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**NORTH ELLENBROOK (WEST) LSP1 – SIGNIFICANT IMPACT ASSESSMENT**

A significant impact assessment for impacts resulting from the proposed action has been undertaken against the Commonwealth Policy Statement *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*. Results are provided in Table 1 for Carnaby's black cockatoo (CBC) and in Table 2 for Forest red-tailed black cockatoo (FRTBC).

**Table 1: Assessment against the Significant Impact Criteria for Carnaby's Black Cockatoo**

| Significant Impact Criteria | Significant Impact | Justification |
|---|---|---|
| **Lead to a long term-decrease in the size of a population.** | **Unlikely to occur** | Black cockatoos forage over a large area, primarily in areas up to 12 km from their nest during the breeding season. During the non-breeding season, black cockatoos will mainly forage in areas up to 20 km from a known night roosting habitat (although may travel farther). Roost sites are typically within 2 km of a natural or artificial water source. Black cockatoos rely on connecting patches of vegetation between foraging resources, breeding habitat, and night roosting habitat.<br>CBC nest mainly in salmon gum, wandoo, tuart, jarrah, flooded gum, karri and marri, and utilise hollows from 10-65 cm diameter (average 26 cm) and >1 m deep (DCCEEW, 2022). The project area is within the known breeding range of Carnaby's black cockatoo.<br>The nearest confirmed breeding site is 18 km north of the project area (DBCA-063). The proposed action will impact 38 potential nesting trees within the project area, none of which contains suitable breeding hollows.<br>The closest known roost site is approximately 700 m south of the project area (in the adjacent lot), where a total of eight white-tailed black cockatoos (assumed to be Carnaby's black cockatoos) have been recorded over four surveys.<br>There are four dams within the project area that provide an artificial water source. As such, watering habitat is present within 2 km of the project area. The presence of tall trees (eucalypts >10 m) within the project area may provide suitable roosting habitat for both species; however, given the sparse nature of these trees it is more likely that black cockatoos will roost in dense forest and woodland areas which are present in the nearby Walyunga National Park, Bullsbrook Nature Reserve, Twin Swamps Nature Reserve, and Gnangara State Forest. No evidence of current roosting by black cockatoos was observed during any survey.<br>The removal of up to 2.33 ha of 'Low to Moderate' to 'High' value foraging habitat for CBC and 38 potential black cockatoo nesting trees (DBH ≥50 cm) with none of the trees containing suitable hollows for breeding, is not expected to lead to a long-term decrease in the size of a population. Removal of up to 2.33 ha represents 0.014% of the estimated suitable CBC foraging habitat within 12 km of the project area (being 16,723.47 ha). Of the 16,723.47 ha of potential foraging habitat within 12 km of the project area, 45.8% (7,396.20 ha) occurs within DBCA managed land.<br>Given the scale of the impacts to foraging habitat, the extent of similar or better-quality habitat conservations areas within 12km, and the distance to any known breeding locations, a long-term decrease in the size of a population is considered unlikely. |
| **Reduce the area of occupancy of the species.** | **Unlikely to occur** | The most recently estimated area of occupancy of Carnaby's black cockatoo is 10,000 $km^2$ (low reliability) (Garnett et al., 2011). |

