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Flora and Fauna Assessment

Wellard Darwin Integrated Live Export Facility

Report Number 23919.80931



Prepared for



Wellard Rural Exports Pty Ltd

1A Pakenham Street
Fremantle WA 6160
Telephone: (08) 9432 2800

ABN: 31 109 866 328

Prepared by



PO Box 411
TOOWOOMBA QLD 4350
Telephone: (07) 4638 2228

ABN: 56 135 005 999

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Executive Summary

EnviroAg Australia Pty Ltd has been engaged to provide a Flora and Fauna Assessment for the development of Wellard Rural Export's Livingstone Integrated Live Export Facility (ILEF).

The land is currently used for grazing stock and pasture production. However, a 2.6 ha patch of native remnant vegetation is located in the middle of the northern part of the site. The development of the site will involve clearing native vegetation. Thus, a Flora and fauna assessment was undertaken.

An onsite vegetation assessment found that the remnant vegetation patch contained no native understory species due to extensive historical clearing. A desktop search of the ILEF site using the Northern Territory's NR Maps found four (4) historical records of protected species onsite. A search using the Department of the Environment's EPBC Act Protected Matters Search Tool found potential habitat onsite for thirteen (13) threatened species and thirteen (13) migratory species.

An assessment of these species with regard to the ILEF site's conditions concluded that the proposed activity will not have a significant impact on any of these species.

The proposed development will not require referral to the Commonwealth Minister for the Environment for consideration under the EPBC Act.

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1. Introduction

Wellard Rural Exports Pty Ltd (Wellard) is proposing to develop an Integrated Live Export Facility (ILEF) in Darwin. The property is referred to as “Livingstone Valley” and is located on Lot 5544 Hundred of Strangways, 2658 Stuart Highway.

The site of the proposed ILEF is located adjacent to Stuart highway and is approximately 1 km away from Berry Creek and its tributary Hardy Creek. The site has been cleared, ploughed and sown to improve pasture (Figure 1) and is currently used for grazing stock and pasture production.

The development of the site will involve clearing 2.6 ha of native vegetation. Thus, a Flora and fauna assessment has been undertaken.



Figure 1 Cultivation and pasture on “Livingstone Valley”

2. Flora and Fauna Surveys

2.1 Desktop Searches

2.1.1 Threatened Flora and fauna

A desktop search of the relevant databases for populations, species and communities listed as threatened under the Environmental Protection and Biodiversity Conservation Act (EPBC Act) and the NT Territory Parks and Wildlife Conservation Act (TPWC Act). These included:

A search of the NT NR Maps (Department of Land Resource Management, 2014) to determine what fauna species have been found on the property and its neighbouring sites that may be threatened under the TPWC Act; and

A search of the Department of the Environment Protected Matters Search Tool (Department of the Environment, 2015a) to determine matters of national environmental significance listed under the EPBC Act that may occur onsite.

NT NR Maps listed four (4) TPWC Act threatened flora and fauna species, namely *Dasyurus hallucatus* (northern quoll), *Ardeotis australis* (Australian bustard), *Mesembriomys gouldii* (black-footed tree rat) and *Cycas armstrongii*. (Gardner Cycad or fire-fern). However, these records were collected between 1989 and 1991, so they may not currently be found onsite. Of these three species, only the northern quoll is listed on the EPBC Act.

The EPBC Act Protected Matters Search Tool identified twelve (12) fauna and one (1) flora species listed as threatened under the EPBC Act that may occur onsite.

Table 3 examines the likelihood of occurrence on the ILEF site based on the habitat and ecological profile of the species. Of these threatened fauna and flora, three (3) species listed under the EPBC Act were considered to have potential habitat represented at the site. This reasoning is based on the open, poorly connected and disturbed nature of the site, as well as the dominance of improved pasture and other introduced species. The potential threatened species are:

Dasyurus hallucatus (northern quoll);

Erythroiorchis radiatus (red goshawk); and

Geophaps smithii smithii (partridge pigeon).

The habitat, primarily consisting of exotic pasture species and a small 2.6 ha are of remnant trees with a weedy understory, is considered unsuitable for many threatened fauna likely to occur in the district.

