55 Coonara Avenue, West Pennant Hills – MNES Impact Assessments

BACKGROUND

Impact assessments are provided here for Matters of National Environmental Significance (MNES) that have been recorded on or near the Current Development Area footprint, and whose habitat may be directly or indirectly impacted by works, being the:

1. Critically Endangered Ecological Community Blue Gum High Forest (BGHF)
2. Critically Endangered Ecological Community Turpentine-Ironbark Forest (TIF)
3. Endangered fauna species *Pommerhelix duralensis* Dural Land Snail
4. Endangered fauna species *Callocephalon fimbriatum* Gang-gang Cockatoo
5. Endangered fauna species *Dasyurus maculatus maculatus* Spotted-tailed Quoll (SE mainland population)
6. Vulnerable fauna species *Pteropus poliocephalus* Grey-headed Flying-fox
7. Vulnerable fauna species *Calyptorhynchus lathami lathami* Glossy Black-Cockatoo
8. Vulnerable fauna species *Hirundapus caudacutus* White-throated Needletail
9. Vulnerable flora species *Syzygium paniculatum* Magenta Lilly Pilly

This impact assessment has been undertaken according to relevant guidelines (Department of the Environment 2013) using the applicable Significant Impact Criteria.

Blue Gum High Forest of the Sydney Basin Bioregion

ECOLOGICAL PROFILE

Blue Gum High Forest (BGHF) of the Sydney Basin Bioregion is listed as Critically Endangered under the Schedules of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). It is also listed as a Critically Endangered Ecological Community (CEEC) under Schedule 2 of the NSW *Biodiversity Conservation Act 2016* (BC Act).

Occurrences of this community must satisfy certain condition criteria to qualify under the EPBC Act. As per the Approved Conservation Advice (DoE, 2014a) for BGHF, to be considered as part of the Commonwealth listed entity of Blue Gum High Forest, an occurrence is to :

- Be greater than 1 hectare in size; and
- Have a canopy cover greater than 10%; or
- Have a canopy cover less than 10% and occur in areas of native vegetation in excess of five hectares.

The Listing Advice for BGHF (Threatened Species Scientific Committee, 2005a) further states that Remnants of the Blue Gum High Forest of the Sydney Basin Bioregion ecological community will typically have components representing the characteristic native species of all structural layers.

While single isolated trees or stands of trees of characteristic canopy species are considered important as biodiversity reservoirs, these areas fall outside the Commonwealth definition of this ecological community due to their severe disturbance and modification (Threatened Species Scientific Committee, 2005a).

The ecological community under the EPBC Act (DoE, 2014a) comprises a tall canopy of dominant trees that may reach a height of over 30 metres, above a midstorey of shrubs and small trees over a diverse ground layer, commonly with ferns. The tree canopy dominated by *Eucalyptus pilularis* (blackbutt) and/or *Eucalyptus saligna* (Sydney blue gum). Other canopy trees that may be present, but are not dominant, include: *Angophora costata* (Smooth-barked Apple) and *Eucalyptus paniculata* (Grey Ironbark). A relatively diverse stratum of small trees is usually present, including *Pittosporum undulatum* (Sweet Pittosporum), *Elaeocarpus reticulatus* (Blueberry Ash) and *Allocasuarina torulosa* (Forest oak. Shrub species are typically mesic and include species such as *Breynia oblongifolia* (Coffee Bush), *Pittosporum revolutum* (Rough-fruited Pittosporum), *Clerodendrum tomentosum* (Hairy clerodendrum), *Notelaea longifolia* (Mock Olive) and *Polyscias sambucifolia* (Elderberry Panax). The ground stratum is often dense and contains a mixture of herb, grass and fern species including *Adiantum aethiopicum* (Maidenhair Fern), *Entolasia marginata* (Bordered Panic), *Lomandra longifolia* (Spiny-headed Mat-rush), *Dianella caerulea* (blue flax-lily) and *Oplismenus imbecillis.* Vine species are also frequently present, in particular *Tylophora barbata* (Bearded Tylophora), *Eustrephus latifolia* (Wombat Berry), *Clematis aristata* (Australian Clematis) and *Pandorea pandorana* (Wonga Wonga Vine).

The main threat to this community is further clearing for urban development and subsequent impacts of fragmentation, understorey disturbance such as mowing that stops regrowth, urban run-off that leads to increased nutrients, sedimentation and weed invasion and inappropriate fire regimes (OEH, 2011).

The extent of this community on the Property, as per the assessment by Cumberland Ecology, totals 5.49 hectares and is directly and functionally connected to other native vegetation on the Property and in the local area, including a larger patch of BGHF in Cumberland State Forest directly to the east. The condition of BGHF within the property occurs in two broad states - i) a good condition state

(incorporating vegetation zones VZ5b and VZ5c as per the Concept Masterplan BDAR) with a variety of canopy trees over a diverse native understorey with scattered weedy patches and ii) a modified/weedy state (incorporating vegetation zones VZ5a and VZ3a as per the Concept Masterplan BDAR) comprising generally only *Eucalyptus saligna* trees over significant weed infestations with only scattered occurrences of common native understorey species.

Photograph 1 Good condition BGHF south of the perimeter road of the Current Development Area

Photograph 2 Dense weed infestation under BHGF canopy trees in northern parts of the Property (Remapped areas of VZ5a)

The current total geographic extent of BGHF varies depending on the source interrogated. The current extent of BGHF in the NSW Threatened Biodiversity Database collection (EHG, 2023d) is listed as less than 200 ha in the year 2000, while Bionet Classification System (EHG, 2023a) estimates the current area of occupancy of the community as 180 ha.

According to the Map of Critically Endangered Ecological Communities NSW Version 6 dated 25/02/2020 (DPIE, 2020) the extent of BGHF in NSW is approximately 758 ha. It is considered that this mapping is the most recent and comprehensive published mapping available and could be considered to be most accurate of the sources reviewed.

Mapping by Keystone Ecological for the Concept Masterplan BDAR shows that there is a total area of 108.93 hectares of BGHF within the local area (defined as a 1,000 hectare buffer around the assessed BDAR subject land), and 243.92 hectares of BGHF within the broader study area (defined as a 10,000 hectare buffer around the assessed BDAR subject land).

Therefore, the extent of BGHF on the Property is equivalent to:

- 0.7% of the total current extent of BGHF;
- 5.0% of BGHF within the local area; and
- 2.3% of BGHF within the broader study area.

The proposed action will require the removal and/or modification of ~0.31 ha of BGHF comprising ~0.02ha of good condition BGHF and ~0.29 ha of modified/weedy BGHF. Indirect impacts can be expected to occur along the interface between developed parts and BGHF.

IMPACT ASSESSMENT - Significant Impact Criteria for Critically Endangered or Endangered Ecological Communities

An action is likely to have a significant impact on a critically endangered, or endangered ecological community if there is a real chance or possibility that it will:

a) reduce the extent of an ecological community;

The proposed action will require the removal and/or modification for APZ purposes of ~0.31 ha of BGHF from the Current Development Area, comprising ~0.02ha of good condition BGHF and ~0.29 ha of modified/weedy BGHF, from a total of 5.49 ha currently mapped within the Property.

While the impacted areas of BGHF occur in two broad condition states, the areas proposed to be impacted show varied degrees of modification by past land uses. The BGHF understorey in the southern parts of the Current Development Area generally comprise weeds and scattered native species over a dense leaf litter along the edges of the existing perimeter road. The northern patch is highly modified as a result of historic clearing for orchards (see Attachment: Historic aerial imagery), past infrastructure installation, plantings, and invasive weeds.

As outlined in the assessment of onsite vegetation against EPBC thresholds (see Attachment_Cumberland Ecology Analysis of EPBC listed communities), the modified/weedy condition of BGHF is only considered as conforming to the EPBC listing of the community as a precautionary measure due to the lack of any defined threshold of native understorey percentage cover in legal documentation.

The total direct impact to ~0.31 ha of BGHF equates to

- ~5.5% of the total extent of this community on the Property;
- 0.04% of the total current extent of BGHF;
- 0.28% of BGHF within the local area; and
- 0.13% of BGHF within the broader study area.

While the clearing within the Current Development Area will result in a minor reduction in the extent of BGHF due to clearing and/or modification of ~0.31 ha (comprising ~0.02ha of good condition BGHF and ~0.29 ha of modified/weedy BGHF), under the Concept Masterplan VMP, existing areas of BGHF will be managed/enhanced while current exotic/landscaped areas will be revegetated to fully structured BGHF. Areas to be managed as BGHF under the Concept Masterplan VMP include:

- Management of ~0.8 ha of good condition BGHF;
- Enhancement of ~0.9 ha of poor condition BGHF; and
- Revegetation of ~ 0.4 ha of exotic and landscaped areas to fully structured BGHF

Further areas of existing BGHF will be managed/enhanced with further areas of BGHF replanting will be implemented under the Forestry VMP.