| Significant Impact Criteria | Significant Impact | Justification |
|---|---|---|
| | | The permanent removal of up to 2.33 ha of suitable foraging habitat for CBC is considered highly unlikely to influence the area of occupancy of the species, particularly given the scale of the impacts and the quantity of similar value foraging resources mapped within the broader landscape. The surrounding area within 12 km of the project area contains up to 16,723.47 ha of potentially suitable foraging habitat for CBC. Of that, up to 7,396.20 ha (45.8%) lies within DBCA managed lands, which is therefore considered to be retained long-term.<br>The removal of 38 potential nesting trees, which do not contain suitable breeding hollows and therefore have never been used for black cockatoo breeding activities is not considered to reduce the area of occupancy of the species.<br>The clearing within the impacted habitat within the project area is considered unlikely to reduce the area of occupancy for the species, given the scale of the impacts in the regional context, the localised nature of the impacts and the availability of habitat within the regional area, that is of similar or better quality to that within the project area. |
| **Fragment an existing population into two or more populations.** | **Unlikely to occur** | The clearing within the project area will result in permanent impacts to 2.33 ha of suitable foraging habitat for the species, which includes 30 potential nesting trees, all without potential nesting hollows. Further 8 stags with a DBH ≥ 50 cm will be removed, which do not contain suitable hollows. Vegetation within the project area is mainly comprised of scattered patches without significant connection to remnant native vegetation outside the project area. Areas where large, continuous patches of habitat occur are located within Nature reserves and State Forests within 12 km of the project area. Vegetation within the project area is disconnected from regional habitat values.<br>Black cockatoos are highly mobile and frequently travel distances of around 12 km (during the breeding season) and 20 km (during the non-breeding season) to access foraging resources (DAWE, 2022). The proposed action will not cause vegetation fragmentation or cause any existing CBC populations to be fragmented. |
| **Adversely affect habitat critical to the survival of the species.** | **Unlikely to occur** | Habitat that is critical to the survival for Carnaby's black cockatoo is defined as eucalypt woodland that provide nest hollows used for breeding, with vegetation that provides foraging habitat, roosting habitat, and that is close to natural or artificial water sources (DPaW, 2013).<br>The project area does not fully meet this definition, as no nest hollows are present and the 38 trees to be removed do not currently show signs of hollow development. The nearest confirmed breeding site is 18 km north of the project area.<br>Although stands of patches of isolated trees may provide suitable roosting habitat, no signs of roosting behaviour within the project area have been observed. |

| Significant Impact Criteria | Significant Impact | Justification |
|---|---|---|
| | | Within 12 km of the project area there is an estimated 16,723.47 ha of vegetation providing potentially suitable foraging habitat for CBC. This vegetation also contains potential roosting and breeding habitat as most vegetation complexes within this area are described as marri, jarrah and wandoo woodlands and forests.<br>Given the absence of suitable nesting hollows within the project area and the abundance of foraging habitat in the surrounding area, the proposed clearing of 38 potential nesting trees and 2.33 ha of foraging habitat is not considered to adversely affect habitat critical to the survival of CBC. |
| **Disrupt the breeding cycle of the population.** | **Unlikely to occur** | The Project Area is within the known breeding range of Carnaby's black cockatoo. The nearest confirmed breeding site is 18 km north of the project area (DBCA-063).<br>In total, 60 potential nesting trees were recorded across the project area. The proposed action will require the clearing of 38 potential nesting trees, all without potential nesting hollows for black cockatoos, including CBC. A total of 22 potential nesting trees will be retained within POS areas.<br>Given the lack of breeding evidence throughout the project area, and the availability of suitable habitat within the region, it is considered unlikely that the necessitated clearing within the project area will disrupt the breeding cycle of the local population. |
| **Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.** | **Unlikely to occur** | Clearing of 2.33 ha of foraging habitat for CBC with a weighted average quality score of 7/10 (moderate) (0.15 ha high, 1.31 ha moderate to high, 0.06 ha moderate, 0.81 ha low to moderate) and 38 potential nesting trees without suitable nesting hollows is unlikely to significantly reduce the availability or quality of habitat.<br>Given the presence of suitable habitat within 12 km of the project area, the proposed action to remove 2.33 ha of foraging habitat, ranging in quality from 'Low to Moderate' to 'High' and 38 potential nesting trees (without suitable hollows) will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the 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.** | **Unlikely to occur** | Potential introduction of weeds and pathogens which may impact the surrounding habitat will be managed as part of initial clearing activities, standard best-practice management mitigation measures will be implemented to avoid the introduction of pathogens and weeds, including ensuring clean machinery is used and clearing is restricted to permitted areas only.<br>Introduction or increase in feral animals within the project area can be minimised through standard practices such as not feeding wildlife, managing waste appropriately, and implementing feral species control if warranted.<br>As such, the risk of invasive species introduction as result of the proposed action will be avoided through the application of standard hygiene measures. |

