

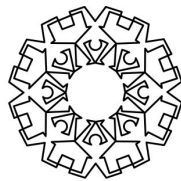
APPENDIX C3

SECTION 5A ASSESSMENT

OYSTER LEASE DREDGING, LEASE # 80 – 178,
WALLIS LAKE

PREPARED FOR:
TREVOR DENT

JULY 2006

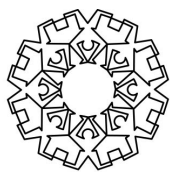


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Report Title:	Section 5A Assessment
Project:	Oyster Lease Dredging, Lease #80-178, Wallis Lake
Client:	Mr Trevor Dent
Report No.:	405062_REO_005_V1
Draft/Final:	Final

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The preparation of this report has been in accordance with the project brief provided by the client and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

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Geolyse Pty Ltd accepts no responsibility for any loss, damage suffered or inconveniences arising from, any person or entity using the plans or information in this study for purposes other than those stated above.

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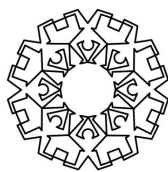


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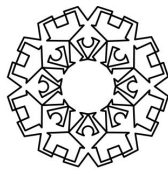
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Introduction

1.1 BACKGROUND

The *Threatened Species Conservation Amendment Act (2002)* amended the *EP & A Act*, by the identification of 7 factors that must be considered when assessing the impacts of a particular proposal. The objective of the Section 5A Assessment is to determine if a proposal is likely to have a *significant effect* on Threatened species, populations or ecological communities, or their habitats.

1.2 DEFINITIONS

1.2.1 LOCAL POPULATION

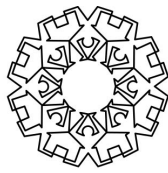
The NSW *Threatened Species Conservation Act 1995* defines a “local population” as “a population that occurs within the site, unless the existence of contiguous or proximal occupied habitat and the movement of individuals or exchange of genetic material across the boundary of the site can be demonstrated” (NPWS, 1996).

1.2.2 VIABILITY OF THE LOCAL POPULATION

The Section 5A assessment requires that a determination be made as to whether the viability of a local population will be compromised by the proposal in question. A viable local population is defined by the NPWS (1996) as “a population that has the capacity to live, develop and reproduce under normal conditions”. With respect to the proposed development, to determine that the local population would be detrimentally affected, it would be necessary to prove that partial removal of this habitat would affect the movement of Subject species to the extent that local populations may become extinct.

1.2.3 REGIONAL POPULATION

The term region is defined by the *Threatened Species Conservation Act 1995* as “a bioregion defined in a national system of bioregionalisation that is determined by the Director-General.....to be appropriate for those purposes”. The study area is situated within the New South Wales North Coast biogeographic region, which extends from the QLD/NSW Border south to about Port Stephens, and west to the Great Dividing Range (Thackway & Cresswell, 1995).



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Section 5A Assessment of Significant Effect on Threatened Species, Populations or Ecological Communities, or Their Habitats

2.1 SQUARE-TAILED KITE (*Lophoictinia isura*)

The Square-tailed Kite is considered to be uncommon yet widespread, occurring in a variety of habitats including open forest, woodland and heath, in areas with greater than 500 mm rainfall per annum (NPWS, 2000). The most important habitat feature appears to be an abundant supply of passerines upon which they forage (Olsen, 1995; NPWS, 1999a). Breeding pairs of the Square-tailed Kite occupy very large territorial ranges estimated at to be at least 100 km² (NPWS, 1999a). Nests are a pile of sticks approximately 0.6 – 1 m in diameter, and are usually located in tall or emergent living trees that are near watercourses (NPWS, 2000; Schodde and Tiedemann, 1993).

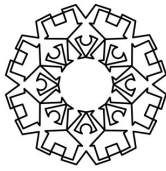
The Square-tailed Kite is considered as likely to occur within the study area given this species high mobility and very large home range, and also occurrence of potential foraging habitat within the proposed pipeline route and stockpile area. This species has been recorded within 12 km of the study area (NPWS, 2006).

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

Only a small number of potential nest trees occurring at the stockpile site will be removed.

The proposed pipeline route and stockpile site represents a small area of potential foraging habitat for the Square-tail Kite in relation to the species mobility and home range. In addition, the habitat resources occurring in these areas are very limited as the majority of pipeline route and stockpile site is cleared.

The area of potential habitat impacted upon as a result of the proposal is therefore considered negligible to the area of suitable habitat occurring in the locality. The proposal is therefore unlikely to have an adverse effect on the life cycle of the Square-tailed Kite such that a viable local population is likely to be placed at risk of extinction.



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- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Square-tailed Kite are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Square-tailed Kite.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not Applicable.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not Applicable.

- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

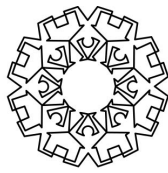
Approximately 56 trees will be removed at the stockpile site and it is considered unlikely that these would represent potential nest trees for the species.

Although predominantly cleared, the stockpile site represents potential foraging habitat for the Square-tailed Kite. Therefore a very small area of potential foraging habitat occurring at the stockpile site for the species will be modified for the proposal.

In addition, potential foraging habitat occurring along the proposed pipeline route will be disturbed by the installation and maintained of the pipes. These disturbances will not result in a significant impact to the species or its habitat.

- II. **Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal.



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III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The proposed pipeline route and stockpile site represents a small area of low quality potential foraging habitat for the Square-tail Kite in relation to the species home range and the area of suitable habitat occurring in the locality.

In addition, habitat for the species adjoining the proposed pipeline route and stockpile site will not become fragmented or isolated from other areas of habitat as a result of the proposal. Further, no known nesting habitat will be removed or modified as a result of the proposal.

The potential habitat proposed to be removed or modified could therefore not be considered an important area of habitat for this species, or considered important to the long term survival of the population of Square-tailed Kites occurring in the locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

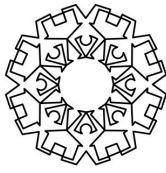
There is currently no critical habitat identified for any populations of the Square-tailed Kite under Section 3 of the *Threatened Species Conservation Act (1995)*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared for the Square-tailed Kite and no threat abatement plans are applicable to the proposal for the species.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.



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Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. Given that the majority of the study area is cleared, the actual amount of the native vegetation proposed to be removed will be limited to a small amount of regrowth vegetation occurring at some locations within the stockpile site. The removal of habitat resources provided by this vegetation is considered negligible when considered in the context of the available habitat adjoining the study area and also occurring in the locality.