With due consideration to the proportion of BGHF to be cleared at various scales and the proposed enhancement/revegetation under the Concept Masterplan VMP, the reduction in the extent of BGHF due to clearing within the Current Development Area is not considered to be significant, especially as the majority of the area removed comprises vegetation in a highly degraded/weedy state.

b) fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines

Two of the major life cycle drivers that can be impaired by fragmentation are the prevention of the movement of pollinators and the interruption of the movement of propagules. The major pollinators of this community are highly mobile species (such as birds and bats) and the movements of these groups will not be impeded by the small loss of vegetation. Similarly, the removal of small areas at the edges of large expanses of BGHF will not impede movement of propagules of its constituent species.

The proposed scale of impact (small) and its location (at the edge of existing development) will not increase the fragmentation of this community or its habitat in any significant manner.

c) adversely affect habitat critical to the survival of an ecological community;

"Habitat critical to the survival" of a listed ecological community (Department of the Environment 2013) refers to areas that are necessary:

- for the long-term maintenance of the ecological community (including the maintenance of species essential to the survival of the ecological community, such as pollinators);
- to maintain genetic diversity and long term evolutionary development; or
- for the recovery of the ecological community.

Such habitat may be, but not limited to, habitat identified in a recovery plan for the ecological community as critical for that ecological community; and / or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act. No such critical habitat for this vegetation community has been declared or mapped.

Other critical features of the habitat for this community include abiotic factors such as the mix of appropriate soils, geology, topographic position, and rainfall. The proposed action will not interfere with this set of factors.

d) modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns;

Potential direct impacts to BGHF are small. In the southern part, it is limited to the edges of areas where existing stormwater infrastructure has been installed as part of the IBM development in the 1980s. In the northern part, it is limited to an area affected also by infrastructure easement works, as well as plantings and weeds.

The proposed action within the Current Development Area is restricted more or less to the existing developed footprint that was previously excavated for the business park and has sought to incorporate the existing stormwater controls with only minor alteration. Therefore, the existing drainage patterns of the Property will not be altered in any significant way.

The potential indirect impacts are restricted to the interface between the BGHF and the Current Development Area, which totals a length of approximately 745 metres of edge habitat. Relevant indirect impacts to abiotic factors arise principally from run off from the adjacent developed area. Any such impacts are already existing and will not be exacerbated by the proposed action.

Water sensitive urban design principles are an integral part of the stormwater control plans for the Current Development Area and includes upgrades to existing stormwater controls without significant expansion of their footprint. All additional stormwater control infrastructure are located outside of the BGHF areas, and are designed to deliver clean runoff to the riparian habitats and BGHF they support. Also, the proposed action includes conservation management of potential indirect edge effects on the adjacent vegetation by the implementation of the Concept Masterplan VMP.

e) cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting;

Life cycle drivers of the species that occur in communities such as this one include drought, fire, and other disturbances. Drought cycles will remain uncontrolled although the implementation of energy efficient residential design will contribute to an appropriate climate change response. The proposed action is unlikely to alter the fire regime currently experienced by the Property, as fire suppression will remain the main objective for the protection of developments on and off the Property.

The proposed action will result in direct impact to ~0.31 hectares of BGHF and potential indirect impact along ~745 metres of edge habitat. Disruption to such small areas are not considered to result in the decline of functionally important species. The conservation management of the retained areas of BGHF under community title will result in an improvement in the ecological functioning of BGHF as it will implement long term weed control.

f) cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:

i) assisting invasive species, that are harmful to the listed ecological community, to become established, or;

The BGHF on the Property is already significantly impacted by invasive weed species and feral species such as foxes and black rats are known to occur within the Property. The implementation of the approved VMP for these lands will reduce existing weed infestations and reduce the potential for future establishment of invasive species in the edge habitats. The Fauna management plan include protocols

to contain and remove feral species offsite if captured. Therefore, the proposed action is considered unlikely to assist further invasive species in becoming established.

ii) causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community;

The upslope and surrounding lands will continue to have hardstand and landscaped gardens, and so the potential for run-off of pollutants will remain. However, such potential impacts are controlled at the implementation of Water Sensitive Urban Design principles and minimum impact best practice stormwater management.

Herbicides will only be used where absolutely necessary, and only minimum impact techniques will be used such as targeted spot spraying or cut and paint. These matters will be addressed in the Landscape Plan (for landscaped areas) and in the VMP (for rehabilitation and conservation management of the retained native vegetation).

g) interfere with the recovery of an ecological community

The recovery of BGHF is greatly facilitated by the conservation zoning, proposed formal recognition and retention, and conservation management of 94% of BGHF on the Property, managed either under community title or as an addition to Cumberland State Forest. The areas of this community to be impacted have been modified and are not actively managed and continue to be impacted by previous and current land uses. Furthermore, any residual impacts will be offset in accordance with the BAM which will contribute to the recovery of the community. Therefore, the proposed action is not considered to interfere with the recovery of BGHF.

SUMMARY

The proposed action within the Current Development Area will result in direct impact to ~0.30 ha of BGHF around existing stormwater infrastructure in the south and for the main development footprint in the north. Existing indirect impacts along approximately 745 metres at the interface of BGHF and developed parts will continue. However, this potential direct impact is very small, and more than offset by the proposed retention of 94% of the BGHF on the Property as well as proposed enhancement/revegetation of existing BGHF; and the existing indirect impacts will be controlled principally by the implementation of the VMP.

Therefore, it is considered that a significant negative impact is unlikely to occur to BGHF.

Turpentine-Ironbark Forest of the Sydney Basin Bioregion

ECOLOGICAL PROFILE

Turpentine-Ironbark Forest (TIF) of the Sydney Basin Bioregion is listed as Critically Endangered under the Schedules of the EPBC Act. It is also listed as a Critically Endangered Ecological Community (CEEC) as Sydney Turpentine Ironbark Forest under Schedule 2 of the NSW BC Act.

The ecological community as listed under the EPBC Act is narrower in scope than the listing under the BC Act. The listing under the EPBC Act includes only remnant patches that meet specific patch size and canopy cover criteria (Department of the Environment, 2023)

As per the Approved Conservation Advice (DoE, 2014b) and the Listing Advice (Threatened Species Scientific Committee, 2005b) for TIF, to be considered as part of the Commonwealth listed entity of TIF, an occurrence is to:

- Contain some characteristic components from all structural layers (tree canopy, small tree/shrub midstorey, and understorey); and
- Tree canopy cover is greater than 10% and remnant size is greater than one hectare; or
- Remnants with tree canopy cover less than 10% are also included if the fragments are greater than one hectare in size and occur in areas of native vegetation in excess of 5 hectares in area.

While single isolated trees or stands of trees of characteristic canopy species are considered important as biodiversity reservoirs, these areas fall outside the Commonwealth definition of this ecological community due to their severe disturbance and modification (Threatened Species Scientific Committee, 2005b).

The ecological community under the EPBC Act (DoE, 2014b) comprises a canopy of eucalypts and related trees that may reach a height of over 30 metres, above a midstorey of shrubs and small trees over a ground layer of herbs and grasses. Some patches may show a woodland structure in response to site condition and disturbance history. The tree canopy is typically dominated to co-dominated by *Syncarpia glomulifera* (Turpentine) and various Ironbark species, such as *Eucalyptus paniculata* (Grey Ironbark), *Eucalyptus crebra* (Narrow-leaved Ironbark) and/or *Eucalyptus fibrosa* (Red Ironbark) depending on local site conditions. A stratum of small trees may occur, including *Pittosporum undulatum* (Sweet Pittosporum), *Trema aspera* (Native Peach) and *Acacia parramattensis* (Parramatta Wattle). Where present, a shrub layer may include *Polyscias sambucifolia* (Elderberry Panax), *Notelaea longifolia* (Mock Olive), *Leucopogon juniperinus* (Prickly Beard-heath), *Breynia oblongifolia* (Coffee Bush), *Maytenus silvestris* (Narrow-leaved Orangebark) and *Ozothamnus diosmifolius* (White Dogwood). The ground layer may include *Oplismenus aemulus* (Basket grass), *Pseuderanthemum variabile* (Pastel flower), *Echinopogon ovatus* (Forest Hedgehog grass) *Microlaena stipoides* (Weeping meadow grass) and *Themeda triandra* (Kangaroo grass).

Threats to this community include clearing for urban development, impacts from fragmentation, mowing, recreational disturbances (such as 4WD tracks), grazing, urban run-off that leads to increased nutrients and sedimentation, weeds and their inappropriate management, and inappropriate fire regimes (NSW Scientific Committee, 2019).

