6.1.1.9 Wetland Habitat Enhancement

Some of the trees fallen during future urban development of the remainder of the property (particularly the large Forest Red Gums in the pastoral woodland) should be laid (eg via crane if the wetland has been constructed) within the wetland to provide roosts for Water Dragons, tortoises and waterfowl. Location can be selected according to maintenance requirements to avoid any problems. Provision of large rocks along some sections (eg around the Duchess Gully linkage to the east) would also enhance habitat opportunities.

6.1.2 Secondary Recommendations

The following recommendation aims to address minor impacts and enhance habitats in line with the goals of the proposal to enhance local biodiversity.

6.1.2.1 Other Koala Habitat Enhancement

The hill off the southeast of the wetland is largely cleared. This area provides excellent potential for expansion of the adjacent dry sclerophyll forest and hence Koala habitat. Recent sighting of a Koala in this area evidences this potential. Similarly, a large bund wall off the southeast of the eastern dam/lagoon is covered in Torpedo Grass, and lies adjacent to the swamp forest which is identified Core Koala Habitat. This bund requires weed control and this could also be combined with some habitat creation incorporating Primary Preferred Koala Browse Species.

A preliminary report in 2006 recommended consideration be given to the above, and this is recognised in the VMP and OSMS with provisions for planting and weed management to achieve the above programmed to proceed in due course (Cardno 2008).

6.1.2.2 Other Restrictions

The perimeter of the wetland and all adjacent habitat areas where pedestrian paths may pass through are to be designated leashed dogs only. This is required to prevent dogs harassing wildlife and swimming.

Furthermore, swimming, recreational boating and model boats should not be allowed in the constructed wetlands again to minimise disturbance to fauna.

Signage will be required to ensure compliance with these restrictions.

6.1.2.3 Hollow-Bearing Tree and Nest Removal Protocol

As noted above, a number of hollow-bearing trees are to be removed in the pastoral woodland. A Whistling Kite nest also occurs in this area.

To minimise the risk of mortality of fauna occupying dens/roosts/nests in tree hollows, the following is recommended:

(a) Hollow-bearing tree removal protocol:

> Where safe and practical, the hollow bearing trees are to be removed in a way that will minimise the risk of injury/mortality of denning/roosting fauna within the limitation of OH&S Guidelines. This is suggested to be achieved by the following general procedure (where practical and safe):

i) *Machine felling*:

- Initial bumping of subject hollow-bearing trees to initiate evacuation of any residents (subject to OH&S limits in regard to falling branches). This is to be repeated at least 3-5 times at about one minute intervals over 5-10 minutes, with progressively shorted intervals (eg 30 seconds, 15 seconds, 5 seconds) to stimulate evacuation. If animals are sighted peeking out of hollows, the bumping should be more violent to stimulate evacuation.

- The hollow-bearing tree is then to be removed via a method that does not require traditional felling. Depending on the size of the affected tree, the best method is the use of an articulated pincer on a large excavator or a heavy crane to hold the trunk while the tree's base is sawn, or a crane.

- The tree is subsequently to be safely and gently lowered to the ground to allow for hollow inspection for fauna. If the tree is to be destroyed, the tree is to be carefully sectioned via chainsaw to allow verification that all hollows are empty, after which the remains may be destroyed/piled. Ideally, the tree should be retained on site as a hollow-log for use by fauna.

ii) *Staged felling*:

- This consists of an arborist employing a crane to hold sections of tree/limbs which are sawn off. The limb/section is gently lowered to the ground for inspection of hollows.

- This process continues until all hollows are removed from the tree, or the tree removed.

An ecologist or OH&S certified member of FAWNA/WIRES is to be present during felling of the hollow-bearing tree and/or sectioning in case of fauna injury. Hollows are to be inspected once each tree is fallen for injured or abandoned offspring, etc, and appropriate measures undertaken eg transport to vet or care by FAWNA/WIRES at the proponent's expense, or held in a cool, dark place on site. All uninjured rehabilitated animals are to be returned into the retained vegetation on or adjacent to the site at dusk.

A written report is to be provided to Council following the removal of the hollow-bearing trees and the pre-clearing survey detailing all results and actions undertaken.

The Whistling Kite nest tree should be removed outside the breeding season which is generally Spring (although breeding can occur at anytime depending on food supply).

6.2 CONCEPT PLAN RECOMMENDATIONS

The following recommendations are provided for consideration for the long term development of the property as per the UIA 14 Structure Plan.

6.2.1 Duchess Gully

Duchess Gully is intended to form the northern corridor (Richards 2004, Cardno 2008, Biolink 2005c). At present the vegetation along this creek is patchy and consists of an eclectic mix of rainforest, wet sclerophyll, swamp forest, dry sclerophyll and weeds.

The 2006 preliminary report by this consultant recommended the riparian vegetation be widened where practical via stock exclusion, weed eradication and bushland regeneration. The majority of the riparian vegetation should be a wet sclerophyll forest (ie eucalypts with a rainforest understorey) to maximise biodiversity and extend on limited resources currently available in this habitat, though some areas

may better be suited to swamp forest and dry sclerophyll forest. Primary preferred Koala food trees should also be included in suitable edaphic conditions eg Tallowwoods, Forest Red Gums and Swamp Mahogany. These measures have been incorporated into the VMP/OSMS (ie areas 2 and 9 in the VMP in figure 13).

The value of this area as habitat could also be enhanced via erection of nest boxes, and placement of some hollow logs derived from the Forest Red Gums in the pastoral woodland which will eventually be cleared.

6.2.2 Restoration and Habitat Enhancement of the East-West Corridor

The proposed east-west corridor includes a significant area of degraded "*Swamp Sclerophyll Forest on Coastal Floodplains*" EEC, with condition ranging from pasture mixed with native sedges and scattered trees, to immature regrowth forest.

Restoration of this area will require some active plantings to supplement the low rate of natural recruitment, and weed control to see elimination of the established pastoral species. This will take a number of years to be established. The OSMS and component VMP have addressed this and detail the works, etc, required to restore this area to fully functional habitat. Some preliminary works have already begun eg cessation of slashing and fencing off stock from nominated regeneration areas, with exceptional response by the native vegetation as shown in Appendix 1. These preliminary measures will increase the potential viability of the southwest Common Planigale and Eastern Chestnut Mouse populations via expanding the current area of habitat and reinforcing linkages to other potential habitat.

In the medium term, subject to flooding constraints, large fallen logs from other portions of the property could be positioned in the corridors as single trees and small piles of logs to provide shelter for a range of fauna eg rodents, reptiles and the Spotted-Tail Quoll, given such key habitat components will take hundreds of years to naturally develop. Nest boxes may also be viable to place in the immature swamp forest just west of the main lagoon to provide potential dispersal/den site opportunities for Squirrel Gliders which may use the habitat in the medium term (eg when a woodland or young forest has been established).

6.2.3 Proposed Southern School Site

The current delineated area for this site includes the densely vegetated drain adjacent to the southwest patch of dry sclerophyll. As detailed in this report, this area is known to support a small population of Common Planigale, Eastern Chestnut Mouse and Wallum Froglet

It is recommended that this habitat area (the entire drain and a fully vegetated buffer zone of at least 30m to the east) be excluded from any filling, etc, within the school footprint. This area should be collectively fenced off with southwest dry sclerophyll/swamp forest, and the total area regenerated and managed appropriately for these species to maximise the potential viability of these small populations.

As for the main Wallum Froglet population, this area may be used for educational purposes but should essentially to be protected under provisions of the OSMS.

6.2.4 Proposed Eco-Tourism Site

The southern half of the generally native grassland falling within the proposed eco-tourism site was found to support the Eastern Chestnut Mouse in 2003. This area was not surveyed again in 2006, and it was completely slashed post-survey. Inspection in July 2008 found the area has been slashed again as part of the ongoing agricultural use of the land, and the limited detritus suggested slashing was occurring at regular periodic intervals which probably reduced the potential for sufficient tall groundcover to develop and attract the Eastern Chestnut Mouse. It is not known if the animal has persisted via surviving in the adjacent dune scrub and dry sclerophyll, but given slashing is likely to have long been a periodic

disturbance of this area, it is not considered unlikely. Further survey may determine if the species is present or not, and hence remains viable.

The development footprint of the Eco-Tourism site is not known at this stage. However, the buffer to the STP ensures that the residential component of the development is restricted to the northern half of Lot 5. APZ setbacks to the east and west will also be required, further narrowing the potential development envelope.

Any future development of this area thus must ensure either the population is extinct (in which case ecological constraints are limited), or is not placed at risk of extinction. In the latter, development and management must ensure:

- Sufficient habitat is retained to support a viable population.
- No barriers to movement/dispersal are emplaced.
- Fire/slashing is managed as required per the species ecology.

PART B: *ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999*: MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

7.0 RELEVANT EPBCA MNES SCHEDULES

7.1 THREATENED AND MIGRATORY FAUNA

7.1.1 Vulnerable and Endangered Species

The Grey-Headed Flying Fox (Vulnerable) was only EPBCA 1999 listed threatened species record on the property by this consultant. The Swift Parrot (Endangered) is indicated on the Atlas of Wildlife (DECC 2009a) to possibly have been recorded in the northern end of the property. These species are automatically subject to the statutory assessments in section 8.0.

A search of the Dept of Environment, Water, Heritage and the Arts (DEWHA) Matters of National Environmental Significance (MNES) website was also taken to generate a list of threatened species potentially occurring on the property. These are shown in the following table, with other species considered by the consultant as potential occurrences in the locality due to suitable habitat. An evaluation of their likelihood of occurrence is also provided.

Table 8: EPBCA listed threatened fauna species potential occurrence assessment

Note: Likelihood of occurrence derived from opinions of consultants in consideration of known ecology of each species (see Appendix 1); and quality of habitat on-site. * indicates listed on EA website search. Excludes marine mammals, reptiles, etc

GROUP	COMMON NAME	RECORDED IN LOCALITY (10km radius)	SUITABLE HABITAT ON PROPERTY	LIKELIHOOD OF OCCURRENCE
BIRDS	*Regent Honeyeater	Y – one bird recorded in Port Macquarie by Hastings Birdwatchers 2004	Forest Red Gums, Swamp Mahogany and possibly White Banksia offer some potential to support opportunistic foraging most likely	No major occurrences known in LGA hence only very rare potential for infrequent visits. Site forms minute fraction of potential habitat in LGA.

			during non-breeding movements.	Unlikely to very low
	Red Goshawk	N	Very marginal – very open and limited prey diversity.	Very marginal – no records south of north coast. Unlikely to very low
	*Swift Parrot	Y	As for Regent Honeyeater.	**Recorded**
MAMMALS	*Long-Nosed Potoroo	N	N	No. Unlikely due to disturbance history
	*Spotted-Tail Quoll	Y	Marginal at best – too open	Marginal potential in SE corner. Low to very low as no significant habitat on property or interlinked.
	*Grey Headed Flying Fox	Y <1km	Y	**Recorded**
	*Dwyer's/Large Pied Bat	N	In broad terms for foraging only.	Marginal and very few coastal records. Foraging only. Very low to unlikely
FROGS	*Green and Golden Bell Frog	Y – Lake Innes area, Port Macquarie	Marginal in broad structural terms. Habitat is artificially created where it may not have existed before. High risk of predation	Considered unlikely as not detected by surveys despite being targeted, high risk of predation and no records in adjoining habitat
	Wallum Sedge Frog	N	Marginal in broad structural terms. Habitat is artificially created where it may not have existed before. High risk of predation	Considered unlikely as not detected by surveys despite being targeted, high risk of predation and no records in adjoining habitat or LGA
	*Stuttering Frog	N	N	N
	*Southern Barred Frog	N	N	N
REPTILES	Burrowing Skink/ Three-Toed Snake-Tooth Skink	N	N.	N

7.1.2 Migratory Species

This consultant recorded the Cattle Egret and Great Egret on the property, and the White-Breasted Sea-Eagle flying over. Clancy and Ayres (1983) recorded the White-Breasted Sea-Eagle, Fork-Tailed Swift and Rufous Fantail.

A number of other migratory bird species listed in the EPBCA have been recorded in the locality of the site and a search of the MNES website also produced a list of likely occurrences (excluding seabirds). All of these species plus some considered by the consultant as potential occurrences in the LGA in similar habitat to that on the property are also shown in the following table, with an evaluation made on likelihood of occurrence based on cited ecology.

