

Tuesday, 16 June 2015

Mr Tim Mecham
Mid Coast Environmental Services
PO Box 353
Kempsey 2440
Delivery via: Email [mecham@bigpond.com.au]

ABN: 81 127 154 787
ACN: 127 154 787

Head Office

PO Box 3401
Helensvale Town Centre
QLD 4212
Phone 1300 319 954
info@naturecall.com.au
www.naturecall.com.au

Dear Tim,

RE: Addendum to Statutory Ecological Assessments for Rural-Residential Subdivision of Lot 280 DP 1098732, Cnr Maria River Road and Crescent Head Road, Crescent Head.

As requested, we provide an addendum to our previous assessment of the proposed development for the minor variation in the layout design.

1. Background Information

1.1 Results of Previous Assessment

The 129.1ha property is located approximately 2km west of Crescent Head, on the corner of Maria River Rd and Crescent Head Rd. It is currently a rural property long used for cattle grazing, with a dwelling and 3 dams. Most of the property is flood-prone, and falls within a SEPP 14 Coastal Wetland.

In September 2014, Naturecall undertook an ecological survey and prepared a statutory ecological assessment for a two stage subdivision and the creation of 14 new Large Lots, with 3 lots attached to the residual land which is mostly SEPP 14. The assessment focused on the northwest corner of the property which falls on a ridgeline, as the landuse on the remainder of the property is not expected to significantly change due to current statutory restrictions and zoning.

The 16ha site's vegetation predominantly consists of derived grassland, with very sparse scattered trees; a small area of mostly regrowth dry sclerophyll forest; some patches of swamp forest; and part of a billabong. The remainder of the property was not thoroughly investigated, but generally consists of a mosaic of derived pasture/wet meadow and swamp forest with aquatic vegetation in a linear billabong (a paleo-channel) and Connection Creek (which forms the eastern to southern boundary).

No threatened flora species were detected on site, but *Maundia triglochinos* was considered a potential occurrence in the remainder of the property eg Connection Creek. In addition, three EECs dominate the floodplain and drainage line on site and on the remainder of the property. These were *Swamp Oak Floodplain Forest of the New South Wales North Coast Bioregion*, *Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions* and *Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions*.

The majority of the site is mapped under the Kempsey Shire Council (KSC) Comprehensive Koala Plan of Management as Potential Koala Habitat, but survey determined it was not Core Koala Habitat due

to lack of evidence indicating Koalas regularly use the site. The proposal was assessed to comply with the CKPoM with no Koala food trees >25cm diameter at breast height (DBH) needed to be removed.

The fauna survey found limited hollow-bearing trees on the site but no threatened species were detected (however survey techniques were limited). A large number of mostly wide ranging threatened species were considered to have potential to use the site or more so better habitats in the study area and remainder of the property, as a small part of their home range. The assessment concluded the proposal was unlikely to have a significant impact, and hence did not warrant referral to the Department of Environment under the EPBC Act or a Species Impact Statement.

1.2 Variation to the Layout

Statutory bushfire provisions now require additional habitat removal/modification than previously considered.

On Lot 7, immature regrowth dominated by Swamp Oak is required near the dwelling to be thinned to comply with Asset Protection Zones (APZ). The extent of modification is limited down to the 1:100 ARI, and hence should not directly impact any Endangered Ecological Community vegetation. The area affected is shown in Figure 1.

On Lot 13, 6 trees are proposed to be removed to achieve APZ standards. This will see loss of a small fig growing on a stump, a Bloodwood and 4 Blackbutts. The location of these trees is shown in Figure 2.

2. Assessment of Variation to Layout

2.1 Kempsey Shire Council Comprehensive Koala Plan of Management

None of the trees nominated to be removed are Koala Food Trees (KFTs) listed in the CKPoM, hence no offset is required.

No further assessment is required.

2.2 EPBC Act 1999 - Matters of National Environmental Significance

The only relevant Matter of National Environmental Significance (MNES) to the proposal are threatened and migratory species.

2.2.1 Threatened Species

The following EPBCA threatened species were considered potential occurrences and were assessed:

- Grey-headed Flying-fox (Vulnerable)
- Koala (Vulnerable)
- Australasian Bittern (Endangered)
- Australian Painted Snipe (Vulnerable)

Since the previous report, the Eastern Curlew (*Numenius madagascariensis*) and Curlew Sandpiper (*Calidris ferruginea*) have been listed as Critically Endangered under the Act. Habitat does not exist on site or in the study area for these species, hence they are not considered further.