The extent of this community on the Property, as per the assessment by Cumberland Ecology, totals ~7.26 ha and is directly and functionally connected to other native vegetation on the Property and in the local area, including a larger patch of BGHF in Cumberland State Forest directly to the east. The condition of TIF within the Property occurs in two broad states - i) a good condition state (incorporating vegetation zone VZ6b as per the Concept Masterplan BDAR) with old growth trees over a diverse native

understorey with scattered weedy patches and ii) a regrowth/weedy state (incorporating vegetation zones VZ6a as per the Concept Masterplan BDAR) comprising younger regrowth over a mix of significant weed infestations and native understorey species.

Photograph 2 Good condition TIF in the southern parts of the Property

Photograph 2 Weedy TIF adjacent to historically cleared grassland areas in the Property

The current total geographic extent of TIF is largely consistent between different sources of information including the NSW Threatened Biodiversity Database collection (EHG, 2023d), the NSW Bionet Classification System (EHG, 2023a) and the Map of Critically Endangered Ecological Communities NSW Version 6

According to the Map of Critically Endangered Ecological Communities NSW Version 6 dated 25/02/2020 (DPIE, 2020) the extent of TIF in NSW is approximately ~911 ha. It is considered that this mapping is the most recent and comprehensive published mapping available and could be considered to be most accurate of the sources reviewed.

Mapping by Keystone Ecological for the Concept Masterplan BDAR shows that there is a total area of 24.28 ha of TIF within a 1,500 m buffer around the assessed BDAR subject land.

Therefore, the extent of TIF on the Property is equivalent to:

- 0.7% of the total current extent of TIF; and
- 29% of TIF within the 1,500m buffer area.

The proposed action will not require the removal of any of this community, although there is the potential for indirect impacts along the 195 metre-long interface with the patch of Vegetation Zone 6b at the south eastern corner of the perimeter road, and 80 metres along the edge of the narrow band of Vegetation Zone 6a along the western boundary of the Property.

IMPACT ASSESSMENT - Significant Impact Criteria for Critically Endangered or Endangered Ecological Communities

An action is likely to have a significant impact on a critically endangered, or endangered ecological community if there is a real chance or possibility that it will:

a) reduce the extent of an ecological community;

The proposed action will not directly impact any of the area occupied by TIF, and therefore will not reduce the extent of the community. Furthermore, under the Concept Masterplan VMP, ~0.28 ha of TIF will be managed/enhanced. Further areas of existing TIF will be also be managed/enhanced under the Forestry VMP.

b) fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines

As there will be no direct impact and loss of this community, there will be no increase in its fragmentation.

c) adversely affect habitat critical to the survival of an ecological community;

"Habitat critical to the survival" of a listed ecological community (Department of the Environment 2013) refers to areas that are necessary:

- for the long-term maintenance of the ecological community (including the maintenance of species essential to the survival of the ecological community, such as pollinators);
- to maintain genetic diversity and long term evolutionary development; or
- for the recovery of the ecological community.

Such habitat may be, but not limited to, habitat identified in a recovery plan for the ecological community as critical for that ecological community; and / or habitat listed on the Register of Critical Habitat maintained by the minister under the *EPBC Act 1999*. No such critical habitat for this vegetation community has been declared or mapped.

Other critical features of the habitat for this community include abiotic factors such as the mix of appropriate soils, geology, topographic position, and rainfall. The proposed action will not interfere with

this set of factors.

d) modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns;

While there will be no direct impacts to TIF, there is the potential for indirect impacts via edge effects along a 275 metre interface between TIF and the Current Development Area. However, any such impacts are already existing and will not be exacerbated by the proposed action.

The proposed action includes conservation management of potential indirect edge effects on the adjacent vegetation by the implementation of the Concept Masterplan VMP.

e) cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting;

Life cycle drivers of the species that occur in communities such as this one include drought, fire, and other disturbances. Drought cycles will remain uncontrolled although the implementation of energy efficient residential design will contribute to an appropriate climate change response. The proposed action is unlikely to alter the fire regime currently experienced by the Property, as fire suppression will remain the main objective for the protection of developments on and off the Property.

The conservation management if the retained areas of TIF under community title will result in an improvement in its ecological functioning as it will implement long term weed control.

f) cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:

i) assisting invasive species, that are harmful to the listed ecological community, to become established, or;

The majority of the TIF on the Property is already impacted by weed species to varying degrees and feral species such as foxes and black rats are known to occur within the Property. The implementation of the approved VMP for these lands will reduce existing weed infestations and reduce the potential for future establishment of invasive species in the edge habitats. The Fauna management plan include protocols to contain and remove feral species offsite if captured. Therefore, the proposed action is considered unlikely to assist further invasive species in becoming established.

ii) causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or;

The upslope and surrounding lands will continue to have hardstand and landscaped gardens, and so the potential for run-off of pollutants will remain. However, such potential impacts are controlled at the implementation of Water Sensitive Urban Design principles and minimum impact best practice stormwater management.

Herbicides will only be used where absolutely necessary, and only minimum impact techniques will be used such as targeted spot spraying or cut and paint. These matters will be addressed in the Landscape Plan (for landscaped areas) and in the VMP (for rehabilitation and conservation management of the retained native vegetation).

g) interfere with the recovery of an ecological community

The recovery of TIF is greatly facilitated by the conservation zoning, proposed formal recognition and retention, and conservation management of TIF on the Property, managed either under community title or as an addition to Cumberland State Forest. The areas of this community to be impacted have been modified and are not actively managed and continue to be impacted by previous and current land uses. Therefore, the proposed action is not considered to interfere with the recovery of TIF.

SUMMARY

The proposed action within the Current Development Area will result in potential indirect impact to 275 metres interface of TIF between it and the Current Development Area. Importantly, these are also existing indirect impacts and they will be controlled principally by the implementation of the VMP and other management plans

Therefore, it is considered that a significant negative impact is unlikely to occur to TIF

***Pommerhelix duralensis* Dural Land Snail**

ECOLOGICAL PROFILE

The Dural Land Snail is listed as Endangered under EPBC Act and the NSW BC Act. The species is a shale-influenced-habitat specialist, which occurs in low densities along the western and northwest fringes of the Cumberland IBRA subregion on shale-sandstone transitional landscapes (EHG, 2023d).

Pommerhelix duralensis is a woodland snail that favours sheltering under rocks or inside curled-up bark. It does not burrow nor climb. The species has also been observed resting in exposed areas, such as on exposed rock or leaf litter, however it will also shelter beneath leaves, rocks and light woody debris. It forages on hyphae and fruiting bodies of native fungi, and probably on other detritus of the forest floor (EHG, 2023d).

This species is known to occur within a number of National Parks and Council bushland reserves (NSW Scientific Committee 2016). Due to its occurrence in areas transitional between shale and sandstone, it is also associated with several endangered ecological communities that also occur in that ecotonal habitat, including Blue Gum High Forest, Cumberland Plain Woodland, Sydney Turpentine Ironbark Forest, and Shale Sandstone Transition Forest (NSW Scientific Commitee, 2016).

Threats to this species include land clearing for agricultural and urban development, habitat fragmentation, and inappropriate fire regimes (NSW Scientific Commitee, 2016; Threatened Species Scientific Committee, 2015).

Two empty shells of this species were found on the Property incidentally during other survey activities - one in the retained natural bushland adjacent to the south eastern corner of the former business park development, and the other at the base of the sandstone retaining wall on the eastern side of the multi-storey car park. These finds prompted additional targeted survey for this species, carried out by Dr Stephanie Clark, an accredited specialist in this fauna group.

This targeted survey concentrated in the areas to be impacted by the initial demolition works and in the Concept Masterplan footprint, as well as in natural bushland on the Property and in immediately adjacent parts of Cumberland State Forest. In total, approximately 4.3 hectares of vegetation was surveyed over two nights (3rd and 14th December 2020). A total of 18 live individuals of this species (comprising both adults and juveniles) were observed in the following 11 locations:

- 4 sites on and above the retaining wall to the north and east of the multi storey car park where one empty shell was found previously;
- 3 sites immediately adjacent and to the east of the car park in Cumberland State Forest;
- 1 site (and 1 individual) in the retained bushland where one empty shell was found previously;
- 1 site to the south of the works area in the retained bushland that is to be transferred to Forestry Corporation; and
- 2 sites in Cumberland State Forest beyond the Property to the south.

As survey conditions were not optimal as the rain that fell before and during survey was insufficient to moisten the leaf litter, the size of the population in the area surveyed is therefore considered to be larger than the 18 live animals observed.

The habitats across the Property were classified in terms of their suitability for this species and potential habitat was mapped in consultation with Dr Clark (see attached Concept Masterplan BDAR at Figure 26 (page 90) and the attached Demolition BDAR at Figure 15 (page 91)). As a result, a total of 12.81 hectares of potential habitat for this species was identified across the Property with an estimated

density of ~8 snails/ha as a minimum. Therefore, it is estimated that a total population size of about 102 individuals occur across the mapped habitat within the Property for this species.