Invasion of native plant communities by exotic perennial grasses has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*.

The stockpile site and some areas of the pipeline route currently contain a number of exotic perennial grass species including *Andropogon virginicus*, and *Setaria* sp.

The proposed maintenance of the pipeline may contribute weed invasion, however this would not be expected to be significant in this habitat. A weed management plan will be prepared as part of the overall Environmental Management Strategy for the project.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

2.2 FOREST OWLS

Powerful Owl (*Ninox strenua*)

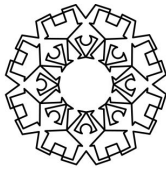
Powerful Owls are known to occur in a variety of forest types along the coast and ranges, with records up to 1500 m ASL (Debus & Chafer, 1994; Higgins, 1999). Powerful Owls often roost during the day in the canopy of trees, although large hollows are used during the breeding season (Higgins, 1999). This species is known to have an extensive home range that may be as large as 1000 ha. The Powerful Owl preys most commonly on arboreal mammals.

Masked Owl (*Tyto novaehollandiae*)

Masked Owls are known to utilise a broad range of habitats, including open forest and woodland with a sparse understorey and adjacent open areas (Hollands, 1991; Debus & Rose, 1994). Essential habitat features include the presence of suitable roosting and nesting hollows and an abundant supply of ground-dwelling or scansorial mammals (Higgins 1999; Kavanagh, 1996). Masked Owls are known to forage and roost within previously disturbed habitats and on the fringes of urban development (Hollands, 1991; Kavanagh, 1996). Most foraging occurs within open forest or along roads and tracks.

Assessment.

The study area and environs contain appropriate foraging habitat for the Powerful Owl, and Masked Owl. The habitats adjoining the pipeline route and stockpile site contain potential nesting habitat for these species. Both the Powerful and Masked Owl have been recorded within 1 km of the study area (NPWS, 2006). These forest owls are therefore likely to occur within the study area and adjoining habitats.



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- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

No known or potential nesting habitat will be removed or modified as a result of the proposal.

The proposed pipeline route and stockpile site represents a small area of potential foraging habitat for the subject Forest Owls in relation to the species' mobility and home range. In addition, given that the majority of pipeline route and stockpile site is cleared, the habitat resources occurring in these areas are very limited.

The area of potential habitat impacted upon as a result of the proposal is therefore considered negligible to the area of suitable habitat occurring in the locality. The proposal is therefore unlikely to have an adverse effect on the life cycle of the Powerful or Masked Owl such that a viable local population of either species is likely to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Powerful Owl or Masked Owl are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to these forest owls.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

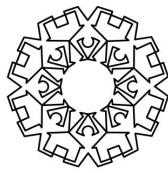
- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.

- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

Although predominantly cleared, the stockpile site represents potential foraging habitat for the Powerful and Masked Owl. Therefore a small area of low quality potential foraging habitat for the Powerful and Masked Owl will be modified for the proposal.



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In addition, potential foraging habitat occurring along the proposed pipeline route will be disturbed by the installation and maintenance of the pipes. These disturbances will not result in a significant impact to these species or their habitat.

Despite the modification of habitat at the stockpile site and disturbance along the pipeline route, these species could continue foraging at these areas.

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

No areas of habitat for the Powerful and Masked Owl will become fragmented or isolated from other areas of habitat as a result of the proposal.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The proposed pipeline route and stockpile site represents a small area of low quality potential foraging habitat for the Powerful and Masked Owl in relation to these species home range and the area of suitable habitat occurring in the locality.

In addition, habitat for the species adjoining the proposed pipeline route and stockpile site will not become fragmented or isolated from other areas of habitat as a result of the proposal. Further, no known or potential nesting habitat for these species will be removed or modified as a result of the proposal.

The potential habitat proposed to be modified could therefore not be considered an important area of habitat for the Powerful or Masked Owl or considered important to the long term survival of the population of either species occurring in the locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

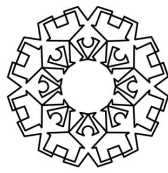
There is currently no critical habitat identified for any populations of the Powerful Owl or Masked Owl under Section 3 of the *Threatened Species Conservation Act 1995*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

A draft recovery plan has been prepared for the three Large Forest Owls, the Powerful Owl, Sooty Owl and Masked Owl. The objectives of this plan are detailed below.

Draft Large Forest Owl Recovery plan Objectives

Objective 1: To minimise further loss and fragmentation of habitat outside conservation reserves and State forests by protection and management of significant owl habitat (including protection of individual nest sites).



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Objective 2: To minimise the impacts of development activities on large forest owls and their habitats outside conservation reserves and State forests.

Objective 3: To assess the distribution and amount of high quality habitat for each owl species across public and private lands to get an estimate of the number and proportion of occupied territories of each species that are, and are not, protected.

Objective 4: To monitor trends in population parameters (numbers, distribution, territory fidelity and breeding success) across the range of the three species and across different land tenures and disturbance histories.

Objective 5: To assess the implementation and effectiveness of forest management prescriptions designed to mitigate the impact of timber-harvesting operations on the three owl species and, (if necessary), to use this information to refine the prescriptions so that forestry activities on State forests are not resulting in adverse changes in species abundance and breeding success.

Objective 6: To improve the recovery and management of the three large forest owls based on an improved understanding of key areas of their biology and ecology.

Objective 7: To raise awareness of the conservation requirements of the three large forest owls amongst the broader community, to involve the community in owl conservation efforts and in so doing increase the information base about owl habitats and biology.

Objective 8: To coordinate the implementation of the recovery plan and continually seek to integrate actions in this plan with actions in other recovery plans or conservation initiatives.

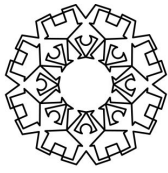
The habitat proposed to be modified or removed is not considered a significant area (in terms of size, quality and importance) of habitat for the Powerful Owl and Masked Owl. In addition, no areas of potential nesting habitat for the Powerful Owl and Masked Owl will be removed for the proposal.

The proposal is therefore considered to be consistent with Objectives 1 – 2 of the draft recovery plan for the Large Forest Owls. Objectives 3 – 8 of the draft recovery plan prepared for the three Large Forest are not considered to be relevant to the proposal.

No threat abatement plans are applicable to the proposal for the Powerful Owl or Masked Owl.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will



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also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. Given that the majority of the study area is clear, the actual amount of the native vegetation proposed to be removed will be limited to a small amount of regrowth vegetation occurring at some locations within the stockpile site. The removal of habitat resources provided by this vegetation is considered negligible when compared to the available habitat adjoining the study area and also occurring in the locality.