Figure 1: Vegetation affected by APZ on Lot 7

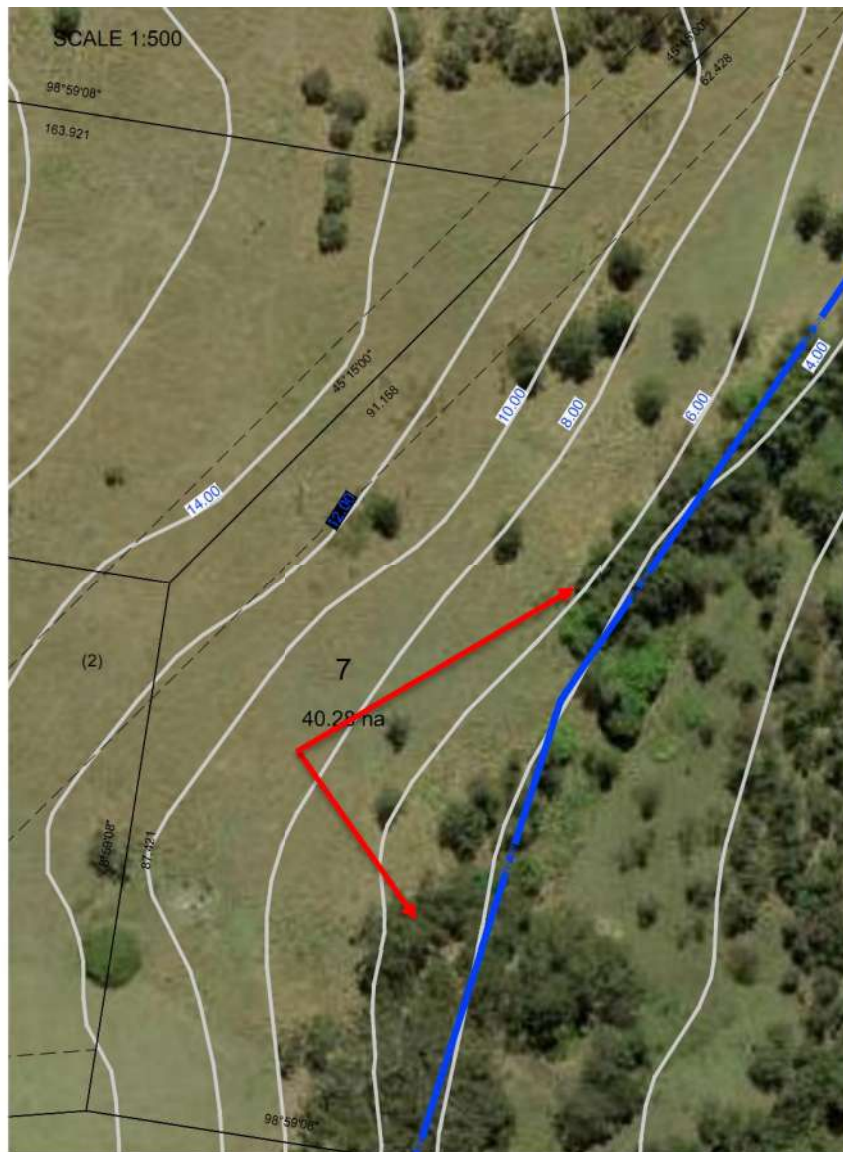
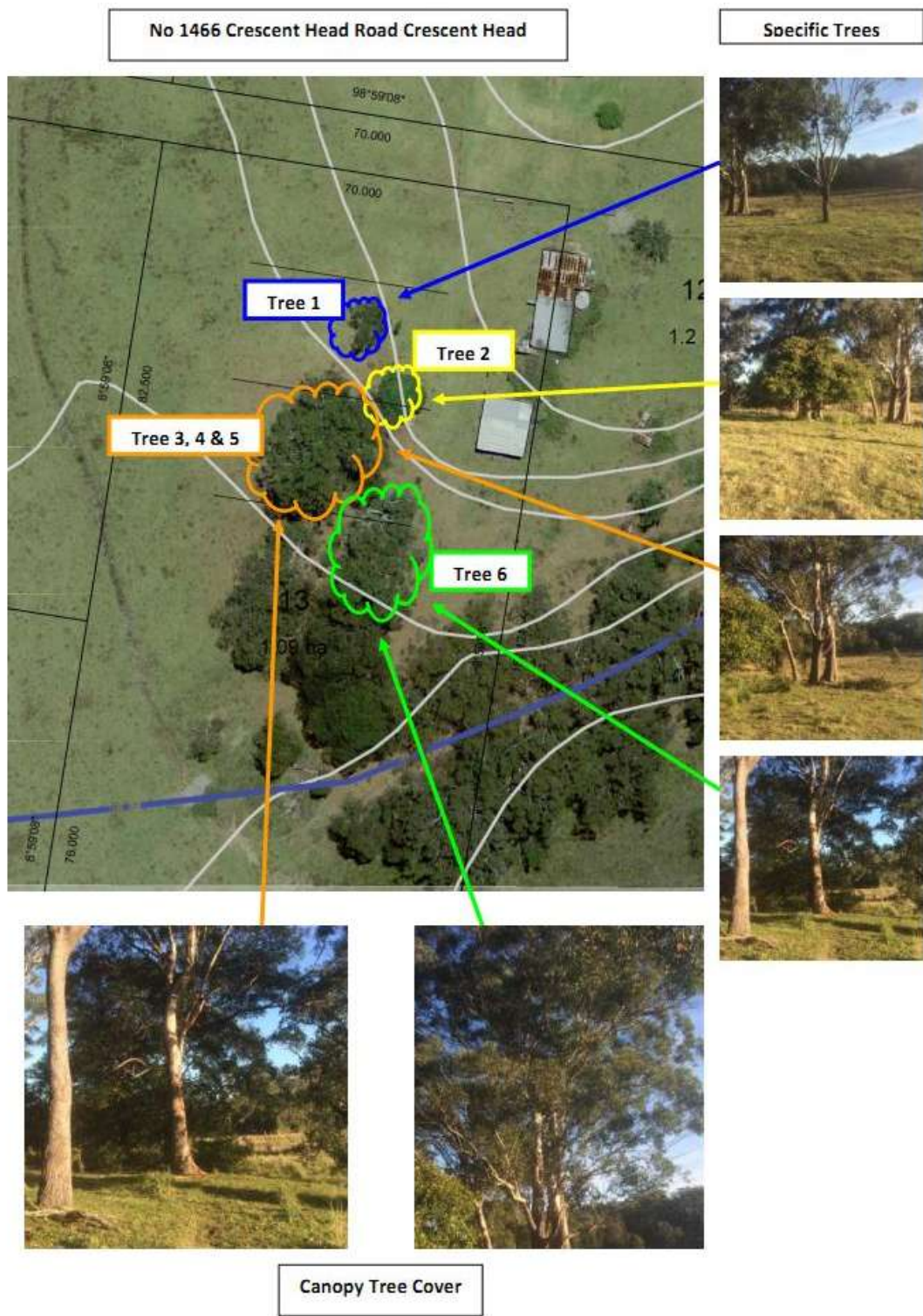


