection do not have either the will or the expertise to identify them, preferring to leave it up to landholders to decide for themselves what to protect. The Auditor General (2019) observed:

*LLS has produced guidelines to assist regional service officers to determine the viability of TECs in the long term however they lack specific criteria and training to adequately guide such decisions.*

*LLS staff in most regions have received some specific training in plant ecology, including the identification of plant community types, but limited training in identifying threatened ecological communities. Records provided indicate that staff in two of the larger regions have received little or no such formal training since the reforms were implemented in 2017.*

In relation to Endangered Ecological Communities (EEC's), Jamax Forest Solutions (2017) cite the following responses from logging contractors:

## NEFA review of 2022 Private Native Forestry code

- EPA not prepared to make a call and identify boundary in the field, leaving the decision to less qualified people (contractor/landowner). If you do get EPA out in the field, they have 3 different opinions/boundaries
- moving goalpost, previously an EEC would cut out if other species present, now can have a "sprinkle" of other species. Have to identify yourself but EPA won't commit to a decision on in/out, won't draw a line in the sand. But they will prosecute you if they think you got in a different location that where they would have put it.
- difficult to identify in the field and left solely with the landowner
- EEC goalposts keep changing - gone from limited number of species to anything is possible
- what's mapped isn't EEC in field;

This is unlikely to change, resulting in many TECs not being adequately identified, and instead logged.

Most PNF logging operations are undertaken in areas where there have been no surveys for threatened species and thus there are no "known" records. The reliance on incidental "site evidence" which is unlikely to be accidentally found for most threatened species will not compensate for the lack of surveys. Even where evidence (such as quoll or Koala scats) is found and identified by a landowner or contractor they have a clear financial incentive not to admit to it. This means that while the PNF code has many potentially useful prescriptions for threatened species they are practically useless.

Port Macquarie-Hastings Council (2021) consider:

*Site surveys should be required prior to PNF approvals. This survey methodology should be comprehensive and using the same methodology as would be required for Development Consent under the EP&A Act.*

The failure to require surveys for PNF Plans is discussed under species.

LLS will maintain a public register of PNF Plans, though this will apparently only be a list without the actual plans being available for public scrutiny. NEFA considers that PNF Plans should be publicly exhibited for comment just like any other Development Application for private lands. At the very least the public register should include the actual approved PNF Plans so that local residents know what is approved.

The agencies will not even commit to making the plans available to Councils. As identified in the Local Government NSW (2021) submission to LLS Amendment Bill "*Councils need to know where PNF sites are being approved in relation to other planning overlays, and where and when active operations will occur in order to ensure impacts on the community are minimised*". They will be notified of a property after a plan has been approved, though apparently they will not be informed what part of that property has been approved, its scale, access routes (roads and bridges), when logging is going to start, whether it is in an environmental zone, etc.

The PNF Plans are not required to identify Council zonings, even where they prohibit logging. In response to a question about this the LLS said:

*LLS considers local planning restrictions at the PNF Plan approval stage. Where forestry operations are prohibited under the relevant Local Environment Plan, LLS does not issue an approval.*

This has not been the case in the past, with Council's kept in the dark where approvals were issued over environmental zones. Though with the Government intent on allowing PNF Plans to over-ride Council LEPs this may soon be a moot point, as identified by the NRC (2022):

*... it is understood that the Government will decouple PNF from the State Environmental Planning Policy (Koala Habitat Protection) 2021 (Koala SEPP 2021) and remove the need for Development Consent requirements for PNF Plans.*

*... The research highlighted that around 25 percent of private native forestry land is subject to a dual consent process, with council approval processes identified as being inconsistent and unpredictable, and in some circumstances difficult and expensive. Removing the requirement for landholders to obtain both a PNF Plan and separate and duplicative approval from councils will help provide landholders with the certainty and consistency required for long-term forest management.*

There are now three logging plan types:

**Small scale harvesting:** requires a PNF Plan (and no FMP) and retention of 14m<sup>2</sup> per ha, though the new PNF Code does apply. It allows the logging of 5 trees per hectare, up to 5 hectares a year, and no more than 50m<sup>3</sup> per year, whichever is smaller.

**Forest Management Plan:** prepared by the landowner (and able to be changed by them) which maps the values identified in the PNF Plan, prescriptions that are required, management intent, and indicative roads, tracks and creek crossings.

**Forest Stewardship Plan:** intended to allow increased logging extent and intensity, such as by lowering basal area limits from 14 m<sup>2</sup>/ha down to 10 m<sup>2</sup>/ha, and increasing clearfelling patches from 0.5ha up to 0.75 ha, and apparently “*site specific variations and conservation of rare species*”. The requirements for this are still being developed as a “Forest Stewardship Plan template”, though there is no intent to release it for public comment.

LLS are now required to be notified within 30 days prior to commencement of the relevant forestry operations, and LLS “*can require that forestry operations are rescheduled to help ensure harvest operations are distributed over time and space*”. This is an improvement as previously there was no requirement for a landowner to notify when logging was undertaken.

Monitoring is proposed, though this seems mostly a desktop process, with any on-ground monitoring requiring the landholders approval.

## 2.LOGGING INTENSITY

**The intensity of logging is principally governed by the average basal area (in m<sup>2</sup>) of trees retained per hectare, with the additional allowance that up 20% of the logging area may be clearfelled in patches under 0.5ha. The 2008 PNF Codes required retention of basal areas of 12-14 m<sup>2</sup>/ha in stands <25m height and 16-18 m<sup>2</sup>/ha for stands ≥25m height. The 2022 PNF Code adopts a flat rate of 14m<sup>2</sup>/hectare which represents a significant increased logging intensity in higher quality stands.**

Both codes allow for Australian Group Selection, Single tree selection and thinning operations. Basal area retention is the principal constraint on logging intensity.

The 2022 PNF Code allows for an increase in logging intensity, previously in forests over 25m high logging had to retain 16-18 m<sup>2</sup>/ha basal area, which has now been reduced down to 14m<sup>2</sup>/hectare.

For single tree selection and thinning operations the 2008 PNF Code required retention of basal areas 12-14 m<sup>2</sup>/ha in stands <25m height and 16-18 m<sup>2</sup>/ha for stands ≥25m height.

The 2022 PNF Code reduces these:

*Single tree selection and thinning operations must not reduce the stand basal area below 14m<sup>2</sup>/hectare across the net harvestable area of a Forest Management Plan.*

In addition to this both codes allow 20% of the logging area to be clearfelled. The 2008 PNF Code allow “*the maximum width of a canopy opening must not exceed twice the stand height*” whereas the 2022 PNF Code allows “*the maximum area of an individual canopy opening must not exceed 0.5 hectares in area*”.

The NRC (2022) note the University of Melbourne modelled the potential forest structure with different basal area retentions, based on an already logged forest with 21.8 m<sup>2</sup>/hectare and applying the assumption that logging “would be a ‘from above’ harvesting operation” “starting with largest trees first until they reach the basal area limit”, concluding:

Where a basal area retention is:

- 16 m<sup>2</sup>/hectare: well-over half of the canopy trees are retained, with the landholder accessing only up to 12-13 trees per hectare under this scenario. This operation is likely to be economically unviable and may have adverse regeneration outcomes in less shade tolerant forest types.
- 14 m<sup>2</sup>/hectare: this scenario leaves a good retention of mature canopy trees, providing habitat for native species and also enables the landholder to harvest up to 21 trees per hectare. This is likely to provide the best balance for environmental and economic outcomes in the more shade tolerant species found in north coast forests.
- 10 and 12 m<sup>2</sup>/hectare: removes almost all of the canopy trees, and in the absence of incentives and experienced forest management, will leave a large proportion of small unmerchantable trees that may have adverse regeneration outcomes.