However, the suitable habitat on the Property is directly connected to realised suitable habitat in Cumberland State Forest. This is in turn directly connected to potential and realised habitat to the south west and beyond, as individuals have also been found in bushland associated with Darling Mills Creek and its tributaries to the west and north west (personal communication Dr Stephanie Clark). The total area of connected bushland that potentially provides habitat for this species (including the Property) is therefore ~300 hectares; most of which is in reserved land or land otherwise zoned for protection.

Of the total 12.81 ha of mapped habitat, a total of ~0.31 ha occurs within the Current Development Area. Based on an estimate of ~8 individuals/ha, the impacted area of the Current Development Area can therefore be expected to contain 2 - 3 individuals. The proposed action will therefore remove only 2.4% of the habitat on the Property, and only 0.1% of the contiguous habitat judged to occur in the local area.

Although this is considered to be an insignificant impact to the population, a pre-clearing relocation protocol, similar to that implemented for works within the Demolition DA, will be implemented under the supervision of Dr Stephanie Clark prior to works, in order to prevent the loss of individuals. An exhaustive search under optimum conditions will be undertaken and all individuals will be collected and relocated to the closest suitable and secure habitat on the Property and / or in Cumberland State Forest. This protocol has been implemented successfully for this species by Dr Clark as an ameliorative measure for development projects in other locations. Further, it is proposed that the conservation management of the retained vegetation incorporate habitat enrichment for this population to ensure the success of the ameliorative measures.

IMPACT ASSESSMENT - Significant Impact Criteria for Critically Endangered or Endangered Species

An action has, will have, or is likely to have a significant impact on an Endangered species if it does, will, or is likely to:

a) lead to a long-term decrease in the size of a population of a species

The current proposed action l has the potential to impact on approximately 2 - 3 individuals of a population in the immediate area that is likely to be approximately 102 individuals. Although the population may be able to withstand this loss, it is proposed to relocate any and all Dural Land Snails found in suitable habitat in the works area in accordance with an approved relocation protocol.

It is considered therefore that the loss of ~0.31 ha of suitable habitat within the Current Development Area will not lead to a long- term decrease of a population of this species.

b) reduce the area of occupancy of the species

The Area of Occupancy (AOO) of this species has been calculated at approximately 638 km² (63,800 ha) (Threatened Species Scientific Committee, 2015), although it is likely to be smaller than this due to subsequent ongoing clearing after the estimate was made.

The proposed action will reduce the area of habitat within the Property by ~0.31ha which comprises 2.4% of the habitat within the Property and 0.001% of the total AOO.

This reduction is not considered to be a significant loss of habitat, particularly as existing habitat will be managed/enhanced and further areas of habitat will be revegetated under the VMP.

c) fragment an existing population into two or more populations

The location of habitat to be removed is restricted to lands immediately surrounding existing development that have been previously modified for the previous development works of the IBM site. Connecting habitats across the Property will be retained.

The spatial configuration of the loss will not divide otherwise uninterrupted bushland and therefore is unlikely to fragment the existing population into two or more populations.

d) adversely affect habitat critical to the survival of a species

"Habitat critical to the survival" of a listed endangered species (Department of the Environment 2013) refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal;
- for the long-term maintenance of the species (including the maintenance of species essential to the survival of the species, such as pollinators);
- to maintain genetic diversity and long term evolutionary development; or
- for the reintroduction of populations or recovery of the species.

No critical habitat for this species has been formally declared. The suitable habitat to be impacted by the proposed action is small (~0.31 hectares) and is comprised almost exclusively of landscaped gardens dating from the 1980s. Notwithstanding its size, this area of habitat is considered likely to support approximately 2 - 3 individuals of an immediate population of 102 individuals. The resident snails will be relocated into adjacent secure habitat, and so the population size is unlikely to be reduced.

This small garden area is unlikely to constitute habitat critical to the survival of the species.

e) disrupt the breeding cycle of a population

The population observed on and around the Property are considered to be breeding, as both adults and juveniles were observed. Little is known about the factors that influence their breeding cycle, except that they lay eggs after rain. Presumably nest sites for egg-laying and development are important, and that they would need to be sheltered from predators and desiccation.

Habitat features that may contribute to breeding habitat in the impact area will be searched thoroughly for eggs and important elements (such as logs) will be retained and relocated to enrich the areas into which individuals will be relocated.

These actions are considered adequate to ameliorate any likely impacts on the breeding cycle of the small number of animals that may occur within the works area, as it has been implemented for other development projects.

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

In the context of the extensive areas of retained habitat and their condition, zoning, and tenure, the areas of proposed loss are very small and insignificant.

The loss of ~0.31 hectares of mostly landscaped garden will not significantly decrease the availability of habitat on the Property to any appreciable extent. The proposed losses of habitat are not of a scale or

in a location likely to lead to a decline of this species.

g) result in invasive species that are harmful to an Endangered species becoming established in the Endangered species' habitat

The proposed action will not further increase the likelihood of invasive species as it will implement weed control measures around the demolition footprint as part of a Construction Environmental Management Plan and the VMP for the retained vegetated areas. feral species such as foxes and black rats are known to occur within the Property. The implementation of the approved VMP for these lands will reduce existing weed infestations and reduce the potential for future establishment of invasive species in the edge habitats. The Fauna management plan include protocols to contain and remove feral species offsite if captured. Therefore, the proposed action is considered unlikely to assist further invasive species in becoming established

h) introduce disease that may cause the species to decline, or

There are no recorded diseases to which this species is susceptible. Best practice hygiene controls will be applied as part of a Construction Environmental Management Plan and VMP.

i) interfere with the recovery of the species.

There is no recovery plan or threat abatement plan for this species. The proposed action will implement pre-clearing survey protocols and a VMP that will implement suitable management and recovery activities on the Property for this species.

SUMMARY

A total of 18 individuals were recorded in 11 locations, including sites within Cumberland State Forest. The proposed action will remove ~0.31 ha of suitable habitat from a total of 12.81 has of identified suitable habitat within the Property. These habitats are also well-connected with other off- site patches of realised and potential habitat, extending to an estimated uninterrupted area of habitat of ~300 hectares.

The clearing and construction works will include fauna sensitive controls to be included in a Construction Environmental Management Plan. A relocation protocol for this species is to be implemented as part of a Fauna Management Plan prior to works commencing and a VMP will be implemented to provide ongoing management of suitable habitat on the Property.

It is considered that the loss and modification to a relatively small area of suitable habitat is unlikely to result in a significant adverse impact on this species.

***Callocephalon fimbriatum* Gang-gang Cockatoo**

ECOLOGICAL PROFILE

The Gang-gang Cockatoo is listed as Vulnerable under Schedule 1 of the NSW BC Act and Endangered under the Schedules of the EPBC Act.

The Gang-gang Cockatoo is a medium-sized slaty grey cockatoo. Both sexes have a crest and the head of the male is scarlet. It is distributed from southern Victoria through eastern parts of New South Wales northward to the Hunter region, although isolated records are known from as far north as Coffs Harbour (NSW Scientific Committee, 2005).

This species exhibits seasonal movements, where it is an altitudinal migrant. They are also known to undertake nomadic as well as directed seasonal movements. In summer, it occupies the tall montane forests and woodland, particularly in heavily timbered and mature wet sclerophyll forests with dense, shrubby acacia and banksia understories, and often in secluded valleys (DAWE, 2022). In winter, it relies on drier more open eucalypt forests (such as box-ironbark) and woodlands at lower altitudes (DAWE, 2022).

Gang-gang Cockatoos feed on flower buds, leaf buds, blossoms, fruit, and seeds of both native and introduced trees and shrubs, with a preference for eucalypts, wattles and introduced hawthorns (DAWE, 2022). The Conservation Advice (DAWE, 2022) identifies all natural foraging habitat exploited during the breeding and non-breeding season as habitat critical to the survival of this species. The Conservation Advice specifically excludes exotic feeding grounds such as ornamental trees, shrubs, and hedges within urban and suburban areas.

Nest sites are usually located in tall mature sclerophyll forests that have a dense understorey, commonly in live trees close to water. Hollow entrances are located from 5 to 10 metres above the ground, with an entry size of approximately 21 x 13 centimetres. This reliance on stands of large hollow-bearing trees for breeding makes such habitat critical to its survival (DAWE, 2022).

Threats to this species include (DAWE, 2022; NSW Scientific Committee, 2005):

- Inappropriate fire management through direct mortality, loss of nesting sites, reduction in available forage, and exposure to other threatening processes such as predation;
- Warming climate that increases water requirements and decreases survival rates due to heat exhaustion;
- Altered rainfall patterns with concomitant impacts on flowering patterns of their food species and bushfire hazards;
- Increased competition for hollow-bearing trees;
- Nest predation by Common Brushtail Possum;
- Psittacine beak and feather disease; and
- Habitat loss through clearing.

When considering potential impact to potential or realised habitat, surveys for occupancy should be conducted at the appropriate times of the year for that area, and the quality of the foraging habitat should be determined in accordance with the availability of preferred foraging species. If removal of critical habitat features cannot be avoided or mitigated, then such impacts must be offset (DAWE, 2022).