Table 1 Flora and fauna listed as protected by the NT and Federal Governments

Scientific Name	Common Name	Status (NT)	Status (Cwth)	Habitat/Ecological Profile*	Likelihood of occurrence
Birds					
<i>Erythrura gouldiae</i>	Gouldian Finch	V	E	<p>Between February and October, they live within wooded hills that contain a variety of Eucalyptus species. Hollows in these trees provide nesting sites. During this period, they forage on the ground, feeding on shed seeds of native sorghum, and find water at small rocky waterholes that remain within the hills until the next wet.</p> <p>In the Wet season, they fly down into lowland drainages to feed on seeds of perennial grasses, including soft spinifex, cockatoo grass and golden beard grass.</p>	Habitat not suitable. Unlikely to occur.
<i>Erythrotriorchis radiatus</i>	Red goshawk	V	V	<p>Inhabits open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water. They are often found in riparian habitats along or near watercourses or wetlands. Adults have large home-ranges, estimated to be as great as about 120 km² for females and 200 km² for males.</p> <p>Between July and December, they nest and raise chicks within 1 km of a watercourse or wetland. Lives in the ranges at other times of the year.</p>	Habitat potentially suitable for foraging.

Scientific Name	Common Name	Status (NT)	Status (Cwth)	Habitat/Ecological Profile*	Likelihood of occurrence	
<i>Geophaps smithii</i>	Partridge (eastern)	Pigeon	V	V	Inhabits lowland tall eucalypt open forests and woodlands, with grassy understoreys. Feeds on seeds, mostly of grasses but also from Acacia and other woody plants in open and burnt areas. It is largely sedentary, although may make local-scale movements (up to 5-10 km) in response to seasonal variations in water and food availability. Nests on the ground in sites with dense grass cover.	Habitat potentially suitable. Has been found on neighbouring property.
<i>Rostratula australis</i>	Australian Snipe	Painted	V	E	No sites are known where the species resides and it is likely nomadic. They occur in shallow, vegetated, freshwater swamps, clay pans or inundated grassland (including temporary wetlands), feeding on seeds and invertebrates at the water's edge and on mudflats.	Habitat not suitable. Unlikely to occur.
<i>Tyto novaehollandiae kimberli</i>	Masked (northern)	Owl	V	V	Distribution poorly known. Recorded in riparian forest, rainforest, open forest, Melaleuca swamps, the edges of mangroves, and along the margins of sugar cane fields. They have a large home range and require large trees with large hollows in closed forest for nesting, with sufficient prey items (mammals).	Habitat not suitable. Unlikely to occur.
<i>Ardeotis australis</i>	Australian Bustard		V		Occurs in open country preferring grasslands, low shrublands, grassy woodlands and other structurally similar areas such as croplands and airfields. They move opportunistically, tracking rainfall, fires and food resources (e.g. grasshopper outbreaks) across the landscape. They are omnivorous, eating seeds, fruit, vegetation, invertebrates and small vertebrates.	Habitat potentially suitable. Has been found onsite before (recorded in 1989).

Scientific Name	Common Name	Status (NT)	Status (Cwth)	Habitat/Ecological Profile*	Likelihood of occurrence
Mammals					
<i>Conilurus penicillatus</i>	Brush-tailed Rabbit-rat	E	V	<p>Found in coastal northern Australian areas with high rainfall. Inhabits mixed eucalypt open forest and woodland or dunes with Casuarina, preferring habitats that are not burnt annually and that have an understorey of perennial grasses. Shelters during the day in tree hollows and hollow logs.</p> <p>Feeds predominantly on seed from perennial grasses, with leaves, plant stems and insects comprising a smaller proportion of the species' diet.</p>	Habitat not suitable. Unlikely to occur.
<i>Dasyurus hallucatus</i>	Northern Quoll	CE	E	<p>Inhabits rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrub land, grasslands and desert.</p> <p>Generally requires a rocky area, hollow log, tree hollow or termite mound for den, with surrounding vegetated habitats used for foraging and dispersal.</p> <p>Opportunistic omnivores, consuming insects, spiders, scorpions and centipedes, as well as fruit, nectar and carrion/road kill.</p>	Habitat potentially suitable for foraging. Has been found on neighbouring properties.
<i>Phascogale pirata</i>	Northern Brush-tailed Phascogale	E	V	<p>Inhabits tall open forests dominated by Darwin Woollybutt (<i>Eucalyptus miniata</i>) and Darwin Stringybark (<i>E. tetradonta</i>). It is arboreal and nocturnal, but forages in trees and on the ground. The species utilises hollows in trees for nesting during the day.</p> <p>They feed on invertebrates and some small vertebrates.</p>	Only semi-mature Darwin stringybark (<i>Eucalyptus miniata</i>) were found onsite, which are unlikely to have deep tree hollows. Habitat not suitable. Unlikely to occur.