Figure 2: Trees to be removed for APZ on Lot 13



The loss of 6 flowering trees on Lot 12 will incrementally add to the very limited of potential foraging habitat for the Grey-headed Flying Fox, but have no impact at all on the other species. The loss and modification of some Swamp Oak on Lot 7 will have no impact on any of these species.

The Grey-headed Flying Fox is thus the only EPBC Act species impacted by the variation. As detailed in Naturecall (2014), the loss of a handful of potential forage trees on site, while a negative impact *per se*, is not significant to the species due to its ecology (eg forages very widely across coastal NSW according to flowering and fruiting seasons), mobility (no known barriers), no impact on roosting habitat and extent of habitat remaining within the local range.

2.2.2 Migratory Species

No migratory bird species were recorded by the survey, but the Great Egret and Cattle Egret have been previously observed on the property. The site/study area also offers potential habitat for a number of species such as the Eastern Osprey, White-bellied Sea-eagle, White-throated Needletail, Rainbow Bee-eater and Satin Flycatcher.

The variation has minimal if impact on any migratory species as the habitat affected is not likely to be used other than incidentally by forest birds, and is of no relevant to wetland birds.

Consequently, no migratory species is likely to be significantly impacted by the proposal.

2.3 Seven Part Tests

As noted above, no threatened flora occur on the 16ha in the northwest portion of the property where the proposed dwellings will be located, and the additional vegetation is proposed to be removed. No further assessment is thus provided.

Three EECs occur on the lower portions of the property. Naturecall (2014) previously considered the removal/modification of the edge of the swamp forest for APZs. The proposal will modify a localised area of swamp forest above the 1:100 and hence modify the buffer zone to part of the EEC. Assessment in the appended updated Seven Part Tests determined this was insignificant.

No threatened fauna species were detected during the 2014 site survey, but the Black-necked Stork has been previously recorded on the property. The following species were subject to the 7 Part Tests as they were considered to have at least a low potential to use some habitat on the property at some time (e.g. now or if they were to potentially recover and expand):

- **Mammals:** Yellow-bellied Glider, Squirrel Glider, Koala, Brushtailed Phascogale, Grey-headed Flying-fox, Yellow-bellied Sheathtail Bat, Little Bent-wing Bat, Eastern Bent-wing Bat, Greater Broad-nosed Bat, East-coast Freetail Bat, Hoary Bat, Southern Myotis, Common Blossom Bat.
- **Birds:** Glossy Black Cockatoo, Masked Owl, Powerful Owl, Square-tailed Kite, Little Eagle, Little Lorikeet, Varied Sittella, Eastern Osprey, Brolga, Black Bittern, Australasian Bittern, Australian Painted Snipe.
- **Amphibians:** Green-thighed Frog, Wallum Froglet.

