Table 1: Assessment of MNES listed as 'Endangered

Significant Impact Criteria	*Calyptorhynchus latirostris* (Carnaby's Cockatoo) EPBC Act (Endangered)	*Calyptorhynchus baudinii* (Baudin's Cockatoo) EPBC Act (Endangered)
Lead to a long-term decrease in the size of a population.	**Significant impact Unlikely** Clearing for the proposed action will not lead to a long-term decrease in the size of the population of Carnaby's Cockatoo. The term 'population' has not been defined for Black Cockatoos due to these species' mobile and widely distributed nature and the variation in flock compositions. In the context of Black Cockatoos, it is more appropriate to consider the significance in terms of impacts on habitat rather than a resident population (DSEWPaC, 2012; DotEE, 2017). The proposed action will require the removal of up to 16 ha of suitable habitat for the species, comprising: • *Eucalyptus wandoo* Woodland over *Banksia* – ***Foraging and Breeding habitat*** • *Corymbia calophylla* and *Eucalyptus marginata* Woodland – ***Foraging and Breeding habitat*** • Grassland with isolated trees (mix of jarrah, marri, and wandoo) – ***Foraging and Breeding habitat****, and* • *Melaleuca* Shrubland – ***Foraging habitat*** Biologic (2021) assessed the habitat quality related to Carnaby's Cockatoo within the proposed action area. Habitat was assessed to vary between 'Moderate' to 'High', with >70% of the proposed action area comprising 'Moderate' quality habitat. Evidence of foraging was recorded across the extent of the proposed action area, particularly in areas consisting of marri. Given the condition and type of vegetation present, the habitat present consists of quality foraging habitat for Carnaby's Cockatoo. The proposed action will necessitate clearing up to 16 ha of potential foraging habitat, representing 0.2% of the available potential foraging habitat within 6 km of the proposed action. Regional mapping of remnant native vegetation associations known to be utilised by Carnaby's Cockatoo indicates a total area of 6,905 ha of potential foraging habitat occurs within 6 km of the proposed action area, with 2,385 ha (34%) of this located within DBCA managed lands as conservation estate (Figure 1). The proposed action will require the removal of up to 244 suitable DBH trees. Of these a total of 19 were recorded by Biologic (2021) as containing hollows. Subsequently, an assessment by Kirkby (2021) was undertaken which determined that 18 of the recorded hollows were unsuitable for nesting by Black Cockatoos. The remaining hollow was assessed as suitable, and considered a likely breeding hollow due to the presence of chew marks. However, no evidence of current breeding by Black Cockatoos was observed at the hollow during any of the fauna assessments and it is possible that the chew marks could be attributable to other species, including galahs. Carnaby's Cockatoo breeding is known to occur in the local area, with two breeding pairs recorded within the Wundowie Reserve, approximately 5 km from the proposed action area. Clearing for the proposed action can result in localised impacts to breeding pairs of Carnaby's Cockatoo which may be significant. However, given the presence of over 6,000 ha of remnant vegetation within 6 km of the proposed action area, of which 2,385 ha is within the DBCA conservation estate, it is considered unlikely that these impacts will result in a long-term decrease in the population. Additionally, a number of mitigation measures will be implemented through the preparation of a Construction Environmental Management Plan (CEMP) to further minimise the risk of impact to the species. These measures will include, but are not limited to: • Prestart and toolbox meeting to raise awareness of environmental management requirements and operational controls, • Definition of work area and exclusion zones using fencing, flagging or other appropriate signage, • Injured, sick or orphaned native fauna located on the project site will be notified immediately to the Superintendent. Contact will be made to either the local DBCA office or Wildlife care centre. • Retention of vegetation and preferential use of previously disturbed areas where possible. On this basis, it is unlikely that the proposed action will lead to a long-term decrease in the size of a population.	