This species was not recorded on the Property during survey and has been recorded once in Cumberland State Forest in 2019 despite the repeated formal and informal surveys on the Property and

in the adjacent forest over many years by experienced birdwatchers and professional ecologists. Therefore, despite the proximity to the area known to support the Endangered Population (in Hornsby and Ku-ring-ga LGAs) and realised foraging habitat in and around the Lane Cove River valley, the potential habitats offered by the Property have not been demonstrated to support this species.

Nevertheless, suitable potential foraging habitat occurs in the native vegetation (both natural and planted) in the Property and in the Current Development Area, and because there is a 2019 record from the adjacent Cumberland State Forest, it is concluded that there remains a reasonable chance that this species may occur in appropriate foraging habitat on the Property from time to time. Therefore, potential direct impacts are predicted to occur due to ~2.45 ha of potential habitat being removed as part of the Concept Masterplan DA. Indirect impact has the potential to occur in the retained vegetation surrounding the development footprint. These are primarily edge effects such as weed incursions, light, and noise.

IMPACT ASSESSMENT - Significant Impact Criteria for Critically Endangered or Endangered Species

An action has, will have, or is likely to have a significant impact on an Endangered species if it does, will, or is likely to:

a) lead to a long-term decrease in the size of a population of a species

The proposed action is considered unlikely to result in a long-term decrease in the size of a population, given the lack of occurrence of the species within the Property and the extent of equivalent or better quality habitat retained on the Property and in its immediate vicinity.

b) reduce the area of occupancy of the species

There are no records of this species within the habitat to be impacted by the works, therefore it cannot be considered as contributing to a reduction in its area of occupancy.

c) fragment an existing population into two or more populations

The proposed action is not of a scale to be able to fragment an existing population into two or more populations. Most of the potential foraging habitat on the Property will be retained and the proposed action will not alter the fundamental nature of the local area. This species is highly mobile, and its ability to move through the landscape will not be impeded by the proposed action.

d) adversely affect habitat critical to the survival of a species

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat for this species. However, the Conservation Advice (DAWE, 2022) states that habitat critical to the survival of species includes foraging habitat where it has been observed foraging, and nesting habitat comprising suitably large hollows.

As all suitably large hollows within the Property that are occupied have been confirmed to be utilised by other common native species such as the Sulphur-Crested Cockatoo or the Powerful Owl, only foraging habitat is relevant to the Current Development Area. This species has not been observed within the Property and so the potential foraging habitat is not considered to comprise habitat critical to the survival of the species. Nevertheless, the area of impact to potential foraging habitat is small and dwarfed by the area of potential foraging habitat to be retained and managed for conservation.

e) disrupt the breeding cycle of a population

As all suitably large hollows within the Property that are occupied have been confirmed to be utilised by other common native species such as the Sulphur-Crested Cockatoo or the Powerful Owl, no

breeding habitat for this species occurs within the Current Development Area or the Property. The proposed action will not disrupt its breeding cycle.

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

The removal of a small area of potential foraging habitat is unlikely to result in a decline of the species. Such declines occur at the scale of landscape disruption, not at the scale of a few hectares of garden trees.

g) result in invasive species that are harmful to an Endangered species becoming established in the Endangered species' habitat

The Current Development Area and wider Property contains many weed species, some of which are recognised as high threat weeds. The implementation of conservation management across the areas of natural vegetation to be retained under Community title will be of advantage to potential habitat for this species. Feral species such as foxes and black rats are known to occur within the Property. The Fauna management plan include protocols to contain and remove feral species offsite if captured. Therefore, the proposed action is considered unlikely to assist further invasive species in becoming established.

h) introduce disease that may cause the species to decline, or

This species is vulnerable to Psittacine circovirus disease. However, there is no evidence to suggest that the proposed works will contribute to this threatening process.

i) interfere with the recovery of the species.

The proposed action will not interfere with the recovery of the Gang-gang Cockatoo as the habitat on the Property is limited to potential foraging habitat which is considered to be relatively unimportant and will not contribute in any significant way to recognised threats to this species. Nevertheless, the retention of and conservation management of the vast majority of the bushland on the Property will continue to provide and improve potential foraging habitat for this species within an area that individuals can access.

SUMMARY

A total of ~2.45 ha of vegetation (mainly planted gardens) that contain potential foraging habitat will be removed. This species is highly mobile, and the critical components of its habitat are those connected to foraging resources at sites where it has been observed, and breeding habitat. The Property does not provide potential breeding resources. Also, it has not been observed on the Property or Current Development Area and so the potential foraging resources do not qualify as habitat critical to its survival.

Nevertheless, it is possible that this species could use appropriate foraging resources on the Property and so the retention and conservation management of such resources are considered sufficient to offset any potential impacts of habitat removal.

It is considered that the loss and modification to a relatively small area of potential foraging habitat is unlikely to result in a significant adverse impact on this species.

***Dasyurus maculatus maculatus* Spotted-tailed Quoll (SE mainland population)**

ECOLOGICAL PROFILE

The Spotted-tailed Quoll is listed as Vulnerable under the Schedules of the BC Act and as Endangered under the Schedules of the EPBC Act.

The Spotted-tailed Quoll (southeastern mainland population)) occurs in eastern Australia from south-eastern Queensland to western Victoria. The Spotted-tailed Quoll is a mainly forest dependent species but occurs in a variety of habitats including closed forests (including temperate and sub-tropical rainforest), tall eucalypt forests, open woodlands, open forests, drier rainshadow woodlands and coastal heathlands (DAWE, 2020).

Spotted-tailed Quolls are solitary animals that occur at low densities. Breeding generally occurs between April and July (DAWE, 2020).

This species, or indications for this species were not detected during survey; this assessment is based on the impact to ~2.45 ha of potential habitat only, the majority of which comprises landscaped gardens which are marginal to sub-optimal habitat for this species.

IMPACT ASSESSMENT - Significant Impact Criteria for Critically Endangered or Endangered Species

An action has, will have, or is likely to have a significant impact on an Endangered species if it does, will, or is likely to:

a) lead to a long-term decrease in the size of a population of a species

The impact area is considered unlikely to result in a long-term decrease in the size of a population, given the extent of equivalent or better habitat retained on the Property and in its immediate vicinity and the absence of records of this species on or near the Property.

b) reduce the area of occupancy of the species

There are no records of this species within the habitat to be impacted by the works, therefore it cannot be considered as contributing to a reduction in its area of occupancy.

c) fragment an existing population into two or more populations

The proposed action is not of a scale to be able to fragment an existing population into two or more populations. The vast majority of the potential foraging and denning habitat on the Property will be retained and the proposed action will not alter the fundamental nature of the local area. This species is highly mobile, and its ability to move through the landscape will not be impeded by the proposed action.

d) adversely affect habitat critical to the survival of a species

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat for this species

However, habitat critical to the survival of species is likely to include foraging habitat and denning habitat, in a matrix of sufficiently connected habitat. This species has not been observed on the Property and there are no records of the species in the locality. Therefore, the potential habitat within the Current Development Area is not considered to contribute to habitat critical to the survival of the species.

Nevertheless, the area of impact is small and dwarfed by the area of potential foraging habitat to be retained and managed for conservation. The majority of the potential habitat to be impacted is also of lesser value to this species as it comprises open garden beds in car parks or dense weed infestations under tall canopy trees.

e) disrupt the breeding cycle of a population

The impact areas do not support suitable breeding or denning habitat.

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

The removal of a small area of marginal to suboptimal habitat is unlikely to result in a decline of the species. Such declines occur at the scale of landscape disruption, not at the scale of a few hectares of garden trees.

g) result in invasive species that are harmful to an Endangered species becoming established in the Endangered species' habitat

The Current Development Area and wider Property contains many weed species, some of which are recognised as high threat weeds. The implementation of conservation management across the areas of natural vegetation to be retained under Community title will be of advantage to potential habitat for this species. Feral species such as foxes and black rats are known to occur within the Property. The Fauna management plan include protocols to contain and remove feral species offsite if captured. Therefore, the proposed action is considered unlikely to assist further invasive species in becoming established.

h) introduce disease that may cause the species to decline, or

Quolls are susceptible to toxoplasmosis, which is spread by Cats. There is no evidence to suggest that the proposed works will contribute to this threatening process.

i) interfere with the recovery of the species.

The proposed action will not interfere with the recovery of the Spotted-tailed Quoll as the habitat within the Current Development Area is considered to be marginal to suboptimal and will not contribute in any significant way to recognised threats to this species. Nevertheless, the retention of and conservation management of the vast majority of the bushland on the Property will continue to provide and improve potential habitat for this species within an area that individuals can access via local riparian corridors.