An updated 7 Part Test (Appendix 1) determined that the updated proposal was unlikely to significant impact any of these species.

Hence a Species Impact Statement is not required.

3. Recommendations

In addition to the recommendations of the Naturecall (2014) assessment, we provide the following to mitigate impacts.

3.1 Hollow-bearing Tree Removal Protocol

The hollow bearing trees that may be removed could contain fauna at the time of clearing. Such fauna may be placed under stress, injured or killed during tree felling via:

- Being nocturnal or in torpor, and unable to escape prior to the tree falling.
- Collapse of the hollow when it impacts the ground.
- Collision with internal walls or via being thrown out when the tree falls.
- Being present as young eg eggs.

Any hollow bearing tree removal must be undertaken via a method that will minimise the risk of injury/mortality of potentially denning/roosting fauna within the limitations of Occupational Health and Safety (OH&S) Guidelines. Undertaken with due care, this practice can demonstrably avoid mortality of common and threatened species during felling of hollow-bearing trees, thereby substantially reducing the potential significance of development impacts. The following general guidelines are recommended:

1. Hollow-bearing trees are preferred to be removed via a method that does not require traditional tree felling methods i.e. clear-drop chainsaw cut or bulldozer/excavator “rip and push” methods should not be utilised due to the violence of tree-ground impact and associated high risk of injury/mortality to fauna (e.g. via hollow collapse, collision with walls, etc). Options include:
 - The use of an excavator or similar machine with a pincer/harvester head attachment, which can hold the trunk while the tree base is sawn, and then the lowers the tree to the ground for inspection (preferred method).
 - Use of a crane to hold the tree while the base is sawn, and then lower the tree to the ground for inspection (preferred method).
 - Employment of an arborist to lop hollow-bearing limbs or tree sections, and lower to the ground with ropes and pulleys or crane, with the non-hollow bearing remainder of the tree later felled by traditional methods (preferred method subject to WH&S constraints).
 - An ecologist and arborist to use a man-box, and be lifted by crane to inspect the hollows (eg with torches and inspection cameras). If hollows are vacant, the entrance is to be blocked (eg trunk hollow) or the hollow-limb felled. If fauna can be removed, the ecologist is to remove the fauna.
 - If none of the above are practical due to WH&S constraints, an excavator can cut the roots and slowly push over the tree, counterbalancing the fall rate by pushing down on the root ball to minimise acceleration and final impact (least preferred method).

2. If a rip and push method is employed, the tree is to be bumped at least 3-5 times at approximately one-minute intervals to initiate evacuation of any residents. Caution will be required not to risk personal injury via falling branches.
3. An ecologist/fauna spotter-catcher must be present during felling of the hollow bearing trees to monitor clearing, capture any resident animals injured or not evacuating, and undertake appropriate emergency actions if required e.g. transport animal to veterinary treatment (care at proponent's cost) or care by FAWNA (with a donation by proponent to cover costs). Hollows are to be immediately inspected once the tree is felled (within OH&S guidelines) for injured individuals or abandoned offspring, and appropriate measures undertaken. All rehabilitated animals are to be released in the retained habitat directly on/or adjacent to the site.
4. If hollows cannot be cleared of fauna, the fallen tree must either be allowed to sit overnight, or may be sectioned by chainsaw to clear hollows of fauna. It may then be destroyed/stacked for destruction.

A report detailing dates, personnel, qualifications, licenses and results is to be provided to Council within 14 days of the monitoring event.

3.2 Nest Boxes

Nest boxes are recommended to be mounted to offset the loss of 3 hollows in H3. A medium hollow and a small hollow are to be removed, hence considering potentially occurring species and their varying requirements, the following nest boxes are recommended to be mounted:

- 1 Yangochiropteran bat box.
- 1 Sugar Glider box
- 1 Lorikeet/rosella box
- 1 Brushtail possum box.

These are recommended to be located in the patch of dry sclerophyll forest in the northern end of the site on proposed Lots 1 & 4. This location has low hollow-bearing tree diversity but has connection to other forest to the west, hence mounting nest boxes here will have the greatest ecological benefit.

Boxes are to be mounted at least 4m above ground, and bat boxes are to be placed in a location with no foliage obscuring the approach or entry to the boxes.

A brief report including location (eg map and GPS coordinates) and photos of the boxes is to be provided to KSC.