Invasion of native plant communities by exotic perennial grasses has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*.

The stockpile site and some areas of the pipeline route currently contain a number of exotic perennial grass species including *Andropogon virginicus*, and *Setaria* sp.

The proposed maintenance of the pipeline may contribute weed invasion, however this would not be expected to be significant in this habitat. A weed management plan will be prepared as part of the overall Environmental Management Strategy for the project.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

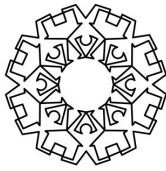
2.3 EASTERN GRASS OWL (*Tyto Capensis*)

The Eastern Grass Owl has been recorded in all mainland states of Australia, but is more commonly recorded in northern and north eastern Australia (NPWS, 2000). Eastern Grass Owls are mainly found in tall grass including tussock grasslands, grass tussocks in swampy areas, grassy plains, swamps, coastal dunes, cane grass and other crops, tree lined creeks, and sedges on floodplains (NPWS, 2000; Garnett and Crowley, 2000). This species nests on the ground which may resemble a trampled platform in a large tussock or heavy growth (NPWS, 2000).

The habitats within and adjoining the pipeline route and stockpile site contain potential foraging habitat for the Eastern Grass Owl. In addition, some areas in the SEPP 14 wetland contain potential breeding habitat. This species has been recorded within 1 km of the study area and is therefore likely to occur within the study area and adjoining habitats (NPWS, 2006).

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The proposed pipeline route and stockpile site represents a small area of potential foraging habitat for the Eastern Grass Owl in relation the species mobility and home range, and also to the available habitat adjoining the study area. In addition, given that the majority of pipeline route and stockpile site is cleared, the habitat resources occurring in these areas are very limited.



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No clearing of potential breeding habitat will occur, however the installation and maintenance of the pipe through the SEPP 14 wetland may cause some disturbance to a small area of potential nesting habitat at this location. The small area of potential breeding habitat occurring along the pipeline route is however considered negligible to the amount of potential breeding habitat adjoining the study area and also occurring in the locality.

The area of potential habitat impacted upon as a result of the proposal is therefore considered negligible to the area of suitable habitat occurring in the locality. The proposal is therefore unlikely to have an adverse effect on the life cycle of the Eastern Grass Owl such that a viable local population of either species is likely to be placed at risk of extinction.

- (b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Eastern Grass Owl are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the species.

- (c) In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not Applicable

- II. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

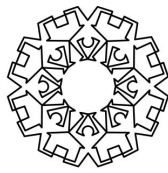
Not Applicable.

- (d) In relation to the habitat of a threatened species, population or ecological community:**

- I. The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

Although predominantly cleared, some areas of the stockpile site represents potential foraging habitat for Eastern Grass Owl. Therefore a small area of low quality potential foraging habitat for the Eastern Grass Owl will be modified for the proposal.

In addition, potential foraging habitat occurring along the proposed pipeline route, and also a small area of potential breeding habitat occurring in the SEPP 14 wetland (approximately 75 m section) will be disturbed by the installation and maintained of the pipes. These disturbances are unlikely to cause a significant impact to this species or its habitat and will be localised to foot traffic around the pipes.



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II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

No areas of habitat for the Eastern Grass Owl will become fragmented or isolated from other areas of habitat as a result of the proposal.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The proposed pipeline route and stockpile site represents a small area of low quality potential foraging habitat for the Eastern Grass Owl. This assessment has been considered in relation to the Eastern Grass Owls home range and the area of suitable habitat adjoining the study area and also occurring in the locality.

The area of potential breeding habitat likely to be impacted upon as a result of the proposal is considered negligible to area of potential breeding habitat adjoining the study area, and also occurring in the locality. In addition, no known breeding habitat is likely to be impacted upon.

The potential habitat proposed to be modified or removed could therefore not be considered an important area of habitat for the Eastern Grass Owl or considered important to the long term survival of the population of either species occurring in the locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

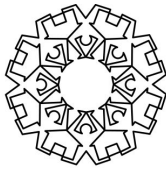
There is currently no critical habitat identified for any populations of the Eastern Grass Owl under Section 3 of the *Threatened Species Conservation Act 1995*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared for the Eastern Grass Owl and no threat abatement plans are applicable to the proposal for the species.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will



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also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. Given that the majority of the study area is clear, the actual amount of the native vegetation proposed to be removed will be limited to a small amount of regrowth vegetation occurring at some locations within the stockpile site. The removal of habitat resources provided by this vegetation is considered negligible when compared to the available habitat adjoining the study area and also occurring in the locality.

Invasion of native plant communities by exotic perennial grasses has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*.

The stockpile site and some areas of the pipeline route currently contain a number of exotic perennial grass species including *Andropogon virginicus*, and *Setaria* sp.

The proposed maintenance of the pipeline may contribute weed invasion, however this would not be expected to be significant in this habitat. A weed management plan will be prepared as part of the overall Environmental Management Strategy for the project.

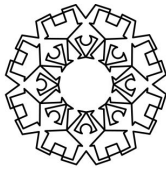
It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

2.4 OSPREY (*Pandion halaetus*)

Ospreys occur around almost the entire coastline of Australia, and along almost all coastlines around the world. In Australia, Ospreys are thinly distributed around the coast and are found to be more abundant in the north of the continent (Readers Digest 1993; Lindsey 1992). The Osprey feeds almost entirely on fish which it predominantly hunts along open coasts. Ospreys will hunt over fresh, salt or brackish water and have a feeding range between 5 km and 20 km (Readers Digest 1993; Lindsey 1992). Breeding occurs between August and November in the southern hemisphere, and between July and September in the north. Nests are a large pile of sticks placed up to 30m above the ground in trees, cliff tops or rock ledges, with clutch sizes between two and three (Lindsey, 1992).

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The proposed dredge site and tidal areas of the pipeline route represent a small area of potential foraging habitat for the Osprey. This area of foraging habitat is considered negligible in relation to the foraging areas available in Wallis Lake and locality and the dredging proposal will only modify the depth of this estuarine habitat. The proposal is therefore unlikely to have an adverse effect on the life cycle of the Osprey such that a viable local population is likely to be placed at risk of extinction.



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- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Osprey are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Osprey.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not Applicable.

- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

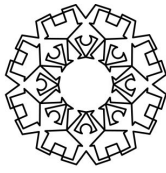
Approximately 8 ha of potential foraging habitat occurring at the proposed dredge site will be modified, and as this will increase the depth of the water in this area, the proposal is considered likely to increase the quality of this habitat for fishing.

- II. **Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal.

- III. **The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

In consideration to the small area of foraging habitat to be modified and that no known nest trees will be removed, the habitat proposed to be removed or modified could not be considered an important area of habitat for the species.



GEOLYSE

- (e) **Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);**

There is currently no critical habitat identified for any populations of the Osprey under Section 3 of the *Threatened Species Conservation Act (1995)*.

- (f) **Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;**

No draft recovery plans or final recovery plans have been prepared for the Osprey and no threat abatement plans are applicable to the proposal for the species.

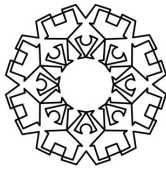
- (g) **Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.

Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*. This KTP is relevant to this species as the proposal includes dredging operations however the impact of this process on the Osprey will be negligible.

Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*. Aquaculture has been identified as contributing to this KTP, and entanglement with and ingestion of marine debris has been listed by the Scientific Committee as likely to affect the Osprey. Given that the proposed oyster lease is a form of aquaculture, this KTP is considered relevant to the species as a result of the proposal. Despite this, the proposal is unlikely to generate fishing gear, packaging materials, convenience items and raw plastics which are identified by the Scientific Committee as a major component of anthropogenic marine debris. The proposed oyster farm is therefore unlikely to significantly contribute to, or increase the impacts of this KTP upon this species or its habitat.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.



2.5 REGENT HONEYEATER (*Xanthomyza phrygia*)

This species occurs in a wide variety of habitat types. The Regent Honeyeater is most commonly found in Box-Ironbark woodlands. Other important habitat includes Swamp Mahogany forests and riverine She-oak (*Allocasuarina*) woodlands. Remnant stands of timber, roadside reserves, travelling stock routes and street trees also provide important habitat for Regent Honeyeaters at certain times. Threats to this species include clearing of available habitat, lack of replacement regeneration and logging of box-ironbark woodland (Ayres *et.al.*, 1999). During times of food shortage, the species use other woodlands and wet lowland coastal forest dominated by Swamp Mahogany (*E. robusta*) or Spotted Gum (*E. maculata*) (Garnett and Crowley, 2000). A large proportion of their time is spent feeding on nectar from a few 'key' Eucalypts; Mugga Ironbark, White Box, Yellow Box, Yellow Gum and Blakely's Red Gum and, mistletoe sp. (Threatened Species Network, 1999). The species is semi-nomadic and follows foraging opportunities. Food sources include nectar from a variety of Eucalypt and mistletoe sp. and arthropods.

Most breeding records are from near coastal south eastern Australia and adjacent inland slopes of the Great Dividing Range (Garnett and Crowley, 2000).

The Swamp Sclerophyll forest adjoining the pipeline route and stockpile area represents potential foraging habitat for the Regent Honeyeater. This species has been recorded within 15 km of the study area is considered as potentially occurring within the study area (NPWS, 2006).

- (a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

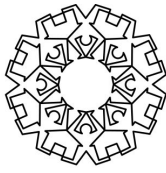
This species is unlikely to utilise the study area or adjoining habitats for nesting. The proposal is therefore unlikely to impact upon potential nesting habitat for the species.

The proposed pipeline route and stockpile site contains limited foraging resources for Regent Honeyeater in relation to the species mobility and foraging range. The small amount of nectar resources provided by the trees proposed to be removed from the stockpile site is considered negligible to the available nectar resources in the adjoining habitats.

The proposal is therefore unlikely to have an adverse effect on the life cycle of the Regent Honeyeater such that a viable local population is likely to be placed at risk of extinction.

- (b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Regent Honeyeater are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Regent Honeyeater.



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- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.

- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

Approximately 56 trees will be removed at the stockpile site, the majority of these trees are saplings and at present produce negligible foraging resources for the species.

- II. **Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal.

- III. **The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

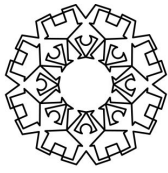
In consideration to the small amount of foraging habitat to be impacted upon, and that the proposal will not impact upon potential nesting habitat, the habitat proposed to be removed or modified could not be considered an important area of habitat for the species.

- (e) **Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);**

There is currently no critical habitat identified for any populations of the Regent Honeyeater under Section 3 of the *Threatened Species Conservation Act (1995)*.

- (f) **Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;**

No draft recovery plans or final recovery plans have been prepared for the Regent Honeyeater and no threat abatement plans are applicable to the proposal for the species.



GEOLYSE

- (g) **Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. Given that the majority of the study area is clear, the actual amount of the native vegetation proposed to be removed will be limited to a small amount of regrowth vegetation occurring at some locations within the stockpile site. The removal of habitat resources provided by this vegetation is considered negligible when compared to the available habitat adjoining the study area or occurring in the locality.

Invasion of native plant communities by exotic perennial grasses has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*.

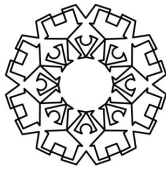
The stockpile site and some areas of the pipeline route currently contain a number of exotic perennial grass species including *Andropogon virginicus*, and *Setaria* sp.

The proposed maintenance of the pipeline may contribute to weed invasion, however this would not be expected to be significant in this habitat. A weed management plan will be prepared as part of the overall Environmental Management Strategy for the project.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

2.6 SWIFT PARROT (*Lathamus discolor*)

Swift Parrots forage in woodlands and riparian vegetation and are increasingly reliant on small remnant patches of mature eucalypts in agricultural areas (NPWS, 2000). The species has been recorded foraging on a range of eucalypt species on the mainland including Blakely's Red Gum (*Eucalyptus blakelyi*) which is a component of the Yellow Box/Red Gum Grassy Woodland (Robinson 1994, in ACT Government, 1999). Their main food is pollen and nectar, particularly from eucalypt trees. They also feed on lerps, insects, insect larvae, seeds, and fruit including berries (Schodde and Tiedemann, 1993).



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Swift Parrots nest only in north-eastern and eastern Tasmania during late September to Early January, and migrate to the mainland between March and May (Schodde and Tidemann, 1993; ACT Government, 1999). Nests are located in hollows in mature and senescent trees.

The Swamp Sclerophyll forest adjoining the pipeline route and stockpile area represents potential foraging habitat for the Swift Parrot. Although the nearest record of this species is over 35 km to the south, this species is considered to occur within the study area given the species high mobility and distribution (NPWS, 2006).