| Significant Impact Criteria | Significant Impact | Justification |
|---|---|---|
| **Introduce disease that may cause the species to decline, or** | **Unlikely to occur** | The proposed clearing has an extremely low risk of introducing diseases to which black cockatoos are susceptible (e.g. Beak and Feather Disease).<br>Black cockatoo species can also be impacted by *Phytophthora cinnamomii* (dieback) disease, given many habitat (plant) species are susceptible to the disease. As part of clearing, standard best-practice management mitigation measures will be implemented to avoid the introduction of pathogens and weeds, including ensuring clean machinery is used and clearing is restricted to permitted areas only.<br>As such, the risk of introducing disease as result of the proposed action will be minimised through standard hygiene measures. |
| **Interfere with the recovery of the species.** | **Unlikely to occur** | The recovery objective for Carnaby's black cockatoo (DPaW, 2013) is "*to stop further decline in the distribution and abundance of Carnaby's cockatoo by protecting the birds throughout their life stages and enhancing habitat critical for survival throughout their breeding and non-breeding range*". Habitat critical to the survival for Carnaby's can be summarised as eucalypt woodland that provide nest hollows used for breeding, with vegetation that provides foraging, roosting habitat and close to natural or artificial water source (DPaW, 2013).<br>The project area is within the breeding range of Carnaby's black cockatoo. It is, however, located outside known breeding areas. The closest confirmed breeding area is 5.7 km north of the project area (DBCA-054), the nearest confirmed breeding site is located 18 km north of the project area.<br>The 38 trees identified for removal do not currently provide breeding habitat given the absence of suitable hollows. The 38 trees therefore do not represent critical habitat for the species.<br>There are fresh water sources within 2 km of the project area from dams and drainage lines.<br>The proposed action will impact 2.33 ha of moderate quality foraging habitat for CBC. This represents 0.014% of the regional foraging habitat extent for CBC within 12 km from the project area. The nearest conservation site (Nature Reserve, State Forest, National Park), which is considered to provide suitable black cockatoo habitat of similar or better-quality than that within the project area, is located approximately 1.9 km west (Gnangara-Moore River State Forest) of the project area and is ~66,007 ha in size (DBCA-011).<br>As such, given the small scale of impacts and absence of known breeding from the project area, the removal of 2.33 ha of moderate quality foraging habitat (0.81 ha of low to moderate, 0.06 ha moderate, 1.31 ha moderate to high and 0.15 ha high quality foraging habitat), which includes 30 potential breeding trees without hollow development, as well as eight additional stags with a DBH ≥ 50 cm and without hollow development will not interfere with the recovery of CBC and is not inconsistent with the recovery plan objective. |

## CBC – Significant Impact Assessment Summary

Based on the assessment in Table 1 the proposed action is unlikely to have a significant residual impact on CBC. Onsite planting will also be implemented at a 2:1 ratio, meaning 76 trees will be planted to replace the 38 that are being impacted to help create future foraging habitat and potential nesting habitat for black cockatoo species.

**Table 2: Assessment against the Significant Impact Criteria for Forest Red-tailed Black Cockatoo**

| Significant Impact Criteria | Significant Impact | Justification |
|---|---|---|
| **Lead to a long term-decrease in the size of a population.** | **Unlikely to occur** | Black cockatoos forage over a large area, primarily in areas up to 12 km from their nest during the breeding season. During the non-breeding season, black cockatoos will mainly forage in areas up to 20 km from a known night roosting habitat (although may travel farther). Roost sites are typically within 2 km of a natural or artificial water source. Black cockatoos rely on connecting patches of vegetation between foraging resources, breeding habitat, and night roosting habitat.<br>FRTBC rely on connecting patches of vegetation between foraging resources, breeding habitat, and night roosting habitat. FRTBC nest mainly in jarrah, marri, karri, wandoo, bullich, blackbutt and tuart, and utilise hollow from 12-150 cm diameter (average 34 cm) and >1 m depth (DCCEEW,2022).<br>The project area is within the distribution range of Forest red-tailed black cockatoo.<br>The proposed action will impact 38 potential nesting trees within the project area, none of which contains suitable breeding hollows.<br>There are a total of 16 roosting sites utilised by white-tailed black cockatoos within 12 km of the Site (Birdlife, 2023). Of these, seven are joint roosts (also utilised by FRTBC). The closest roosting site used by white-tailed black cockatoos is situated 700 m south of the Site, with a cumulative count of eight (recorded over four surveys between 2010 and 2023). There are a total of eight roosting sites utilised by FRTBC within 12 km of the Site (Birdlife, 2023). Of these seven are joint roosts. The closest roosting site used by FRTBC is 1.6 km southeast of the Site, with a cumulative count of 41 (recorded over five surveys between 2014 and 2023).<br>There are four dams within the project area that provide an artificial water source. As such, watering habitat is present within 2 km of the project area. The presence of tall trees (eucalypts >10 m) within the project area may provide suitable roosting habitat for both species; however, given the sparse nature of these trees it is more likely that black cockatoos will roost in dense forest and woodland areas which are present in the nearby Walyunga National Park, Bullsbrook Nature Reserve, Twin Swamps Nature Reserve, and Gnangara State Forest. No evidence of current roosting by black cockatoos was observed during any survey.<br>The removal of up to 1.46 ha of 'Moderate to High' and 'High' value foraging habitat for FRTBC and 38 potential black cockatoo nesting trees (DBH ≥50 cm) with none of the trees containing suitable hollows for breeding, is not expected to lead to a long-term decrease in the size of a population. Removal of up to 1.46 ha represents 0.021% of the estimated suitable FRTBC foraging habitat within 12 km of the project area (being 6,832.75 ha). Of the 6,832.75 ha of potential foraging habitat within 12 km of the project area, 49.6% (3,386.80 ha) occurs within DBCA managed land. |