**Significant impact Unlikely** The proposed action will not lead to a long-term decrease in the size of the Baudin's Cockatoo population. As for the other two Black Cockatoo species, the term 'population' has not been defined for Baudin's Cockatoos due to the mobile and widely distributed nature of these species and the variation in flock compositions. For Baudin's Cockatoos, it is more appropriate to consider the significance of impacts on habitat rather than a resident population (DSEWPaC, 2012; DotEE, 2017). The proposed action will require the removal of up to 15.8 ha of suitable habitat for the species, comprising: • *Eucalyptus wandoo* Woodland over Banksia - **Foraging and Breeding habitat** • *Corymbia calophylla* and *Eucalyptus marginata* Woodland), - **Foraging and Breeding habitat** and • Grassland with isolated trees (mix of jarrah, marri and wandoo - **Foraging and Breeding habitat** Within the proposed action area, habitat considered suitable for Baudin's Cockatoo coincides with that suitable for Carnaby's Cockatoo, except for *Melaleuca* Shrubland. Biologic (2021) assessed the quality of habitat present as ranging between 'Moderate' to 'High', with the majority (>70%) of the proposed action area comprising 'Moderate' quality habitat. Regional mapping indicates that 6,014 ha and 23,190 ha of potential foraging habitat for Baudin's Cockatoo occurs within 6 km and 12 km of the proposed action area, respectively. Approximately 19,167 ha, within 12 km is located within DBCA managed lands as conservation estate (Figure 1). The Proposed action will necessitate the clearing of up to 15.8 ha of potential foraging habitat for the species, representing approximately 0.2% of the total available potential foraging habitat within 6 km of the proposed action area, based on remnant native vegetation associations known to be utilised by the species. The proposed action will require the removal of up to 244 suitable DBH trees, of which one was assessed to contain a suitable nesting hollow. The proposed action is not expected to impact any breeding habitat for Baudin's Cockatoo as they are not known to breed within or near the proposed action area. Within this region, the nearest known Baudin's breeding area is located 50 km south of the proposed action area within the Wungong catchment area (T. Kirkby, pers. comm.). In implementing the proposed action, several mitigation measures will be undertaken by preparing a CEMP to minimise the risk of impact on the species. These measures will include, but are not limited to: • Prestart and toolbox meeting to raise awareness of environmental management requirements and operational controls, • Definition of work area and exclusion zones using fencing, flagging or other appropriate signage, • Injured, sick or orphaned native fauna located on project site will be notified immediately to the Superintendent. Contact will be made to either the local DBCA office or Wildlife care centre. • Retention of vegetation and preferential use of previously disturbed areas where possible. On this basis, it is unlikely that the proposed action will lead to a long-term decrease in the size of a population.
Reduce the area of occupancy of the species	**Significant impact Unlikely** The proposed action will not significantly reduce the area of occupancy of Carnaby's Cockatoo. As outlined by IUCN (2017), the 'area of occupancy' can be defined as 'a scaled metric that represents the area of suitable habitat currently occupied by the taxon'. Carnaby's Cockatoo has an estimated area of occupancy of 10,000 km^2 across south-western Australia (DotEE 2019a).	**Significant impact Unlikely** The proposed action will not significantly reduce the area of occupancy of Baudin's Cockatoo. The current area of occupancy estimates for Baudin's Cockatoo is estimated at 25,000 km^2 (Garnett et al. 2011). The proposed action represents 0.0006% of the estimated area of occupancy. Accordingly, clearing as a result of the proposed action is not expected to significantly reduce the species' total area of occupancy.

Significant Impact Criteria	*Calyptorhynchus latirostris* (Carnaby's Cockatoo) EPBC Act (Endangered)	*Calyptorhynchus baudinii* (Baudin's Cockatoo) EPBC Act (Endangered)
	The proposed action represents approximately 0.002% of the estimated area of occupancy. Accordingly, clearing as a result of the proposed action is not expected to significantly reduce the species' total area of occupancy	
Fragment an existing population into two or more populations	**Significant impact Unlikely** The proposed action will not fragment an existing population as clearing involves the removal of a relatively small area of habitat already bisected by the Great Eastern Highway. Connections to the adjacent foraging and breeding habitat will remain north, south, and east of the proposed action. The scale and nature of the proposed action are not sufficient to sever connections between nearby areas of black cockatoo habitat, nor sever connections between two or more populations that occur within known distributions.	**Significant impact Unlikely** The proposed action will not fragment an existing population as clearing involves the removal of a relatively small area of habitat which Great Eastern Highway already bisects. The proposed action will not create a gap of 4km or more between foraging and breeding habitat areas. The scale and nature of the proposed action are not sufficient to sever connections between nearby areas of black cockatoo habitat, nor sever connections between two or more populations that occur within known distributions.