This doesn't seem to have accounted for the clearfelling of up to 20% of the logging area.

Logging from above is poor silvicultural practice as it leaves poor and suppressed trees behind, and is often blamed for the degraded nature of many forests and used by the industry to justify clearfelling of degraded stands. There needs to be a restorative silvicultural method applied.

NEFA considers that the starting point for any simulation for assessing the impacts of basal area removal should be a natural forest rather than already degraded stands. These can be 2-4 times the baseline used for the NRC assessment,

### 3.HABITAT TREES

The three means of mitigating the impacts of logging on fauna are the exclusion areas identified at the PNF Plan stage, the retention of habitat trees within the logging area, and the application of species-specific conditions. Habitat trees comprise hollow-bearing trees, recruitment trees and feed trees:

- Hollow-bearing trees are typically the biggest oldest trees that have developed branch and trunk hollows suitable as nests and roosts for the numerous hollow-dependent animals that depend upon them. These are best retained scattered across the logging area to maximise use, particularly by territorial species,
- Recruitment trees are retained as potential future hollow-bearing trees when existing ones die. To achieve this in a reasonable timeframe these need to be the next oldest and largest trees.
- Feed trees are retained to provide nectar or other food for wildlife. Around 40 species are listed. It is the large mature to late mature trees that provide the most nectar and other resources.

**The 2008 PNF Code required the retention of 10 live hollow-bearing trees, 10 recruitment trees and 6 feed trees per 2 hectares, within the net logging area.**

**There has been a concerted attack on habitat trees under the 2022 PNF Codes. The requirement for the retention of 10 live hollow bearing trees per 2 hectares has been reduced down to 8 per 2 hectares and they have been redefined to remove the emphasis on protecting the oldest and largest trees, instead allowing small trees with burnt out bases to replace them.**

Regardless of reduced retention of hollow-bearing trees, and their redefinition, the Government has removed the requirement that they “*be evenly distributed throughout the area of harvesting operations and within the net logging area*”, meaning that trees already requiring retention in exclusion areas can now be counted as habitat trees. The NSW agencies still deny the effects of this change, though the habitat tree retention requirements are now mostly a pretence. This change will result in the logging of hundreds of habitat trees in each operation that would have previously required retention, thereby greatly amplify logging impacts on threatened animals. To add to the problem, the prohibition on damaging habitat trees only has to be “*as far as practicable*”, making this “*difficult to enforce*”.

Both the old and new PNF codes require the retention of “*10 hollow bearing trees per 2 hectares where available*” and the retention of a recruitment tree for each, with the proviso that where there are “*less than 10 trees per 2 hectares, additional recruitment trees must be retained to bring the total number of retained hollow bearing and recruitment trees up to 20 trees per 2 hectares*”.

The 2022 PNF Code has changed these retention requirements by allowing “*2 dead standing trees may contribute to the total of 10 hollow-bearing trees per 2 hectares*”. Effectively reducing the retention of live hollow-bearing trees down to 8 per 2 hectares. The 2008 PNF Code specified “*Dead standing trees cannot be counted as hollow bearing trees*”. While dead trees can still provide hollows which many species utilise, they are unlikely to survive for too long and are readily burnt out in fires. On State forests they are treated as an additional requirement, particularly because they have no timber resource impacts.

The 2022 PNF Code has changed the definition of hollow-bearing trees from “*the largest*” “*dominant or co-dominant living tree*”, to “*a tree 30 cm diameter at breast height ... or greater*” thereby enabling small trees with burnt out bases to be retained while large oldgrowth trees are logged.

The 2008 Code defines:

(a) A **hollow bearing tree** is a dominant or co-dominant living tree, where the trunk or limbs contain hollows, holes or cavities.... If there are more than the minimum required number of habitat trees, preference shall be given to the largest. ...

(5) ... Preference should be given to trees with well developed spreading crowns and minimal butt damage.

The 2022 Code defines it:

(a) a **hollow bearing tree** is a tree 30 cm diameter at breast height over bark (DBHOB) or greater, where the trunk or limbs:

(i) contain visible hollows, holes or cavities (including basal hollows), or

(ii) have inferred hollows as it is an older growth stage tree and has one or more obvious deformities such as a burl, large protuberance or a broken limb.

This is a gross weakening of the emphasis on retaining the largest trees by instead focusing on trees over 30cm dbh and allowing burnt out tree bases to count as large hollows. It is important to recognise that basal hollows are of no use to most hollow-dependent animals, and actually weaken trees, increasing the risk of their early loss due windthrow or wildfire. This could mean that a live (or dead) 30cm diameter tree with a large butt cavity due to fires could be retained in preference to a live 1 m diameter tree which has small branch hollows, or even a live 2m diameter tree with large canopy hollows.

The removal of the need to protect the largest hollow-bearing trees is an unprecedented change in hollow-bearing tree definitions, particularly as usually these large trees are of the most benefit for hollow-dependent animals. The intent to allow their replacement with small (30cm dbh) trees with burnt out basal hollows is outrageous, particularly as such basal hollows are of little wildlife benefit. This change is clearly intended to allow more of the largest hollow-bearing trees to be logged.

Similarly the definition of recruitment trees has been changed from “a large, vigorous tree capable of developing hollows to provide habitat for wildlife”, to “a large, vigorous tree (30cm or greater in DBHOB) capable of developing hollows to provide habitat for wildlife”. Both require “preference must be given to trees from the next cohort to that of retained hollow bearing trees”. Given the reduction in the sizes of hollow-bearing trees, and the limitation of 30cm or greater in DBHOB applied to what constitutes a large tree, this too removes the emphasis on protecting the biggest and oldest trees necessary to provide the hollow-bearing trees of the future.

Noting that habitat tree retention on State forests need to be within the net logging area, these hollow-bearing tree retention requirements are effectively less than half of what the NRC (2021) recommended for State Forests:

*The Commission has proposed temporary additional measures relating to hollow-bearing trees and recruitment trees for medium and high-risk zones. However, the Commission considers the following measures could also enhance the standard Coastal IFOA prescriptions:*

- *retain a minimum of eight hollow-bearing trees per hectare where they exist (as per the requirement in the standard Coastal IFOA prescriptions)*
- *if hollow-bearing trees are not available, then retain suitable substitutes, in priority order being, potential future hollow-bearing trees, the largest mature tree in the stand or a regrowth tree that is not suppressed*
- *retain two recruitment trees per retained hollow-bearing tree*

It is clear that the NRC (2021) consider that this change should be permanent and applied across all native State forests.

The NRC (2021) recognised:

*The Coastal IFOA standard prescriptions do not provide effective retention of feed and habitat trees, including recruitment trees in timber harvest areas of state forests, to support the persistence of species dependent on these resources in a severely fire-affected landscape*

Fires had also had a significant impact on private forests and they occur in the same severely fire affected landscape where a significant number of already depleted hollow-bearing trees were lost by being burnt out. It is extraordinary that the NRC approved these reductions in the numbers of hollow bearing trees down to 4 per hectare, while also removing the requirements to protect the largest trees, after they had advised Ministers that because of the extensive wildfires, for public lands they should restore a minimum of 8 hollow-bearing trees per hectare within the net logging area, with two large recruitment trees for each.