| Significant Impact Criteria | Significant Impact | Justification |
|---|---|---|
| | | Given the scale of the impacts to foraging habitat, the extent of similar or better-quality habitat conservations areas within 12 km, and the distance to any known breeding locations, a long-term decrease in the size of a population is considered unlikely. |
| **Reduce the area of occupancy of the species.** | **Unlikely to occur** | The most recently estimated area of occupancy of Forest red-tailed black cockatoo 20,000 $km^2$ (low reliability) (Garnett et al., 2011).<br>The permanent removal of up to 1.46 ha of suitable foraging habitat for FRTBC is considered highly unlikely to influence the area of occupancy of the species, particularly given the scale of the impacts and the quantity of similar value foraging resources mapped within the broader landscape. The surrounding area within 12 km of the project area contains up to 6,832.75 ha of potentially suitable foraging habitat for FRTBC. Of that, up to 3,386.80 ha (49.6%) lies within DBCA managed lands, which is therefore considered to be retained long-term.<br>The removal of 38 potential nesting trees, which do not contain suitable breeding hollows and therefore have never been used for black cockatoo breeding activities is not considered to reduce the area of occupancy of the species.<br>The clearing within the impacted habitat within the project area is considered unlikely to reduce the area of occupancy for the species, given the scale of the impacts in the regional context, the localised nature of the impacts and the availability of habitat within the regional area, that is of similar or better quality to that within the project area. |
| **Fragment an existing population into two or more populations.** | **Unlikely to occur** | The clearing within the project area will result in permanent impacts to 1.46 ha of suitable foraging habitat for the species, which includes 30 potential nesting trees, all without potential nesting hollows. Further 8 stags with a DBH ≥ 50 cm will be removed, which do not contain suitable hollows. Vegetation within the project area is mainly comprised of scattered patches without significant connection to remnant native vegetation outside the project area. Areas where large, continuous patches of habitat occur are located within Nature reserves and State Forests within 12 km of the project area. Vegetation within the project area is disconnected from regional habitat values.<br>Black cockatoos are highly mobile and frequently travel distances of around 12 km (during the breeding season) and 20 km (during the non-breeding season) to access foraging resources (DAWE, 2022). The proposed action will not cause vegetation fragmentation or cause any existing FRTBC populations to be fragmented. |
| **Adversely affect habitat critical to the survival of the species.** | **Unlikely to occur** | Habitat that is critical to the survival of Forest red-tailed black cockatoo is identified as all marri, karri, and jarrah forests, woodlands, and remnants in the south-west of WA receiving more than 600 mm of annual average rainfall (DEC, 2008). |