Adversely affect habitat critical to the survival of a species	**Potential Significant Impact** The proposed action may impact habitat critical to the survival of the species. DPAW (2013) defines habitat critical to the survival of Black Cockatoos, particularly Carnaby's Cockatoo as: • Known breeding and nearby feeding habitat; • Former breeding habitat that has hollows intact; and • Vegetation that provides habitat for feeding, watering and regular night roosting. Based on the findings of the biological surveys (Bamford 2015, Biologic 2021, Kirkby 2021), vegetation within the proposed action area comprises both breeding and foraging habitat. The proposed action will require the removal of up to 244 suitable DBH trees. One of these trees contains a suitable nesting hollow. This tree appears to have evidence of chewing within the hollow; however, it remains undetermined whether this is due to use by Black Cockatoos. Kirkby (2021) was not able to get a camera or drone to the hollow due to the presence of a power line and dense tree foliage. However, it should be noted that no evidence of current usage has been recorded. Three additional trees with suitable nesting hollows were recorded during the Biologic (2021) survey, however these occur outside of the proposed action area and will not be subject to direct impacts and will continue to provide future potential breeding habitat for the species. No evidence of current use was observed in these hollows. The proposed action will necessitate the clearing of 16 ha of habitat suitable for Black Cockatoo species. Within the proposed action area, habitat suitable for Black Cockatoo species consists of: • *Eucalyptus wandoo* Woodland over *Banksia* – Foraging and Breeding habitat • *Corymbia calophylla* and *Eucalyptus marginata* Woodland – Foraging and Breeding habitat • Grassland with isolated trees (mix of jarrah, marri and wandoo) – Foraging and Breeding habitat, and • *Melaleuca* Shrubland – Foraging habitat (Carnaby's Cockatoo only) Within the proposed action area, Biologic (2021) assessed the habitat quality to vary between 'Moderate' to 'High', with >70% of the proposed action area comprising 'Moderate' quality habitat. Evidence of foraging for all three Black Cockatoo species was recorded throughout the proposed action area, particularly in areas comprised of marri. Foraging habitat and water are critical in supporting breeding sites, particularly habitat within 6 km (Groom, 2015; Le Roux, 2017; Saunders, 1990). Based on remnant vegetation data, up to 6,905 ha of vegetation is present within 6 km of the proposed action area. Clearing associated with the proposal represents a 0.2% reduction in available habitat within 6 km. It is important to note that of the 6,905 ha of mapped vegetation, 2,385 ha is protected within DBCA tenure (Nature Reserve). With regards to roosting sites, a night roost was recorded on Mairinger Way, approximately 500 m from the proposed action area (Biologic, 2021), which is utilised by up to 30 birds (mixture of Carnaby's and Baudin's) and a further three are known within 6 km of the proposed action area. Evidence of roosting is usually seen through chewed off branches and discarded feathers. Biologic (2021) did not record evidence of potential roosting within the proposed action area. The clearing of up to 15.6 ha of suitable foraging habitat, while small in the regional context, may provide habitat significant in its support of local roosting sites. Breeding for Carnaby's Cockatoo is known to occur in the local area. Two breeding pairs have been recorded within the Wundowie Reserve, approximately 5 km from the proposed action area. Clearing will likely result in localised impacts to habitat considered critical to the survival of Black Cockatoos. Foraging habitat is likely to provide support to both roosting and breeding sites within the local area. The removal of 16 ha of foraging habitat could potentially represent a significant reduction in available local foraging resources. However, when considering the proximity of nearby Conservation estate and that the proposal will reduce local habitat by <1%, it is considered unlikely that these impacts will influence the species	**Significant impact Unlikely** The *Forest Black Cockatoo Recovery Plan* (Department of Environment and Conservation [DEC], 2008) identifies habitat critical for the survival of Baudin's Cockatoo as those areas: • Currently occupied by the cockatoos • Not currently occupied by the cockatoos due to recent fire but capable of supporting cockatoo populations when sufficiently recovered • Of natural vegetation in which the cockatoo's nest, feed and roost • Of natural vegetation through which the cockatoos can move from one occupied area to another • Of suitable vegetation within the recorded range in which undiscovered cockatoo populations may exist. In considering the broad definition above, the proposed action area contains habitat critical to the survival of the species. However, the proposed action is not expected to result in a significant impact on critical habitat either directly or indirectly that would compromise the species' survival. While the proposed action area comprises of suitable foraging habitat that ranges from moderate to high quality, as discussed previously, this habitat represents 0.2% of the surrounding vegetation that is likely to consist of similar if not better habitat that would meet the definition of critical habitat. The proposed action is unlikely to impact on breeding habitat for the species. While suitable nesting trees are present adjacent to the proposed action area, it is not anticipated that the species will breed in the area as no known breeding of Baudin's Cockatoo occurs within the proposed action area. Baudin's Cockatoo commonly breed during summer months (between November and February) in karri trees (*Eucalyptus diversicolor*) in the southern jarrah forest bioregion (Higgins 1999). Baudin's Cockatoo are known to breed in low numbers in the Serpentine Hills area and in the Wungong Catchment approximately 50 km to the south of the proposed action, therefore it is not expected that this species breeds within the proposed action area. In considering the above, it is unconsidered unlikely that the Proposed action will result in a significant adverse effect on habitat critical to the survival of the species.