SUMMARY

Critical elements of habitat for this species includes den sites and the availability of prey. The Current Development Area is devoid of suitable denning habitat and supports poor quality habitat for its prey species in the car park garden beds and weedy edges. By contrast, the adjoining uninterrupted natural bushland that will be retained has a complex structure, many large hollow trees and large hollow logs, and good habitat for prey species.

It is considered that the loss and modification to a relatively small area of potential foraging habitat is unlikely to result in a significant adverse impact on this species.

***Pteropus poliocephalus* Grey-headed Flying-fox**

ECOLOGICAL PROFILE

The Grey-headed Flying-fox is listed as Vulnerable under Schedule 1 of the BC and under the Schedules of the EPBC Act.

The Grey-headed Flying-fox is a large flying-fox with a white or greyish head, reddish mantle around the neck and thick, leg fur extending to the ankles (DCCEEW, 2023b). This species has a distribution along eastern coastal Australia from Rockhampton in Queensland to western Victoria (Churchill, 2008). The Grey-headed Flying-fox occurs in a variety of habitats including subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops (EHG, 2023b).

Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Individual camps may have tens of thousands of animals and are used for mating, and for giving birth and rearing young. This species can travel up to 50 km from the camp to forage though commuting distances are more often <20 km (EHG, 2023b).

Being so highly mobile, connectivity of forest patches is not critical for this species to be able to exploit different areas of vegetation. However, they are impacted by direct loss of habitat as well as via long term changes on critical features such as nectar flow wrought by dieback and other consequences of forest fragmentation.

A number of individuals were detected foraging on the eucalypt blossom in the project area and beyond in Cumberland State Forest. The Property supports ~16.13 ha of woody vegetation that may provide potential foraging resources for this species, of which 2.45 ha will be impacted within the Current Development Area.

IMPACT ASSESSMENT - Significant Impact Criteria for Vulnerable Species

An action has, will have, or is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will*:*

a) lead to a long-term decrease in the size of an important population of a species

An *important population* is one that is necessary for a species' long-term survival and recovery.

The Grey-headed Flying Foxes recorded during survey are likely to be part of the nearby Parramatta Park camp, which is a recognised nationally important camp (DCCEEW, 2023a) . This is due to it being a significant long-term site (noted as early as 1798) and is now protected and managed for the long term survival of the species.

This camp and its functioning will not be directly affected by the proposed action. However, the proposed action will remove some foraging resources that may be used by some individuals of this important population. Although the total area of woody vegetation to be impacted within the Current Development Area is ~2.45 ha, not all of that area is likely to provide foraging habitat as it is dominated by landscaped gardens (~2.14 ha) which in places is dominated by trees that do not provide forage such as *Casuarina glauca* (Swamp Oak) or is occupied by young and stunted trees in poor condition due to their growing conditions that also are unlikely to provide forage such as in much of the on grade car parks.

The size of this important population is determined by factors affecting the camp site, the availability of food within their foraging range (which is largely driven by season), and factors that affect the available habitats external to the local area (such as fire affected breeding grounds). The available foraging habitat

in the footprint is only a small part of this complex web of influences.

This species flies long distances between the camp site and its foraging grounds, and although this species can travel up to 50km from a camp as a foraging range, areas within 20 kilometres of a camp site are considered to be within the foraging range of the individuals using a camp. Although the foraging radius around the Flying fox camp is highly urbanised, it includes large areas of intact (and largely reserved) bushland such as in the Berowra Valley to the north, along vegetated gullies and creeklines, in the north west, Western Sydney Parklands to the south west, and in the Holsworthy area near the Georges River to the south. These large areas of bushland alone represent in the order of 19,377 hectares of potential foraging habitat. In this context, the area of foraging habitat to be removed is very small – representing only approximately 0.01% of the large intact areas of vegetation.

The removal of this small area that contains at least some poor foraging habitat is considered unlikely to result in a long-term decrease in the size of this important population.

b) reduce the area of occupancy of an important population

The area of occupancy for this species in NSW has been mapped by Office of Environment and Heritage as part of the Saving Our Species program and is at least approximately 7.7 million hectares along the eastern seaboard and adjacent ranges. This species is highly mobile such that an individual can occupy any part of the known distribution of the species. The impact area of 2.53 hectares represents only 0.00005% of its area of occupancy.

In this context, the area of loss is considered to be negligible and the proposed action is unlikely to reduce its area of occupancy to any appreciable degree.

c) fragment an existing important population into two or more populations

The proposed action is not of a scale to be able to fragment an existing important population into two or more populations. Most of the potential foraging habitat on the Property will be retained and the proposed action will not alter the fundamental nature of the local area. This species is highly mobile, and its ability to move through the landscape will not be impeded by the proposed action.

d) adversely affect habitat critical to the survival of a species

Habitat critical to the survival of species can include important winter foraging areas, and breeding / roosting habitat.

Some of the species of trees on the Property are known to flower in the late winter, but the dominant species provide resources in the spring and summer months. The Property is 5 kilometres from the known camp site in Parramatta Park which will not be impacted by the proposed action.

Therefore, the proposed action is not considered to adversely affect habitat critical to the survival of this species.

e) disrupt the breeding cycle of an important population

The proposed action is unlikely to disrupt the breeding cycle of this species due to its distance from known breeding habitat, the relatively small area of the habitat to be removed, and the nature of this habitat.

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

The removal of a small area of foraging habitat is unlikely to result in a decline of the species. Such declines occur at the scale of landscape disruption, not at the scale of a few hectares of predominantly garden trees.

g) result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The Current Development Area and wider Property contains many weed species, some of which are recognised as high threat weeds. The implementation of conservation management across the areas of natural vegetation to be retained under Community title will be of advantage to potential habitat for this species. Feral species such as foxes and black rats are known to occur within the Property. The Fauna management plan include protocols to contain and remove feral species offsite if captured. Therefore, the proposed action is considered unlikely to assist further invasive species in becoming established.

h) introduce disease that may cause the species to decline, or

Although they are a vector for human disease, there is little reported regarding diseases affecting the Grey-headed Flying-fox. Parasites are few, principally bat-flies, nematodes and protozoans. The proposed action unlikely to introduce any diseases for this species based on the type of development and mitigation measures being implemented.

i) interfere substantially with the recovery of the species.

The proposed action will not interfere substantially with the recovery of the Grey-headed Flying Fox as the habitat to be removed is considered to be suboptimal foraging and will not contribute in any significant way to recognised threats to this species.

SUMMARY

A total of 2.45 ha of vegetation (mainly planted gardens) that contain potential foraging habitat will be removed. This species is highly mobile, and the critical components of its habitat are those connected to their camp sites, and available forage in the lean winter months.

The habitat to be impacted is relatively small in the context of what remains available to this species in the local area.

Therefore, it is considered that the proposed action is unlikely to have a significant adverse impact on this species.

***Calyptorhynchus lathami lathami* Glossy Black-Cockatoo**

ECOLOGICAL PROFILE

The Glossy Black-Cockatoo is listed as Vulnerable under Schedule 1 of the NSW BC Act and as Vulnerable under the Schedules of the EPBC Act.

The plumage for this species is mostly dull black, with a blackish-brown head, an inconspicuous crest and a broad bulbous bill. Adult males have bright red panels in the tail. Adult females have yellowish-red panels in the tail, and variable yellow patches on their heads (NSW Threatened Species Scientific Committee, 2023)

South-eastern glossy black cockatoos are uncommon but widespread. They can be found from Mitchell, Queensland, through eastern New South Wales to East Gippsland, Victoria (Map 1). Their distribution is continuous through the forested parts of the Great Dividing Range but becomes more scattered inland, to as far west as the Riverina in New South Wales (DCCEEW, 2022)

South-eastern Glossy Black-Cockatoos feed almost exclusively on the seeds of nine She-oak species (Allocasuarina spp. and Casuarina spp.), usually relying on one or two species within a region. This preference may explain the patchy distribution in parts of its range (NSW Threatened Species Scientific Committee, 2023).

The Glossy Black Cockatoo are hollow nesters, utilising large hollows in both living and dead eucalypt trees (NSW Threatened Species Scientific Committee, 2023).

Threats to the South-eastern Glossy Black-Cockatoo are land clearing resulting in habitat fragmentation and degradation, wildfire and inappropriate fire regimes, grazing by rabbits and other feral herbivores on foraging habitat, invasive weeds, competition for nesting hollows, increased likelihood of extreme events and the temporal or spatial shift of resources as a result of climate change, disease outbreak, predation from Common Brushtail Possum Trichosurus vulpecula, feral cats Felis catus and foxes Vulpes vulpes and illegal bird and egg collection (NSW Scientific Committee, 2005).

When considering potential impact to potential or realised habitat, surveys for occupancy should be conducted at the appropriate times of the year for that area, and the quality of the foraging habitat should be determined in accordance with the availability of preferred foraging species. Importantly, as this species may not occur in suitable habitat each year and their movements are poorly understood, both recent survey data and historical records need to be considered when determining the likelihood of their occurrence in an area. If removal of critical habitat features cannot be avoided or mitigated, then such impacts must be offset that provide benefits in a similar timeframe to the impacts from the actions (DCCEEW, 2022).