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

No known or potential nesting habitat will be removed or modified as a result of the proposal.

The proposed pipeline route and stockpile site contains limited foraging resources for the Swift Parrot in relation to the species mobility and foraging range. The small amount of nectar resources provided by the trees proposed to be removed from the stockpile site is considered negligible to the available nectar resources in the adjoining habitats and locality.

The proposal is therefore unlikely to have an adverse effect on the life cycle of the Swift Parrot such that a viable local population of the species is likely to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Swift Parrot are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Swift Parrot.

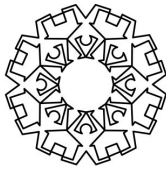
- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.



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(d) In relation to the habitat of a threatened species, population or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the action proposed, and

Approximately 56 trees will be removed at the stockpile site, the majority of these trees are saplings and at present produce negligible foraging resources for the species.

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

In consideration to the small amount of foraging habitat to be impacted upon, and as no nesting habitat will be impacted, the habitat proposed to be removed or modified could not be considered an important area of habitat for the species.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

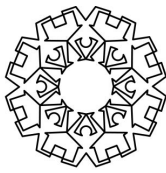
There is currently no critical habitat identified for any populations of the Swift Parrot under Section 3 of the *Threatened Species Conservation Act (1995)*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared for the Swift Parrot and no threat abatement plans are applicable to the proposal for the species.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.



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Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. Given that the majority of the study area is clear, the actual amount of the native vegetation proposed to be removed will be limited to a small amount of regrowth vegetation occurring at some locations within the stockpile site. The removal of habitat resources provided by this vegetation is considered negligible when compared to the available habitat adjoining the study area or occurring in the locality.

Invasion of native plant communities by exotic perennial grasses has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*.

The stockpile site and some areas of the pipeline route currently contain a number of exotic perennial grass species including *Andropogon virginicus*, and *Setaria* sp.

The proposed maintenance of the pipeline may contribute weed invasion, however this would not be expected to be significant in this habitat. A weed management plan will be prepared as part of the overall Environmental Management Strategy for the project.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

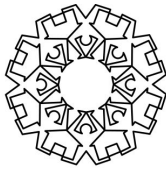
2.7 PIED OYSTERCATCHER (*Haematopus longirostris*)

The Pied Oystercatcher occurs around the entire coastline of Australia. Throughout its range, the Pied Oystercatcher favours beaches, intertidal flats and sand banks and occasionally rocky headlands (NPWS, 2000). Molluscs have been noted to be a staple food source; however, worms, crabs and small fish may be taken (NPWS, 2000; Scodde & Tidemann, 1993). Pied Oystercatchers primarily nest on coastal or estuarine beaches and occasionally they may use saltmarsh or grassy areas. Nests are shallow scrapes in the sand above the high tide mark or amongst low growth behind the beach (NPWS, 2000).

The Pied Oystercatcher is known to utilise the proposed dredge areas for foraging, however the area of potential foraging habitat proposed to be modified is negligible in relation to the foraging areas available in Wallis Lake (NPWS, 2006). The study area does not contain breeding habitat for the Pied Oystercatcher.

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The intertidal mudflat and sandflat areas within the proposed dredge site represent a small area of known foraging habitat for the Pied Oystercatcher. In total, less than 4 hectares of this foraging habitat is proposed for removal. When this area of foraging habitat is considered in relation to the area of known foraging areas in Wallis Lake and the along the oceanic beaches of the area the loss of this area of foraging habitat is considered negligible. The proposed development area does not contain any potential breeding habitat.



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The proposal is therefore unlikely to have an adverse effect on the life cycle of the Pied Oystercatchers such that a viable local population is likely to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Pied Oystercatcher are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Pied Oystercatcher.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.

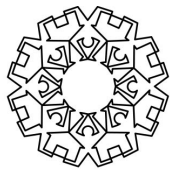
- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

As the proposed dredge area is known foraging habitat of the species the proposal will result in the loss of up to 7 hectares of this foraging that is currently accessible at low tide. This area of habitat is considered minor in the context of known foraging habitat of the species within Wallis Lake and the Oceanic beaches in the vicinity.

- II. **Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal.



III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The area of potential foraging habitat proposed to be removed is considered negligible in relation to the area of suitable habitat occurring in the local area. The proposal will not isolate any areas of habitat, and the proposal will not impact upon known or potential nesting habitat for the species.

The potential habitat proposed to be removed or modified could therefore not be considered an important area of habitat for this species, or considered important to the long term survival of the population of the species occurring in the locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

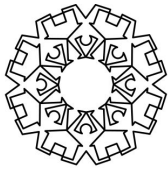
There is currently no critical habitat identified for any populations of the Pied Oystercatcher under Section 3 of the *Threatened Species Conservation Act (1995)*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

To date, no draft or final recovery plans have been prepared for the Pied Oystercatcher, however one threat abatement plan, Predation by the Red Fox (*Vulpes vulpes*) is applicable to the species. The Pied Oystercatcher is considered as a high priority species for the implementation of the plan as fox predation is known to impact on the breeding success of the species. As the proposal will not result in increased fox populations, lead to increased predation and as no breeding habitat will be impacted by the proposal, the implementation of the threat abatement plan is not relevant to the proposed development.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.



Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*. Aquaculture has been identified as contributing to this KTP, and entanglement with and ingestion of marine debris has been listed by the Scientific Committee as likely to affect the Pied Oystercatcher. Given that the proposed oyster lease is a form of aquaculture, this KTP is considered relevant to the species as a result of the proposal. Despite this, the proposal is unlikely to generate fishing gear, packaging materials, convenience items and raw plastics which are identified by the Scientific Committee as a major component of anthropogenic marine debris. The proposed oyster farm is therefore unlikely to significantly contribute to, or increase the impacts of this KTP upon this species or its habitat.

As only foraging habitat will be impacted and the proposal will not lead to an increase in feral predators, it is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to the proposal.

2.8 LITTLE TERN (*Sterna albifrons*)

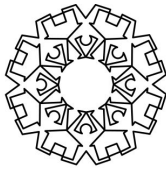
The Little Tern occurs around the coast to Australia from mid WA, around northern and eastern Australia to the east coast of Tasmania and around the Gulf of STR Vincent in SA (NPWS, 1999). Throughout its range, Little Terns are predominantly found in coastal waters, bays, shallow inlets salt or brackish lakes, with sheltered environments preferred (NPWS, 1999, NPWS; 2000). Little Terns nest in small scattered colonies and nests are small scrapes, usually located on low dunes, or sandy beaches near the mouths of estuaries, or to adjacent coastal lakes and islands (NPWS, 1999; NPWS, 2000; Scodde & Tidemann, 1993). The Little Tern feeds upon small fish, crustaceans, insects, annelids and molluscs (NPWS, 1999).