Scientific Name	Common Name	Status (NT)	Status (Cwth)	Habitat/Ecological Profile*	Likelihood of occurrence
<i>Saccolaimus saccolaimus nudicluniatus</i>	Bare-rumped Sheathtail Bat	DD	CE	Occurs mostly in lowland areas in a range of woodland, forest and open environments. Roosts in deep tree hollows in the Poplar Gum, Darwin Woollybutt and Darwin Stringybark. They are insectivorous, but there is no information on foraging habitat for this species.	Only semi-mature Darwin stringybark (<i>Eucalyptus miniata</i>) were found onsite, which are unlikely to have deep tree hollows. Habitat not suitable. Unlikely to occur.
<i>Xeromys myoides</i>	Water Mouse	DD	V	Inhabits mangrove forests, freshwater swamps and floodplain saline grasslands, where it builds burrows or mounds to live in. It is nocturnal, foraging entirely on the ground for mainly marine and freshwater invertebrates.	Habitat not suitable. Unlikely to occur.
<i>Mesembriomys gouldii</i>	Black-footed tree rat	V		Occurs in tropical woodlands and open forests in coastal areas. They are nocturnal animals, sheltering in tree hollows during the day. Hard fruits and seeds are a major component of their diet, supplemented by grass and invertebrates and other seasonal resources such as nectar rich flowers.	Has been found onsite before (recorded in 1989). However, habitat currently onsite is not suitable with no tree hollows and very little woodland area available.
Reptiles					
<i>Acanthophis hawkei</i>	Plains Death Adder	V	V	Inhabits flat, treeless floodplains and cracking soil plains across mainland northern Australia. Feeds on frogs, reptiles and rats.	Habitat not suitable. Unlikely to occur
Fish					
<i>Pristis pristis</i>	Freshwater Sawfish		V	Potentially occurs in all large rivers of northern Australia. Juvenile and sub-adults predominantly occur in rivers and estuaries, while mature animals tend to occur more often in coastal and offshore waters up to 25 m in depth.	No waterbody onsite. Habitat not suitable. Not likely to occur.

Scientific Name	Common Name	Status (NT)	Status (Cwth)	Habitat/Ecological Profile*	Likelihood of occurrence
Plants					
<i>Atalaya brevialata</i>			CE	Inhabits footslope sites with open woodland vegetation on deeper, coarser sandy soils. Varying proportions of <i>Eucalyptus tectifera</i> and <i>Corymbia foelscheana</i> but also with <i>Xanthostemon paradoxus</i> , <i>Terminalia grandiflora</i> and <i>Acacia hemignosta</i> in the overstorey with open layer of perennial grasses such as <i>Eriachne avenacea</i> . It is absent from finer sandy soils or rocky soils in similar topographic situations where a naturally dense grass or shrub layer is present.	Habitat not suitable. Unlikely to occur.
<i>Cycas armstrongii</i>		V		It occurs mainly in open grassy woodland on yellow and red earths, limited in the area by drainage.	Habitat is suitable, but was not found onsite during vegetation assessment.

*Habitat/Ecological Profile descriptions from Department of Land Resource Management (2015) and Department of the Environment (2015b)

2.1.2 *Migratory Fauna*

Migratory species listed under the EPBC Act are a matter of national environmental significance under the EPBC Act's assessment and approval provisions. Listed migratory species include species listed in:

- Appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals) for which Australia is a Range State under the Convention;
- The recognised agreement between Australia and the People's Republic of China for the Protection of Migratory Birds and their Environment (CAMBA);
- The recognised agreement between Australia and the Republic of Korea on the Protection of Migratory Birds (ROKAMBA); and
- The recognised agreement between Australia and Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA).

Listed migratory species also include any native species identified in an international agreement approved by the Commonwealth Environment Minister. The Minister may approve an international agreement for this purpose if satisfied that it is an agreement relevant to the conservation of migratory species. An action will require approval from the Environment Minister if the action has, will have, or is likely to have a significant impact on a listed migratory species.

A review of the Protected Matters Search Tool indicated that thirteen (13) migratory species are likely to occur onsite. These species and an assessment of the subject site as potential habitat are provided in Table 2. This shows that potential habitat is present for six (6) of these species, of which three (3) are primarily aerial foragers in the site's habitat. The potential impact on these species was assessed under EPBC Act considerations.