Table 9: EPBCA listed Migratory fauna species potential occurrence assessment
(* indicates likely to occur in LGA in consultant's opinion)

COMMON NAME	SCIENTIFIC NAME	PREDICTED TYPE OF OCCURRENCE	RECORDED IN LOCALITY	HABITAT ON PROPERTY	LIKELIHOOD TO OCCUR
White-Bellied Sea-Eagle	*Haliaetus benghalensis*	Species and/or habitat likely to occur in area	Y	Large lagoons appear to contain fish, hence potential to offer minute area of foraging habitat. Isolated trees in woodland offer potential nest sites.	**Recorded** flying over property
Osprey	*Pandion cristatus*	-	Y	As above	Unlikely to low – no nests on site and very limited forage
Latham's Snipe	*Gallinago hardwickii*	Species and/or habitat likely to occur in area	Y	Seasonally flooded pasture may offer potential foraging habitat	At least fairly likely when groundcover not too low. Site used as small part of wider non-breeding range
Painted Snipe	*Rostratula benghalensis*	Species and/or habitat likely to occur in area	N	Marginal at best	Unlikely
*Cattle Egret	*Egretta ibis*	Species and/or habitat likely to occur in area	Y	Y	Y. **Recorded** on property
*Great Egret	*Egretta alba*	Species and/or habitat likely to occur in area	Y	Y	Y. **Recorded** on property.
*Swift Parrot	*Lathumus discolor*	Species and/or habitat likely to occur in area	Y	As previous	**Recorded**
Rufous Fantail	*Rhipidura rufifrons*	Breeding or breeding habitat likely to occur in area	Y	Dry sclerophyll may offer some marginal potential – likely to occur in adjacent littoral rainforest	Low to marginally fair using site for non-breeding range. Previously recorded in 1983 but habitat removed.
Satin Flycatcher	*Myiagra cyanoleuca*	Breeding or breeding habitat likely to occur in area	Y	As for Rufous Fantail	Low
Black Faced Monarch	*Monarcha melanopsis*	Breeding or breeding habitat likely to occur in area	Y	As for Rufous Fantail	Low

Spectacled Monarch	*M. trivirgatus*	Breeding or breeding habitat likely to occur in area	Y	As for Rufous Fantail	Very low
*Oriental Cuckoo	*Cuculus saturatus*	Species and/or habitat likely to occur in area	N	Y – Dry sclerophyll areas	Low to fair – small part of non-breeding range
Regent Honeyeater	*Xanthomyza phrygia*	Species and/or habitat likely to occur in area	N	As previous	Unlikely to very low
*Rainbow Bee-eater	*Merops ornatus*	Species and/or habitat likely to occur in area	Y	Dry sclerophyll offers some marginal potential	At least fair
White-Throated Needletail	*Hirundapus caudacutus*	Species and/or habitat likely to occur in area	Y	Y	Highly likely to occur
*Fork-Tailed Swift	*Apus pacificus*	Species and/or habitat likely to occur in area	Y	Y	Recorded in 1983, highly likely to occur.

A number of seabirds and estuarine waterfowl listed as Migratory under the EPBCA (some are also listed as Threatened under the TSCA) may occur in the locality eg Eastern Curlew. However, no habitat occurs on the property for these species as the site does not contain tidal habitats or suitable watercourses. The tidal sections of Duchess Gully may offer some marginal potential for some species, though habitat is better developed in downstream sections (pers. obs.).

Similarly, while several migratory marine turtles and mammals also occur or may occur in the ocean to the far east (eg Blue Whale, Long-Nosed Spinner Dolphin, Humpback Whale and Green Turtle), the site and property obviously does not offer suitable habitat for these species. The migratory marine turtles, marine mammals and wetland and seabirds (discussed above) are not considered in the later assessment due to the lack of potential impacts on these groups of species.

7.2 THREATENED FLORA

No EPBCA listed threatened plants were recorded on the site or property. A search of the DECC Rare or Threatened Plants (ROTAP) database (2009a), Bionet (2009) and available literature (eg Biolink 2003, Berrigan and Bray 2002) indicated the following EPBCA 1999 listed species occur in the locality:

- *Melaleuca biconvexa:* Lake Innes NR.
- *Acacia courtii*: Dooragan NP, Yoorigan NP
- *Grevillea caleyi:* Dooragan NP
- *Allocasuarina defungens:* Crowdy Bay NP.
- *Thesium australe:* Kattang NR, Crowdy Bay NP
- *Cynanchum elegans:* Middle Rock
- *Phaius tankervilliae:* Cowarra SF

None of these species were found or considered likely potential occurrences on site or the property (see section 3.2.1 and Appendix 1). The following table lists other species considered potential occurrences in the locality derived from the MNES site:

Table 10: EPBCA threatened flora species potential occurrence assessment

Note: Likelihood of occurrence derived from opinions of consultant in consideration of local records, known ecology of each species (see section 2.2.1.2 and after this table); and quality of habitat on-site. * indicates not recorded on ROTAP database in region as yet

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	RECORDED IN LOCALITY (10km radius)	SUITABLE HABITAT ON-SITE AND LIKELIHOOD OF OCCURRENCE ON SITE	SUITABLE HABITAT ON-PROPERTY AND LIKELIHOOD OF OCCURRENCE ON PROPERTY
Leafless Tongue Orchid	*Cryptostylis hunteriana*	V	N	N. Unlikely	N. Unlikely
*Frogbit Fern	*Hydrocharis dubia*	V	N	N. Unlikely	N. Unlikely
Clear Milkvine	*Marsdenia longilobia*	V	N	N. Unlikely	N. Unlikely
-	*Parsonsia dorrigoensis*	E	N	N. Unlikely	N. Unlikely
Snake Orchid	*Diuris pedunculata*	E	N	N. Unlikely	N. Unlikely

These species are assessed in Appendix 1. The other species listed in the above table is considered as follows:

- Frogbit (*Hydrocharis dubia*) is an aquatic perennial plant with emergent and floating leaves, with the plant rooted when in shallow water, or floating if in deeper water. It is found north from the Clarence River, NSW, and grows in small shallow freshwater bodies or swamps. The drains and dams/lagoons offered marginal potential habitat, but this species was not found by the survey. It is not considered a potential occurrence given the marginal habitat and lack of LGA records.

7.3 THREATENED ECOLOGICAL COMMUNITIES

Of the Threatened Ecological Communities currently listed on the DEWHA, only one is relevant:

- *Littoral rainforest and Coastal Vine Thickets of Eastern Australia* – Critically Endangered Ecological Community.

This EEC occurs in the dune vegetation off the northeast corner of the site, most of which is mapped as SEPP 26 #116.

7.4 KEY THREATENING PROCESSES

In addition the Key Threatening Processes relevant to the site and property and listed in section 3.4 the following Key Threatening Processes listed in the EPBCA are also relevant to the locality of the site:

- Competition and land degradation by feral Rabbits
- Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*)
- Incidental catch (bycatch) of Sea Turtle during coastal otter-trawling operations within Australian waters north of 28° South
- Incidental catch (bycatch) of Sea Turtle during coastal otter-trawling operations within Australian waters north of 28° South
- Infection of amphibians with chytrid fungus resulting in chytridiomycosis
- Land clearance
- Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases
- Predation by Feral Cats
- Predation by the European Red Fox (*Vulpes vulpes*)

8.0 MNES – STATUTORY ASSESSMENTS

8.1 GENERAL CONSIDERATIONS/SUMMARY

The provisions of the EPBCA 1999 require determination of whether the proposal has, will or is likely to have a significant impact on a "*matter of national environmental significance"*. These matters are listed and addressed as follows:

1. **World Heritage Properties**: The site is not listed as a World Heritage area nor does the proposal affect any such area.

2. **Ramsar Wetlands of International Significance**: No Ramsar wetland occurs on the site, nor does the proposal affect a Ramsar Wetland.

3. **EPBCA listed Threatened Species and Communities**: No EPBCA listed species are likely to be significantly affected (See section 8.2 and Appendix 1).

4. **Migratory Species Protected under International Agreements**: The site does not offer significant known or potential habitat for such migratory species and the proposal does not significantly negatively affect any such sites. The new wetland may offer a substantial area of new potential habitat.

5. **Nuclear Actions**: The proposal is not a nuclear action.

6. **The Commonwealth Marine Environment (CME)**: The site is not within the CME nor does it affect such.

7. **National Heritage**: The site is not listed as National Heritage nor does it affect any such item.

The proposal thus is not considered to require referral to the DEWHA for approval under the EPBCA 1999.

8.2 EPBCA 1999 - THREATENED SPECIES

8.2.1 Threatened Flora

As detailed in section 7.2 and table 14, no EPBCA 1999 listed flora species were found or considered likely potential occurrences on the study site, and are thus not considered further.

8.2.2 Threatened Fauna

8.2.2.1 General Consideration

The Grey Headed Flying Fox was the only EPBCA species recorded on site during surveys by this consultant, and is automatically assessed in section 8.2.2.2. The Swift Parrot has also been reported to occur on site (DECC 2009a), and is assessed in section 8.2.2.3.

A number of other EPBCA threatened species have been recorded in the locality (Bionet 2009, DECC 2009a), or are considered potential occurrences in the locality in terms of potentially suitable habitat (see Appendix 1). A significant number of others have also been recorded in the region in similar habitats to those occurring in the locality (Bionet 2009, DECC 2009a, 2009b, Strahan 2000, Smith *et al* 1995,

Churchill 1998, etc). The following groups of species are not considered further as the proposal has no consequence upon them:

1. **Marine reptiles, fish and mammals** eg Grey Nurse Shark, Great White Shark, Southern Right Whale, Loggerhead Turtle, Green Turtle and Leatherback Turtle.

2. **Migratory/open ocean seabirds** eg Gould's Albatross, Southern Giant Petrel, Blue Petrel, Northern Giant Petrel, Sooty Albatross, Kermadec Petrel, Shy Albatross and Grey-Headed Albatross.

These species were considered likely to be unaffected by the development proposal due to:

- Lack of habitat affected eg pelagic species
- Extremely rare probability of occurrence near site or in locality
- Nesting or foraging habitat not potentially or significantly affected
- No threats to be introduced or enhanced.

The following species listed under the EPBCA are potential or known occurrences in the locality or LGA, and are considered for potential impacts, risk and significance in the evaluation table in Appendix 1. These species are generally dually listed under the NSW *Threatened Species Conservation Act 1995*. Species considered are:

1. Birds: Regent Honeyeater, Painted Snipe and Red Goshawk.
2. Mammals: Dwyer's Bat, Spotted-Tail Quoll, Long-Nosed Potoroo (latter two considered as entire species).
3. Frogs: *Litoria olongburensis, L. aurea, Mixophyes balbus, M. iteratus.*

None of these species were considered to have at least a fair chance of occurrence on the property overall (see Appendix 1) and were considered unlikely to be significantly affected by the development proposal for one or more of the following reasons:

- Potential habitat does not occur on or near the site/property.
- Potential habitat is not affected at all or significantly.
- Site has minimal potential to support these species to any significant extent eg key part of migratory range, breeding habitat, refugee, etc.
- Habitat loss represents negligible contraction of a marginally suitable fraction of a larger potential range.

8.2.2.2 Vulnerable Species: Grey-Headed Flying Fox

8.2.2.2.1 Factors to be Considered for Vulnerable Species

The guidelines to assessment of significance to this Matter, define an action as likely to have a significant impact on a vulnerable species, if it will:

a) Lead to a long-term decrease in the size of an important population of a species, or:
b) Reduce the area of occupancy of an important population, or:
c) Fragment an existing important population into two or more populations, or:
d) Adversely affect habitat critical to the survival of a species, or:
e) Disrupt the breeding cycle of an important population, or:
f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or:
g) Result in invasive species, that are harmful (by competition, modification of habitat, or predation) to a Vulnerable species, becoming established in the Vulnerable species' habitat , or:
h) Interferes substantially with the recovery of the species.

An *important population* is one that is necessary for a species' long-term recovery. This includes such populations as:

- Key populations either for breeding or dispersal.
- Populations that are necessary for maintaining genetic diversity, and or:
- Populations that are near the limit of the species range:

8.2.2.2.2. Assessment of Significance

This section addresses each of the previous points listed.

For the purposes of discussion, the "important population" of Grey-Headed Flying Foxes is defined as that population of the species likely to depend on colonial roosts in the locality or within foraging range of the site.

a) *Lead to a long-term decrease in the size of an important population of a species*, or:

This species was recorded on the property using it as a minor fraction of its wider foraging range (Eby 2000a, 2000b, DECC 2009b). The property does not contain known roosting habitat for the Grey-Headed Flying Fox and it is unlikely to be used for roosting.

The proposal is likely to remove a handful of declining eucalypts and immature paperbarks, resulting in a minute contraction of the local foraging resource. The loss is considered unlikely to be significant to the local foraging success of the Grey-Headed Flying Fox as:

- The trees are not considered to be critical foraging habitat;
- The loss will be ameliorated by tree plantings elsewhere on the site;
- A relatively large area of similar habitat is accessible locally.

The property will retain its potential to support seasonal foraging by the Grey-Headed Flying Fox as part of a larger foraging range and since other aspects of the life cycle will not be affected the proposed development is unlikely to lead to a long-term decrease in the size of an important population of this species.

b) *Reduce the area of occupancy of an important population*, or:

The proposal will not result in the loss of any Grey-Headed Flying Fox roosting habitat and will not produce any barriers to their access to foraging habitat. Some potential foraging habitat will be removed, but the small area of loss was considered to be insignificant relative to the large area of suitable habitat accessible locally and should be replaced by landscaping plantings in the long term. Hence, the area of occupancy for populations of the Grey-Headed Flying Fox will not be effectively reduced.

c) *Fragment an existing important population into two or more populations*, or:

The Grey-Headed Flying Fox is highly mobile and known to be capable of crossing human-modified habitat. The proposal will offer no barrier to movement. Thus it will not fragment an existing important population.

d) *Adversely affect habitat critical to the survival of a species*, or:

"*Critical habitat*" refers to areas critical to the survival of a species or ecological community and may include areas that are necessary for/to:

- Activities such as foraging, breeding, roosting or dispersal.
- Succession.
- Maintain genetic diversity and long term evolutionary development, or
- Reintroduction of populations or recovery of the species/community.