Although this species has been recorded within 10 kilometres of the Property on 45 occasions from 1989 to 2022, it has not been recorded on the Property nor in the adjacent Cumberland State Forest (despite the Forest being surveyed for many years by experienced birdwatchers and professional ecologists). The Property supports potential foraging habitat, although little is within the Current Development Area (restricted to as few as 5 potential feed trees), and although the Property contains potential nest trees, none occur in the Current Development Area.

IMPACT ASSESSMENT - Significant Impact Criteria for Vulnerable Species

An action has, will have, or is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:

a) lead to a long-term decrease in the size of an important population of a species

Given the absence of this species on or near the Property, the limited potential foraging habitat within the Current Development Area is not considered as supporting an important population.

Notwithstanding that conclusion, the impact area is considered unlikely to result in a long-term decrease in the size of an important population, give the extent of equivalent or better habitat retained on the Property and in its immediate vicinity.

b) reduce the area of occupancy of an important population

There are no records of this species within the habitat to be impacted by the works, therefore it cannot be considered as contributing to a reduction in its area of occupancy.

c) fragment an existing important population into two or more populations

The proposed action is not of a scale to be able to fragment an existing important population into two or more populations. Most of the potential foraging habitat on the Property will be retained and the proposed action will not alter the fundamental nature of the local area. This species is highly mobile, and its ability to move through the landscape will not be impeded by the proposed action.

d) adversely affect habitat critical to the survival of a species

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat for this species. However, the Conservation Advice (DCCEEW, 2022) states that habitat critical to the survival of species includes foraging habitat where it has been observed foraging, and nesting habitat comprising suitably large hollows.

As all suitably large hollows within the Property that are occupied have been confirmed to be utilised by other common native species such as the Sulphur-Crested Cockatoo or the Powerful Owl, only foraging habitat is relevant to the Current Development Area. This species has not been observed within the Property and so the potential foraging habitat is not considered to comprise habitat critical to the survival of the species. Nevertheless, the area of impact to potential foraging habitat is small and dwarfed by the area of potential foraging habitat to be retained and managed for conservation.

e) disrupt the breeding cycle of an important population

As all suitably large hollows within the Property that are occupied have been confirmed to be utilised by other common native species such as the Sulphur-Crested Cockatoo or the Powerful Owl, no breeding habitat for this species occurs within the Current Development Area or the Property. The proposed action will not disrupt its breeding cycle.

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

The removal of a small area of limited but potential foraging habitat is unlikely to result in a decline of the species. Such declines occur at the scale of landscape disruption, not at the scale of a few hectares of garden trees in an area where this species has not been observed.

g) result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The Current Development Area and wider Property contains many weed species, some of which are recognised as high threat weeds. The implementation of conservation management across the areas of natural vegetation to be retained under Community title will be of advantage to potential habitat for

this species. Feral species such as foxes and black rats are known to occur within the Property. The Fauna management plan include protocols to contain and remove feral species offsite if captured. Therefore, the proposed action is considered unlikely to assist further invasive species in becoming established.

h) introduce disease that may cause the species to decline, or

This species is vulnerable to Psittacine circovirus disease. However, there is no evidence to suggest that the proposed works will contribute to this threatening process.

i) interfere substantially with the recovery of the species.

The proposed action will not interfere substantially with the recovery of the Glossy-black Cockatoo as the habitat on the Property is considered to be relatively unimportant and will not contribute in any significant way to recognised threats to this species. Nevertheless, the retention of and conservation management of the vast majority of the bushland on the Property will continue to provide potential foraging and nesting habitat for this species within an area that individuals can access.

SUMMARY

Critical habitat elements for this species include appropriate nest sites and good foraging habitat. The proposed action within the Current Development Area will require the removal of only ~5 potential feed trees and no potential nest trees. Such small scale habitat loss cannot be considered likely to result in a significant adverse impact on this species.

***Hirundapus caudacutus* White-throated Needletail**

ECOLOGICAL PROFILE

The White-throated Needletail is listed both as a Migratory species and a Vulnerable species under the Schedules of the EPBC Act. This species is not listed under the NSW BC Act.

The White-throated Needletail is a large swift with a cigar shaped body with a stubby tail and long pointed wings (TSSC, 2019). They are widespread in eastern and south-eastern Australia and are recorded in all coastal regions of Queensland and NSW (TSSC, 2019).

In Australia, the White-throated Needletail is mostly aerial and can occur over most types of habitat, However, they are recorded most often above wooded areas, including open forest and rainforest but may also fly below the canopy between trees or in clearings. In coastal areas, they have been observed flying over sandy beaches or mudflats, and often around coastal cliffs and other areas with prominent updraughts, such as ridges and sand-dunes (TSSC, 2019)

It roosts regularly in trees both among dense foliage in the canopy or in hollows (TSSC, 2019).

Threats to this species are relatively few in Australia. Collisions with wind turbines, overhead wires, windows and lighthouses are a primary threat. The widespread use of insecticides and reduction in forested roosting habitat have also been considered as possible causes of decline (TSSC, 2019).

There are many records of this species from the local area, mainly of birds flying overhead, though none have been recorded within the Property. However, suitable potential roosting habitat occurs on the Property in the trees, but particularly the trees in vegetation with a dense canopy, such as in riparian habitats, and there is potential that this species may occur within roosting habitats in the Property on occasion.

IMPACT ASSESSMENT - Significant Impact Criteria for Vulnerable Species

An action has, will have, or is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:

a) lead to a long-term decrease in the size of an important population of a species

An *important population* is one that is necessary for a species' long-term survival and recovery.

Given the absence of this species within the Property, the potential habitat within the Current Development Area is not considered as supporting an important population.

Notwithstanding that conclusion, the impact of clearing within the Current Development Area is considered unlikely to result in a long-term decrease in the size of an important population, given the extent of equivalent or better habitat retained on the Property and in its immediate vicinity.

b) reduce the area of occupancy of an important population

There are no records of this species within the habitat to be impacted by the works, therefore it cannot be considered as contributing to a reduction in its area of occupancy.

c) fragment an existing important population into two or more populations

The proposed action is not of a scale to be able to fragment an existing important population into two or more populations. All of the potential roosting habitat on Property will be retained and the proposed action will not alter the fundamental nature of the local area. This species is highly mobile, and its ability to move through the landscape will not be impeded by the proposed action.

d) adversely affect habitat critical to the survival of a species

Habitat critical to the survival of species includes roost sites and topographic conditions that provide updrafts for foraging. While there is potential roosting habitat within the Property, the habitats within the Current Development Area are not considered to contribute to habitat critical to the survival of the species given the lack of records of this species within the Property.

Nevertheless, the area of impact is small and dwarfed by the area and nature of the potential roosting habitat to be retained and managed for conservation.

e) disrupt the breeding cycle of an important population

This species does not breed in Australia.

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

The removal of a small area of potential habitat is unlikely to result in a decline of the species. Such declines occur at the scale of landscape disruption, not at the scale of a few hectares of predominantly garden trees in an area where this species has not been observed.

g) result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The Current Development Area and wider Property contains many weed species, some of which are recognised as high threat weeds. The implementation of conservation management across the areas of natural vegetation to be retained under Community title will be of advantage to potential habitat for this species. Feral species such as foxes and black rats are known to occur within the Property. The Fauna management plan include protocols to contain and remove feral species offsite if captured. Therefore, the proposed action is considered unlikely to assist further invasive species in becoming established.

h) introduce disease that may cause the species to decline, or

This species is not known to be vulnerable to any diseases. The proposed action is also unlikely to introduce any potential diseases for this species based on the type of development and mitigation measures being implemented.

i) interfere substantially with the recovery of the species.

The proposed action will not interfere substantially with the recovery of the White-throated Needletail as the habitat to be removed is considered to be suboptimal and will not contribute in any significant way to recognised threats to this species. Nevertheless, the retention of and conservation management of the vast majority of the bushland on the Property will continue to provide potential roosting habitat for this species, especially in the riparian environments, within an area that this highly mobile species can access.

SUMMARY

Suitable potential roosting habitat occurs on the Property in the trees, but particularly the trees in

vegetation with a dense canopy, such as in riparian habitats, and there is a reasonable chance that this species may occur in that habitat on occasion. None of the riparian vegetation will be removed and so direct impacts to potential habitat will not occur in those locations. However, there is the potential for direct impact to potential roosting habitat arising from the removal of trees within the Current Development Area. There is the potential for indirect impacts to those areas of potential habitat adjacent to the Current Development Area footprint, where they will likely experience indirect short-term impacts during construction from noise, increased activity, dust, and increased exposure to sun and wind.

However, the potential roosting habitat to be removed is considered to be suboptimal. The proposed management of vegetation under the VMP will improve potential roosting habitats within the Property in the long term and indirect impacts will be mitigated via implementation of noise and dust management measures.