Table 2 Protected migratory fauna

Scientific Name	Common Name	Status (NT)	Status (Cwth)	Habitat/Ecological Profile*	Likelihood of occurrence
<i>Apus pacificus</i>	Fork-tailed Swift			Mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. Insectivorous and forage aerially, up to hundreds of metres above ground.	Habitat potentially suitable for aerial foraging.
<i>Crocodylus porosus</i>	Salt-water Crocodile			Occurs mostly in tidal rivers, coastal floodplains and channels, billabongs and swamps up to 150 km inland from the coast.-	No waterbody onsite. Habitat not suitable. Not likely to occur.
<i>Haliaeetus leucogaster</i>	White-bellied Eagle	Sea-		Found along the coastline and extending inland along some of the larger waterways. Typically found near large areas of open water, but have been recorded in (or flying over) a variety of terrestrial habitats, including freshwater swamps, lakes, reservoirs, billabongs, saltmarshes and sewage ponds.	Habitat not suitable. Not likely to occur.
<i>Hirundo rustica</i>	Barn Swallow			Inhabits open country in coastal lowlands, often near water, towns and cities. Typically seen in freshwater wetlands, paperbark <i>Melaleuca</i> woodland, mesophyll shrub thickets and tussock grassland. Aerial forager that consumes mainly flying insects.	Habitat potentially suitable for aerial foraging.
<i>Merops ornatus</i>	Rainbow Bee-eater			The Rainbow Bee-eater occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation.	Habitat potentially suitable for aerial foraging.
<i>Rhipidura rufifrons</i>	Rufous Fantail			Inhabits wet sclerophyll forests, often in gullies dominated by eucalypts with a dense shrubby understorey often including ferns.	Habitat not suitable. Not likely to occur.

Scientific Name	Common Name	Status (NT)	Status (Cwth)	Habitat/Ecological Profile*	Likelihood of occurrence
<i>Ardea alba</i>	Great Egret			Inhabits wetland areas including swamps and marshes; margins of rivers and lakes; damp or flooded grasslands, pastures or agricultural lands; reservoirs; sewage treatment ponds; drainage channels; salt pans and salt lakes; salt marshes; estuarine mudflats, tidal streams; mangrove swamps; coastal lagoons; and offshore reefs.	Habitat not suitable. Not likely to occur.
<i>Ardea ibis</i>	Cattle Egret			Inhabits tropical and temperate grasslands, wooded lands and terrestrial wetlands. High numbers have been observed in moist, low-lying poorly drained pastures with an abundance of high grass; it avoids low grass pastures. Commonly associated with cattle, but also pigs, sheep, horses and deer.	Habitat potentially suitable. Has been found on neighbouring properties.
<i>Charadrius veredus</i>	Oriental Plover			Inhabits coastal habitats such as estuarine mudflats and sandbanks, on sandy or rocky ocean beaches or nearby reefs when they first arrive in Australia. Then disperse further inland to flat, open, semi-arid or arid grasslands, where the grass is short and sparse, and interspersed with hard, bare ground, such as claypans, dry paddocks, playing fields, lawns and cattle camps, or open areas that have been recently burnt.	Habitat potentially suitable.
<i>Glareola maldivarum</i>	Oriental Pratincole			Inhabits open plains, floodplains or short grassland, often with extensive bare areas. They often occur near terrestrial wetlands, such as billabongs, lakes or creeks, and artificial wetlands such as reservoirs, saltworks and sewage farms, especially around the margins. The species also occurs along the coast, inhabiting beaches, mudflats and islands, or around coastal lagoons.	Habitat potentially suitable.

Scientific Name	Common Name	Status (NT)	Status (Cwth)	Habitat/Ecological Profile*	Likelihood of occurrence	
<i>Rostratula australis</i>	Australian Snipe	Painted	V	E	No sites are known where the species resides and it is likely nomadic. They occur in shallow, vegetated, freshwater swamps, clay pans or inundated grassland (including temporary wetlands), feeding on seeds and invertebrates at the water's edge and on mudflats.	Habitat not suitable. Unlikely to occur.
<i>Anseranas semipalmata</i>	Magpie Goose				Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Equally at home in aquatic or terrestrial habitats; often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes.	Has been found on neighbouring properties with swampy-wetland areas. Habitat not suitable on proposed site. Not likely to occur.
<i>Pandion haliaetus</i>	Osprey				Mostly found in coastal areas but occasionally travel inland along major rivers. They require extensive areas of open fresh, brackish or saline water for foraging.	Habitat not suitable. Not likely to occur.