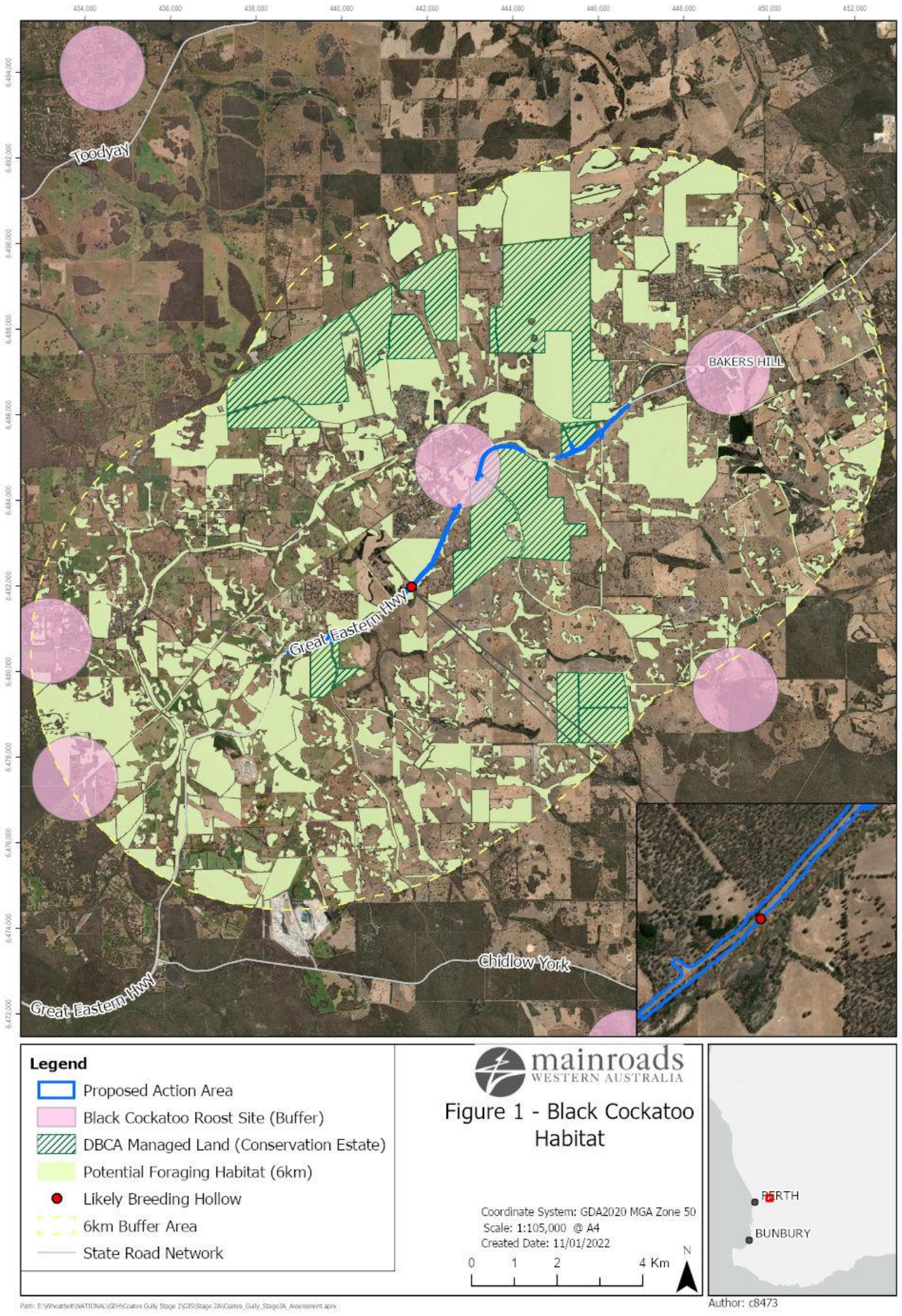
Significant Impact Criteria	*Calyptorhynchus latirostris* (Carnaby's Cockatoo) EPBC Act (Endangered)	*Calyptorhynchus baudinii* (Baudin's Cockatoo) EPBC Act (Endangered)
	survival.	