4. Conclusion

This addendum assessment has determined that the proposal to remove another 4 Blackbutts, a bloodwood, a young fig, and a small area of Swamp Oak forest has no potential to result in the overall proposal having a significant impact. This action is also compliant with the KSC CKPoM. Consequently, the conclusions of the Naturecall (2014) report remain valid, and the proposal does not require a Species Impact Statement or referral to the Dept of Environment.

It is anticipated this correspondence contains all the relevant information you require, however if any additional information is required, or you wish to discuss the project further please don't hesitate to contact Jason on 0410 522 399.

Yours faithfully,



Jason Berrigan,

B. Nat. Res. (Hons), Grad. Cert. (Fish.).

MECANSW, MRZSNSW, MABS, MAHS, MAPCN, MRBIA

Mobile: 0410 522 399

Email: jason@naturecall.com.au



Head Office:

Phone: 1300 319 954

Email: info@naturecall.com.au

All Mail: PO Box 3401 Helensvale Town Centre QLD 4212

Office: 1/52 Newheath Drive, Arundel, QLD

NSW Office:

Phone: 1300 319 954

Email: info@naturecall.com.au

Office: Level 1, Suite 3, 64 Clarence Street, Port Macquarie, NSW



Appendix 1: Updated 7 Part Test

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

The impact of the proposal will vary in significance and context per species/species groups as follows:

Maundia triglochinoides:

The proposal has no potential to impact this plant as:

- Known or potential habitat is not directly or indirectly affected by the proposal.
- No barriers to dispersal will be created.
- No change to the hydrological regime will occur.

Consequently, the proposal has no potential to place a local viable population at risk of extinction.

Koala

The Koala was not detected on site during the survey. The habitat limitations and lack of usage indicate the site is unlikely to be significant to the Koala for foraging. At best, it may occur infrequently as part of a low density population in the wider area or as a transient during specific lifecycle stages e.g. breeding season dispersal of sub-adults. Thus the local population would extend well beyond the confines of the site/study area and home ranges would be largely centred on adjacent habitat, as records suggest.

Due to requirements of the CKPoM, the proposal has been designed to avoid the loss of any KFTs on the site therefore the proposal will not contribute towards the loss of Potential Koala Habitat in the locality. This includes the further vegetation to be removed for the amended proposal.

The proposal is thus unlikely to disrupt the life cycle of the Koala.

Yellow-bellied Glider, Squirrel Glider, Brushtailed Phascogale

None of these species have been recorded on the site, however proximate records for the Yellow-bellied Glider, Squirrel Glider and Brushtailed Phascogale exist in interconnected habitat (OEH 2014a, Darkheart 2005j).

The small area of dry sclerophyll on site represents generic potential foraging habitat for these species, and contain preferred sap trees for the gliders. No active sap incisions were noted indicating presence of gliders. Suitable hollows appear to occur on site, but most are located in the southeast of the property with very poor connectivity to suitable habitat. Hence denning is not likely to occur on site.

The proposal will slightly impact the Yellow-bellied Glider, Squirrel Glider and Brushtailed Phascogale via a relatively minor loss of carrying capacity as only a small number of trees offering nectar, sap and pollen sources and an insect foraging substrate will be removed. The more negative impact is loss of 1 hollow-bearing tree (H3) which contained at least one potentially large (and

assumedly sufficiently developed) hollow, but this occurs in an area poorly connected other suitable habitat. Consequently, its loss is considered insignificant, and nest boxes are proposed to offset the loss.

Overall thus, while the proposal will have a negative impact on the current carrying capacity and habitat quality of the site/study area; the impact is not considered likely to be of sufficient order of magnitude to adversely affect the local population's life cycle to the point that it would be at significant risk of loss of viability.

Grey-headed Flying-fox

These species of bats traverse over a very large range according to seasonal flowering and fruiting, and lifecycle stage e.g. maternity season (OEH 2014b, Eby 2002, 2000a, 2000b). Hence the site/study area only has potential to form a small to minute part of a local breeding colony's seasonal range, and consequently, a local population of either species needs to fulfil the majority of its lifecycle requirements well beyond the site/study area.

Only a handful of canopy trees and a small area of regrowth will be removed as part of the proposed development, and all KFTs which are also a food source for Grey-headed Flying-fox will be retained. The paperbark swamp forest which offers key habitat for this species in the eastern part of the property will also remain as is. Given the ecology of the species, extent of local habitat, and extent of habitat removed, this loss is clearly not capable of disrupting the lifecycle of a local population of these bat species.