*Habitat/Ecological Profile descriptions from Department of Land Resource Management (2015) and Department of the Environment (2015b)

2.2 Site Vegetation Survey

EcOz Pty Ltd (EcOz) was engaged to undertake a rapid vegetation assessment on the site. They found that the vast majority of the property has been cultivated and sown to improved pasture species Jarra Grass (*Digitaria milaniana cv Jarra*) and Tully grass (*Urochloa humidicola cv Tully*).

A patch of native remnant vegetation is located in the middle of the northern part of the site. The patch is approximately 2.6 ha and contains no native understory species due to extensive historical clearing. The following table (Table 3) lists the native flora species identified by EcOz during their survey.

Table 3 Native plant species recorded within the native vegetation patch

Botanical Name	Vegetation Strata	Conservation Status (TPWC Act)
<i>Eucalyptus tetradonta</i>	Upper	Least Concern
<i>Acacia auriculiformis</i>	Upper	Least Concern
<i>Syzygium suborbiculare</i>	Upper	Least Concern
<i>Syzygium eucalyptoides</i>	Mid	Least Concern
<i>Xanthostemon paradoxus</i>	Mid	Least Concern
<i>Planchonia careya</i>	Mid	Least Concern
<i>Erythrophleum chlorostachys</i>	Mid	Least Concern
<i>Persoonia falcate</i>	Mid	Least Concern
<i>Petalostigma pubescens</i>	Mid	Least Concern
<i>Melaleuca viridiflora</i>	Mid	Least Concern
<i>Fiscus acuminata</i>	Mid	Least Concern
<i>Calytrix exstipulata</i>	Mid	Least Concern
<i>Acacia holosericea</i>	Mid	Least Concern

3. EPBC Act Assessment

An assessment of the impact of the proposed development threatened species, populations and ecological communities, World Heritage values, and migratory species listed under the EPBC Act is presented below.

3.1 Impacts on threatened species and ecological communities

3.1.1 *Critically endangered and endangered species*

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

- Lead to a long-term decrease in the size of a population;
- Reduce the area of occupancy of the species;
- Fragment an existing population into two or more populations;
- Adversely affect habitat critical to the survival of a species;
- 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;
- Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat; or
- Interfere with the recovery of the species.

Dasyurus hallucatus (northern quoll) was found onsite in 1989. It is a generalist species found a variety of habitats, but it requires a rocky area or hollow logs for a den. Hill and Ward (2009) found that Quolls were also not recorded in fragments with less than 65% woodland within a 4 km radius of the trapping site. The proposed site currently has a small, degraded area with semi-mature trees that are unlikely to provide this habitat. As such, it is likely that the species is no longer found onsite and it is considered unlikely that the proposed action will disrupt its lifecycle such that any potentially viable local population would be placed at risk of extinction.

The potential impacts of the proposed action on this species are not likely to result in any of the points listed above. However, two key threatening processes for this species are the spread of cane toads and gamba grass through the NT. The Environmental Management Plan will ensure that steps are taken to reduce the spread of these pests.

3.1.2 *Vulnerable species*

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

- Lead to a long-term decrease in the size of an important population of a species;
- Reduce the area of occupancy of an important population;
- Fragment an existing important population into two or more populations;
- Adversely affect habitat critical to the survival of a species;
- Disrupt the breeding cycle of an important population;
- Modify, destroy, remove or 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 a vulnerable species becoming established in the vulnerable species' habitat; or
- Interferes substantially with the recovery of the species.

An important population is one that is necessary for a species' long-term survival and recovery. This may include populations that are:

- Key source populations either for breeding or dispersal;
- Populations that are necessary for maintaining genetic diversity; and/or
- Populations that are near the limit of the species' range.

No EPBC Act vulnerable species have been observed onsite. However, potential habitat exists for *Erythrotriorchis radiatus* (red goshawk) and *Geophaps smithii smithii* (partridge pigeon). Whilst not listed under the EPBC Act, *Ardeotis australis* (Australian bustard) is listed as vulnerable under the NT TPWC Act and will be assessed under the same guidelines.

Only foraging habitat is likely to exist for *E. radiatus* onsite due to the lack of mature trees with hollows for nesting. This species has a large home range of up to 200 km, so is considered unlikely that the proposed action will disrupt its lifecycle such that any potentially viable local population would be placed at risk of extinction. The potential impacts of the proposed action on this species are not likely to result in any of the points listed above.