As mentioned previously, the land proposed for development is not roosting habitat for the Grey-Headed Flying Fox, nor is any significant area of potential foraging habitat to be removed by the proposal. Tree plantings and bush regeneration on the site are expected to retain the long term potential to support seasonal foraging by the Grey-Headed Flying Fox as part of such locally abundant habitat and the site is thus not considered to be critical habitat.

e) *Disrupt the breeding cycle of an important population*, or:

The Grey-Headed Flying Fox is dependant on a sufficient extent of reliable sources of nectar, pollen and fruits for successful reproduction, and uses specific maternity roosts (Eby 2000). The site/property is not a maternity habitat, nor is it likely to be suitable as it contained limited Winter-Spring flowering species. The development will result in a minor contraction of the potential foraging resource of nectar but tree plantings should provide long term potential for seasonal foraging. Additionally, access will be retained to the relatively large areas of similar habitat in the locality. Thus local foraging success will not be significantly affected and the breeding cycle is not expected to be disrupted by the proposed development.

f) *Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*, or:

As detailed previously, only a small area of potential habitat loss will result from the development and in the long term the site is expected to effectively retain its potential to support seasonal foraging as part of a larger home range. Hence, it is unlikely that the development will impact on a local population of Grey-Headed Flying Fox to the point that it could cause a decline of the species.

g) *Result in invasive species, that are harmful (by competition, modification of habitat, or predation) to a Vulnerable species, becoming established in the Vulnerable species' habitat*, or:

No new species that affects the Grey-Headed Flying Fox will be introduced.

h) *Interferes substantially with the recovery of the species*.

Ideally, the goal in threatened species recovery is to increase the number and extent of the threatened species, so that it is not at risk of becoming extinct.

The proposal as modified by the recommendations of this assessment aims to retain the current potential of the site to support opportunistic foraging by the Grey-Headed Flying Fox by removing the potential foraging habitat.

8.2.2.3 Endangered Species: Swift Parrot

8.2.2.3.1 Factors to be Considered for Endangered Species

The guidelines to assessment of significance to this Matter, define an action as likely to have a significant impact on an Endangered species, if it will:

a) Lead to a long-term decrease in the size of a population of a species, or:
b) Reduce the area of occupancy of the species, or:
c) Fragment an existing population into two or more populations, or:
d) Adversely affect habitat critical to the survival of a species, or:
e) Disrupt the breeding cycle of a population, or:
f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or:
g) Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species´ habitat:

h) Interferes substantially with the recovery of the species.

8.2.2.3.2. Assessment of Significance

As the subject bird species is migratory, it is very difficult to qualify the "population" of the species. Unless specified thus, the population is referred to as either the remaining number of the species, or the handful of birds that may occur in the area at some time.

a) *Lead to a long-term decrease in the size of a population of a species*, or:

Habitat in the property and the general area is provided for the bird by the range of flowering species. For the Swift Parrot, the Winter to early Spring flowering species are the most important potential foraging resources eg Swamp Mahogany and Forest Red Gum.

The proposal may result in the loss of about two dozen scattered declining Forest Red Gums. This loss is considered insignificant relative to the extent of locally available habitat (eg Darkheart 2006h, 2004q) and will be compensated via replantings as part of proposed landscaping. As the species has also been recorded in modified, rural and even urban habitats (Menkhorst *et al* 1998, Olivier 1998, Smith *et al* 1995, Berrigan 2002d), this suggests the area will retain its foraging value as part of the wide migratory range of the species.

Overall, the proposal is not likely to lead to a long-term decrease in the size of a population of the Swift Parrot as the species breeds in Tasmania, and migrates northwards in Winter. Thus the site only forms a very small fraction of potential foraging habitat stretching coastally to the NSW/Qld border.

b) *Reduce the area of occupancy of the species*, or:

The proposal may result in the loss of about two dozen scattered marginal potential non-breeding foraging habitat.

The Swift Parrot is a migratory species that travels from its breeding habitat in Tasmania, to Winter foraging habitat along the east coast to the inland slopes of the Great Dividing Range of the mainland, up to Duaringa. The Swift Parrot is predicted to occur over 860 000km^2 (medium confidence), with only about 4000km^2 occupied and decreasing (low confidence) (Garnett and Crowley 2000). In this context, the loss of handful of trees scattered over about 2ha is relatively insignificant. This loss should be compensated via replantings.

c) *Fragment an existing population into two or more populations*, or:

The Swift Parrot migrates annually and has no known barriers (Smith *et al* 1995). The proposal thus will not fragment any population.

d) *Adversely affect habitat critical to the survival of a species*, or:

"*Critical habitat*" refers to areas critical to the survival of a species or ecological community may include areas that are necessary for/to:

- Activities such as foraging, breeding, roosting or dispersal.
- Succession.
- Maintain genetic diversity and long term evolutionary development, or
- Reintroduction of populations or recovery of the species/community.

As mentioned previously, the locality is not breeding habitat for the Swift Parrot. Use of the area is considered at most to be opportunistic, as part of the other potential habitat in the locality utilised as part of their migratory range. The site is thus not considered critical to the survival of the species.

e) *Disrupt the breeding cycle of a population*, or:

The Swift Parrot breeds only in Tasmania, thus the proposal has no effect on breeding.

f) *Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*, or:

The proposal will constitute the loss of about two dozen scattered eucalypts which provide marginal potential foraging habitat. This is considered insignificant given that both species range over extensive areas (as noted above), and hence it is considered rather unlikely that the proposal will contribute significantly to the decline of the species. This habitat loss will also be compensated by replantings.

g) *Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species´ habitat*, or:

No feral species that may affect the birds is likely to be introduced (since foxes, cats, feral cats and wild dogs are already likely to occur on or near the site).

h) *Interferes substantially with the recovery of the species*.

Ideally, the goal in threatened species recovery is to increase the number and extent of the threatened species, so that it is not in risk of becoming extinct.

The proposal will result in a relatively small area of habitat being lost/ that is considered inconsequential to the species given its ecology and extent of locally available habitat and that the loss will be regained via replantings. Given that the site it not critical to the species, it is not considered likely to interfere substantially with the recovery of the species.

8.2.2.4 Conclusion

The proposal is not considered likely to have a significant impact on any EPBCA listed threatened species.

8.3 EPBCA 1999 - Migratory Species

The following EPBCA species have been recorded on the property (Berrigan 2003h, Clancy and Ayres 1983, this survey):

- White-Breasted Sea-Eagle
- Fork-Tailed Swift
- Rufous Fantail
- Great Egret
- Cattle Egret

Other migratory bird species were considered at least a fair chance of occurrence on the site at some time, based on the presence of potential habitat eg Rainbow Bee-eater, Fork-Tailed Swift and the White-Throated Needletail.

These species are considered in the following section.

8.3.1 Factors to Be Considered

The guidelines to assessment of significance to this Matter, define an action as likely to have a significant impact on a migratory species, if it will:

a) *Substantially modify (including fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat of the migratory species, or;*

b) *Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat of the migratory species, or;*

c) *Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of the species.*

An *important area of habitat* is:

1. Habitat used by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, or:
2. Habitat utilised by a migratory species which is at the limit of the species range, or;
3. Habitat within an area where the species is declining.

8.3.1.1 Assessment of Significance

This section addresses each of the previous points listed.

The site is not considered likely to constitute an *important area of habitat* on the basis of the following:

1. Five migratory species have been recorded on the property. All of these species occurs widely in the locality and across the mid-north coast and the site is not considered to be an important area of habitat. The value of this habitat to all these species is as a fraction of a significant extent of similar habitat not only in the LGA, but the North Coast Bioregion. The site is not known breeding habitat for any of these species and it is not considered capable of supporting an ecologically significant proportion of any of these species (at most, only a small group or transient individuals).

2. While some migratory species occurring in the locality may be at the limits of their range, no such species were recorded in the study area. Additionally, similar habitat is known to occur both north and south of the LGA.

3. If the site were located at the limits of a species whose abundance and range is declining, it would not be considered significant as such habitat is locally abundant in the area, and habitat with greater capability occurs within 10km eg State Forest, conservation reserves, etc.

In regards to point (**a**): the proposal does not affect important habitat. The proposal will remove a small area of canopy trees and grassland. This may result in temporary reduction in the local area of marginal potential habitat for the Rainbow Bee-Eater, Great Egret and Cattle Egret, and potential prey habitat for aerial foragers such as the Fork-Tailed Swift. However, such habitat is abundant throughout the locality and the individuals are highly likely to utilise alternative foraging habitat. Conversely, the wetland will provide excellent habitat for the White-Breasted Sea-Eagle and Great Egret, and landscaping will increase habitat for other species.

In regards to point (**b**): An invasive species is one that may become established in the habitat, and harm the migratory species by direct competition, modification of habitat, or predation. No such invasive species is to be introduced by the proposal, though pet cats and dogs may potentially increase predatory rates.

In regards to point (**c**): No disruption to the lifecycle of any migratory bird is likely as:

- Habitat affected is either only marginally suitable, and/or locally abundant.

- Minimal habitat loss with majority retained or regenerated with tree plantings.
- Only a small portion of foraging habitat will be affected and this is insignificant relative to the area of potential habitat available in the locality.
- More optimum habitat for several EPBCA migratory species will be created.

In view of the above, no migratory bird is considered likely to be significantly negatively affected by the proposal. Conversely, several will be positively benefited via creation of new habitat which has been subject to major historical declines (NSWSC 2004e).

9.0 CONCLUSION

This survey has identified that the property and to a lesser extent the project application site has known and potential value for a number of threatened species with 9 threatened fauna species and two Endangered Ecological Communities found to occur on the property.

Due to the current highly modified state of the land within the development envelope, the Project Application will have relatively minimal negative impact on the current capacity of the property to support the recorded and potentially occurring threatened species as it generally only remove marginal potential habitat with limited values to threatened species. The best habitat on the property will be retained after this proposal is completed and the species currently present in the retained habitat areas are recorded in modified environments such as urban remnants (eg Darkheart 2006c, 2006e, 2005a, 2005b, 2005d, 2005i, 2005m, 2004n, 2004o, 2004p, 2004u, etc), as are many of those threatened species considered potential occurrences (eg Microchiropteran bats), hence will not be significantly affected by the construction activities associated with the proposal. Furthermore, viable examples of the EECs will be retained, with positive impacts on both the EECs and threatened species associated with the new habitat provided by the extensive bush regeneration in the open space/drainage corridor, and associated landscaping.

Overall, the Project Application will only marginally contribute incrementally and cumulatively to known threatening processes and have subsequently minor impacts on threatened species and EECs. In the long term, it has potential to have some positive impacts on a range of known and potential threatened species as well as the local EECs with a net result of increased biodiversity via the extent of habitat creation/regeneration proposed. Consequently, the Project Application is not considered likely to have a significant effect on any threatened species or EEC, provided the recommendations of this report are effectively implemented in regard to the Wallum Froglet.

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APPENDIX 1: Likelihood of Occurrence

The following tables are used as a summary to address threatened species (as detailed below) in terms of potential occurrence, and likelihood of being significantly affected by the proposal. A threatened species has been assessed if it has been:

a) Recorded on-site;

b) Not recorded on site, but recorded within a 10km radius (the locality), and may occur to some degree on-site or in the study area (land within 100m of site) due to broadly suitable potential habitat, key habitat component, etc;

c) Not recorded in the locality as yet, but recorded in the bioregion, and thus may occur in the locality, and possibly to some extent, may occur on the site, due to potential habitat.

The "*habitat requirements*" column is derived from the previously listed references. Likelihood of occurrence is based on the probability of occurrence in terms of:

- Habitat extent (eg sufficient to support an individual or the local population; comprises all of home range; forms part of larger territory, etc); quality (ie condition, including an assessment of threats, historical land uses on and off-site, and future pressures); interconnectivity to other habitat; and ability to provide all the species life-cycle requirements (either the site alone, or other habitat within its range);

And:

- Occurrence frequency (ie on-site resident; portion of larger territory; seasonal migrant or transitory opportunist and thus when and how often, etc)

And:

- Usage ie breeding or non-breeding; opportunistic foraging (eg seasonal, migratory or opportunistic); marginal fringe of core range; refuge; roosts; etc.

Table 11: Likelihood of Occurrence – Flora

Note: Habitat requirements sources from previous references. Those in bold listed under EPBCA 1999.