The Little Tern is known to forage within Wallis Lake and adjoining oceanic areas. There are no breeding areas recorded within Wallis Lake post 1990. Prior to this time a man-made island was known to be utilised for breeding (A. Rose pers comm.). The potential habitat within the proposed dredge area may represent foraging habitat however the area proposed to be removed is negligible in relation to the foraging areas available in Wallis Lake (NPWS, 2006).

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The proposed dredge site and intertidal areas along the pipeline route provides a small area of potential foraging habitat for the Little Tern. This area of foraging habitat is considered negligible in relation to the species mobility and foraging range and the foraging areas available in Wallis Lake and adjoining oceanic habitats. No known or potential breeding habitat will be removed or modified as a result of the proposal.

The area of potential foraging habitat impacted upon as a result of the proposed development is therefore considered negligible and the proposal is unlikely to have an adverse effect on the life cycle of the Little Tern such that a viable local population is likely to be placed at risk of extinction.



GEOLYSE

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Little Tern are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Little Tern.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.

- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

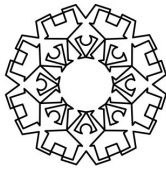
The entire proposed dredge area represents potential foraging habitat for the species however the proposal will only result in the modification of this habitat. As the dredging will increase depth the proposal may result in increased foraging (fishing) habitat for the species.

- II. **Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal

- III. **The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

As only a very small area of foraging habitat will be impacted and no breeding habitat will be impacted, the area of potential habitat proposed to be modified could not be considered an important area of habitat for the species.



GEOLYSE

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

There is currently no critical habitat identified for any populations of the Little Tern under Section 3 of the *Threatened Species Conservation Act (1995)*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

A final recovery plan has been prepared for the Little Tern and the objectives of this plan are detailed below.

Final Little Tern Recovery plan Objectives

Objective 1: Inform land managers of their responsibilities regarding the conservation requirements of Little Terns.

Objective 2: Site Management

Objective 3: To evaluate and provide secure additional nesting, resting and fledgling feeding habitat for Little Terns on estuarine islands at a range of sites along the NSW coast.

Objective 4: To investigate the potential for reservation of nesting, resting and fledgling feeding habitat.

Objective 5: Monitor active nesting sites, breeding success and population trends of Little Terns in NSW in order to guide management actions, identify problems and gauge management success.

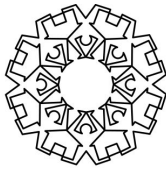
Objective 6: Conduct and promote research on the Little Tern in NSW in order to increase the biological, ecological and cultural knowledge of the species.

Objective 7: To provide for the cost-effective and efficient Statewide co-ordination of recovery actions for the Little Tern in NSW during each breeding season.

Objective 8: Raise awareness of the conservation status of the Little Tern and involve the community in the Recovery Program for the species

Objective 9: To develop a field manual to advise on 'best practise' field-based methodologies.

The habitat proposed to be removed is not appropriate for breeding and would be used only on an occasional basis for foraging purposes. This potential foraging habitat is considered negligible in relation to the foraging areas available in Wallis Lake and adjoining oceanic environments and is therefore not considered a significant area of habitat for the Little Tern. As the objectives are concerned with management of breeding area and increased public awareness, the proposal does contravene the objectives of the recovery plan for this species.



GEOLYSE

One threat abatement plan, Predation by the Red Fox (*Vulpes vulpes*) is applicable to the species. The Little Tern is considered as a high priority species for the implementation of the plan as fox predation is known to impact on the breeding success of the species. As the proposal will not result in increased fox populations, lead to increased predation and as no breeding habitat will be impacted by the proposal, the implementation of the threat abatement plan is not relevant to the proposed development.

- (g) **Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.

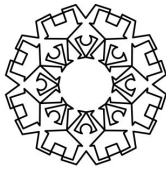
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*. Aquaculture has been identified as contributing to this KTP, and entanglement with and ingestion of marine debris has been listed by the Scientific Committee as likely to affect the Little Tern. Given that the proposed oyster lease is a form of aquaculture, this KTP is considered relevant to the species as a result of the proposal. Despite this, the proposal is unlikely to generate fishing gear, packaging materials, convenience items and raw plastics which are identified by the Scientific Committee as a major component of anthropogenic marine debris. The proposed oyster farm is therefore unlikely to significantly contribute to, or increase the impacts of this KTP upon this species or its habitat.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

2.9 BLACK BITTERN (*Ixobrychus flavicollis*)

The Black Bittern is distributed from southern NSW, north to Cape York and along the entire northern coast to the Kimberley Region and also in the south western corner of WA (NPWS, 1999). This species occurs in dense vegetation, particularly amongst swamp she oaks and mangroves alongside streams, estuarine and terrestrial wetlands, tidal creeks and mudflats, and swamps. (NPWS, 2000; NPWS, 1999). This species forages mostly at night and amongst waterside vegetation, feeding upon fish amphibians, molluscs, insects and crustaceans (Schodde and Tidemann, 1993; NPWS, 2000).

The Black Bittern has been recorded within 6 km of the study area, and the study area is considered to contain potential foraging habitat for the species (NPWS, 2006).



GEOLYSE

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The saltmarsh and mangrove areas fringing the dredge site represents potential habitat for this species. In addition, this species is considered likely to utilise some areas of the swamp forest such as the SEPP 14 wetland and Swamp Oak forest.

This area of potential foraging habitat occurring in the study area is considered negligible in relation to the similar habitats within Wallis Lake and also occurring in the locality. The proposal is therefore unlikely to have an adverse effect on the life cycle of the Black Bittern such that a viable local population is likely to be placed at risk of extinction. No known or potential nesting habitat will be removed or modified as a result of the proposal.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Black Bittern are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Black Bittern.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

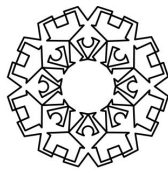
- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.

- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

Potential foraging habitat occurring along the proposed pipeline route will be disturbed by the installation and maintenance of the pipes. These disturbances are unlikely to cause a significant impact to the species or its habitat and will be localised to foot traffic around the pipes.



II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The area of potential foraging habitat proposed to be modified is considered negligible in relation to the species home range and the area of suitable habitat adjoining the study area and this potential habitat will not become isolated from other areas of habitat.