The 2008 PNF Code specified that habitat trees (hollow-bearing, recruitment, nectar feed trees) “should, where possible” be retained within the net logging area, with the exception that up to half of all required recruitment trees (not other habitat trees) can be located in a riparian buffer zone, specifying:

*(5) Habitat trees should, where possible, be evenly distributed throughout the area of harvesting operations and within the net logging area. Preference should be given to trees with well developed spreading crowns and minimal butt damage.*

*Up to half of all required recruitment trees can be located in a riparian buffer zone where the subject 2-hectare area is within 200 metres of, and partly includes, that riparian buffer zone.*

The 2022 PNF Code has removed the requirement that habitat trees “be evenly distributed throughout the area of harvesting operations and within the net logging area”, though retained the exception that “Up to half of all required recruitment trees can be located in a riparian buffer zone”. This change clearly means that legally there is no longer a requirement to retain habitat trees within the net logging area. I thought this may have been a mistake, so I raised it in writing with both the EPA and LLS, and in a video linkup with the agencies and NRC, though they would not admit to any

problems, so I can therefore only assume that the change to remove the legal requirement was intentional.

Strangely all NSW agencies claim that there is an intent for the habitat tree prescriptions to apply within the net logging area, though they cannot point to any clause or statement that says so. It is apparently an unexpressed desire. The best LLS can come up with is:

*The Codes still require hollow trees to be met within the harvest area, as no exception has been made to specifically permit retention in exclusion zones (like what applies for recruitment trees), and the conditions clearly require hollow trees to build on the exclusion zone network.*

This is extraordinary reasoning. LLS seem to be maintaining that because it doesn't say that you can retain habitat trees in exclusion areas this means that you can't. They are relying upon 2 clauses to establish the intent and legal obligation that habitat (hollow-bearing, recruitment and feed) trees be retained within the net logging area:

*(Table C) Up to half of all required recruitment trees can be located in a riparian exclusion zone where the subject 2-hectare area is within 200 metres of, and partly includes, that riparian exclusion zone.*

This clause only applies to recruitment trees, and does not preclude the rest of the recruitment trees being situated in other types of exclusions.

The second clause is:

*4 (c) preference must be given to habitat trees that will provide habitat connectivity, build on existing landscape features (Table B), provide additional protections for threatened species, and build on existing habitat islands, refugia and conservation areas adjacent to and within the PNF Plan area*

This clause does not express an intent that habitat trees be outside exclusion areas, as they could be claimed to fulfil the identified functions within exclusions.

Nowhere do the 2022 PNF Codes express a clear intent, let alone legal requirement, that habitat trees be retained within the net logging area, and because the clause expressly requiring they be retained "*evenly distributed throughout the area of harvesting operations and within the net logging area*" was removed, this would seem to be intentional. The retention of the remaining specific habitat tree clauses seems illusory, aimed at maintaining a pretence they still apply.

This means that the 5 hollow-bearing, 2.5 recruitment, and 6 nectar feed trees per hectare that used to have to be retained within the net logging area outside exclusions, can now be retained within exclusion areas, where they would have been retained anyway. Over a 100 hectare net logging area this is a lot of trees. This is a massive reduction in habitat retention requirements and will have major impacts on threatened species beyond what was previously allowed.

The NSW Government needs to come clean on whether this was the intent or not. If there is an honest intent to retain habitat trees in the net logging areas, the PNF Codes must be changed to reinstate it. If, as it seems, this is a deliberate change then they must own up and say so.

The NRC (2022) note "*If the final draft PNF Codes are to deliver ESFM and meet their identified outcomes, they will require effective implementation and enforcement*". Enforcement requires clear and unambiguous prescriptions that are capable of legal enforcement. While it is necessary to encourage voluntary compliance, this also requires the ability to be able to enforce rules when required.

This is particularly important given that most landholders are primarily interested in maximising profits and don't want to know about PNF codes. From their survey of PNF contractors in north-east NSW Jamax Forest Solutions (DPI 2017) report that "*67% of PNF harvesting contractors believed*

that the majority to vast majority of landowners were only interested in maximising the income from their forest”. “Whilst many PNF landowners are aware of PNF requirements, many still don’t know or don’t want to know”, and “78% of landowners understand very little (0-20%) about the PNF requirements”.

This emphasises the need for a “carrot and stick” approach. There needs to be clear enforceable prescriptions to be effective. It is clear that the PNF Code rules for habitat trees are loose and confused making enforcement unlikely.

The requirements to avoid damage to retained trees was already weak and effectively unenforceable, though has been further weakened by the 2022 PNF Code:

*As far as practicable, forestry operations must not damage or heap debris around protected trees, and post-harvest burns must minimise damage to trunks and foliage of protected trees.*

The EPA have previously recognised that “as far as practicable” makes rules unenforceable. In response to questions on this the EPA stated “such terminology is difficult to enforce, it acknowledges of the complexity of complying with no tolerance limits”.

Uses of terms such as “heap” and “minimise” are also equivocal.

## 4.STREAM PROTECTION

**The 2022 PNF Code significantly improves the width of exclusion zones on headwater “drainage lines”, and adds them for unmapped “drainage lines” which may represent half of upper headwater streams. Though there is sleight of hand involved, as by adopting a very narrow definition of “stream” in the 2022 PNF Code, it effectively reduces exclusion zones for 2nd and 3rd order streams from 20-30m down to 10m where they do not comply.**

Ten metres is still a lot less than the minimum of 30m that numerous studies have recommended, but is greater than the 5m applied to what are effectively first order and unmapped streams on State forests.

The 2008 Code required:

Table F: Riparian exclusion and riparian buffer zones

Drainage feature	Riparian exclusion zone distance from drainage feature	Riparian buffer zone distance beyond riparian exclusion zone
Mapped first-order streams	5 metres	10 metres
Mapped second-order streams	5 metres	20 metres
Mapped third-order or higher streams	5 metres	30 metres
Prescribed Streams	20 metres	15 metres

The 2022 Code seems to significantly improve exclusion zones, and adds them for unmapped drainage lines, though reduces buffers on some 2<sup>nd</sup> and 3<sup>rd</sup> order streams by redefining them:

Table E: Riparian exclusion zones

Drainage feature	Riparian exclusion zone
Unmapped drainage lines, unmapped and mapped first-order streams, mapped drainage features	10 metres
Mapped second-order streams	20 metres
Mapped third-order or higher streams	30 metres
Prescribed Streams	

The 2022 Code defines “drainage line” as:

*A channel down which surface water naturally concentrates and flows. Drainage lines exhibit one or more of the following features which distinguish them from drainage depressions:*

- *evidence of active erosion or deposition, e.g. gravel, pebble, rock, sand bed, scour hole or nick point and/or*
- *an incised channel more than 30 centimetres deep with clearly defined bed and banks and/or*
- *a permanent flow.*

This definition is also encompassed by “mapped drainage features”, meaning that both mapped and unmapped drainage lines receive 10m exclusion zones around them.

Previously streams have been taken to be those mapped on 1:25,000 topographical maps. The new 2022 PNF Code has added a definition for a stream:

**Stream** *A stream, unmapped or mapped, is defined as an incised watercourse with a defined channel, bed and banks and minimum depth of 30 centimetres.*

This effectively reduces exclusion zones for 2nd and 3rd order streams from 20-30m down to 10m where they do not have “*an incised watercourse with a defined channel, bed and banks and minimum depth of 30 centimetres*”.

It is common for streams not to have beds 30cm deep with defined banks, at least in part, which means that buffers can be reduced wherever this occurs. While parts of all streams risk being defined out of existence, they are effectively covered by the definition of “mapped drainage feature” which is defined to include “*evidence of active erosion or deposition*”, which means the minimum buffer width of 10m applies.