NAME	HABITAT REQUIREMENTS	LIKELIHOOD OF OCCURRENCE
Acacia courtii	A localised species, found only on Middle and North Brother Mountains. It grows on steep, dry rocky slopes in mixed dry forest on shallow soils, often under a canopy of White Mahogany and Grey Gum. Several populations are known to occur on North Brother South Brother and Middle Brother Mountains. In Dooragan National Park, *A. courtii* occurs on dry locations on the midslopes of the mountain and has been recorded in association with the Stringybark forest and white mahogany/ ironbark associations on skeletal soils on western and northern side of the Mountains.	It is found in the locality, however the property did not contain suitable habitat for this species and it was not found. It is not considered a likely occurrence due to lack of suitable habitat, restricted distribution and disturbance history.
A. chrysotricha	A small to medium tree restricted to wet sclerophyll and rainforest in steep, narrow gullies on quartzite soil. The nearest records are north of Nambucca Heads and near Frederickton.	The property did not contain suitable habitat for this species and it was not found. Not found in the locality. It is not considered a likely occurrence.
A. ruppii	An erect or spreading shrub with smooth grey bark, found in dry sclerophyll forest and shrubland on sand. It is reportedly confined to the Grafton-Coaldale area. Recorded on Grafton database.	Possibly broadly suitable potential habitat but the plant was not found, nor is it considered to likely occur on-property due to the location being beyond the known range of the species.
Acalypha eremorum	A new species. This shrub is found in dry rainforest near Lismore. Recorded on Grafton database. Its potential range is unknown.	Suitable habitat does not occur and the plant was not found, nor is it considered to likely occur on-site due to lack of suitable habitat and location beyond the known range of the species.
Acronychia littoralis	An understorey tree found in littoral rainforest on sand. This species has been recorded in littoral rainforest at Big Hill. Recorded on Bare Point, Hastings LGA, Kempsey, Nambucca, Macksville LGA and Coffs Harbour databases.	The property does not contain suitable habitat though wet sclerophyll along part of Duchess Gully may be marginally suitable. Not known to occur in adjacent littoral rainforest. Not found nor is it considered likely to occur due to long disturbance history.
Alexfloydia repens	A creeping grass found in moist Casuarina forest and above the king tide zone above mangrove forest in the Coffs Harbour district. It is known from only 10 locations south of Coffs Harbour.	The property does not contain suitable habitat; the plant was not found; and the property is beyond the known range of this species. It is not considered a likely occurrence.
Allocasuarina defungens	A straggly oak about 2m high with blue-green foliage found in heath on sand (sometimes clay and sandstone soils), and swamp sclerophyll forest margins. This plant has been recorded on Hastings LGA, Kempsey, Bare Point, Coffs Harbour, Greater Taree City Council LGA, Bulahdelah and Camden Haven databases	It is found in the locality. The property does not contain habitat (may have in past before pastoralism etc but long since modified/cleared), and it was not found on the property despite targeted searches. Considered unlikely to occur due to extent of habitat modification via drainage, pastoralism, etc
Allocasuarina simulans	A she-oak found in heath on sand from Nabiac to Forster, with another population in the Grafton LGA. Recorded on Bare Point database.	The study property was considered not to be preferred habitat and the species was not found in a targeted search. Restricted distribution suggests not a likely potential occurrence as well
Amorphospermum whitei	An understorey tree found in littoral and warm temperate rainforest, and also wet sclerophyll forest along riparian zones. Recorded north from Macleay river.	The property was considered to be unsuitable habitat and it was not found via targeted searches. It is not considered likely to occur.

Angophora inopina	Is a small to large tree endemic to the central coast region of NSW. Ecological knowledge about this species is limited. Recorded on Bulahdelah database.	This property is beyond the known range of the species. It is not considered a likely occurrence.
Angophora robur	A small tree found on sandy soils derived from sandstone, and is mainly found northwest of Coffs Harbour and Grafton.	The species was not found and as the property is beyond the expected range and no suitable habitat hence the species was considered unlikely to occur.
Arthraxon hispidus	A grass found in (or is likely to occur in) littoral rainforest, dry rainforest, subtropical rainforest, warm-temperate rainforest, cool-temperate rainforest, wet sclerophyll forest and riparian forests (including gallery rainforests) at no particular altitude. Variable geology and various, mainly richer loams soils are favoured. Recorded on Coffs Harbour database.	The property was considered to be unsuitable habitat (Duchess Gully extremely marginal) and it was not found via targeted searches. It is not considered a likely occurrence due to lack of local records, marginal habitat and disturbance history.
Asperula asthenes	An herb found in damp sites along riverbanks and similar areas. Recorded in Bulahdelah, Great Lakes, Greater Taree, Kempsey and Hastings (in State Forest near Wilson River) LGA databases.	Some very marginal potential habitat on property along Duchess Gully, drainage lines, etc, however, the plant was not found, nor is it likely to occur due to lack of local records and disturbance history.
Babingtonia silvestris.	A shrub found in only 3 localities (Dorrigo National Park, Mt Neville Nature Reserve and a State Forest). It grows on granite and rhyolite rock outcrops in mixed shrublands. Recorded on Dorrigo database.	The property does not contain suitable habitat; the plant was not found; and the property is beyond the known range of this species.
***Bertya* sp. Cobar-Coolabah**	A shrub to small tree found from Cobar to Coolabah in shallow soils with mallee.	The property is beyond the known range; suitable habitat does not exist on-site; and the plant was not found, nor is it likely to occur.
Boronia hapalophylla	The Shannon Creek Boronia is a small straggling shrub that originally only occurred in dry woodland on sandstone hill slopes and ridge tops above Shannon Creek. Found on Camden Haven, Grafton and Bare Point Databases.	The property did not contain suitable habitat and it was not found, nor is it considered a likely occurrence.
Boronia umbellata	A shrub recorded in "scrub" in the Coffs Harbour locality.	The property is beyond the species known range; it was not found; nor is it likely to occur due to the property's location outside the known range of the species.
Chamaesyce psammogeton	An herb that grows on fore dunes and exposed sites on headlands. Recorded on Bare Point, Kempsey, Hastings, Nambucca, Coffs Harbour and Bulahdelah LGA databases.	The property did not contain suitable habitat for this species and it was not found, nor is likely to be found due to lack of suitable habitat.
Cryptostylis hunteriana (**Leafless Tongue Orchid**)	A leafless saprophytic terrestrial orchid with a poorly developed root system. This orchid is only detectable during the flowering period of Nov-Feb (Bell 2001). It has been described from isolated records as occurring in a variety of habitats from swamp fringes to bare hillsides in eucalypt forest, with favoured soils being sandy but with records in clay (Bishop 1996). However, the habitats of known populations in Victoria and the NSW central coast were described as being either coastal plains woodland/forest with heathy understorey; heathland; or grasstree plains, all on sandy soils (Bell 2001). Flowering is inconsistent, but has been recorded 18 months to 5 years following fire (Bell 2001). Recorded on Great Lakes (Bulahdelah), Coffs Harbour and Clarence LGA databases.	The Disturbed/Regrowth Swamp Forest and disturbed sedge land on the property are marginal potential habitat in very broad terms, though both have been extensively disturbed. It is considered a n unlikely potential occurrence given habitat disturbance and modification, and lack of LGA records.

Cynanchum elegans	A twiner occurring predominately in dry rainforest, littoral rainforest and the ecotone between dry rainforest and open forest, however it has been found in the Manning Valley and Hastings in Open Forest types on specific geologies eg limestone and serpentine respectively (Garry Germon pers. comm. 2004, personal observations). It occurs on a variety of lithology's and soil types. It has been found between the altitudinal ranges of 0 to 600 metres ASL and rainfall >760mm annually (NPWS 1999). Common associated species include *Geijera parviflora, Notelaea microcarpa, Banksia integrifolia, Ficus spp., Guioa semiglauca, Melia azedarach, Streblus brunonianus* and *Pittosporum revolutum.* Recorded in Camden Haven, Hastings LGA, Grafton, Kempsey, Wingham, and Bulahdelah databases.	Recorded in locality in adjacent littoral rainforest at Middle Head. Marginally suitable habitat in very broad terms perhaps in wet and dry sclerophyll along Duchess Gully but not found by targeted survey. Considered an unlikely occurrence due to low quality habitat and extensive disturbance history.
Cyperus aquatilis	A small annual sedge found in open ephemerally wet sites north of the Evans Head area. Recorded on Grafton database.	The property is beyond the known range. Unlikely to occur.
Eleocharis tetraquetra	A spikerush found in swampy areas that has been recorded in the Boambee area, south of Coffs Harbour.	The property is beyond the known range; marginally suitable habitat occurs on property, however, the plant was not found, nor is it likely to occur.
Elyonurus citreus	A perennial tufted grass that grows in sandy soils near rivers or along the coast in wallum areas or sand dunes. It occurs north from Grafton where it is only known from several locations. Recorded on Bare Point database.	The property does not contain suitable habitat and it was not found, nor is it likely to occur.
Eucalyptus tetrapleura	A tall ironbark tree found in wet sclerophyll forest on moderately fertile soil, dry sclerophyll forest, grassy sclerophyll forest, riparian forests (including gallery rainforests), at no particular altitude and with variable geology and soils. Recorded on Kempsey, Coffs Harbour and Grafton databases.	The property does not contain significant suitable habitat and the plant was not found, nor is it likely to occur due to lack of local records and an extensive disturbance history.
Grammitis stenophylla	A fern often found on mossy wet sandstone walls in rainforest and gallery forest. Recorded on the Dorrigo database.	Suitable habitat does not exist on-site, and the plant was not found, nor is it likely to occur due to lack of suitable habitat.
Grevillea beadleana	A spreading shrub up to 3m high found on granite scarps and exposures, and is confined to the catchments of the Mole and Guy Fawkes River, and possibly Apsley River (generally Northern Tablelands region). Recorded on Grafton database.	The property is beyond the species' known range; does not contain suitable habitat; and the plant was not found, nor is it likely to occur due to lack of suitable habitat.
Grevillea caleyi	A spreading shrub usually found in woodland or open forest dominated by *Eucalyptus capitellata, Corymbia gummifera* and *E. sieberi* with an understorey dominated by plants of Proteaceae and Fabaceae families, on lateritised sandstone ridge tops in Central Coast Botanical region, but has also been recorded on North Brother near Laurieton. Recorded on Hastings LGA and Camden Haven database.	Found in locality. Suitable habitat does not exist on-site, and the plant was not found, nor is it likely to occur.
Grevillea guthrieana	A spreading shrub known from only two locations – Booral near Bulahdelah and on the Carrai Plateau south west of Kempsey. It grows in sandy loams on creek lines in moist eucalypt forest and also along cliff lines with granitic or sedimentary soils (Plantnet 2004). Recorded on Bulahdelah and Kempsey databases.	The property is beyond the species' known range; does not contain suitable habitat; and the plant was not found, nor is it likely to occur due to lack of suitable habitat.
G. masonii	A low-growing shrub that occurs on gravely loams and in sand in open eucalypt woodland. It occurs in a few locations between Grafton and Casino. Recorded on Grafton database.	The property did not contain suitable habitat and the plant was not found, nor is it likely to occur.

G. quadricuada	A shrub usually found in gravelly loam or in sand as an undershrub in Eucalypt woodland mostly along creeks and drainage lines. It has a northern NSW-Southern Qld distribution. Recorded northwest of Whiporie.	The property did not contain suitable habitat and the plant was not found, nor is it likely to occur due to its location well outside the known range.
Hakea archaeoides	A woody shrub found on steep, rocky, sheltered slopes and deep gullies in open eucalypt forest. It is restricted to hinterland around Mt Boss, Broken Bago State Forest and Landsdowne. Recorded on Camden Haven and Kempsey LGA databases.	Suitable habitat does not exist on property, and the plant was not found, nor is it likely to be found due to lack of habitat.
Harnieria hygrophiloides.	Was formerly known as *Justica* or *Calaphanoides hygrophiloides*. This is a glabrescent shrub growing in rainforest or adjacent wet sclerophyll only from Brunswick Heads to Hortons Creek in far northeastern NSW. Recorded on Grafton database and Dorrigo topographic map.	The property did not contain suitable habitat, and is well beyond the species' known range. The plant was not found
Hibbertia hexandra	A tall shrub or small tree, which occurs mainly in heath, open forest and rainforest around Mt. Warning (Harden 1993). A separate population in the Wauchope-Kendall area has plants with smaller leaves that are found in crevices and gullies in rocky terrain (NPWS 2000). Recorded on Camden Haven and Kempsey databases.	Suitable habitat does not exist on property, and the plant was not found, nor is it likely to be found due to lack of habitat.
H. marginata	A small shrub that grows in grassy or shrubby dry open eucalypt forest at low altitudes on sandstone. It occurs only in northeast NSW, where it's restricted to southern Richmond Range between Grafton and Casino.	The property does not contain suitable habitat and it is well beyond the known range of the species. The plant was not found and it is not considered a likely occurrence.
Lindernia alsinoides	Is a diffuse or erect annual herb that grows in swampy sites in sclerophyll forest and coastal heath. It occurs north from Bulahdelah. Recorded on Bulahdelah and Grafton databases.	Marginally suitable habitat may be present on property in the Disturbed/Regrowth Swamp Forest and disturbed sedge land, but the species was not found via targeted searches. Nor is it considered to occur due to lack of local records and extensive disturbance history.
Lindsaea incisa	A ground fern found in damp sandy places and open forest. Recorded on Coffs Harbour database.	No suitable habitat occurs on property, the species was not found and the known records do not extend south of Coffs Harbour.
Macrozamia johnsonii.	A cycad known only from a small area in the Dalmorton district in northern coastal NSW. It grows in wet to dry sclerophyll forest, on shallow, rocky, usually steeply sloping and poor soils, and is also occasionally cultivated as an ornamental. Recorded on Grafton database.	The property is beyond the species' known range and does not contain suitable habitat. The plant was not found and it is not considered a potential occurrence.
Marsdenia longilobia	A slender climber with clear, watery latex (sap). Occurs in rainforest and moist eucalypt forest adjoining rainforest, at no particular altitude, sometimes in areas with rock outcrops. Found at scattered sites from Barrington Tops to SE Queensland (NPWS 2000). Recorded northeast of Byabarra in the Hastings LGA and also recorded on Kempsey, Macksville, Coffs Harbour, Grafton and Bare Point databases.	The absence of local records, the location south of its known range, the lack of suitable habitat and the property's disturbance history suggests this species is not a likely chance of occurrence.
Maundia triglochinoides	An aquatic herbaceous plant found in swamps or shallow fresh water on heavy clay on the north and central NSW coast. Recorded on Hastings and Kempsey databases.	Potential habitat may occurs on property in the drainage lines, edge of dams, Duchess Gully, and during wet periods when the disturbed sedge land and pasture land become waterlogged. However, the plant was not found on property. The disturbance history of the property indicates the species is unlikely to occur.