Whilst *G. smithii smithii* has been found on neighbouring properties, it requires heterogeneity in the landscape, so that there is grass seed available for food year round. As a result, changed fire regimes, introduction of exotic pasture species, as well as grazing by livestock are the key threats listed for this species. Since this site has been used for these purposes for a long time, it is considered unlikely that the proposed action will disrupt its lifecycle such that any potentially viable local population would be placed at risk of extinction. It is likely that it has been found on the neighbouring site due to the presence of a waterway on that site. The potential impacts of the proposed action on this species are not likely to result in any of the points listed above.

A. australis has been listed as vulnerable due to a severe decline in population numbers in the NT. Potential threats listed include predation, altered fire regimes, hunting, disturbance, habitat alteration (e.g. woody weed infestation), pesticides and grazing. However, not much is known about the relative effects of these threats. The proposed development site has been used for pasture and grazing, with significant habitat alterations for an extended period of time. It is unlikely that these development changes will significantly impact this species due to its highly mobile nature and the generalist feeding behaviour. The potential impacts of the proposed action on this species are not likely to result in any of the points listed above.

C. armstrongii habitat is available onsite, but due to the already disturbed nature of the site, no individuals were found during vegetation surveys. As a result, it is unlikely that this development will impact existing value of this site to *C. armstrongii*.

3.1.3 *Critically endangered and endangered ecological communities*

The proposed site does not contain any critically endangered or endangered ecological communities and hence does not require referral to the Commonwealth Minister for the Environment for consideration under the EPBC Act.

3.1.4 *Impacts on migratory species*

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

- Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat of the migratory species;
- Result in invasive species that is harmful to the migratory species becoming established in an area of important habitat of the migratory species; or
- Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of the species.

An area of important habitat is:

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

No EPBC Act migratory species have been observed onsite. However, potential habitat exists for *Apus pacificus* (fork-tailed swift), *Hirundo rustica* (barn swallow), *Merops ornatus* (rainbow bee-eater), *Ardea ibis* (cattle egret), *Charadrius veredus* (oriental plover) and *Glareola maldivarum* (oriental pratincole).

A. pacificus and *H. rustica* do not breed in Australia and are fairly generalist species found in a variety of habitats. Additionally, *M. ornatus* does breed in Australia but is also a generalist species likely to be found in a variety of habitats. These three species are likely to only use the site for aerial foraging, as nesting habitat is subpar compared to surrounding areas of vegetation.

C. veredus and *G. maldivarum* foraging are the only migratory species listed with agricultural land clearance as a key threat. However, they do not breed in Australia and they prefer to roost in wet areas, so neighbouring properties down the hill with swampy-wetlands are more likely to attract them than the proposed site. They may use the proposed site for foraging, but have not been recorded onsite.

A. ibis is likely to use the site as habitat for foraging due to the presence of cattle and pasture. However, roosting is more likely to occur on neighbouring properties down the hill with swampy-wetlands. Construction will temporarily remove cattle from site, however once construction is complete, the irrigation block will still contain pasture and cattle will be transported onsite. There is enough pasture ground on neighbouring properties that this temporary change to the habitat will not have a significant effect on this species.

Any future development onsite will not decrease the habitat available for these species, or disrupt the lifecycle of these species such that a viable local population is likely to be placed at risk of extinction. The study site is not considered to comprise an area of important habitat for either of these species. The proposed development is not likely to have a significant impact on these species and is not likely to result in any of the points listed above under the migratory species provisions of the EPBC Act.

3.2 EPBC Act assessment

The impact of the proposed activity on matters of National Environmental Significance was assessed accordingly:

- The proposed development is located within the Berry Creek Catchment;
- The flora and fauna assessment concluded that the proposed activity will not have a significant impact on any listed threatened or migratory species listed under the EPBC Act or recorded on site; and
- There are no endangered ecological communities onsite.

3.3 Referral Recommendation

The proposed development does not require referral to the Commonwealth Minister for the Environment for consideration under the EPBC Act.

4. References

Department of Land Resource Management 2014, *NR Maps: Natural Resource Maps*, viewed 17 March 2015, nrmmaps.nt.gov.au/

Department of Land Resource Management 2015, *Threatened Species List*, viewed 9 July 2015, <http://www.lrm.nt.gov.au/plants-and-animals/threatened-species/specieslist>

Department of the Environment 2015a, *Protected Matters Search Tool*, viewed 17 March 2015, <http://www.environment.gov.au/epbc/protected-matters-search-tool>

Department of the Environment 2015b, *Species Profile and Threats Database*, viewed 9 July 2015, <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>

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