Overall, given the ecology of these species i.e. that the seasonally variable range of the species is measured in terms of tens to hundreds of thousands of hectares (Eby 2002, 2000a, 2000b), and hence the habitat loss is miniscule in this context; that no barrier to connectivity for these species will be created; that the subject species are also known to forage in rural areas and in retained habitat within or adjacent to rural-residential and urban areas (hence are likely to occur in the study area post-development to an equivalent level of current probability); and that the local populations of the subject species would extend well beyond the confines of the site/study area to meet the majority of their life cycle requirements: the order of magnitude of the proposal's sum negative effect is not considered sufficient to result in a direct decline (i.e. reduce viability) of a local population of these species.

Masked Owl and Powerful Owl

These species of owl were not recorded during this or previous surveys, but these large range species are often only detected by long term surveys using specific survey methods (DEC 2004). Both have been recorded in the locality and on nearby Dulconghi Hill (OEH 2014a).

The subject owls require very large territories, or seasonably variable ranges that far exceed the site/study area/property (OEH 2014b, Smith *et al* 1995, DECC 2006a, Debus 1994, 1995, NPWS 2003). Hence the site/study area/property only has potential to form a small to minute part of a local pair's range, and consequently, a local population needs to fulfil its lifecycle requirements well beyond the study area/property.

The proposal will impact these owls via a minor but incremental and cumulative loss of habitat within their territory. This may result in a minor reduction of potential habitat for prey species such as rodents, possums and birds, however the majority of habitat on the site along with linkages to

adjacent habitat will be retained. No suitable hollow-bearing trees for these species occur on the site, hence none will be removed by the proposal. The loss of one hollow-bearing tree will remove potential prey habitat, but given prey abundance and diversity on site is likely to be very poor, this is not considered significant.

Given the above, the order of magnitude of the proposal's sum negative effect is not considered sufficient to result in a direct decline (i.e. reduce viability) of a local population of these species.

Square-tailed Kite and Little Eagle

These raptors were not recorded by the survey, however the Square-tailed Kite has been recorded within the locality (OEH 2014a).

These raptors require very large territories, or seasonably variable ranges that far exceed the site/study area (OEH 2014b, Debus 2012, NSWSC 2009). Hence the site only has potential to form a small to minute part of their range, and consequently, a local population needs to fulfil its lifecycle requirements well beyond the site/study area/property.

The site/study area/property overall offers some generic potential foraging opportunities, although due to the extent of modification, prey abundance would be low. The proposal will impact the Square-tailed Kite and Little Eagle via a relatively minute but incremental and cumulative loss of potential foraging habitat within their territory. The territories of this species is measured in terms of square kilometres (Debus 2012), hence the relatively minute loss of carrying capacity to their territories, while a negative impact, is not sufficient to undermine the local pair's ability to obtain sufficient forage to raise young to fledging.

No known nest sites will be removed, hence there is negligible risk of direct mortality. The species has been recorded building nests in urban remnants and along busy roads, hence its potential to nest on site will be retained.

Overall, due to the ecology of the subject species; that no critical habitat will be removed; and the presence of extensive areas of forest adjacent and within range of the site/study area/property : the proposal will essentially constitute a relatively minute contraction of their wider foraging range and hence the order of magnitude of the proposal's sum negative effect is not considered sufficient to result in a direct or indirect decline (i.e. reduce viability) of the local population of the subject species.

Little Lorikeet

This bird traverses over a very large range according to seasonal flowering (OEH 2014b, NSWSC 2009). Hence the site/study area/property only has potential to form a small to minute part of a local pair's seasonal range, and consequently, a local population needs to fulfil its lifecycle requirements well beyond the site/study area/Precinct.

The variation to the original proposal will an additional loss of potential foraging trees. Relative to the extent of habitat, particularly high quality habitat in terms of extensive Blackbutt-dominated dry sclerophyll forest, this loss is clearly insignificant. The loss of at least 1 potential (if suitably developed and available) nesting hollow will reduce the local abundance of this key habitat component, however isolation of the hollow from potential habitat, dominance of the area by conspecifics and edge effects strongly suggest this bird is unlikely to nest on site.

Given the above; the ecology of the subject species and the presence of extensive areas of forest adjacent and within range of the site/study area/property; that no barrier to connectivity for this species will be created; that the species are known to forage in retained habitat within or adjacent to rural-residential and urban areas (hence likely to occur in the study area post-development); and that the local population of the species would extend well beyond the confines of the site/study area/property to routinely meet virtually all of its life cycle requirements: the order of magnitude of the proposal's sum negative effect is not considered sufficient to result in a direct decline of a local population of the Little Lorikeet.

Varied Sittella

This species have not been recorded on site, however records exist in the locality with the nearest being west of the study site within Maria National Park (OEH 2014a).

The additional loss of some marginal generic foraging habitat on site would not have any measureable impact on the current potential carrying capacity of the site, given that it only offers a relatively small and marginal area of potential habitat on the outermost fringe of a large body of potential habitat.