Melaleuca biconvexa	A paperbark shrub/small tree found in damp places, often near streams, on the coast and adjacent tablelands from Jervis Bay to Port Macquarie. Recorded on Bulahdelah, Kempsey, Hastings and Camden Haven databases.	Found in the locality. Structurally suitable habitat exists on the property but not considered preferred soils. The plant was not found despite targeted searches, nor is it considered likely to occur.
Melaleuca groveana	A paperbark shrub/small tree that grows in dry sclerophyll, heath and exposed sites generally at higher elevations, though this consultant has recorded it in dry sclerophyll forest on a basalt ridge about 50m asl at Scotts Head (pers. obs.). Recorded on Bulahdelah, Camden Haven, Hastings, Kempsey and Macksville databases.	Found in the locality. The property did not contain suitable habitat and this species was not found during the threatened species searches. Due to disturbance history, low potential habitat and patchy locations of this species, it is not considered a likely occurrence.
Melaleuca tamariscina ssp *irbyana*	A paperbark shrub or small tree up to 8m high, found in open eucalypt forest on poorly drained sites north from the Casino District. Recorded on Grafton database.	The property contains marginal potential habitat but is well outside known habitat range. Considered unlikely to occur.
Melichrus hirsutus	A spreading shrub on sandstone, found near Glenreagh and the upper Clarence Valley. Recorded on Grafton and Bare Part databases.	The property is beyond the species' known range; suitable habitat does not exist on-site; and the plant was not found, nor is it likely to occur due to lack of suitable habitat.
Oberonia titania	An epiphytic orchid that grows in a tight clump in a variety of habitats from subtropical to littoral rainforest, *Melaleuca* swamps, and gorges within dry sclerophyll forest. It occurs north of Kendall. Recorded on Coffs Harbour database	Suitable habitat does not exist on-site, and the plant was not found, nor is it likely to occur due to lack of suitable habitat.
Olax angulata	A shrub up to 1m high known only from Minnie Waters on sandy soils and woodland near swamps. Recorded on Bare Point database.	Suitable habitat not present and the property is well beyond the known range of this species.
Olearia flocktoniae	A short-lived shrub found in recently disturbed sites in wet sclerophyll and warm temperate rainforest essentially in the Dorrigo area.	The property is beyond the known range of this species, and the plant was not found, nor is it likely to occur.
Parsonsia dorrigoensis	A climber found in sub-tropical and warm temperate rainforest, and sclerophyll forest often on brown clay soils on the north coast south to the Hastings River. It is associated with Blackbutt, Tallowwood, Brush Box, Crabapple, Lilly Pilly, Tree Heath and Water Gum. It may favour some disturbance, including fire. Recorded on Macksville, Kempsey, Coffs Harbour, Grafton and Camden Haven databases.	Possibly very marginal potential habitat in disturbed wet sclerophyll along Duchess Gully but not found given disturbance history and lack of proximate records, considered unlikely to occur.
Phaius tankervilliae (recorded on Hastings LGA database) and ***P. australis*** (Bare Point, Coffs Harbour)	Are orchids that generally grow in *Melaleuca quinquenervia* swamps on the coast or at sea level, as well as littoral rainforest, dunes (including stabilised dunes), riparian forests (including gallery rainforests), swamp forests, swamps (including marshes and intermittent wetlands), mainly at low altitudes. Sandy alluvium is the favoured geology and sandy, damp to humic soils are favoured.	Potentially suitable habitat occurs on-site in the swamp forest, but the plants were not found in a targeted search. Potential to occur is considered very unlikely due to lack of local records and the disturbance history.
Phyllanthus microcladus	Is a small shrub that is usually found on banks of creeks and rivers, in streamside rainforest. In NSW it is confined to a few locations in the Tweed, Brunswick, Richmond and Wilson River Valleys with an outlying population near Grafton.	The property may contain potential habitat along Duchess Gully. However, the plant was not found and the property is well beyond the known range of the species and it is not considered a potential occurrence.

Pomaderris queenslandica	A shrub 2-3m high, found in moist sclerophyll forest with shrubby understorey and occasionally along creeks. Recorded on Wingham/Taree and Hastings LGA database.	The property contains potential habitat along Duchess Gully in broad terms. It was not found and is not considered a likely potential occurrence due to lack of local records and high disturbance history.
Pultenaea maritima	A prostrate, mat-forming shrub with hairy stems. It occurs in grasslands, shrublands and heath on exposed coastal headlands. It occurs from Newcastle to Byron Bay. Found on Camden Haven database.	The property does not contain suitable habitat and the plant was not found. It is not considered a likely occurrence due to lack of suitable habitat.
***Quassia* sp. Moonee Creek**	A shrub found in dry rainforest and riparian wet sclerophyll forest. Recorded on Coffs Harbour, Grafton and Bare Point databases.	The property does not contain any particularly suitable habitat and it is beyond the known range of this species. It is not considered a likely occurrence.
Rutidosis heterogama	A perennial herb, to 30cm high, with yellow everlasting flowers, usually found in heath, often along disturbed roadsides mainly on the coast from Maclean to Hunter Valley, and inland to Torrington. Recorded on Bare Point database.	Suitable habitat does not occur on the property, and the species was not found. It is not considered a likely occurrence.
Sarcochilus dilatatus	A semi-pendant epiphyte found on trees in rainforest in coastal ranges up to 400m ASL	The property was considered to be unsuitable habitat and the plant was not found. The disturbance history and lack of local records suggest this plant is not likely to occur.
S. fitzgeraldii	A semi-pendant epilith (rarely an epiphyte) orchid found on rocks or tree bases in subtropical rainforest usually near trees from 500-700m ASL.	The subject property is below the known altitudinal range, and the plant was not found in the study area.
S. hartmannii	A semi-erect epilithic or terrestrial herb usually found on volcanic rocks often in shallow soil in dry rainforest, subtropical rainforest, wet sclerophyll forest, dry sclerophyll forest, grassy sclerophyll forest, riparian forests (including gallery rainforests), rocky crevices and scree or exposed sites 500-1000m alt., previously north from the Richmond River, but recently recorded in the Kempsey LGA. Preferred geology is mainly volcanics and various (mainly skeletal and poor) soils are favoured. Recorded on Coffs Harbour, Wingham LGA and Kempsey LGA database.	Suitable habitat does not exist on the property and the plant was not found, nor is it likely to be found.
Senna acclinis	A shrub found in or on the edges of subtropical and dry rainforest. Variable geology and soils are favoured. Recorded in Kerewong SF and Lorne SF in the Hastings LGA and also in Bulahdelah, Great Lakes, and Coffs Harbour LGA databases.	Suitable habitat was not found on property and the plant was not found, nor is it likely to be found.
Sophora tomentosa subsp. australis	A coastal shrub that occurs on recent sands on frontal coastal dunes northwards from Port Stephens. Port Macquarie has the largest known population eg Shelley and Nobby's Beaches. Recorded on Kempsey, Hastings LGA, and Bare Point databases.	No potential habitat on property. The plant was not found, nor is it likely to be found due to lack of suitable habitat.
Syzygium paniculatum	A type of Lilly Pilly, which has a shrub to small tree habit and grows in subtropical and littoral rainforest on sandy soils or stabilised dunes on the coast. It is also widely cultivated as an ornamental.	Suitable habitat does not occur on property and the plant was not found, nor is it considered a likely occurrence due the property's location well outside its known range.
Tetratheca juncea	A small shrub that grows in sandy, sometimes swampy heath, and also dry sclerophyll forest mainly along the lower end of the region around Bulahdelah.	Suitable habitat to some broad structural extent does occur on the property, but this species was not found. The lack of local records, location of the property beyond the known range and disturbance history suggest the species is not a likely occurrence.

Thesium australe	A parasitic herb commonly associated with Kangaroo Grass, and has been recorded on coastal headlands at Coffs Harbour, Hat Head, Crescent Head, Diamond Head and Perpendicular Point in Kangaroo Grass areas. Recorded on Hastings LGA, Kempsey, Bare Point, Coffs Harbour, Korogoro and Camden Haven databases.	Occurs in locality. Suitable habitat does not exist on property and the plant was not found, nor is it considered likely to occur.
Tinospora smilacina	A twiner found in dry subtropical rainforest. Recorded on Coffs Harbour and Grafton databases.	Suitable habitat does not occur on property and the plant was not found, nor is it likely to be found.
Tinospora tinosporoides	A woody climber found in wetter subtropical rainforest. Recorded on Coffs Harbour database.	Suitable habitat does not occur on property and the plant was not found, nor is it likely to be found due to lack of suitable habitat and disturbance history.
Triplarina imbricata (formerly *Baeckea camphorata*)	A shrub occurring mainly in sheltered positions on shady slopes, gorges or creek banks, within about 80km of the coast (Australian Plants Online website). This species is also commonly cultivated. Recorded on Dorrigo database.	Suitable habitat does not strictly exist on property (Duchess Gully is marginal), and the plant was not found, nor is it considered a potential occurrence due to the disturbance history and lack of local records.
Tylophora woolsii	A twiner found in wet sclerophyll and rainforest in the northern ranges and slopes of NSW from Barrington Tops NP to southern Queensland (NPWS 1999). It has also been recorded within in the Bonville-Archville area and along disturbed roadside verges (NPWS 1999). Associated species include: *Acacia melanoxylon, A. binervata, Caldcluvia, Ehretia, Schizomera, Syncarpia, Eucalyptus microcorys and E. saligna*. Recorded on Coffs Harbour database.	The plant was not found on the property, which lacks significant potential habitat. It is not considered a potential occurrence.
Typhonium sp. aff. brownii	A perennial deciduous tuberous geophyte found on rainforest margins, sheltered gullies and along creek banks. It appears to be confined to the ranges up to 30km west of Woolgoolga and Coffs Harbour.	The property is beyond the known range of this species. The plant was not found, nor is it considered likely to occur.
Z. prostrata	A shrub restricted to low coastal heath in the Coffs Harbour area.	The property is beyond the known range of this species; suitable habitat does not exist on-site; and the plant was not found, nor is it likely to occur due to lack of suitable habitat.
Zieria smithii	Diggers Head Zieria is a sprawling shrub known only from Diggers Head at Coffs Harbour. It occurs in Low Heath with Kangaroo Grass (*Themeda australis*) on a coastal headland.	The property is beyond the known range of the species and suitable habitat is not present. It was not found nor is it likely to occur.

From the above, it is determined that no flora species requires formal assessment.

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Table 12: Likelihood of Occurrence – Fauna

Note: Habitat requirements sources from previous references. Those in bold listed under EPBCA 1999.