This reduction in protection for 2nd and 3rd order streams has not been quantified, though in some landscapes the loss of exclusions is likely to be very significant, both reducing the amount of important riparian habitat requiring protection and reducing the buffers needed to trap sediments and stop them polluting streams. This will have the affect of opening up previously protected areas for logging.

## 5.THREATENED SPECIES

**The 2022 PNF Code identifies 55 threatened animal species and 174 threatened plant species that require site-specific prescriptions to reduce impacts on them, though for all but 2, the prescriptions only apply around records of the species and there are no requirements or intent to undertake surveys to identify new records. Without surveys the prescriptions are a sham. Compared to the 2008 PNF Code, two species have been removed, two species have had requirements for 100-500m buffers removed, and 15 species have had requirements to apply prescriptions to adjacent records removed. On the positive side new prescriptions have been added for 11 recently listed species, though these only require exclusions around nests or dens which would require detailed surveys to locate, and the Barking Owl buffer has been increased from 500m up to 1000m.**

The 2022 PNF Code has species specific prescriptions for 55 threatened animal species and 174 threatened plant species included in Appendix A. This is clear recognition of the need to take additional measures to reduce logging impacts on these species. While these prescriptions have never been monitored to assess their effectiveness, at least they provide increased habitat and key resources that each species is known to need, targeted to where it's known to be needed. While some benefit may be provided for some of these species within the base exclusion areas, it is clear that many of them will be significantly affected by logging of their habitat or direct impacts, accentuated by the reduced protection for habitat trees and 2<sup>nd</sup> and 3<sup>rd</sup> order streams.

The principal problem is that the prescriptions for 227 of these species are only applied around a record of that species. There are very few records on private lands as most have never been surveyed. Many of these species are cryptic, require an expert to identify and/or require targeted survey methods, and so are unlikely to be recognised or stumbled upon by a landholder or even an LLS officer wandering around. To enact the PNF Codes' species-specific prescriptions there has to be professional surveys, targeting the threatened species likely to occur on a property, undertaken to inform preparation of PNF Plan.

The failure of the 2022 PNF Code to require any surveys is its greatest failure. Without any requirement to look before they log, threatened species will not be found, and the prescriptions will not be applied. In their submission to LLS on PNF, Ballina Shire Council (2020) observe:

*In respect to threatened entities, the code of practice is highly reliant on records submitted into NSW BioNet. This is not suitably reflective of the likely presence of threatened species in forested areas that are utilised for PNF or the impact of habitat loss on flora and fauna resulting from PNF operations.*

*The application process should require site specific threatened species surveys pertinent to contemporary data, literature and methodology. Ecological assessment should be required to have regard for landscape and cumulative impacts associated with PNF.*

...

*Many of the ecological prescriptions listed in Appendix A rely on a specific record within the forest operation to trigger exclusions, buffers or directives for harvesting. However, as previously noted in the above comments, there is no requirement to undertake surveys. It is unlikely that habitat, sightings and indications of occurrences for many (if not all threatened species) are being observed to subsequently trigger the appropriate prescriptions. For example, observation of koala scats is unlikely if no specific search is carried out.*

The 2022 PNF Code has compounded this problem by discounting species records outside the logging area, but close enough that they would trigger species-specific prescriptions within the logging area if applied. Under the new code, requirements to account for nearby records have been removed for 15 species: Loveridge's frog, Pugh's Frog, Mountain frog, Sphagnum frog, Richmond frog, White-crowned Snake, Pale-headed Snake, Rufous Scrub-bird, Albert's Lyrebird, Marbled Frogmouth, Powerful Owl, Masked Owl, Sooty Owl, Barking Owl and Eastern Bristlebird.

Prescriptions not reliant upon records are only applied for two species:

- For the Common Blossom-bat habitat protection of 75% of key nectar species is required in wet sclerophyll and swamp sclerophyll forest within 30 kilometres of the coast.
- Outside of mapped core Koala habitat, the 2008 PNF Code was only triggered by the record of a Koala, under the 2022 PNF Code the prescription is now triggered where modelled Koala habitat occurs within the logging area, requiring the retention of 20 Koala feed trees per hectare (see Koalas below).

There are 53 threatened animal species identified as requiring species specific prescriptions, that are only triggered where there is a record:

- Many prescriptions rely on exclusions around records. Seven frogs require 50m-exclusions, with Giant burrowing frog requiring 300m. Two mammals, 2 snakes and 1 bird require 30-200 m exclusions, with 3 of these also requiring additional 100-200m buffers with increased habitat protection.
- Many prescriptions are based on buffers within which increased habitat is protected. Records of 2 mammals and 2 reptiles trigger 100-500m buffers within which increased tree retention and habitat retention is required. A record of a Long-nosed potoroo triggers 5m exclusions around 12 retained trees per ha across the logging area. Records of the four forest owls trigger 1,000m buffers within which 15 hollow-bearing trees and recruits are

required to be retained per 2 ha. A record of a Glossy Black-cockatoo triggers a 200m buffer within which damage to casuarinas must be minimised. Records of Regent honeyeater and Swift parrot trigger the retention of 10 eucalypt feed trees per ha across the logging area. Within 300m of a Rufous scrub-bird record all suitable microhabitat must be protected. Seven of these birds also require 20-50m exclusions around records of nests and/or roosts.

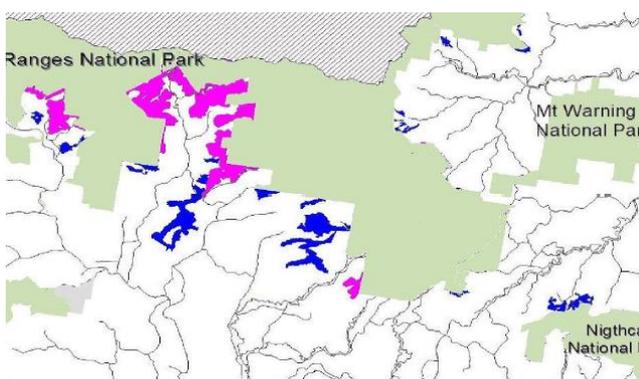
- For 3 frogs, 2 bats and 2 birds increased (20-30m) riparian buffers are required, mostly within 100-300m of records, with a record of a Marbled Frogmouth triggering increased riparian buffers throughout the logging area.
- For 20 threatened species the only protection required to be applied is to dens or nests, requiring an even greater level of survey and expertise to detect. For four threatened mammals 50-200m exclusions are only applied where their dens are found. For Grey-headed Flying-fox a 50m exclusion is required around camps. For 15 threatened birds 25-100m exclusions are only applied to their nests when detected in the breeding season.

It total there are 174 threatened plant species that whose records are required to be protected, with 130 of these requiring exclusion areas of 10-50m around the records, and the balance requiring the species not to be harmed:

- Records of 40 species require 50m exclusions around them,
- Records of 84 species require 20m exclusions,
- Records of 6 species require 10m exclusions and 10m buffers, and
- Records of 44 species require them not to be “picked”.

Given the paucity of records on private properties, and the lack of any requirement to look before they log, these prescriptions will rarely be triggered, even when the species is present. Without requirements to survey for species likely to occur within a logging area the numerous species-specific prescriptions are tokenism.

A glaring example of the Code’s failure to provide protection identified as necessary, is the northern NSW population of the Endangered Eastern bristlebird (*Dasyornis brachypterus*). It inhabits open forest with dense tussocky grass understorey and sparse mid-storey near rainforest ecotones. The Code identifies “*These birds are very rare, with fewer than 40 individuals known in northern NSW*”. There is no national recovery plan, though one is identified as necessary.