Disrupt the breeding cycle of a population.	**Potential Significant Impact** The proposed action will require the removal of up to 244 suitable DBH trees, including one assessed by Kirkby (2021) as a potential nest tree suitable for breeding. Although Kirkby (2021) was unable to evaluate the internals of the hollow, in subsequent discussions, he noted that no current breeding activity was observed but that he could not rule out the potential to support breeding. Additionally, within 10 m of the proposed action area, Kirkby (2021) recorded three trees with suitable hollows. These trees will not be directly impacted, and management actions will be implemented to minimise indirect impacts. Within the local area (6 km) there are two known breeding pairs of Carnaby's Cockatoo located within the Wundowie Reserve. The removal of up to 16 ha of suitable quality foraging habitat may result in localised impacts to breeding Black Cockatoos, however, as clearing represents 0.2% of potential foraging habitat within 6 km, these impacts are not likely to result in a disruption to the breeding cycle or result in failed breeding efforts. Noting the removal of one tree with a potential breeding hollow may reduce hollow availability in the local region and the presence of three known nesting trees in close proximity to project works, it is considered that implementation of the proposed action may be potentially significant at the local scale. However, the proposed action is not expected to disrupt the breeding cycle of Carnaby's Cockatoo to the extent that the species will decline.	**Significant impact Unlikely** The proposed action is not expected to disrupt the breeding cycle of a population of Baudin's Cockatoo as no known breeding of Baudin's Cockatoo occurs either within the proposed action area or its surrounds. The proposed action area occurs outside of the modelled breeding range for the species. In personal correspondence with Tony Kirkby, he advised the closest known breeding area for Baudin's Cockatoo is 50 km east of the proposed action area within the Wunggong Catchment area. Baudin's Cockatoo are known to breed in low numbers in the Serpentine Hills area and in the Wungong Catchment approximately 50 km to the south of the proposed action, therefore it is not expected that this species breeds within the proposed action area. Considering the above, it is unlikely that the proposed action will result in a significant impact that will disrupt the breeding cycle of a population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Significant impact Unlikely** The proposed action will not impact the availability or quality of habitat to the extent that Carnaby's Cockatoos are likely to decline. The clearing of approximately 16 ha of potential habitat represents a 0.2% reduction in foraging and potential breeding habitat for Carnaby's Cockatoo within the local area (suitable remnant vegetation within a 6 km radius). This relatively small reduction in the area of foraging habitat may result in a minor localised impact; however, when considered in the context of the regional area, it is highly unlikely that this will result in the decline of the species. The proposed action area is located within an area that is known to contain breeding pairs of the species. As discussed previously, the proposed action will require the removal of up to 244 suitable DBH trees. One tree deemed suitable to support breeding by the species will be removed. However, no active breeding has been recorded within this tree, in three survey attempts. Within the context of the survey, a total of 491 suitable DBH trees were recorded from within the larger biological survey area. Clearing for the proposed action represents a reduction in suitable DBH trees within the wider survey area by 49%. However, it should be noted that over 12,000 ha of vegetation, retained within conservation estate, occurs within 12 km of the proposed action area. On this basis, the proposed action is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline.	**Significant impact Unlikely** The proposed action is not expected to impact the availability or quality of habitat to the extent that Baudin's Cockatoos are likely to decline. The clearing of approximately 15.8 ha of potential habitat represents a 0.2% reduction in potential foraging and breeding habitat for Baudin's cockatoo within the local area (suitable remnant vegetation within a 6 km radius). This relatively small reduction in the area of foraging habitat may result in a minor localised impact, however, when considered in the context of the surrounding area, it is considered highly unlikely that this will result in the decline of the species. The proposed action area is located outside of the known Baudin's Cockatoo breeding areas. On this basis, the proposal is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	**Significant impact Unlikely** The DEC (2008), Department of Parks and Wildlife (DPaW) (2013) [now both DBCA] and EPA (2019) identify the potential threats to the survival of Black Cockatoos as including nest competition from feral bees (such as *Apis mellifera* (Honeybee)) and other native invasive species. The proposed action does not involve any actions which could potentially introduce Honey bees into the proposed action area or surrounds. The proposed action is also considered unlikely to result in the introduction or spread of any other flora or fauna taxon known to be harmful to individuals of Black Cockatoo which could become established within the proposed action area.	**Significant impact Unlikely** The proposed action is unlikely to introduce harmful or invasive species to the Proposed action area. The proposed action will be implemented in accordance with a number of management plans, including a fauna management and dieback management plan, that will include measures to manage the potential spread of weeds, dieback and feral animals into adjacent retained vegetation that could comprise habitat for the species.
Introduce disease that may cause the species to decline	**Significant impact Unlikely** The DEC (2008), DPaW (2013) and EPA (2019) identify the potential threats to the survival of individuals of Black Cockatoo as including declining vegetation health and other diseases. Dieback (*Phytophthora cinnamomi)* and Marri Canker (*Quambalaria coyrecup*) can infect flora species used by Black Cockatoos for foraging, nesting and roosting. A recent Dieback occurrence assessment (Glevan 2021) identified multiple occurrences of *Phytophthora* Dieback infestations or evidence of disease presence within the proposed action area and surrounding area. The potential for the introduction and/or spread of Dieback (and Marri Canker, if present) can be appropriately managed through a Dieback Management Plan, developed in consultation with the DBCA,	**Significant impact Unlikely** The proposed action is unlikely to introduce a disease (e.g. beak and feather disease virus) that may cause the species to decline. There are no known diseases that may be introduced to the area that may cause the population to decline and it is unlikely that any disease already exists in the proposed action area that may be spread by the activities of the proposed action (as there has been no indication of any such disease). Development and implementation of a dieback management plan during construction will prevent the spread of dieback and other soil-borne pathogens, which could otherwise lead to the subsequent decline in habitat quality for Baudin's Cockatoo.