| Significant Impact Criteria | Significant Impact | Justification |
|---|---|---|
| | | The project area does not fully meet this definition, as no nest hollows are present and the 38 trees to be removed do not currently show signs of hollow development.<br>Although stands of patches of isolated trees may provide suitable roosting habitat, no signs of roosting behaviour within the project area have been observed.<br>Within 12 km of the project area there is an estimated 6,832.75 ha of vegetation providing potentially suitable foraging habitat for FRTBC. This vegetation also contains potential roosting and breeding habitat as most vegetation complexes within this area are described as marri, jarrah and wandoo woodlands and forests.<br>Given the absence of suitable nesting hollows within the project area and the abundance of foraging habitat in the surrounding area, the proposed clearing of 38 potential nesting trees and 1.46 ha of foraging habitat is not considered to adversely affect habitat critical to the survival of FRTBC. |
| **Disrupt the breeding cycle of the population.** | **Unlikely to occur** | In total, 60 potential nesting trees were recorded across the project area. The proposed action will require the clearing of 38 potential nesting trees, all without potential nesting hollows for black cockatoos, including FRTBC. A total of 22 potential nesting trees will be retained within POS areas.<br>Given the lack of breeding evidence throughout the project area, and the availability of suitable habitat within the region, it is considered unlikely that the necessitated clearing within the project area will disrupt the breeding cycle of the local population. |
| **Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.** | **Unlikely to occur** | Clearing of 1.46 ha of foraging habitat for FRTBC with a weighted average quality score of 8/10 (moderate to high) (0.15 ha high, 1.31 ha moderate to high) and 38 potential nesting trees without suitable nesting hollows is unlikely to significantly reduce the availability or quality of habitat.<br>Given the presence of suitable habitat within 12 km of the project area, the proposed action to remove 1.46 ha of foraging habitat, ranging in quality from 'Moderate to High' to 'High' and 38 potential nesting trees (without suitable hollows) will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the 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.** | **Unlikely to occur** | Potential introduction of weeds and pathogens which may impact the surrounding habitat will be managed as part of initial clearing activities, standard best-practice management mitigation measures will be implemented to avoid the introduction of pathogens and weeds, including ensuring clean machinery is used and clearing is restricted to permitted areas only.<br>Introduction or increase in feral animals within the project area can be minimised through standard practices such as not feeding wildlife, managing waste appropriately, and implementing feral species control if warranted.<br>As such, the risk of invasive species introduction as result of the proposed action will be avoided through the application of standard hygiene measures. |

| Significant Impact Criteria | Significant Impact | Justification |
|---|---|---|
| **Introduce disease that may cause the species to decline, or** | **Unlikely to occur** | The proposed clearing has an extremely low risk of introducing diseases to which black cockatoos are susceptible (e.g. Beak and Feather Disease).<br>Black cockatoo species can also be impacted by *Phytophthora cinnamomii* (dieback) disease, given many habitat (plant) species are susceptible to the disease. As part of clearing, standard best-practice management mitigation measures will be implemented to avoid the introduction of pathogens and weeds, including ensuring clean machinery is used and clearing is restricted to permitted areas only.<br>As such, the risk of introducing disease as result of the proposed action will be minimised through standard hygiene measures. |
| **Interfere with the recovery of the species.** | **Unlikely to occur** | The recovery objective for Forest red-tailed black cockatoo (DEC, 2008) is "*to stop further decline in the breeding populations of Baudin's Cockatoo and the Forest Red-tailed Black Cockatoo and to ensure their persistence throughout their current range in the south-west of Western Australia for the duration of this plan*". Habitat critical to the survival for FRTBC can be summarised as marri, karri and jarrah woodlands with more than 600 mm of rain per year (DEC, 2008).<br>The project area is outside the breeding range of Forest red-tailed black cockatoo.<br>The 38 trees identified for removal do not currently provide breeding habitat given the absence of suitable hollows. The 38 trees therefore do not represent critical habitat for the species.<br>There are fresh water sources within 2 km of the project area from dams and drainage lines.<br>The proposed action will impact 1.46 ha of moderate to high quality foraging habitat for FRTBC. This represents 0.021% of the regional foraging habitat extent for FRTBC within 12 km from the project area. The nearest conservation site (Nature Reserve, State Forest, National Park), which is considered to provide suitable black cockatoo habitat of similar or better-quality than that within the project area, is located approximately 1.9 km west (Gnangara-Moore River State Forest) of the project area and is ~66,007 ha in size (DBCA-011).<br>As such, given the small scale of impacts and absence of known breeding from the project area, the removal of 1.46 ha of moderate quality foraging habitat (1.31 ha of moderate to high and 0.15 ha high quality foraging habitat), which includes 30 potential breeding trees without hollow development, as well as eight additional stags with a DBH ≥ 50 cm and without hollow development will not interfere with the recovery of FRTBC and is not inconsistent with the recovery plan objective. |

## FRTBC – Significant Impact Assessment Summary

Based on the assessment in Table 2 the proposed action is unlikely to have a significant residual impact on FRTBC. Onsite planting will also be implemented at a 2:1 ratio, meaning 76 trees will be planted to replace the 38 that are being impacted to help create future foraging habitat and potential nesting habitat for black cockatoo species.

Department of Environment and Conservation. (2008). *Forest Black Cockatoo (Baudin's Cockatoo Calyptorhynchus baudinii and Forest Red-tailed Black Cockatoo* Calyptorhynchus banksii naso*) Recovery Plan*. Available from: https://www.dcceew.gov.au/sites/default/files/documents/wa-forest-black-cockatoos-recovery-plan.pdf