NAME	HABITAT REQUIREMENTS	LIKELIHOOD OF OCCURRENCE
Glossy Black Cockatoo (*Calyptorhynchus lathamii*)	Dry sclerophyll forest and woodland containing preferred Allocasuarina and Casuarina, and large tree hollows. Preferred regional forage species are *A. littoralis* and *A. torulosa.* Requires sufficient extent of forage within home range to support breeding. Food trees generally have large cone crops (eg >200 cones) and young cones (easier to open and the seeds have higher protein content). Cones are not selected on size but on number of seeds per cone (to maximise foraging effort), thus a tree with a large crop is not necessarily a preferred food tree (Clout 1989). Trees may require at least 10 years of growth before being potentially utilised (Mt King Ecological Surveys 1993). Lives in loose groups ranging from 2-20 individuals, occupying a permanent area (range over 100km), following the fruiting pattern of its preferred food tree species.	Recorded in the locality but not on property by this or previous studies. The property overall has only limited potential of supporting this species as it contains only a small area of preferred forage species (thus only has potential only to form a minute proportion of foraging range). Few tree hollows on the property marginally suitable for nesting, however given the limited abundance of such hollows (thus high competition rates with common species); the potential for nesting is limited. Considered a very low to marginally fair chance of occurrence on the property as part of a broader foraging range.
Swift Parrot (*Lathumus discolor*)	Breeds in Tasmania and Winters in Victoria with some dispersal northwards. Feeds mostly on pollen and nectar of Winter flowering eucalypts, but also feeds on fruit, seeds, lerps and insect larvae (Schode and Tideman 1990). Also favours profusely flowering banksias. Favoured species are *E. robusta*, *Corymbia gummifera*, *E. globulus, E. sideroxylon, E. leucoxylon, E. labens, E. ovata, C. maculata, Banksia serrata* and *B. integrifolia*	Has been recorded in the locality and on the property. Not recorded on site or property during study. Limited foraging resources on site but preferred foraging resources are present in limited abundance on parts of property i.e. Swamp Mahogany, Forest Red Gum and *Banksia integrifolia*. Considered a low to fair chance of occurrence on site and property as seasonal forager.
Little Lorikeet (*Glossopsitta pusilla*)	Small locally nomadic and gregarious nectarivorous bird. Occurs in regrowth and old growth dry, open eucalypt forests and woodlands. Feed on eucalypts, melaleuca and mistletoes. Nests in hollows usually in living trees, often re-using the same hollow annually for life (NSWSC 2009).	Site and study area has generic potential for this bird as part of locally nomadic range depending on flowering incidence. Hollows in trees on site offer potential nest sites in competition with other common and rare species. Recorded locally, hence fair chance to occur.
Powerful Owl (*Ninox strenua*)	Wet and dry sclerophyll forests. Nests in tree hollows. Requires high diversity and abundance of medium-sized arboreal prey. Very large territory (500-5000ha).	Twice recorded within 750m of the property in the Queens Lake State Forest, however not recorded on site or property. Low prey diversity in general of the property limits the potential for the species to forage. However, given the close proximity of local records and the species large home range the property is considered a low to marginally fair chance of being part of a broader home range.
Barking Owl (*N. connivens*)	Well-forested hills and flats, eucalypt savannah (especially), and riverine woodland in coastal and subcoastal areas. Prefers hunting in more open country for mammals (rabbits, rats, mice, small bats and small marsupials) and birds (small up to Frogmouths and Magpies). Large territories. Nest in hollows.	One record of species at extremity of locality. Property offers good habitat for foraging by the species with the large areas of open country as is preferred. Presence of rats and mice offer foraging resource along with microbats and small bird species. Scope of foraging on site is limited due to lack of habitat with

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		small birds and foraging bats making up the potential foraging resource on site. Limited potential nesting hollows present on site and property. Not detected on site or property. Very low to marginally fair chance to occur as an occasional forager on site and property.
Masked Owl (*Tyto novaehollandiae*)	Eucalypt forest and woodlands with sparse understorey. Nests in tree hollows. Requires high diversity and abundance of prey 200-600g weight. Large territory.	Not recorded on site or property. Four records of the species occurring in the locality, including within 1km of site. Suitable habitat occurs on property overall with the pasture land, grassland, woodland, swamp forest etc forming a complex mosaic. However a low diversity of prey on the study site will limit the species potential to forage on the site. At best marginal potential nesting sites for this species (thus unlikely to be utilised as nesting habitat). The number of records in the locality coupled with the species large territory suggests the species is a low to fair chance of occurrence as an occasional forager on site and property.
Sooty Owl (*T. tenebricosa*)	Rainforest and tall, moist eucalypt forest. Nests in tree hollows. Requires high diversity and abundance of medium-sized arboreal prey. Large territory.	Not recorded on site, property or in locality. Property (including the site) does not provide suitable habitat. Suitable prey species may occur but failure to detect them indicates a low diversity and abundance. Very low to unlikely potential to occur.
Eastern Grass Owl (*T. capensis*)	Inhabit coastal and inland grasslands, coastal heath, agricultural crops and swamp margins. Dependant on good numbers of rodent prey. Highly mobile.	Twice recorded in the locality but not on site or property. Native grassland possibly structurally suitable but insufficient in area to support this species. No prey species detected on site. Considered unlikely to occur.
Red Goshawk (***Erythrotriorchis radiatus***)	Found in tropical open woodland, taller woodland, open forests, rainforest edges and dense riparian vegetation of coastal and subcoastal drainages. Territorial and utilise same nest. Breeding territories estimated 50-220km^2. Preys on bird especially honeyeaters, parrots, kookaburras and slight waterbirds, as well as some mammals, reptiles and large insects.	Not recorded in locality, and not recorded on-site or property. Suitable habitat in broad terms may occur on the property and marginally the site. Considered unlikely to occur as this extremely rare raptor has not been reported south of the far north coast of NSW for many years (Birds Australia 2009).
Little Eagle (*Hieraaetus morphnoides*)	Medium sizes raptor found in open eucalypt forest, woodland, etc. Nests in living trees. Eats birds, reptiles and mammals, large insects and carrion. Previously depended on rabbits, but now heavily dependant on prey, many of which are declining. Very large home ranges (NSWSC 2009).	Site and general area is potential and probably known habitat given records locality. No nests on site, and generic potential for nesting, but limited by existing raptor nest. At least fair chance of infrequent fly over as part of territorial movements.
Spotted Harrier (*Circus assimilis*)	Raptor which prefers grassy open woodland, mallee, inland riparian woodland, grassland and shrub steppe (Marchant and Higgins 1993; Aumann 2001a). Most commonly found in native grassland but also in agricultural land. Forages for terrestrial mammals (especially rabbits), birds and reptiles, occasionally large insects but rarely carrion over open habitats including edges of inland wetlands. Avoids dense forest typical of coast. Builds a stick nest in a tree (NSWSC 2009).	Not commonly found on coast but potential occurrence in pastoral areas where suitable prey. Site has limited prey abundance due to pasture type (low growing) with prey limited to regrowth forest on site and adjacent. Competitive species on site already including nesting Whistling Kite. Record in locality (UIA 13) but only few records in LGA. Very low to unlikely potential to occur perhaps flying over during non-breeding nomadic range.
Osprey	Fish and carrion eater. Forages along coastal rivers, lakes, beaches, creeks and inlets.	Not recorded on site or property but numerous records exist

(*Pandion haliaetus*)	Requires possible nest sites near water.	within the locality. No nest detected on site or property. No suitable foraging habitat on site and only marginal potential foraging habitat on property with Duchess Gully. Considered a low to fair chance to occur on the site opportunistically.
Square-Tailed Kite (*Lophoictinia isura*)	Open forests and woodlands in coastal and subcoastal areas, rich in small birds especially honeyeaters and nestlings. Extremely large home range. Observed in urban areas foraging on sparrows and starlings (per. obs), and nesting in urban remnants.	Not recorded on site, but has been previously observed over southern end of property and recorded locally. Property contains suitable habitat which (including parts of the site) has potential to form a small part of this species extensive foraging range. No nest detected on site or property.
Wompoo Fruit Dove (*Ptilinopus magnificus*)	Sub-tropical, littoral, warm temperate and dry rainforest, and wet sclerophyll with rainforest understorey. Feeds on fruit. Known to feed on Camphor Laurel and Lantana.	Detected on property, however, no rainforest or significant presence of potential fruiting sources on property (including the site). Its presence on site was likely to be opportunistic as it moved to better habitat. Low to unlikely potential to occur as a forager.
Barred Cuckoo Shrike (*Coracina lineata*)	Gregarious rainforest/moist forest (especially creek gullies) species feeding mainly on fruit on tall rainforest trees and shrubs, and insects; generally moving with fruiting patterns.	Generally as for Wompoo Fruit Dove, but not recorded on site, property or in locality. Low to unlikely potential to occur.
Rose-Crowned Fruit Dove (*Ptilinopus. regina*)	Inhabits dense rainforest or vegetation containing fruit bearing trees, feeding on fruit. Migratory with fruiting patterns.	Generally as for Wompoo Fruit Dove, but not recorded on site, property or in locality. Low to unlikely potential to occur.
Regent Honeyeater (*Xanthomyza phrygia*)	Nomadic. Inhabits temperate eucalypt woodlands and open forest, including forest edges, woodland remnants on farmland and urban areas. Also uses *Casuarina cunninghamiana* gallery forests. Requires reliable and ample nectar supplies to support semi-permanent (core breeding) habitat. Favoured nectar sources are *E. sideroxylon, E. albens, E. melliodora, E. leucoxylon, E. robusta, E. planchoniana*, and heavy infestations of mistletoe. Also take insects and orchard fruits. Breeds in pairs or small colonies in open woodland/forest and occasionally more disturbed woodland near housing and farmland, depending on food availability, from August-January. Breeding less likely to occur if nectar flows are low or unreliable, or heavy competition with more aggressive honeyeaters eg Noisy Miner, Red Wattlebirds and Noisy Friarbirds.	Not recorded on-site, property or locality though recent record of single bird in Port Macquarie (Hastings Birdwatchers 2004). Swamp Mahogany (a preferred nectar species) is present on the property in limited abundance and at best could be used opportunistically by this bird as part of non-breeding range. Very low to unlikely potential of occurrence on site and low to unlikely chance of occurrence on property as rare transient.
Painted Honeyeater (*Grantiella picta*)	Strongly migratory and locally nomadic. Exploits almost exclusively mistletoe-infested (mainly *Amyema* genus) eucalypt forest/woodland in mainly drier areas. Leaf insects occasionally taken. May extend range or visit woodland remnants and suburban gardens during poor seasons. Breeding habitat is mistletoe-laden eucalypt forest/woodland	No significant mistletoe on site property. Not recorded on site, property or locality. Very low to unlikely potential to occur as rare transient.
Bush Stone Curlew (*Burchinus grallaris*)	Nocturnal, sedentary and territorial (when breeding) species generally inhabiting open grassy woodlands with few or no shrubs. Abundant leaf litter and fallen debris such as tree branches required for foraging and roosting. Nests in more open areas with very little groundcover (even recorded on mown lawns and golf courses). Coastally, often associated with Swamp Oak groves, saltmarsh, mangroves, *Melaleuca quinquenervia* woodlands and even golf courses, etc. May travel as far as 3km from roost site to foraging grounds.	Not recorded on site, property or locality. Potential habitat in broad terms occurs on site and the property in various communities. However, leaf litter and fallen debris is largely absent in these areas limiting potential foraging and roosting resources. Potentially suitable nesting areas occur on site and property though risk of cattle trampling and periodic slashing considered likely to displace to more optimal area where less disturbances. Overall as it is not recorded in locality, on site or

		on the property and given the presence of predators (i.e. feral cats, foxes and dogs), it is considered unlikely to very low to potential to occur on the property.
Varied Sittella *(Daphoenositta chrysoptera)*	Sedentary bird found in all habitats except grasslands and desert. Usually found in eucalypt forests and woodlands, especially rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees, and from small branches and twigs in the tree canopy. Builds a cup-shaped nest of plant fibres and cobweb in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years (NSWSC 2009)	Recorded in locality. Small patches of forest along Duchess Gully and perhaps in the northwest considered to have some generic value but fragmented and less optimal compared to extensive forest to west and south of Bonny Hills. Considered very low to unlikely potential to occur on site due to marginal habitat quality.
Flame Robin (*Petroica phoenicea*)	Small passerine bird which breeds in upland moist eucalypt forests and woodlands, often on ridges and slopes, in areas of open understorey. Migrates in Winter to more open lowland habitats such as grassland with scattered trees and open woodland on the inland slopes and plains. Forages from low perches, feeding on invertebrates taken from the ground, tree trunks, logs and other coarse woody debris. Builds an open cup nest of plant fibres and cobweb, which is often near the ground in a sheltered niche, ledge or shallow cavity in a tree, stump or bank (NSWSC 2009).	Only recorded in upper LGA. Small patches of forest along Duchess Gully and perhaps in the northwest considered to have some generic value but no true grassy woodlands, etc which this species prefers, and majority of site is low pasture with scattered trees, hence very limited prey potential. Out of nesting range. Considered very low to unlikely potential to occur on site due to marginal habitat quality, probably as rare transient.
Scarlet Robin (*Petroica boodang*)	Small passerine bird usually found in open forests and woodlands from the coast to the inland slopes (Higgins and Peter 2002). Usually breeds in drier eucalypt forests and temperate woodlands, often on ridges and slopes, within an open understorey of shrubs and grasses and sometimes in open areas. Abundant logs and coarse woody debris are reported to be important structural habitat components. Migrates seasonally (Autumn and Winter) to more open habitats such as grassy open woodland or paddocks with scattered trees. Forages from low perches, feeding on invertebrates taken from the ground, tree trunks, logs and other coarse woody debris. Builds an open cup nest of plant fibres and cobwebs, sited in the fork of tree (often a dead branch in a live tree, or in a dead tree or shrub) which is usually more than 2 m above the ground (Higgins and Peter 2002; Debus 2006a,b, NSWSC 2009).	Recorded locally in Cowarra State Forest and Port Macquarie. Small patches of dry sclerophyll on site offer generic potential but lack maturity ie logs uncommon and not true grassy understorey as typically preferred. More extensive forest/woodland habitat to west and in upper LGA. Considered very low to unlikely potential to occur on site due to marginal habitat quality, probably as rare transient.
White-Browed Woodswallow (*Artamus superciliosus*)	Breeds in open forests and woodlands from the inland slopes to the far western plains but during dry years its distribution extends east to open habitats of the tablelands and coast (Higgins *et al.* 2006). Usually found in eucalypt, sheoak and *Acacia* woodland, including mallee, and adjacent open areas including grassland with scattered trees or shrubs. In agricultural landscapes it prefers healthy woodland patches with low disturbance and little grazing (Higgins *et al.* 2006). It eats arthropods, including insects that swarm above vegetation, plus some nectar and small native fruits builds a cup-shaped nest of twigs and plant fibres in a fork, crevice or foliage in a tree or shrub (live or dead), vine, creeper, stump or artificial structure (NSWSC 2009).	Site has some generic potential for this species but not as potentially productive as other areas in locality. Only 3 records in LGA. Very low to unlikely rare transient non-breeding occurrence.
Brown Treecreeper (*Climacteris pciumnus*) eastern subspecies	Medium-sized insectivorous bird occupying eucalypt woodlands, particularly open woodland lacking a dense understorey. Sedentary and nests in tree hollows within permanent territories, breeding in pairs or communally in small groups (Noske 1991). Birds forage on tree trunks and on the ground amongst leaf litter and on fallen logs	Not recorded on site or property, and one record in locality. Parts of property contain marginal structurally suitable habitat though not true dry sclerophyll woodland as typical of the areas where this species has been recorded is present. Very few