The potential habitat proposed to be modified could therefore not be considered an important area of habitat for this species, or considered important to the long term survival of the population of the species occurring in the locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

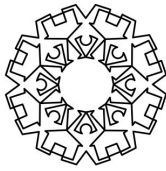
There is currently no critical habitat identified for any populations of the Black Bittern under Section 3 of the *Threatened Species Conservation Act (1995)*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared for the Black Bittern and no threat abatement plans are applicable to the proposal for the species.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.



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Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*. This KTP is relevant to this species as the proposal includes dredging operations. The impact of this KTP as a result of the proposal will not significantly contribute to, or increase the impacts of this KTP upon this species or its habitat.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

2.10 AUSTRALIAN BITTERN (*Botaurus poicilotilus*)

The Australasian Bittern occurs from southern Queensland to Tasmania and south eastern South Australia. In NSW this species has been recorded along the coast as well as inland wetlands and rivers (NPWS, 1999). The Australasian Bittern occurs in estuarine and freshwater wetlands with tall dense vegetation, including sedges, spike rushes, reeds and bulrush (NPWS, 2000; NPWS, 1999). Feeds mostly at night upon frogs, yabbies, spiders, insects, snails, small fish and mice (Schodde and Tidemann, 1993; NPWS, 2000).

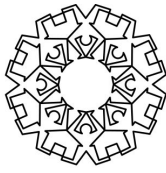
The Australasian Bittern has been recorded within 10 km of the study area and the saltmarsh and intertidal areas around the dredge site represents potential habitat for this species (NPWS, 2006).

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The saltmarsh along the pipeline route represents a small area of potential foraging habitat for the Australasian Bittern. In addition, this species is likely to utilise some areas of the swamp forest such as the SEPP 14 wetland and Swamp Oak thickets. This area of foraging habitat is considered negligible in relation to the similar habitats associated with Wallis Lake and also occurring in the locality. No known or potential nesting habitat will be removed or modified as a result of the proposal. The proposal is therefore unlikely to have an adverse effect on the life cycle of the Australasian Bittern such that a viable local population is likely to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Australasian Bittern are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Australasian Bittern.



GEOLYSE

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.

- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

Potential foraging habitat occurring along the proposed pipeline route will be disturbed by the installation and maintenance of the pipes. These disturbances are unlikely to cause a significant impact to the species or its habitat and will be limited to foot traffic around the pipes.

- II. **Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal.

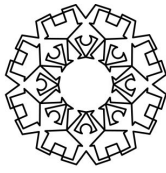
- III. **The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

The area of potential foraging habitat proposed to be modified is considered negligible in relation to the species home range and the area of suitable habitat occurring in Wallis Lake. The proposal will not isolate habitat for the species and the proposal will not impact upon potential nesting habitat for the species.

The potential habitat proposed to be modified could therefore not be considered an important area of habitat for this species, or considered important to the long term survival of the population of the species occurring in the locality.

- (e) **Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);**

There is currently no critical habitat identified for any populations of the Australasian Bittern under Section 3 of the *Threatened Species Conservation Act (1995)*.



(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared for the Australasian Bittern and no threat abatement plans are applicable to the proposal for the species.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.

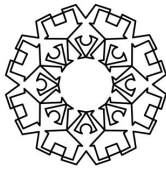
Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*. This KTP is relevant to this species as the proposal includes dredging operations. The impact of this KTP as a result of the proposal will not significantly contribute to, or increase the impacts of this KTP upon this species or its habitat.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

2.11 BLACK-NECKED STORK (*Ephippiorhynchus asiaticus*)

The Black-necked Stork is restricted mainly to coastal and near-coastal areas of northern and eastern Australia. They are wide spread in northern Australia and sparse in coastal eastern Australia from QLD to southern NSW (NPWS, 2000). Throughout the monsoonal areas of northern Australia, the Black-necked Stork is still widespread, but fewer numbers appear southwards to eastern Australia (Australian Museum, 2005; NPWS, 2000).

The Black-necked Stork inhabits wetlands, such as floodplains of rivers with large shallow swamps and pools, and deeper permanent bodies of water. Occasionally individuals will utilise open grass, woodland areas or flooded paddocks in search of food (Australian Museum, 2005). The most important habitat feature for the Black-necked Stork appears to be extensive open shallows where it feeds upon fish, frogs and larger crustaceans, reptiles, rodents, invertebrates, carrion and sometimes small water birds (Lindsey, 1992; NPWS, 2005b; Readers Digest, 1997).



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Nests are large flat piles of sticks, and reeds, and are usually located at the top of a tree near appropriate feeding habitat where they lay between 2-4 eggs (Garnett and Crowley, 2000; NPWS, 2000; Readers Digest, 1997).

The Black-necked Stork is known to occur within Wallis Lake and the study area contains potential foraging habitat for this species (NPWS, 2006).

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The saltmarsh and intertidal areas along the pipeline route represents a small area of potential foraging habitat for the Black-necked Stork. This area of foraging habitat is considered negligible in relation to the similar habitats associated with Wallis Lake and also occurring in the locality. The proposal is therefore unlikely to have an adverse effect on the life cycle of the Black-necked Stork such that a viable local population is likely to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Black-necked Stork are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Black-necked Stork.

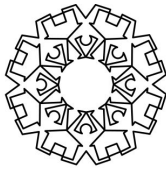
- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.



GEOLYSE

(d) In relation to the habitat of a threatened species, population or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the action proposed, and

Potential foraging habitat occurring along the proposed pipeline route will be disturbed by the installation and maintenance of the pipes and no potential nest trees will be removed. These disturbances are unlikely to cause a significant impact to the species or its habitat and will be localised to foot traffic around the pipes. The loss of the intertidal area will also reduce the potential foraging habitat for the species however the area of this habitat is minor in a local and regional context.

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The area of potential foraging habitat proposed to be modified is considered negligible in relation to the species home range and the area of suitable habitat occurring in the locality.

Habitat for the species will not become isolated and from other areas of habitat, and the proposal will not impact upon known nesting habitat for the species.

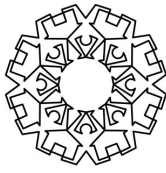
The potential habitat proposed to be removed could therefore not be considered an important area of habitat for this species, or considered important to the long term survival of the population of the species occurring in the locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

There is currently no critical habitat identified for any populations of the Black-necked Stork under Section 3 of the *Threatened Species Conservation Act (1995)*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared for the Black-necked Stork and no threat abatement plans are applicable to the proposal for the species.