Significant Impact Criteria	*Calyptorhynchus latirostris* (Carnaby's Cockatoo) EPBC Act (Endangered)	*Calyptorhynchus baudinii* (Baudin's Cockatoo) EPBC Act (Endangered)
	and the implementation of appropriate hygiene measures during land clearing and earthmoving. The implementation of hygiene measures will assist in ensuring that the proposed action will not introduce and/or spread disease to an extent which may cause a reduction in the quality of the Black Cockatoo foraging habitat present, which could in turn cause the species to decline. Hygiene measures will include but not be limited to: • Movements of machines and other vehicles to be restricted to the areas of clearing for the proposal • All vehicles, machinery and tools shall arrive at site clean of soil, mud or vegetative material, will be inspected for compliance and sterilised prior to work if necessary (full hygiene clean down) • Where practicable works to be undertaken in dry soil conditions, especially within protectable areas • Clean on Entry (CoE) points are to be established and clearly demarcated on site using flagging and signage prior to the commencement of works • If works are being undertaken during a rainfall event, all run-off from the CoE points is to be retained on site and must not be permitted to dissipate into the surrounding vegetation. It is recommended that were possible works are undertaken under dry soil conditions. The disease status of Black Cockatoos in the wild remains unknown, although infectious diseases such as beak and feather disease, avian polyomavirus and *chlamydophilosis* may pose a threat, as they are significant in other captive and free-living psittacine species. The Project does not involve any actions which could potentially introduce infectious diseases within black cockatoo populations which could cause the taxon to decline.	
Interfere with the recovery of the species	**Significant impact Unlikely** The Project will result in the clearing of up to 16 ha of moderate to high-quality foraging habitat and 244 suitable DBH trees, one of which has been identified as a likely breeding tree. The removal of foraging habitat, potential future breeding trees, and one large tree with a suitable hollow likely to be utilised for breeding, is not expected to interfere with any natural or Government-led recovery of Carnaby's Black Cockatoos.	**Significant impact Unlikely** The Project will result in the clearing of up to 15.8 ha of moderate to high-quality foraging habitat and 244 suitable DBH trees (outside of the species' breeding range), one of which has been identified as a likely breeding tree. National recovery plans have been produced for all three Western Australian Black Cockatoo species. These plans provide measures for species recovery. In the proposed action is not inconsistent with the recovery plans for Baudin's Cockatoo

Table 2: Assessment of MNES listed as 'Vulnerable

Significant Impact Criteria	*Calyptorhynchus banksii naso* (Forest Red-tailed Black Cockatoo) EPBC Act (Vulnerable)
Lead to a long- term decrease in the size of an important population of a species.	**Significant impact Unlikely** The proposed action is not expected to lead to a long-term decrease in the size of the Forest Red-tailed Black Cockatoo (FRTBC) population. As with Carnaby's and Baudin's Cockatoo, the term 'population' has not been defined for FRTBC, due to the mobile and widely distributed nature of these species, and the variation in flock compositions. For FRTBCs, it is more appropriate to consider the significance in terms of impacts on habitat rather than a resident population (DSEWPaC, 2012; DotEE, 2017). The proposed action will necessitate clearing up to 15.8 ha of potential FRTBC foraging habitat, representing 0.2% of the total available potential foraging habitat within 6 km of the proposed action area, based on remnant native vegetation associations known to be utilised by FRTBC. The Proposed action will require the removal of 15.8 ha of suitable habitat, comprising: • *Eucalyptus wandoo* Woodland over *Banksia* - **Foraging and Breeding habitat** • *Corymbia calophylla* and *Eucalyptus marginata* Woodland), - **Foraging and Breeding habitat** and • Grassland with isolated trees (mix of jarrah, marri and wandoo - **Foraging and Breeding habitat** Within the proposed action area, habitat considered suitable for FRTBC coincides with that suitable for Baudin's Cockatoo. Biologic (2021) assessed the quality of habitat present as to range between 'Moderate' to 'High', with the majority (>70%) of the proposed action area comprised of 'Moderate' quality habitat. Regional mapping indicates that 6,014 ha and 23,190 ha of potential foraging habitat for FRTBC occurs within 6 km and 12 km of the proposed action area, respectively. Approximately 19,167 ha within 12 km is located within DBCA managed lands as conservation estate (Figure 1). The proposed action will necessitate the clearing of up to 15.8 ha of potential foraging habitat, representing 0.2% of the total available potential foraging habitat within 6 km of the proposed action area, based on remnant native vegetation associations known to be utilised by the species. The proposed action will require the removal of up to 244 suitable DBH trees, of which 19 were assessed by Biologic (2021) to contain potentially suitable hollows when assessed from the ground. Subsequently, Kirkby (2021) undertook a targeted hollow assessment, which identified one of these hollows as being suitable for breeding. Following further investigations with a camera pole by Main Roads Environment personnel, it was determined that this tree was not currently in use. Evidence of chewing was observed; however, this could be attributable to other species including galahs. Two additional trees containing suitable hollows were recorded immediately adjacent to the proposed action area (<10m), no evidence of use was observed. No breeding by FRTBC has been recorded within the proposed action area. Breeding for FRTBC is known to occur in the regional area with breeding recorded approximately 9 km east of the proposed action area. Clearing for the proposed action has the potential to result in localised impacts to breeding FRTBCs, however, given the distance of the nearest known breeding location from the proposed action and the amount of vegetation present, this impact is not considered to be significant. Furthermore, given the presence of over 6,000 ha of remnant vegetation within 6 km of the proposed action area, of which 2,385 ha is within DBCA conservation estate, it is considered unlikely that these impacts will result in a long-term decrease to the population. In addition, a number of mitigation measures will be implemented through the preparation of a CEMP to minimise the risk of impact to the species. These measures will include, but are not limited to: • Prestart and toolbox meeting to raise awareness of environmental management requirements and operational controls, • Definition of work area and exclusion zones using fencing, flagging or other appropriate signage, • Injured, sick or orphaned native fauna located on project site will be notified immediately to the Superintendent. Contact will be made to either the local DBCA office or Wildlife care centre. • Retention of vegetation and preferential use of previously disturbed areas where possible. On this basis it is unlikely that the proposed action will lead to a long-term decrease in the size of a population.