	for ants, beetles and larvae (Noske 1979). Distributed through central NSW on the western side of the Great Dividing Range and sparsely scattered to the east of the Divide in drier areas such as the Cumberland Plain of Western Sydney, and in parts of the Hunter, Clarence, Richmond and Snowy River valleys, Coffs Harbour and Great Lakes Shire.	records of the species along coastal margin and is considered unlikely to occur on site.
Grey-Crowned Babbler (*Pomatostomus temporalis temporalis*) eastern subspecies	Occupies open woodlands dominated by mature eucalypts, with regenerating trees, tall shrubs, and an intact ground cover of grass and forbs. Builds conspicuous dome-shaped nests and breeds co-operatively in sedentary family groups of 2-13 birds (Davidson and Robinson 1992). Insectivorous and forage in leaf litter and on bark of trees. Occurs on the western slopes and plains but less common at the higher altitudes of the tablelands. Isolated populations are known from coastal woodlands on the North Coast, in the Hunter Valley and from the South Coast near Nowra (Blakers *et al.* 1984, Schodde & Mason 1999).	Generally as for Brown Treecreeper. Not recorded on-site, property or locality. Very low to unlikely to occur.
Hooded Robin (*Melanodryas cucullata cucullata)* south-eastern form	Occupies a wide range of Eucalypt woodlands, *Acacia* shrublands and open forests, favouring open areas adjoining large woodland blocks, with areas of dead timber and sparse shrub cover. Live in small family groups of pairs or trios, with relatively large home ranges (average 18ha in New England Tableland). Feeds on the ground on insects, and forages in areas with a mix of bare ground, ground cover and litter.	Generally as for Brown Treecreeper. Not recorded on-site, property or locality. Very low to unlikely to occur.
Diamond Firetail (*Stagonopleura guttata*)	Occupies eucalypt woodlands, forests and mallee where there is a grassy understorey. Build bottle-shaped nests in trees and bushes, and forages on the ground, largely for grass seeds and other plant material, but also for insects (Blakers *et al.* 1984, Read 1994). Distributed through central and eastern NSW, extending north into southern and central Queensland and south through Victoria to the Eyre Peninsula, South Australia. In NSW, the species occurs predominantly west of the Great Dividing Range, although populations are known from drier coastal areas such as the Cumberland Plain of western Sydney and the Hunter, Clarence, Richmond and Snowy River valleys (Blakers *et al.* 1984, Schodde & Mason 1999).	Generally as for Brown Treecreeper. Not recorded on-site, property or locality. Very low to unlikely to occur.
Speckled Warbler (*Pyrrholaemus sagittata*)	Inhabits mostly inland woodlands (some drier coastal areas) with grassy understorey often on ridges and gullies. Sedentary in pairs or trios, and nests on ground in grass tussocks, dense litter and fallen branches. Forages on ground or understorey for arthropods and seeds within home range of 6-12ha. Remnants <100ha not suitable.	Generally as for Brown Treecreeper. Not recorded on-site, property or locality. Very low to unlikely to occur.
Black-Necked Stork/Jabiru (*Ephippiorhynchus asiaticus*)	Lakes, swamps, freshwater pools and mangroves. Has been observed foraging around sewage ponds and farm dams.	Not recorded on the property but several records exist in the locality. Suitable habitat occurs mainly around dams and drains, with extensive parts of the Disturbed Sedgeland offering potential as opportunistic foraging habitat when prolonged inundation following heavy rain or local flooding occurs. Considered at least a fair chance of occurrence on site and property.
Brolga (*Grus rubicunda*)	Inhabits coastal and inland wetlands, shallow lakes, grassland, saltmarsh, farm and dry open land. Forages for large invertebrates, frogs, fish, seeds, green shoots and bulbs. Breeding occurs predominantly in tropical wetland and large inland swamps and irrigated grasslands at inland and central northern Australia (eg Queensland and Northern Territory), though has been recorded in the northwest and north-eastern	Not recorded on site, property or locality. Nearest record near Lakewood. Potential habitat and foraging opportunities occur on site and property similar for the Jabiru though the latter is locally more common. Limited LGA and other records indicates the species is at best a low chance of occurrence.

	corner of NSW and Victoria.	
Comb-Crested Jacana (*Irediparra gallinacea*)	Deep, permanent water with surface/floating vegetation (eg Water Lily). Sedentary or locally nomadic. Forages on surface. Nest a raft in screened, emergent vegetation. Sensitive to water level changes and to disturbance. Breeds in response to rising water level Sep-Jan.	All dams on the property do not have sufficient floating/surface vegetation as preferred by this species. Large dams at best very marginal. Not recorded in locality and overall a very low to unlikely potential of occurrence.
Black Bittern (*Dupetor flavicollis*)	Coastal waterways and rivers lined with mangroves etc; denser paperbark woodlands near coastal swamps.	Not recorded in locality. Large dams offer limited potential as restricted cover and few trees to roost in near water. Duchess Gully (estuarine portion) is considered structurally suitable though best habitat occurs downstream of property. Low potential to occur on property but low to fair chance to occur downstream of property in Duchess Gully using it as non-breeding habitat as part of wider range.
Australasian Bittern (*Botaurus poiciloptilus*)	Extensive dense reedbeds and wetland margins.	Recorded in locality but not recorded on site or property. As for Black Bittern.
Painted Snipe (*Rostratula benghalensis*)	Prefers shallow, freshwater swamps and bogs. Most active at night, feeding on aquatic insects, grasshoppers, crickets, earthworms and various plant seeds. Usually solitary and nomadic.	Not recorded in locality, on site or property. Marginal potential habitat property in southern areas and sedge land during wet periods. Very low to unlikely chance of occurrence on property due to rarity of this species in the region.
Little Tern (*Sterna albifrons*)	Nests on beaches and sandy inlets in colonies. Feeds on wet intertidal flats on molluscs and crustaceans.	No suitable habitat on the site or property. Recorded within 10km. Unlikely to occur on site or property.
Blue-Billed Duck (*Oxyura australis*)	Inhabits deep freshwater marshes with dense vegetation; as well as more open waters in non –breeding season. Has been recorded in larger tertiary treatment ponds in sewage treatment works.	Not recorded site or property but recorded in the locality. Large dams to south are considered structurally suitable in broad terms though increased human presence to south may be a deterrent to its use. Unlikely to marginally fair potential occurrence in large dams using for non-breeding opportunistic foraging habitat.
Freckled Duck (*Stictonetta naevosa*)	Usually in small groups. Nomadic, breeds in densely vegetated freshwater wetlands with thickets of small trees, usually in western NSW. After breeding, disperses to open fresh or saline water, often in eastern NSW. Breeds Sept-Dec or after flooding rain. Nests in tree, low over water. (Morecombe 2000)	Large dams on site considered at best marginal potential habitat offering some limited potential to support non-breeding foraging. However, not recorded by this or any previous surveys or in the locality. Very low to unlikely potential occurrence in study area.
Pied Oystercatcher (*Haematopus longirostris*)	Beaches, sandy-shored bays, estuaries, exposed sand bars and mudflats.	As for Little Tern.
Sooty Oystercatcher (*H. fuliginosus*)	Mainly forages on rocky foreshores, reefs, wave-cut platforms, coral reefs and stony beaches. Rarely seen on sandy beaches. Eats limpets, periwinkles, bivalves and mussels. Breed on off-shore islands adjacent to non-breeding foraging grounds.	As for Little Tern, though not recorded in locality.
Eastern Chestnut Mouse (*Pseudomys gracilicaudatus*)	Appears to prefer heathland especially dense wet heath and swampy areas. Also recorded from mid-elevation grasslands, open dry and wet sclerophyll woodland. In the Port Macquarie area, associated with heathland with dense shrub layer of *Banksia ericifolia*, *B. serratifolia, Xanthorrhoea* spp, *Dillwynia floribunda, Boronia spp*, *Leptospermum flavescens* and *Melaleuca nodosa*. Requires specific fire regime and often colonises areas post fire.	Recorded on property but not site.

Long-Nosed Potoroo (*Potorous tridactylous*)	Coastal heath and shrublands; paperbark forest; woodland with dry heathy understorey; high elevation rainforest or moist hardwood forest; moist shrublands with dense or moderately dense understoreys and sedge-dominated groundcover; wet or dry sclerophyll forests where average annual precipitation exceeds 760mm. Requires thick groundcover for refuge, while foraging in open areas on ridges, slopes or gullies, typically on ecotones, and prefers sandy soils for digging. Eats roots, tubers, fungi, fleshy fruits, leaves, insects and other soil invertebrates. Optimum habitat generally considered a mosaic of regenerating dense understorey vegetation as result of patchwork of periodic low to medium intensity fires.	Not recorded on site, property or in locality. Dune Scrub on property offered marginal potential habitat, however extremely limited in extent and overall habitat in area fragmented and relatively isolated. Feral predators also present. Overall unlikely potential occurrence.
Koala (*Phascolarctos cinereus*)	Areas where preferred food species occur in sufficient concentrations and diversity, and generally on more fertile soils.	Previously recorded on property. Property contains Core Koala Habitat with Potential Koala Habitat also occurring on site and property.
Common Planigale (*Planigale maculata*)	Wide variety of habitats. Preference for areas of dense groundcover due to heat/dehydration problems. Often found on ecotones of dry/wet habitats.	Recorded on property but not site.
Brushtailed Phascogale (*Phascogale tapoatafa*)	Range of forest habitats but prefers drier sclerophyll forest. Requires tree hollows for nesting. Has been recorded in swamp forest. Phascogales reportedly have a large home range (20-100ha), generally exclusively occupied, other studies in areas of limited habitat may be much smaller eg this consultant has recorded several individuals within 8.7ha (Berrigan 2000a, 2000b) and <30ha (Berrigan 2003a).	Dry sclerophyll forest on the property in the southeast continuous with similar vegetation around the STP considered to offer the best potential habitat for this species. Rest of property's forested habitats considered at best marginal due to small extent, high levels of modification and risk of predation. Not recorded during survey or any previous surveys. Recorded in locality but not by surveys in northeast Bonny Hills or in forest along coastal strip adjacent to property. Overall a very low to unlikely potential of occurrence on property, at most an infrequent dispersing sub-adult.
Spotted-Tail Quoll (*Dasyurus maculatus*)	Various forested habitats with preference for dense forests. Requires tree hollows, hollow logs or caves for nesting. Large home range (>500ha) and may move over several kilometres in a few days.	Recorded in the locality. Property overall offers very marginal habitat as majority is open pasture, and limited extents of forest have low abundance and diversity of prey. Linkage to property from other habitat also tenuous, hence not likely to form regular part of home range. Presence of competitive feral predators. Not recorded on site or property. Considered unlikely to very low chance of occurrence.
Yellow-Bellied Glider (*Petaurus australis*)	This arboreal species feeds on honeydew, arthropods, pollen and sap of eucalypts (depending on the phenology of the forest), which generally restricts it to mature, tall eucalypt forests in temperate and sub-tropical regions with high rainfall. Occurrence is significantly influenced by the presence of a mosaic of species with overlapping flowering periods and bark shredding into long strips to provide foraging habitat for arthropods. Territory is large, around 35-65ha, being occupied by small family groups. Multiple large hollows are required for nesting and roosting. Suitable sap species and smooth-barked eucalypts with bark that peel in strips are considered most important for foraging for arthropods.	Not recorded on site or property but has been recorded in the locality <1km from site. The property has some relatively isolated patched of structurally suitable habitat including preferred sap species, and some hollows, however interconnectivity between habitats on property and adjacent lands would preclude this species. Overall considered unlikely potential occurrence.