Overall, considering the minor amount of habitat loss relative to the extent of habitat in the study area and beyond, the order of magnitude of impacts associated with the proposal is not considered likely to be sufficient to be considered likely to place a local population of these birds at risk of extinction.

Eastern Osprey, Black-necked Stork, Brolga, Australian Painted Snipe, Black Bittern and Australasian Bittern:

The additional loss of vegetation has no potential to impact these species, and the proposal has been previously determined to have no potential to place a local viable population at likely risk of extinction.

Glossy Black Cockatoo:

This species has limited potential to occur due to a limited abundance of preferred food species on site, and lack of potential nesting hollows. Numerous records occur to the west and northwest on Dulconghi Hill where a relative abundance of food trees occur.

The additional loss of vegetation has no potential to impact the species, and the proposal has been previously determined to have no potential to place a local viable population at likely risk of extinction.

Common Blossom Bat:

This species is not likely to occur on site. It is more likely to occur in the extensive paperbark forest on the property during peak flowering events. There is no potential roosting habitat on the property, hence this species would range from such habitat elsewhere, if it occurred close enough.

The proposal will not place a local population at risk of extinction given:

- Roosting habitat is not affected.
- The overwhelming majority of potential foraging habitat is not affected at all.

- No barriers to access will be created.
- No new mortality threat will be created.

Yangochiropteran Bats: East-coast Freetail Bat, Eastern Bent-wing Bat, Little Bent-wing Bat, Greater Broad-nosed Bat, Yellow-bellied Sheath-tail Bat, Southern Myotis, Hoary Bat.

Although none of these bats have been recorded on the site (though targeted survey was not undertaken), the study site/area/property is considered to provide some suitable foraging and roosting habitat. The presence of hollow-bearing trees may provide potential roosts but due to rarity, would be subject to competition with common species of bats, birds, reptiles and arboreal mammals (several of which are potential predators). This habitat is a minute fraction of similar and much more optimum habitat in nearby forested habitat to the south and east of the site/study area/property.

All of these bats require home ranges or seasonably variable ranges that far exceed the site/study area at least seasonally depending on lifecycle stage or due to their ecology e.g. summer migrants in the south of the bioregion e.g. Dwyer 1966, 1968, OEH 2014b, ABS 2014, Smith *et al* 1995, Churchill 2009, etc.). Hence ecologically, while an individual/s may use the site/study area for foraging or possibly roosting in tree hollows at some time, any known/potentially occurring local population of these species would extend well beyond the site/study area to meet all their full lifecycle requirements.

The proposal will see additional removal of trees, resulting in a slight modification to foraging structure; and 1 hollow-bearing tree. The majority of habitat on the site will be retained, including the remainder of the property.

Considering the minor amount of habitat loss relative to the extent of habitat in the area, and that a local population of these bats would extend well beyond the site/property for most of its foraging requirements, this impact is considered insignificant.

The more negative impact is loss of 1 hollow-bearing tree (H3) which contained at least one potential (assumedly sufficiently developed) hollow. Its likelihood of use for a key lifecycle stage (eg breeding) is considered at best very low however due to its exposure to edge effects (eg predation) and competition with other fauna for a limited resource.

Overall thus, the order of magnitude of impacts associated with the proposal is not considered likely to be sufficient to be considered likely to place a local population of the subject bats at risk of extinction.

Green-thighed Frog:

The additional loss of vegetation has no potential to impact this species as no potential habitat is affected, and the proposal has been previously determined to have no potential to place a local viable population at likely risk of extinction.

Wallum Froglet:

The additional loss of vegetation has no potential to impact this species as no potential habitat is affected, and the proposal has been previously determined to have no potential to place a local viable population at likely risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No Endangered Population occurs on site or in the study area, hence none are affected by the proposal.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**
- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,**

As mentioned previously, three EECs occur on low-lying parts of the site and more extensively over the total property and on adjoining land. These comprise *Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions* (most extensive), *Freshwater Coastal Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions* and *Swamp Oak Floodplain Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner*.

The proposal generally avoids the overwhelming majority of the local occurrence of these EECs as the new dwellings are located above the 1:100 ARI. Some localised Swamp Oak regrowth which occurs on the edges of the Swamp Oak Floodplain Forest EEC will be modified for an APZ. This will reduce the buffer zone to the EEC, but given the current weed infestation and landuse; that no significant change to edge effects are considered likely to occur due to the nature of the proposal and current condition of habitat; the extent of the local occurrence of these EECs; and that the underlying ecological processes will not be affected: this has no capability of placing these EECs at risk of local extinction.