PNF Code map of potential Eastern Bristlebird habitat

For Eastern Bristlebird the 2022 PNF Code prescription requires a 200-metre exclusion zone around records and a 150m buffer around that. The PNF Code has a map showing very limited areas of modelled habitat, which could be appropriately used to trigger surveys. Very little oldgrowth occurs within the modelled habitat. Given Eastern Bristlebird habitat is outside rainforest and there is little oldgrowth, it is likely to occur primarily within the net logging area. Because there is no need to look before they log, this means that any unknown locations in likely habitat of this extremely rare species can be indiscriminately logged with no effective protection. Even worse, the stopping of

records outside the logging area from triggering prescriptions means that, even if a record is a few metres away, the required protection will not be applied

There have been a variety of reductions in prescriptions between the 2008 and 2022 Codes. Black Flying Fox and Osprey have been removed. Requirements for 500 m buffers (requiring increased tree retention) around records of Brush-tailed Phascogale and 100m of Yellow-bellied glider have been removed. The NSW Agencies were asked for justifications for these reductions, their response being “*protections have been made consistent with the IFOA*”. This adoption of prescriptions from State forests is invalid, both because exclusions on State forests are twice the size (see below) and because State forests were subjected to 20 years of detailed surveys up until 2018. For example, for the Brush-tailed Phascogale the CIFOA requires continued retention of the 20 ha exclusions around records identified over the proceeding 20 years of pre-logging surveys.

On the positive side new prescriptions for 25m exclusions around nests in the breeding season have been added for 10 recently listed birds, as well as a 50m exclusion around Greater Glider dens. A 100m exclusion around nests of coastal Emu has been added. Buffers for Barking owl have been increased from 500m up to 1000m.

In response to my questions about the lack of surveys to trigger prescriptions, using the Eastern Bristlebirds as an example, the NSW agencies responded that “*The PNF Codes, similar to the IFOAs, are designed so that the general environment protections provide the bulk of protections*”. The comparison is invalid as exclusions on private land are only said to represent an average 26% of the logging area compared to 50% for State Forests. To compensate for removing pre-logging survey requirements for most species the 2018 CIFOA required an additional 10-12% of the net logging area to be excluded from logging as habitat tree and wildlife clumps, and still requires survey for a number of specified plants and animals.

It is correct that under the PNF Code, with the removal of the need to retain habitat trees in the net logging area, that protection is primarily limited to exclusions, though with a variety of threatened species likely to have important (and sometimes their only) habitat in the 74% available for logging, far less reliance can be placed on exclusions to mitigate impacts. Particularly given the reduced protection for habitat trees and 2<sup>nd</sup> and 3<sup>rd</sup> order streams.

In relation to the need to retain more Koala feed trees on private land compared to State forests, the NRC (2022) recognised the need to increase retention rates because of the reduced exclusions, stating:

*This rate considers the contribution from existing areas excluded from harvesting on private land in northern and southern code regions being 26 percent and 21 percent respectively. In comparison, while the state forest estate is subject to lower koala feed tree retention rates under the relevant forestry rule set, on average around 50 percent of the state forest estate is permanently excluded from harvesting and many other activities.*

Aside from Koalas, there are numerous species models that could have been used to trigger prescriptions or focus areas for surveys, though none were used.

Plants, particularly understorey species, within logging areas, suffer high mortalities and damage during logging. Any threatened plant species within the 74% available for logging can be expected to be significantly impacted, if not eliminated, if not first identified.

The EPA needs to recognise that the base exclusions on private lands are unlikely to provide adequate habitat to mitigate impacts on the listed species without application of the species-specific conditions, and that most threatened species are unlikely to be found without targeted surveys.

The NRC (2022) recommended Appendix A should be subject to a risk-based, scientific review within 12 months of approving the codes. If it's anything like the process that went into rewriting the prescriptions, only further wind-backs can be expected.

## 6.KOALAS

The 2022 Code retains the exclusion from logging of core Koala habitat identified in a Council Koala Plan of Management (KPoM) before 2022, totalling 10,430 hectares of core koala habitat, while allowing a claimed 58 existing PNF Plan approvals covering 500 hectares of core Koala habitat to continue until they expire. The Code does not allow logging to be excluded from core Koala habitat identified in any future KPoMs.

The triggering of prescriptions for Koalas is no longer solely dependent on records, now also being triggered by a model of high quality habitat, which is an improvement. This model has not been verified. The concern is that landowners will be able to challenge the mapping using an unidentified methodology which hasn't been released, which may not even require a Koala survey. The record based trigger has also been increased from one Koala scat to 10, still with no surveys, reducing the likelihood that this will apply.

Where the prescription applies the required retention rate for Koala feed species has been increased from 15 to 20 per hectare, while this sounds good, the tree size limit has been reduced from 30cm dbh down to 20cm dbh, which more than halves the volume of browse retained. In good Koala habitat this may allow 65% of Koala feed trees to be logged, including most of the larger trees Koalas prefer. It is good they have improved the criteria for identifying a tree used by Koalas, which require 20m exclusions, though without surveys they are unlikely to be identified. While the Koala feed tree species list has not been reviewed, the NSW agencies were unconcerned when we identified that the key primary feed tree Small-fruited grey gum was misidentified as a secondary feed species, thereby reducing its retention.

The NSW agencies claim there are “*requirements to search for koalas before logging*”, though the only requirement is to “*visually assess*” trees for koalas “*immediately prior to it being felled*” within identified habitat, which is not a search and can be satisfied by a machine operator having a look from inside a machine as they decide which way to fell it.

### Core Koala Habitat.

The 2008 PNF Code required

*Forest operations are not permitted within any area identified as 'core koala habitat' within the meaning of State Environmental Planning Policy No. 44 – Koala Habitat Protection.*

The 2022 PNF Code limits this to 'core koala habitat' identified prior to April 2022, though exempts 'core koala habitat' within all approved PNF Plans up to that date – until they expire.

*Forestry operations must not occur on any land mapped as 'PNF Core Koala Habitat – April 2022' – except where forestry operations are authorised by a PNF Plan as at 7 April 2022 for the duration of the PNF Plan*

While the LLS now claims there are only 58 PNF approvals over 500ha of core Koala habitat, this is at odds with other publicly available information:

Table 7 from the Koala Inquiry, taken from Local Land Services submission, identifies “Legacy PNF Plans that overlap with Koala Habitat identified in a KPOM” as 97 in Ballina, 91 in Coffs Harbour, and 12 in Kempsey. And this is only based on habitat mapped as core Koala habitat, and not the areas added that were mapped as high quality habitat.

Daniel Bennett, Senior Strategic Planner, Bellingen Shire Council, informed the Koala Inquiry (3 February 2020) “*Over a quarter of our mapped koala habitat has pre-existing private native forestry [PNF] approvals over it, which is a potential threat, according to our strategy*”

Coffs Harbour City Council submitted to the inquiry into the LLS Amendment Bill in January 2021 *“based on the updated draft Coffs Koala Habitat Map, there are (as at December 2020) 65 properties with core koala habitat, under the revised mapping, that have a PNF approval”*.

In response to my request to the agencies to explain the differences, LLS said that it was because some plans had expired and *“correction of errors and duplicate polygons from the data set”*. Though this does not satisfactorily explain the significant differences.