Reduce the area of occupancy of an important population	**Significant impact Unlikely** The proposed action will not significantly reduce the area of occupancy of FRTBC. FRTBC has an estimated area of occupancy of around 20 000 km² (Garnett et al. 2011). The proposed action will impact less than 0.3% of the available foraging habitat within 6 km of the Project (GoWA 2019). Accordingly, the proposed action will not reduce the total area of occupancy of FRTBC significantly.
Fragment an existing population into two or more populations	**Significant impact Unlikely** The proposed action will not fragment an existing population as clearing involves the removal of a relatively small area of habitat adjacent to and already bisected by Great Eastern Highway. Connections to the adjacent foraging and breeding habitat will remain north, south and east of the proposed action and clearing will not create a gap of greater than 4 km between patches of suitable habitat (breeding, foraging or roosting). The scale and nature of the proposed action is not sufficient to sever connections between nearby areas of Black Cockatoo habitat, nor sever connections between two or more populations that occur within known distributions.
Adversely affect habitat critical to the survival of a species	**Significant impact Unlikely** The *Forest Black Cockatoo Recovery Plan* (DEC, 2008) identifies habitat critical for the survival of FRTBC as those areas: • Currently occupied by the cockatoos • Not currently occupied by the cockatoos due to recent fire but capable of supporting cockatoo populations when sufficiently recovered • Of natural vegetation in which the cockatoo's nest, feed and roost • Of natural vegetation through which the cockatoos can move from one occupied area to another • Of suitable vegetation within the recorded range in which undiscovered cockatoo populations may exist. In considering the broad definition above, the proposed action area contains habitat critical to the species' survival. However, the proposed action will not significantly impact critical habitat either directly or indirectly, which would compromise the species' survival. While the proposed action area comprises suitable foraging habitat that ranges from moderate to high quality, as discussed previously, this habitat represents 0.2% of the surrounding vegetation that is likely to consist of similar if not better habitat that would meet the definition of critical habitat. The proposed action is unlikely to impact on breeding habitat for the species. While breeding records for FRTBC are known within 9 km of the proposed action area, FRTBC typically nests in large, mature marri (*Corymbia calophylla*) with an estimated average age of 222 years (Johnstone, Kirkby & Sarti, 2013). As discussed previously, the proposed action will require the removal of up to 244 suitable DBH

Significant Impact Criteria	*Calyptorhynchus banksii naso* (Forest Red-tailed Black Cockatoo) EPBC Act (Vulnerable)
	trees, of which 19 were assessed by Biologic (2021) to contain potentially suitable hollows. Kirkby (2021) undertook a targeted hollow assessment, which identified only one potential breeding tree with a suitable hollow, a *Eucalyptus wandoo,* within the proposed action area. An additional two trees, both *Eucalyptus wandoo,* containing potentially suitable hollows were recorded outside, but within 10m, of the proposed action area. Considering the species of tree present and noting the preferred nesting habitat for FRTBC, habitat present within the proposed action area is more suitable to support Carnaby's Cockatoo breeding than FRTBC. In considering the above, it is unconsidered unlikely that the Proposed action will result in a significant adverse effect on habitat critical to the survival of the species.