(d) in relation to the habitat of a threatened species, population or ecological community:

- (i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,**

The dwellings can be located in existing clearings which will minimise tree removal for the proposal. A handful of trees and undergrowth will require removal for APZs. Small areas of modified groundcover vegetation and scattered shrubs will also require removal. Ongoing maintenance of the groundcover via slashing/mowing is also expected to prevent regeneration.

No KFTs will be removed from the site, but 1 hollow-bearing tree will be removed. The remainder of the property is expected to remain under the same landuse, with existing protective provisions under the *Native Vegetation Act 2003* and SEPP 14.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action,

The site is not mapped as a regional or sub-regional corridor, and offers no significant linkage values due to the patchy nature of the mostly regrowth vegetation. In contrast, the extensive swamp forest in the east of the property forms part of a key local corridor.

The proposal will see relatively minor change to current vegetation patterns and hence connectivity due to the current state of the site ie mostly open paddock. Some narrowing of the regrowth of dry sclerophyll may occur in the north, but overall, current patterns and limitations are expected to remain.

The proposal is thus not considered likely to significantly increase the level of fragmentation on the site and current connectivity from habitat on site to adjacent habitat will essentially be maintained.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

As noted in part (a), the study site and on-site study area generally offers some mostly low quality potential foraging and refuge (denning, roosting, etc.) habitat for a number of threatened fauna species. However, to meet all lifecycle and routine foraging requirements, the range of all the species is considered likely to extend off the site/study area due to key habitat constraints (e.g. hollow-bearing trees, foraging resources). Hence it is not of any key significance to any fauna species, other than potentially to the Green-thighed Frog if it were to occur and use a dam for breeding. This however appears unlikely given limited support habitat around the dams. Overall thus no habitat of critical importance to the survival of any species in the locality is to be removed.

For the EECs, the study area compromises only a very small fraction of the local occurrence due to extent on the remainder of the property, adjacent land and the larger SEPP 14 area. It is thus not critical for genetic viability or connectivity. Hence it is not critical to the persistence of the EEC in the locality.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No relevant areas of critical habitat have been declared, as yet, under Part 3 of the TSCA.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

Draft/final recovery plans have only been prepared for the Forest Owls, Yellow-bellied Glider, Grey-headed Flying-fox and Koala (DEC 2006, NPWS 2003, DECCW 2009, DECC 2008). Priority actions have been identified for all of the other species, and the EECs (OEH 2014b).

The *Recovery Plan for Koalas* (DECC 2008) specifies actions considered to be key threats to Koalas. This plan specifies habitat loss, fragmentation and degradation as the most important threats to Koalas throughout their range. The proposal is consistent with this Plan as it is consistent with the KSC CKPoM.

The proposal is slightly inconsistent with the Recovery Plans for the Forest Owls, Yellow-bellied Glider, Grey-headed Flying-fox as it will see some minor loss of generic potential habitat, however as this habitat is not of any specific importance, and no barriers to movement created, it is not capable of significantly affecting the objectives of any of these Plans.

For all other species and the EECs, the proposal may remove vegetation from the site which by strict interpretation could be considered as adding to the main threatening process affecting these species (habitat loss), and hence is inconsistent with the recovery of these species. However, given the relatively marginal quality of the habitat to be affected, the minor area of habitat to be removed, the extent of habitat and EECs to be retained on the property, current maintenance regime, and the abundance of similar habitat on adjacent land and in the locality; the loss is considered to be insignificant to the long term recovery of these species or the EECs.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The TSCA 1995 defines a “threatening process” as “a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities”. Loss and fragmentation of habitat due to urban, residential and rural development is a recognised threat to these species (Smith *et al* 1995, Lindenmayer and Fisher 2006, Johnson *et al* 2007, Smith *et al* 1995, Gibbons and Lindenmayer 2002, OEH 2014b, NPWS 1999b, Watson *et al* 2003, Gilmore and Parnaby 1994, NPWS 2003b, etc.). The proposal thus generically qualifies as a class of activity that is considered a threatening process.

For all of the subject species and the EECs, the proposal will or may contribute (to varying extents) to the following Key Threatening Processes:

Table 1: Key threatening processes

KTP	Extent/Manner Which Proposal Affects KTP	Mitigable?
Loss of hollow-bearing trees (NSWSC 2007)	Removal of 1 hollow-bearing tree with 1 medium and 1 small hollow.	Nest boxes to be mounted in patch of dry sclerophyll forest.
Clearing of native vegetation (NSWSC 2001c).	Removal of a small number native trees within the eastern portion of the site and some loss of native groundcover and shrubs.	Subdivision design has minimised clearing by placing development envelopes in open areas of the site. All KFTs and hollow-bearing trees will be retained.
Human caused climate change (NSWSC 2000d).	As above and generation of greenhouse gasses by machinery during construction.	As above.