## **The prescription trigger:**

The triggering of Koala prescriptions under the 2008 PNF Code was solely dependent on records of Koalas, with no requirement to survey for them. The 2022 PNF Code now also allows modelling of areas of high koala habitat suitability to trigger the Koala prescriptions, with allowance for on-ground surveys to change the maps. This is a significant improvement as it increases the likelihood that the prescription will be applied to where Koalas live. Though this does not compensate for prohibition on logging in core Koala habitat identified in a KPoM.

The 2008 PNF Code identifies that the Koala prescription applies:

*Where there is a record of a koala within an area of forest operations or within 500 metres of an area of forest operations or a koala faecal pellet (scat) is found beneath the canopy of any primary or secondary koala food tree*

The 2022 PNF Code identifies that the Koala prescription applies:

*Where there is a record of a koala within the area of forestry operations, or within 500 metres of an area of forestry operations, or where 10 or more koala scats (or one or more koala scats in the Central and Southern Tablelands Koala Management Area as shown in Figure 8) are found beneath the canopy of a primary koala feed tree or secondary koala feed tree during pre-harvest surveys or harvest operations, or the area of forestry operations is on any land mapped as ‘high koala habitat suitability’ on any PNF koala prescription map*

The increase from one to 10 or more koala scats on the north coast is a reduction in the application of this trigger, particularly as finding 10 scats often requires a search and none are required.

Figures 6 and 7 show *“Areas mapped as high koala habitat suitability under the PNF koala prescription map”*, which was developed by the NRC from the DPI Forestry and DPE EES models. Steps, such as deleting areas of high value where it was just in one model, removing all Category 1 Exempt land, Category 2 - Sensitive regulated land and small patches of habitat are of concern. The mapping has not yet been verified and may still miss significant Koala habitat. Whatever the shortcomings, this is a major improvement as the application of the Koala prescription is no longer solely dependent on records of Koalas with no need to survey for them.

The 2022 PNF Code provides a mechanism for a landholder to have the mapping changed by undertaking a survey:

*Where the landholder(s) considers the PNF Koala Prescription Map is inaccurate on their property because it is not high koala habitat suitability, and/or where the required number of koala feed trees cannot be found (as per clause 4.10 (1) (a) (vi) of this Appendix), the landholder may commission a review be undertaken by a suitably qualified expert(s).*

The *“koala habitat verification survey”* methodology has yet not been released, though it is of significant concern that it may not require an actual survey for Koalas, and may just be an assessment of whether the *“actual vegetation and habitat correlates with the modelled vegetation and habitat”*, even though these attributes may themselves be wrong for defining Koala habitat. As noted by NRC (2022):

*In developing its draft advice to LLS, the Commission noted that the surveys are being conducted to resolve instances where mapped koala habitat is disputed by the landholder.*

*As such, the Commission’s position is that this process should remain focused on verification of the available koala habitat, not the presence or absence of koalas. A simpler and more effective test is to check that the actual vegetation and habitat correlates with the modelled vegetation and habitat. By focusing on koala habitat, it also provides for potential re-colonisation of the forest by koalas in the future, if they are not currently present.*

## The prescription:

It is well known that Koalas prefer larger trees, while the 2008 PNF Code set a minimum size of 30cm dbhob, the 2022 PNF Code reduces the size limit to 20 cm dbhob. Smaller trees are proportionally used less, have smaller canopy volumes and have higher mortalities, and therefore the overall outcome is a reduction in suitable browse. It is also evident that Koalas prefer larger trees for reasons other than just nutritional quality as claimed by NRC.

Where the prescription was triggered the 2008 Code required retention of:

*(i) A minimum of 10 primary koala food trees and 5 secondary koala food trees must be retained per hectare of net harvesting area (not including other exclusion or buffer zones), where available.*

*(ii) These trees should preferably be spread evenly across the net harvesting area, have leafy, broad crowns and be in a range of size classes with a minimum of 30 centimetres diameter at breast height over bark.*

The 2022 PNF Code increases retention but reduces tree size:

*A minimum of 15 primary koala feed trees and 5 secondary koala feed trees must be retained per hectare in the forestry operations area (not including other exclusion or buffer zones), where available*

*... have leafy, broad crowns and be in a range of size classes with a minimum of 20 centimetres diameter at breast height over bark*

The NSW agencies claim the 2022 PNF Code “includes increased tree retention”, which is technically correct as retention rates have increased from 15 per hectare up to 20 per hectare, though in doing this the minimum tree sizes have been reduced from 30 cm dbh (diameter at breast height) down to 20 cm dbh, which more than halves the volume of browse retained. A 20cm dbh tree has about 37% of the biomass of a 30 cm dbh tree, which would be reflected in canopy volume, and thus the potential browse available. So the substitution of 20x20cm trees for 15x30 cm trees results in a loss of about half the browse available for Koalas. In reality it would be far greater as generally there are numerous potential trees around 20cm in size, though the more limited numbers above 30 cm is likely to require retention of more significantly larger trees, with a 40cm tree having over 5 times the biomass of a 20cm tree, and a 50cm tree having almost 10 times the biomass of a 20cm tree.

Size Class	Grey Box/ha	Grey Gum/ha	Red Gum/ha	Koala feed trees/ha
60+	3.0	0.8	0.8	4.6
45-59.9	7.8	0.8	3.2	11.8
30-44.9	14.5	2.4	5.9	22.8
20-29.9	8.6	4.8	4.3	17.7
Grand Total	33.9	8.8	14.2	56.9

**Average numbers of Koala feed trees per hectare and size class across the proposed Sandy Creek Koala Park. Note that in this case the new 2022 PNF logging rules only require the temporary retention of 20 (35%) of the 56.9 Koala feed trees >20cm dbh per hectare, allowing most of the feed trees above 30cm dbh preferred by Koalas to be logged.**

As an example of the consequences, NEFA (Pugh 2020) found that across the logged forests of the proposed Sandy Creek Koala Park there are currently 56.9 potential Koala feed trees >20cm dbh per hectare. This means that only 35% of existing Koala feed trees would need to be retained. Of the trees 20-29.9 cm dbh, 17.7 are Koala feed species, meaning that only 3 trees above 30cm dbh would need to be retained to satisfy tree retention requirements.

The NSW agencies justify this reduction in tree size based on a study that found that the nutritional value of foliage doesn't change with tree size and an unpublished radiotracking study by DPI Forestry "that found koalas to use the full range of tree sizes above 8cm DBH".

The nutritional value of leaves mightn't change with tree size, but the data from numerous studies shows that Koala preferences do. There are obviously other reasons why Koalas prefer larger trees, such as stability, volume of browse, ease of roosting, cooling effect etc..

For the State forests covered by the CIFOA, even the EPA held out for minimum 25cm dbh until over-ridden by the NRC, presumably because they then considered tree size does matter. This time the status-quo was trees greater than 30cm dbh, and this has been reduced down to 20 cm dbh, and the EPA imply this is "consistent with recent telemetry studies that found koalas to use the full range of tree sizes above 8cm DBH", effectively denying their own findings (and those in many other studies) for unpublished claims by DPI Forestry. In referring to this unpublished research the NRC (2021) report 'Koala response to harvesting in NSW north coast state forests' provides more detail:

*While the research found koalas used small trees, analysis of nocturnal tree-use data (when koalas mostly feed) indicates they most commonly used medium sized trees (mean 36 centimetres DBH).*

This appears to contradict the NSW agencies' pretence that size doesn't matter, particularly in light of the fact there are far more trees below 36 cm dbh than above it. It is noted that koalas may visit the range of tree sizes, though this tells you nothing about tree size preference as that is related to the number of trees in a size class they visit relative to the availability of that sized tree. The NSW agencies claim the "NRC also considered the EPA's research ... other available literature". Though in the NRC report I can find no reference to the EPA study, or the numerous other studies that have found that Koala's tree use increases with size.