Squirrel Glider (*P. norfolcensis*)	Dry, open forest and woodland, and occasionally wet eucalypt and rainforest. Most common in floriferous sub-coastal and coastal forests within abundant Winter flowering trees and shrubs. Most commonly recorded along the coastal margin where Banksias dominate the understorey. Home ranges of 2-4ha (densities approximately 0.9-1.5 individuals/hectare), which overlap with other groups to form a local population (suggesting low territoriality except in core areas of habitat), which also overlaps with Sugar Gliders. Gilmore and Parnaby (1994) report a home range of 20-30ha, suggesting home range may be determined by habitat quality. A range of 0.65-8.55ha is considered a general guide (NPWS 1999). Breeding occurs throughout the year, depending on food availability, with high mortality within the first 12 months.	Not detected on site or property by this survey but has been observed in contiguous habitat to the southeast around the STP hence likely to use the DSF D. Winter flowering species such as Swamp Mahogany are also prevalent in this area in the adjacent Disturbed/Regrowth Swamp Forest. Due to proximate records the species is considered at least a fair chance of occurrence in the southeast adjacent to the site.
Eastern Pygmy Possum (*Cercartetus nanus*)	Found in rainforest, sclerophyll forest, woodland and tree heath. Predominantly nectarivorous (opportunistically insectivorous and also eats fruits during flowering lulls) feeding on Banksias, Leptospermum, Melaleucas, Eucalypts and Callistemons. Nest in very small hollows, or within bark/leaf nests in tree forks (eg Melaleucas and Banksias), Myrtaceous shrubs, abandoned bird nests or under loose eucalypt bark. Often Winters in torpor.	Recorded in the locality but not on site or property. Potential habitat on property occurs in the DSF D and Dune Scrub given abundance of Banksias in this area and in adjoining habitat. The subject land and general area has been subject to an extensive disturbance history and the species is considered a unlikely occurrence on site and a very low to marginally fair potential of occurrence on the property.
Grey-Headed Flying Fox (*Pteropus poliocephalus*)	Nomadic, roosting in camps. Camps often located near rivers and in subtropical rainforest, wet sclerophyll forest, melaleucas, casuarinas or mangroves. Feeds on nectar, pollen, flowers and fruit of rainforest trees, vines, Melaleucas, eucalypts and banksias, and occasionally exotic species eg Camphor Laurel and orchard fruits.	Recorded on property by the survey. Property forms part of general foraging range. No likely roosting habitat on site or property.
Queensland/Common/Eastern Blossom Bat (*Syconycteris australis*)	Found in well-timbered habitats. Roosts in rainforest and wet sclerophyll forest. Feeds in heathlands and paperbark swamps up to 4km from roost. Key food species include Banksia, Melaleucas, Callistemons and Bloodwoods.	Not recorded on site or property (though not specifically targeted). Recorded roosting in adjacent littoral rainforest by other study. No likely roosting habitat present on property – very marginal in Wet Sclerophyll. Forest Red Gums offer marginal potential forage – other parts of property may form small part of local range which is likely to be focussed on Banksia scrub north of Lake Cathie. Low to fair chance of seasonal occurrence on site as forager.

Dwyer's Bat/Large Eared Pied Bat (*Chalinobus dwyeri*)	Found in moderately wooded habitats such as dry sclerophyll forest, tall open eucalypt forests, woodlands, sub-alpine woodlands, edge of rainforest and wet sclerophyll forest. Roosts in caves, mines and abandoned bottle-shaped mud nests of Fairy Martins. In caves and mines, tend to roost in twilight sections near entrance. Insectivorous but habits poorly known. Fly relatively slowly, direct and manoeuvrable, low to ground or 6-10m above ground.	Not recorded on site, property, locality or LGA and few regional records. General foraging preferences of this poorly known species suggests that the property may contain some small areas of marginally suitable habitat. No caves, mines, etc on property for roosting. Not recorded within 10km radius of site (or in the LGA). Likelihood of occurrences is considered very low to unlikely.
Yellow-Bellied Sheathtail Bat (*Saccolaimus flaviventris*)	Ecology poorly known. Found in almost all habitats, particularly wet and dry sclerophyll forests and woodlands below 500m altitude, and also open woodland, Acacia shrubland, mallee, grasslands and desert. Roosts mainly in tree hollows, but also under bark, under roof eaves and in other artificial structures. Fast flying species, believed to forage above the canopy or closer to the ground in open areas. Insectivorous. May be Summer migrant.	Property and site offers a range of potential foraging opportunities. Tree hollows on property may also provide some roosting opportunities, while decorticating bark may provide some temporary non-breeding roosting habitat in the dry Blackbutt forest. Not recorded in locality or during this or previous surveys on subject land but recorded in and near Port Macquarie. Considered a low to fair potential of occurrence.
Greater Broad Nosed Bat (*Nycticeius rueppellii*)	Forages over range of habitats including rainforests and moist forests, but prefers ecotones between riparian forest, woodland and cleared land. Requires sparse understorey and will forage over water. Roosts in tree hollows. Feeds on larger insects, small vertebrates and perhaps other bats.	Site and property contain potential foraging opportunities. Tree hollows on site and property may also provide some roosting opportunities. Not recorded by the survey but does occur in the locality. Considered a fair occurrence on site and property.
Common Bent-Wing Bat (*Miniopterus schreibersii*)	Habitat generalist - forages above well-forested areas, Banksia scrub and woodland. Roosts in old buildings, caves, mines etc. Dependant on nursery caves and communal roosts.	Not recorded on site, property but has been recorded in locality. Property offers potential foraging resource. A marginal potential roost site occurs on the property in farm buildings though tree hollows may provide some better non-breeding roosting opportunities. Considered at least fair chance of occurrence on the property.
Little Bent-Wing Bat (*M. australis*)	Forages above and below canopy of well-forested areas and woodlands. Roosts in old buildings, caves, mines etc, but also detected using tree hollows and banana bunches. Dependant on nursery caves and communal roosts.	Recorded as a "*confident'* passing on site and other part of property. Foraging and roosting opportunities as for the Common Bent-Wing.
Southern Myotis/Large-Footed Mouse-Eared Bat (*Myotis macropus/M. adversus*)	Tunnel, cave, bridges, old buildings, tree hollows, bird nests and dense foliage roosting bat which prefers riparian habitat over 500m long with nearby roosting habitat. Key habitats are streams, rivers, creeks, lagoons, lakes and other water bodies. Feeds on aquatic insects and small fish.	Not recorded on site, property but "probably" recorded in locality. Potential habitat occurs along Duchess Gully, over dams and over ephemeral water on disturbed sedgeland, with potential roosts in tree hollows. Overall thus low to fair chance of occurrence on some part of property.
Eastern Freetail Bat or Eastern Little Mastiff-Bat (*Mormopterus norfolkensis*)	Specific habitat requirements of this species are poorly known. Has been recorded in habitats ranging from rainforest to dry sclerophyll and woodland, with most recorded in the latter (State Forests 1995, Allison 1991). Roosts in small colonies under tree hollows and under loose bark; has been found under house eaves, in roofs and metal caps on telegraph poles. Recorded roosting in roof in Hat Head village. Probably forages above forest or woodland canopy, and in clearings adjacent to forest. Most records are of single individuals, and is likely to occur at low densities over its range.	Property offers range of potential foraging habitat over forests and in adjacent cleared land. Site offers marginal potential as foraging resource over cleared land adjacent to forest. Tree hollows may also provide some roosting opportunities on site and property, while decorticating bark may provide some temporary non-breeding roosting opportunities in the dry Blackbutt forest. Considered a fair chance of occurrence on property and a low to fair occurrence on site.

Eastern False Pipistrelle (*Falsistrellus tasmaniensis*)	A large vespertilionid which feeds on moths and insects. Known to roost in caves, abandoned buildings, but mostly in trees hollows higher rainfall forested areas. It is suspected that some populations migrate in Winter from higher altitudes to coastal areas, or may simply enter torpor. Prefers tall forests (>20m high) and extensive movements (eg 12km recorded between foraging and roost sites). Recently recorded in Thrumster west of Port Macquarie.	Not recorded on site, property or in locality. The history of disturbance on the property has excluded or severely reduced tall (>20m) forested areas as preferred by the species. Property offers some potential roosting in farm buildings and perhaps hollows. Overall considered a low potential of occurrence on property (including the site).
Eastern Cave Bat (*Vespadelus troughtoni*)	Rare and poorly known bat. Cave dwelling bat roosting in small (5) to large (500) groups in sandstone overhang caves, boulder piles, mines, tunnels and sometimes buildings. Tend to roost in well lit portions of caves in avons, domes, cracks and crevices. Inhabits tropical mixed woodland and wet sclerophyll forest on the coast and dividing range, but extend into drier forest on western slopes and inland areas.	Not recorded on site, property or in locality. Property may contain some marginal potential foraging habitat but does not contain suitable roosting habitat. Considered unlikely to very low potential occur on site or property. More likely to use extensive forest to west closer to potential roosts in Jolly Nose.
Beccari's Freetail Bat (*M. beccarii*)	Wide range of habitats from rainforest, floodplains, tall open forest, savannah woodlands, arid shrublands and grasslands. Commonly caught along watercourses, over water and over canopy as prefers areas free of obstructions due to low manoeuvrability. Feeds above canopy in fast flight but agility on ground suggests ability to forage on flightless insects. Very few records in NSW – sporadic and possibly Summer nomadic.	Not recorded on site, property or in locality though unconfirmed record near Herons Creek. Property and site offers structurally suitable foraging habitat for this species in broad terms with hollows offering potential roosts. Given very few records south of north coast of NSW, considered very low to unlikely chance of occurrence.
Three-Toed Snake-Tooth Skink (*Coeranoscincus reticulatus*)	Poorly known ecology. Found in moist layered forest, closed forest and tall open forest (Cogger 1993). Soil type appears important – rich dark or loamy basaltic soils (SFNSW 1994). Also recorded in closed forest on silica dunes, coastal eucalypt woodlands on sand, and in logged forest with tall softwood regrowth. Usually found under leaf litter, moist rotting logs, or loose friable soil.	Not recorded on site, property or in locality. Extremely marginal potential habitat in limited areas of DSF D and perhaps Dune Scrub, but limited leaf litter in the latter, plus long history of habitat disturbance over general area considered likely to have excluded potential to occur. Unlikely to occur given lack of local records and disturbance history of the subject land.
Stephen's Banded Snake (*Hoplocephalus stephensii)*	Inhabits variety of habitats over large tracts including dry rainforest, sub-tropical rainforest, wet and dry sclerophyll, rocky outcrops (especially granite and sandstone) - requires close proximity to variety of vegetation formations. Nocturnal and primarily arboreal - sheltering under decorticating bark, within tree scars, hollows, logs, rock crevices and slabs. Active predator of variety of vertebrates including geckos, skinks, frogs, small mammals, bats, birds	Not recorded on site, property or in locality. In broad structural terms the property (including the site) contains some vegetation communities that may be potentially suitable (predominantly the dry sclerophyll forest). However the subject land has been subject to an extensive disturbance history and habitats are largely isolated. Not detected on the subject land (though extremely difficult to detect) or in the locality. Very low to unlikely potential to occur due to disturbance history and lack of local records.
Pale-Headed Snake (*Hoplocephalus bitorquatus*)	Wet and dry sclerophyll, preferring those with *Callitrus* spp, riparian vegetation, and occasionally rainforest. Terrestrial and semi-arboreal predator of small vertebrates (mainly lizards and frogs, small mammals and probably co-habitating bats). Shelters under decorticating bark and within hollows especially close to watercourses.	As for Stephen's Banded Snake.
Wallum Froglet (*Crinia tinnula)*	Predominantly confined to acidic paperbark swamps of coastal areas (Cogger 1992). Also found in wet heathland and Melaleuca sedgelands. Recorded breeding in flooded pasture adjacent to paperbark swamp (Berrigan 2002a).	Recorded in disturbed wetland and drain on property

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Giant Barred Frog (*Mixophyes iteratus)*	Moist hardwood forest, Antarctic Beech and rainforest near flowing streams. May also occur in coastal riverine rainforest and riparian vegetation. Forages in areas adjacent to riparian zones. Males call from under leaf litter or rocks by flowing streams. Eggs laid at streamside to await washing into stream by rainfall.	Not recorded on site, property or in locality. No suitable habitat on site or property. Very unlikely to occur.
Barred Frog *(M. balbus)*	Found in wet forest usually above 100m, predominantly near slow-flowing mountain streams. Also found in moist gullies within areas of dry forest, where it may utilise very small, hardly flowing trickles of water (Tyler 1997).	As for *M. iteratus*. Very unlikely to occur.
Green and Golden Bell Frog (*Litoria aurea*)	Found in large permanent swamps and ponds where no Plague Minnow (*Gambusia affinis)* and little macro-algae. Requires emergent vegetation, grass tussocks or rocks for shelter. May use disturbed sites opportunistically - may depend on seral stages. Eats insects and other frogs.	Not recorded on site, property or in locality – nearest records near northern end of Lake Innes NR. Some broadly suitable potential habitat in dams on property but infested with Plague Minnow and subject to high predation by waterfowl.. Given the disturbance history of the subject land, the rarity of this species in the region and the failure to detect it in three separate surveys it is considered a unlikely occurrence.
Green Thighed Frog (*Litoria brevipalmata*)	Poorly known. Found in range of habitats such as warm temperate open forest, rainforest, and forestry dams in dry, open forest, dry sclerophyll forest with swamp forest drainage lines; breeding aggregations around oxbow lakes, ditches, flooded paddocks, overflows and grassy semi-permanent ponds. Males call only for few days after Spring and early Summer rains. Possibly a lowland forest ground-dweller.	Occurring in the locality but not on the study site or property. At times habitat generalist requirements suggest property (including the site) may offer some at least structurally suitable habitat for this species. However the potential for this species to occur is limited by the disturbance history and the failure to detect it in targeted searches in three separate surveys. Unlikely chance of occurrence.
Olongburra Sedge Frog (*Litoria olongburensis*)	Apparently restricted to marshes and swamps with emergent vegetation, and often associated with tannin-stained, acidic water.	Not recorded on site, property or in locality. Some marginal potential habitat in disturbed sedgeland and wetland, and low lying plains on property, however not detected by 3 surveys and very few records south of Coffs Harbour. Given the disturbance history of the subject land and the rarity of this species in the region it is considered an unlikely occurrence.