Therefore, it is considered that the proposed action is unlikely to have a significant adverse impact on this species.

***Syzygium paniculatum* Magenta Lily Pilly**

ECOLOGICAL PROFILE

Syzygium paniculatum Magenta Lilly Pilly is listed as Vulnerable under the Schedules of the EPBC Act. It is listed as Endangered under the NSW BC Act.

Magenta Lilly Pilly is a small to medium sized rainforest species, usually growing up to a height of 8 metres (EHG, 2023c). This species is naturally restricted to a 400 kilometre stretch of coastal habitat within NSW between Conjola National Park in the south to Upper Lansdowne in the north (EHG, 2023c). The National Recovery Plan (OEH, 2012) identifies five metapopulations based on a 30 kilometre foraging range the species' larger dispersal agents: Jervis Bay; Coalcliff; Botany Bay; Central Coast and Karuah-Manning.

It occurs naturally on sandy soils or stabilised sand dunes in coastal areas, littoral rainforest on sand or subtropical rainforest on sandy soils derived from sandstone, in sandy soils or stabilised quaternary sand dunes with littoral or subtropical rainforest, or in subtropical and littoral rainforest on sandy soils or stablished dunes near the ocean (OEH, 2012).

In the Sydney area, the Sydney Metropolitan mapping project (OEH, 2016) found this species occurring naturally in three vegetation types:

- Coastal Dune Littoral Rainforest - this vegetation is restricted to small, isolated stands of this rainforest occur in the Sydney area on the Kurnell Peninsula and Bundeena;
- Coastal Sand Bangalay Forest – this vegetation is found on flat, low-lying coastal marine sand deposits of the coastal zones; and
- Coastal Freshwater Swamp Forest – this vegetation occupies poorly drained substrates that are periodically inundated by fresh or brackish water across the coastal plain and hinterland of the Sydney metropolitan area. Examples have been mapped in the Kings Wetland at Brighton Le Sands, the Lachlan Swamps of Centennial Parklands, in the Warringah area, and near Wallacia.

A number of active threats are recognised for this species and its local populations, including clearing and fragmentation of habitat, low genetic diversity, Myrtle Rust, weed infestations, frequent fire regimes, climate change, recreational activities, and invertebrate pests (EHG, 2023c; OEH, 2012).

Naturally-occurring populations of this species are considered to be important and, therefore, all habitat in which these populations occur is considered to be critical to the survival of the species (OEH 2012). However, despite its natural rarity, it is widely cultivated in eastern Australia as an ornamental garden plant and a range of horticultural varieties have been developed by the nursery industry (OEH, 2012). The National Recovery Plan (OEH 2012) recognises that the plants in cultivation are hybrids or of unknown genetic origin and therefore should be excluded from "*all actions related to the conservation of the species in the wild*" (OEH 2012).

During surveys, a total of 19 individuals of Magenta Lilly Pilly were recorded on the Property: 18 within a landscaped drainage line immediately adjoining the now demolished business park buildings (now removed under consent) and another single adult tree in an garden bed along the western boundary of the Property. The individuals ranged in age from mature trees that were planted as part of landscape works of the IBM site in the 1980s, to younger trees that may have seeded from the planted individuals.

Although this species was probably self-seeding within the constructed drainage feature in the Demolition Stage works area, these individuals are naturalised from the original planted specimens and do not constitute a naturally-occurring population in the sense used in conservation policy and

regulation.

The provenance and genetic integrity of the plantings and their offspring are unknown and therefore cannot be an important contributor to the conservation of the species, per the National Recovery Plan (OEH 2012). It follows that the individuals recorded on the Property cannot be regarded as representing an important population *sensu* the *EPBC Act 1999* and the constructed habitats available cannot be considered to be critical to the survival of this species.

IMPACT ASSESSMENT - Significant Impact Criteria for Vulnerable Species

An action has, will have, or is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will*:*

a) ***lead to a long-term decrease in the size of an important population of a species***

The 19 individuals are made up of 14 planted mature trees and 5 self-seeded younger trees from unknown provenance material in a landscaped drainage feature. Of these one mature individual occurs within a garden bed within the Current Development Area. As a horticultural specimen from unknown provenance in a constructed landscape, this individual is not considered to constitute part of an important population.

The loss therefore will not lead to a long-term decrease of an important population.

b) ***reduce the area of occupancy of an important population***

The individuals present do not constitute an important population and occur in an entirely artificial habitat.

According to the Threatened Species Profile (EHG, 2023c), this species occurs naturally in BGHF and STIF (=TIF), although no individuals were observed outside of the gardens. Based on this, the sheltered gully habitats in these communities in the Property provide potential habitat for this species, all of which will be retained. However, no individuals have been recorded outside of the landscaped garden beds.

All other authoritative sources note that this is a species of coastal and near-coastal Littoral Rainforest communities on sand. The only known specimens in north western Sydney are horticultural ones or their progeny, reflecting its popularity in horticulture.

As the occurrence of this species within the Current Development Area and wider Property is limited to planted individuals, the potential area of occupancy of an important population will not be reduced.

c) ***fragment an existing important population into two or more populations***

The extent of individuals and suitable habitat on the Property are not considered to be part of any existing important population or natural habitat within the Sydney metropolitan area. The removal of garden plants of unknown provenance will not fragment any existing population.

d) ***adversely affect habitat critical to the survival of a species***

While no critical habitat for this species has been formally declared, all habitat in which naturally-occurring populations occur is considered to be critical to the survival of the species. The observed individuals on the Property are planted and naturalised horticultural specimens in artificial habitat, and therefore do not represent critical habitat for the survival of the species.

e) ***disrupt the breeding cycle of an important population***

The individuals on the Property and habitats are not considered to be a part of any identified important population. The removal of reproductive material with the proposed works therefore will not disrupt the breeding cycle of an important population.

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

The loss of habitat so described in this factor is applicable to natural habitat that supports naturally-occurring populations. The proposed action will remove planted individuals and their offspring a small constructed drainage feature and garden bed - not naturally-occurring habitat.

The proposed action will therefore not affect availability or quality of habitat to the extent that the species is likely to decline.

g) ***result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat***

Weed species are known to compete with this species for water, nutrients and sunlight. As gully forests in the local area may provide potential habitat for this species, the potential for the proposed works to result in indirect impacts to such habitat has been considered. Although the areas subject to the proposed action are managed as part of a landscaped garden, they do support some invasive weed species and thus there is the potential to mobilise weed propagules as part of the works.

This potential will be controlled and ameliorated by the implementation of weed control measures as part of a Construction Environmental Management Plan, the Vegetation Management Plan relevant to bushland retained in the Current Development Area and any other bushland works programs in surrounding lands.

h) ***introduce disease that may cause the species to decline, or***

This species is known to be affected by Myrtle Rust and has been reportedly identified as a known host of this pathogen. There are no other recorded diseases to which this species is susceptible.

Myrtle Rust was not observed on the Property. Best practice hygiene controls for Myrtle Rust will be applied as part of a Construction Environmental Management Plan, Vegetation Management Plan, and any other bushland works programs in surrounding lands.

The proposed action is therefore not considered to introduce disease that may cause the species to decline.

i) ***interfere substantially with the recovery of the species.***

The national recovery plan for this species (OEH 2012) identified the following specific objectives to help protect known subpopulations of this threatened species:

- ensuring a coordinated and efficient approach to the implementation of recovery efforts;
- establishing the full extent of the distribution of the species;
- increasing the understanding of its biology and ecology;
- minimising the decline of the species through *in situ* habitat protection and management;
- reducing impacts of Myrtle Rust on this species and its habitat;
- maintaining a representative *ex situ* collection of this species; and

- raising awareness of the conservation significance of this species and involving the broader community in the recovery program.

The Property is not within a recognised subpopulation of this species. Nevertheless, the proposed action is consistent with these strategies in the survey and assessment process to identify the total extent of suitable habitats on the Property, and the implementation of best practice control protocols for Myrtle Rust. In addition but external to this proposed action is *in situ* habitat protection and management for the large expanse of native vegetation that will be transferred to Forestry Corporation.

SUMMARY

A total of 1 planted individual and the constructed/landscaped garden habitat in which it will be directly impacted by the proposed action.

The Recovery Plan (OEH 2012) recognises that plants in cultivation are hybrids or of unknown genetic origin and therefore should be excluded from "*all actions related to the conservation of the species in the wild*". As the single individual to be removed from the Current Development Area is a planted individual, it does not constitute a naturally-occurring individual of a natural population in the sense used in conservation policy and regulation. Similarly, as they occur in artificial habitat, they cannot be regarded as representing an important population and the constructed habitats available cannot be considered to be critical to the survival of this species. All potential natural habitat within the Property falls outside of the proposed footprint, and will be retained and protected.

Therefore, it is considered that the proposed action is unlikely to have a significant adverse impact on this species.

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