It is apparent that both the EPA and the NRC are cherry picking data, and ignoring studies that don't suit. Numerous studies have found Koala usage of trees increases with tree size (as detailed in previous NEFA submissions), as confirmed by the EPA (2016) Kola Habitat Mapping Project, which states:

*Analysis of size class data for Carwong, Royal Camp and Clouds Creek indicate that koalas preference for utilisation of feed trees by koalas is towards larger trees (higher diameter at breast height >30 centimetres).*

An example of their findings;

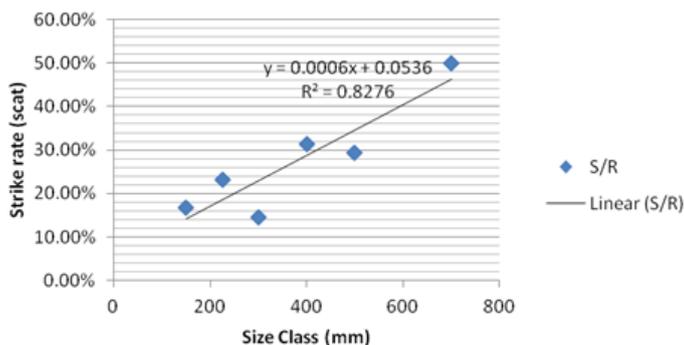


Figure 4 from EPA (2016) results: Size class of small-fruited grey gum versus scat strike rate

*The structural component of a forest comprises trees of different size classes, and both size and structural diversity of forests correlates with higher koala occupancy (Lunney et al. 1996; Phillips' 2013; Smith 2004). This study found koala activity correlated with larger tree size classes and mapped mature forest components of the pilot areas. Smith (2004) found forest structure to be a key predictor of koala scat density after food tree species diversity and abundance, where scat abundance was greatest under trees with a diameter at breast height (dbh) of 40–80 centimetres. Phillips' (2013) reports similar preferencing for trees >30 centimetres in low fertility areas.*

In their submission to the new IFOA logging rules, the Office of Environment and Heritage (2018) commented:

*While Koalas will use small trees, research has shown that they selectively prefer larger trees. In our experience, the proposed minimum tree retention size of 20cm dbh will be inadequate to support koala populations and should be increased to a minimum of 30cm dbh. Many Koala food trees are also desired timber species, so there is a high likelihood that larger trees will be favoured for harvesting, leaving small retained trees subject to the elevated mortality rates experienced in exposed, intensively-logged coupes.*

The scat trigger for the retention of individual trees with 20m buffers has been reduced and distinctive scratches can now count, though this will be of limited effect as there is still no requirement to look for scats or scratches:

The 2008 PNF Code required:

*Any tree containing a koala, or any tree beneath which 20 or more koala faecal pellets (scats) are found (or one or more koala faecal pellets in Koala Management Area 5) must be retained, and an exclusion zone of 20 metres (50 metres in Koala Management Area 5) must be implemented around each retained tree.*

The 2022 PNF Code improves on this, requiring:

*Any tree containing a koala, or any tree beneath which 10 or more koala scats are found (or one or more koala scats in Central and Southern Tablelands Koala Management Area as shown in Figure 8), or where the presence of a koala is clearly identifiable by recent scratches must be retained, and an exclusion zone of 20 metres (50 metres in Central and Southern Tablelands Koala Management Area as shown in Figure 8) must be implemented around each tree required to be retained*

The requirement is to retain 15 primary and 5 secondary feed trees per hectare. The species list has not been reviewed, though 2 obvious issues were raised with the NSW agencies: the allocation of Small-fruited grey gum *Eucalyptus propinqua* as a secondary feed tree, when it is clearly a primary species; and the omission of Forest Oak as a secondary feed tree given that numerous studies have found this to be the case around Coffs Harbour/Dorrigo. The response was “*the list aligns with the tree lists used for koala habitat information base*” and was approved by NRC.

They were unconcerned that the EPA (2016) Kola Habitat Mapping Project, states:

*In areas of northern NSW east of the Great Dividing Range, tallowwood (*Eucalyptus microcorys*), grey gum (*E. propinqua*), forest red gum (*E. tereticornis*) and swamp mahogany (*E. robusta*) are consistently identified as among the most preferred food tree species.*

*This study found that grey gum was statistically the highest utilised species in all pilot areas with the exception of Clouds Creek.*

Also that the OEH 2018 ‘A review of koala tree use across New South Wales’ identified Small-fruited grey gum as one of 9 documented high use trees for the north coast, ranking it as 3<sup>rd</sup> highest based on bionet records. From NEFA’s (Pugh 2020) extensive surveys in the Spotted Gum forests of the Richmond River catchment we have identified it as the most important keystone species and in need of the highest level of protection.

Only having to retain up to 5 Small-fruited grey gum per hectare across a logging operation, with the other 15 preferentially chosen from species of lesser importance, will have unnecessary additional impacts on Koalas,

The NSW agencies claim there are “requirements to search for koalas before logging”, though the only requirement is to “visually assess” trees for koalas “immediately prior to it being felled”, which is not a search. The requirement is that where the tree retention prescription is triggered “Each tree must be visually assessed for koalas immediately prior to it being felled”, though there is no required methodology, and this can be complied with by a person in a harvesting machine looking up a tree as they decide which way to fell it – where they are unlikely to see a Koala even if it is there. There is also a requirement to visually assess trees that have been identified as requiring a 20m buffer “for koala presence during harvest operations”, though there is no requirement to identify qualifying trees.

## 7. Climate Heating

**The EPA have a legal duty to adapt their objectives, guidelines and policies to address emerging threats to the environment from climate change. There have been numerous studies and scientific papers that identify the increasing vulnerability of, and risk to, threatened species and ecosystems due to the accelerating impacts from climate change, including from the 2019/20 fires. The EPA have failed their legal obligations to take these into account in the revision of the 2022 PNF Code, particularly by adapting prescriptions to reflect the increasing vulnerability of threatened species and ecosystems.**

The NRC (2022) recognise the EPA’s legal responsibility to address climate change:

*In August 2021, NSW Land and Environment Court ordered the NSW Environment Protection Authority (EPA) to develop environmental quality objectives, guidelines and policies to ensure the protection of the environment in NSW from climate change. According to the judgement, the EPA have a duty to adapt their objectives, guidelines and policies to address emerging threats to the environment.*

Given that the Codes allow increased logging intensity and reduced protections for most threatened species (by reducing prescriptions for some, removing the use of records on adjacent lands, and reducing habitat tree retention within logging areas), does not allow for a change in prescriptions for burnt, drought and Bell Miner Associated Dieback affected forests, does not identify drought refuges (ie riparian areas for Koalas) for increased protection, does not address the increased flammability caused by logging (including the threat to adjoining rainforest) and fails to make any changes (aside from the ability to temporarily suspend operations in extreme circumstances) there is no evidence that any changes were made to the codes to adapt to the emerging threat of climate change.

The 2019-20 wildfires burnt some 1,118,659ha of Private Lands in north-east NSW, including over 45% of north coast PNF areas, though the PNF rules had no contingencies for fires. After the fires there were no changes to the logging rules to reduce impacts on burnt forests, depleted threatened species or streams, and no changes have been made to the 2022 PNF Codes to accommodate these changes.