Disrupt the breeding cycle of an important population	**Significant impact Unlikely** As discussed above, the proposed action is unlikely to impact on known breeding habitat for the species. While breeding records for FRTBC are known within 9 km of the proposed action area, FRTBC typically nest in large, mature marri (*Corymbia calophylla*) with an estimated average age of 222 years (Johnstone, Kirkby & Sarti, 2013). As discussed previously, the proposed action will require the removal of up to 244 suitable DBH trees, of which 19 were assessed by Biologic (2021) to contain potentially suitable hollows. Kirkby (2021) undertook a targeted hollow assessment, which identified only one potential breeding tree, a *Eucalyptus wandoo* within the proposed action area. An additional two trees, both *Eucalyptus wandoo,* containing potentially suitable hollows were recorded outside, but within 10m, of the proposed action area. Considering the species of tree present and noting the preferred nesting habitat for FRTBC, habitat present within the proposed action area is more suitable to support Carnaby's Cockatoo breeding than FRTBC. EPA (2019) discusses that Black Cockatoos rely on overlapping foraging resources within 6 km and 12 km of breeding sites in addition to water resources to support breeding pairs. While the proposed action will require the removal of 15.8 ha of quality foraging habitat, it is not expected to result in a significant impact when considered in the context of the surrounding vegetation and the presence of several nature reserves. Considering the above, it is unlikely that the proposed action will result in a significant impact that will disrupt the breeding cycle of a population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Significant impact Unlikely** The proposed action is not expected to impact the availability or quality of habitat to the extent that FRTBC are likely to decline. The clearing of approximately 15.8 ha of potential habitat represents a 0.2% reduction in potential foraging and breeding habitat for FRTBC within the local area (suitable remnant vegetation within a 6 km radius). The reduction in foraging and potential breeding habitat for the species may result in a minor residual impact associated with the proposed action but this impact is not considered significant. On this basis, the proposal is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	**Significant impact Unlikely** The proposed action is unlikely to result in the introduction of harmful or invasive species. The proposed action will be implemented according to several management plans, including a fauna management and dieback management plan, which include measures to manage the potential spread of weeds, dieback and feral animals into adjacent retained vegetation that could comprise habitat for the species.
Introduce disease that may cause the species to decline, or	**Significant impact Unlikely** The DEC (2008), DPaW (2013) and EPA (2019) identify the potential threats to the survival of individuals of Black Cockatoo as including declining vegetation health and other diseases. Dieback (*Phytophthora cinnamomi)* and Marri Canker (*Quambalaria coyrecup*) can infect flora species used by Black Cockatoos for foraging, nesting and roosting. A recent Dieback occurrence assessment (Glevan 2021) identified multiple occurrences of *Phytophthora* Dieback infestations or evidence of disease presence within the proposed action area and surrounding area. The potential for the introduction and/or spread of Dieback (and Marri Canker, if present) can be appropriately managed through a Dieback Management Plan, developed in consultation with the DBCA, and the implementation of appropriate hygiene measures during land clearing and earthmoving. The proposal will involve implementation of hygiene measures, including but not limited to: • Movements of machines and other vehicles to be restricted to the areas of clearing for the proposal • All vehicles, machinery and tools shall arrive at site clean of soil, mud or vegetative material, will be inspected for compliance and sterilised prior to work if necessary (full hygiene clean down) • Where practicable works to be undertaken in dry soil conditions, especially within protectable areas • Clean on Entry (CoE) points are to be established and clearly demarcated on site using flagging and signage prior to the commencement of works • If works are being undertaken during a rainfall event, all run-off from the CoE points is to be retained on site and must not be permitted to dissipate into the surrounding vegetation. It is recommended that were possible works are undertaken under dry soil conditions. The implementation of the Dieback Management Plan will assist in assist in ensuring that the proposed action will not introduce and/or spread disease to an extent which may cause a reduction in the quality of the Black Cockatoo foraging habitat present, which could in turn cause the species to decline. The disease status of Black Cockatoos in the wild remains unknown, although infectious diseases such as beak and feather disease, avian polyomavirus and *chlamydophilosis* may pose a threat, as they are significant in other captive and free-living psittacine species. The Project does not involve any actions which could potentially introduce infectious diseases within Black Cockatoo populations which could cause the taxon to decline.
Interfere with the recovery of the species.	**Significant impact Unlikely** The Project will result in the clearing of up to 15.8 ha of moderate to high-quality foraging habitat and 244 suitable DBH trees, one of which has been identified as a likely breeding tree. National recovery plans have been produced for all three Western Australian Black Cockatoo species. These plans provide measures for species recovery. In the proposed action is not inconsistent with the recovery plans for FRTBC.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BAKERS HILL
Great Eastern Hwy
Great Eastern Hwy
Chidlow York
Legend
Proposed Action Area
Black Cockatoo Roost Site (Buffer)
DBCA Managed Land (Conservation Estate)
Potential Foraging Habitat (6km)
Likely Breeding Hollow
6km Buffer Area
State Road Network
mainroads
WESTERN AUSTRALIA
Figure 1 - Black Cockatoo Habitat
Coordinate System: GDA2020 MGA Zone 50
Scale: 1:105,000 @ A4
Created Date: 11/01/2022
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BUNBURY
Author: c8473

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