Based on scientific advice of the significant impact of the fires, in early 2020 the Environment Protection Authority (EPA) and Forestry Corporation (FCNSW) negotiated Site Specific Operational Conditions to apply in addition to the standard logging rules (CIFOA) in burnt forests. These included temporary retention of unburned or lightly burned forest and increased exclusions, protection of all hollow-bearing trees, 10m buffers around rainforest, stopping logging on steep slopes, and increases of buffers around headwater streams from 5m to 20m.

The EPA commissioned [Dr. Andrew Smith to undertake a review](#), who found that the standard logging conditions fail to guarantee ecologically sustainable forest management and are likely to

cause an ongoing decline and significant impact on biodiversity, primarily due to the increased logging intensity they allow and inadequate exclusions. He considered that the EPA's Site Specific Operational Conditions would only be effective if made permanent, commenting:

*The time required for recovery of threatened and sensitive species after average fires ranges from around 10 - 120 years. Recovery times are likely to be around 10 years for the Hastings River Mouse, up to 45 years for the Koala and 20-120 years for the Greater Glider and Yellow-bellied Glider ... An examination of case studies indicates that protection of unburnt and lightly burnt areas could mitigate logging impacts in burnt landscapes if it was made permanent (or longer than 20-120 years) and extended to protect a minimum 50% of the least burnt area of forest in each compartment across the entire landscape.*

Following disputes between the EPA and FCNSW, the NRC (2021) was asked to assess the prescriptions in the aftermath, concluding the standard logging rules (CIFOA) "was not designed to mitigate the risks of harvesting in severely fire-affected landscapes like those from the 2019/20 wildfires".

The NRC engaged [University of Wollongong](#) to undertake an assessment of the impacts of the 2019/20 wildfires on NSW Regional Forest Agreement (RFA) areas. They cited findings that 59 to 91 percent of the 700 listed threatened plant species in NSW had some part of their range burnt, about 5 percent having > 90 of their range burnt, and 411 out of 1600 threatened and/or endemic plant species in NSW are now at high risk. Within the RFA regions they identified particular concern for the burning of up to 40% of rainforests, and moist riparian habitats important for refugia and erosion control. Because of the increase in fire frequency they identified more than half of the forests at risk of a potential decline in plant diversity if disturbed again within the next 5-10 years. They conclude:

*These changes to fire regimes, wrought by the 2019/20 fires, were likely to pose significant risks to the CIFOA objectives and outcomes. Importantly the magnitude of the fires and their effect on disturbance regimes have placed the CIFOA, generally, in a highly vulnerable state where risk may be maintained at an elevated level into the immediate future. In particular, the integrity of riparian buffers, regeneration, hollows and carbon stocks may have been negatively directly affected by the 2019/20 fires and resultant changes to disturbance regimes.*

The [University of Wollongong](#) study assessed impacts on 25 animal species in the RFA regions using habitat models, finding about 27-62% of predicted suitable habitat burnt in the 2019/20 fires, with about half this burnt at the highest levels of severity. Koalas had about 40% of their modelled habitat burnt, 17% at high and extreme fire severity. They conclude:

*While the overall proportion of the area of harvested predicted habitat burned in 2019/20 within the forested portion of the CIFOA domain was relatively low (< 7 percent), compounding effects of these disturbances may have been acute. Given the size of the fires, their overlay across dispersed pockets of recent harvesting may have diminished connectivity of suitable potential habitat in the short term.*

The study also assessed future impacts of climate change scenarios on fires and the modelled distribution of 24 fauna species, identifying 14 animal species affected by the fires that are also likely to suffer significant declines in predicted climatically suitable habitat under future climate heating scenarios by 2030, with 8 species potentially losing over half their suitable habitat by then. This makes them even more vulnerable to fires and logging over the next decade. They conclude:

*under a hotter and possibly drier future risks to the integrity of forests are likely to be directly and indirectly elevated (i.e. through changed fire regimes). Whether or not such changes are incremental or sudden, as wrought by the 2019/20 fire season, there remains a strong likelihood that change will be rapid.*

For their part [FCNSW estimated](#) significant losses of trees in heavily burnt forests, particularly on the south coast. On the north coast in 62,100 ha affected by crown fires all trees less than 30cm

diameter were killed and half those over 30cm, increasing to 90% of trees killed in forests logged within the past 4 years. Losses halved in the 82,400 ha subject to hot burns.

NRC's (2021) recommendations to the Ministers for Forestry and Environment to take urgent action to require increased retention of unburnt and partially burnt forests for 3 years post fire, according to the assessed risk on a broad Management Area (MA) basis, and to change the logging rules for State forests (CIFOA) to retain or restore 8 hollow-bearing trees per hectare and to retain 2 recruitment trees for each of these.

It is clear that the NRC (2021) consider that this change should be permanent and applied across all native State forests. Two and a half years after the fires, and almost a year after the NRC recommendations were made to the Ministers for urgent action, nothing has been done.

For extreme events, such as bushfires, a clause was added to the 2022 PNF Code:

*The Minister administering the Local Land Services Act 2013 can request harvest operations are reviewed where an unforeseen event (such as wildfire, mass dieback or a forest biosecurity event) has caused, or has the potential risk of causing serious or irreversible environmental damage on private land at a bioregional scale.*

This only allows for “short-term suspension of PNF activities in affected areas” in very extreme circumstances. It does not allow for modifications to prescriptions, and is dependent upon Ministerial action which is unlikely to be forthcoming

This, and the ability to “delay forestry operations to address potential cumulative impacts” were the only changes to the 2022 PNF Code identified by the NSW agencies in response to my question “What changes to the Codes were specifically made or recommended to ensure the protection of the environment in NSW from climate change, particularly in light of the 2019/20 wildfires?”.

There have been numerous studies and scientific papers that identify the increasing vulnerability of, and risk to, threatened species and ecosystems due to the accelerating impacts from climate change, including from the 2019/20 fires. The EPA have failed their legal obligations to take these into account in the revision of the 2022 PNF Code, particularly by adapting prescriptions to reflect the increasing vulnerability of threatened species and ecosystems.

## 8. REFERENCES

DPI - Department of Primary Industries NSW (2018) NSW planning and regulatory instruments that interact with private native forestry. Report for North coast private native forest project.

EPA (2016) Koala Habitat Mapping Pilot: NSW state forest Report. Environment Protection Authority

Jamax Forest Solutions (2017) Report on survey of NSW north coast private native forest harvesting contractors. Report to NSW Department of Primary Industries.

OEH (2018) Submission to the NSW Environmental Protection Agency on the Draft Coastal Integrated Forestry Operations Approval remake. NSW Office of Environment and Heritage Conservation and Regional Delivery Division, North East Branch. Obtained under a GI(PA) request.

NRC (2021) Final report Coastal IFOA operations post 2019/20 wildfires, June 2021. Unpublished report by the Natural Resources Commission.

NRC (2022) Final report, Advice on finalising Draft Private Native Forestry Codes of Practice, March 2022. Natural Resources Commission.

NRC (2021) Research program, Koala response to harvesting in NSW north coast state forests, Final report, September 2021. Natural Resources Commission. <https://www.nrc.nsw.gov.au/Final%20report%20-%20Koala%20research%20-%20September%202021.pdf?downloadable=1>

Pugh, D. (2020) Proposed Sandy Creek Koala Park. North East Forest Alliance. [https://d3n8a8pro7vhm.cloudfront.net/ncec/pages/40/attachments/original/1597453150/Proposed\\_Sandy\\_Creek\\_Koala\\_Park.pdf?1597453150](https://d3n8a8pro7vhm.cloudfront.net/ncec/pages/40/attachments/original/1597453150/Proposed_Sandy_Creek_Koala_Park.pdf?1597453150)