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- (g) **Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.

Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*. This KTP is relevant to this species as the proposal includes dredging operations. The impact of this KTP as a result of the proposal will not significantly contribute to, or increase the impacts of this KTP upon this species or its habitat.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

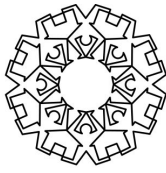
2.12 LESSER SAND PLOVER (*Charadrius mongolus*)

The Lesser Sand Plover breeds in Asia and migrates to the Australian coast between September and March where it occurs on mudflats, sandy beaches, estuaries and tidal areas in mangroves (NPWS, 2000). The Lesser Sand Plover primarily feeds upon crustaceans, molluscs, insects, and marine worms (NPWS, 1999).

The study area contains potential foraging habitat for the Lesser Sand Plover, and this species has been recorded within 2 km of the study area within Wallis Lake (NPWS, 2006).

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The proposed dredge site provides a small area of potential foraging habitat for the Lesser Sand Plover. This area of foraging habitat is considered negligible in relation to the species mobility and foraging range and also the foraging areas available in Wallis Lake and locality. The proposed dredge site represents foraging habitat however this area represents a negligible percentage of suitable foraging habitat occurring within Wallis Lake. Large expanses of appropriate feeding and roosting habitat also occur at the other estuaries of the Hunter and Manning Rivers and hence the loss of less than 5 ha of appropriate foraging habitat Lesser Sand plover could not be considered an important area of habitat for the species.



GEOLYSE

The area of potential foraging habitat impacted upon as a result of the proposed development is therefore considered negligible and the proposal would not result in an adverse effect on the life cycle of the Lesser Sand Plover such that a viable local population is likely to be placed at risk of extinction.

- (b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Lesser Sand Plover are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Lesser Sand Plover.

- (c) In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

- II. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.

- (d) In relation to the habitat of a threatened species, population or ecological community:**

- I. The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

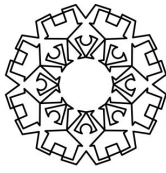
The proposed dredge area represents potential foraging habitat at low tide for the Lesser Sand Plover however when this is considered in the context of the available habitat within Wallis Lake and other sites such as Farquhar Inlet and Kooragang Wetlands, the loss of this area of potential foraging habitat is insignificant.

- II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal.

- III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

As discussed in part (a), the area of potential habitat proposed to be modified could not be considered an important area of habitat for the species.



GEOLYSE

- (e) **Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);**

There is currently no critical habitat identified for any populations of the Lesser Sand Plover under Section 3 of the *Threatened Species Conservation Act (1995)*.

- (f) **Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;**

No draft recovery plans or final recovery plans have been prepared for the Lesser Sand Plover and no threat abatement plans are applicable to this species.

- (g) **Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.

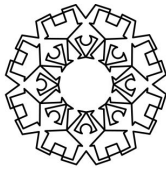
It is considered that the proposal would not enhance any of the remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)*.

2.13 TEREK SANDPIPER (*Xenus cinereus*)

The Terek Sandpiper is a small wader that is a non-breeding migrant to Australia between August and April where this species occurs along the east, west and north coast (NPWS, 1999; Readers Digest, 1993). In NSW the two main sites for this species are the Hunter and Richmond estuaries (Smith 1991 in NPWS, 1999).

This species has been recorded on coastal mudflats, lagoons, creeks and estuaries with records indicating that the species prefers muddy beaches near mangroves but may also occur on rocky pools and coral reefs (NPWS, 1999). Terek Sandpipers feed upon a variety of invertebrates including segmented worms, crustaceans, small shell fish, and the adults and larvae of various flies, beetles and water bugs (Higgins & Davies, 1996 in NPWS, 1999).

The study area contains potential foraging habitat for the Terek Sandpiper, and this species has been recorded within 2 km of the study area within Wallis Lake (NPWS, 2006).



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- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The proposed dredge site provides a small area of potential foraging habitat for the Terek Sandpiper. This area of foraging habitat is considered negligible in relation to the species mobility and foraging range and also the foraging areas available in the local area and region. The study area also does not contain any high tide roost areas for the species. The potential habitats within the study area represent a minor percentage of a mosaic of suitable foraging habitat occurring in the locality and could not be considered an important area of habitat for the species. In addition, the study area is not located in the Richmond or Hunter estuaries which have been identified as the two main sites for the species in NSW (NPWS, 1999).

The area of potential foraging habitat impacted upon as a result of the proposed development is therefore considered negligible and the proposal is unlikely to have an adverse effect on the life cycle of the Terek Sandpiper such that a viable local population is likely to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Terek Sandpiper are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Terek Sandpiper.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

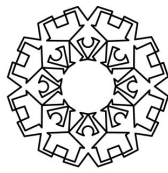
- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.

- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

The proposed dredge area represents potential foraging habitat at low tide for the Terek Sandpiper however when this is considered in the context of the available habitat within Wallis Lake and other sites such as Farquhar Inlet and Kooragang Wetlands, the loss of this area of potential foraging habitat is insignificant.



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II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

No areas of potential foraging habitat for the species will become fragmented or isolated as a result of the proposal.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

As discussed in part (a), the area of potential habitat proposed to be modified could not be considered an important area of habitat for the species.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

There is currently no critical habitat identified for any populations of the Terek Sandpiper under Section 3 of the *Threatened Species Conservation Act (1995)*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

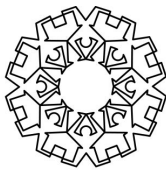
No draft recovery plans or final recovery plans have been prepared for the Terek Sandpiper and no threat abatement plans are applicable to this species.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.

Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*. This KTP is relevant to this species as the proposal includes dredging operations. The impact of this KTP as a result of the proposal will not significantly contribute to, or increase the impacts of this KTP upon this species or its habitat.

It is considered that the proposal would not enhance any of the remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)*.



2.14 BLACK-TAILED GODWIT (*Limosa limosa*)

The Black-tailed Godwit is a non-breeding migrant to Australia between spring and autumn (NPWS, 2000). Predominantly occurs in estuaries, sheltered bays, lagoons with extensive tidal mudflats or sandbars, ephemeral inland lakes (Morcombe, 2002). The Black-tailed Godwit feeds by probing its long bill deep into mud in search of crustaceans, molluscs and worms. Insects and larvae, spiders, tadpoles and plant matter may be taken as well (Schodde and Tidemann, 1993).

The study area contains potential foraging habitat for the Black-tailed Godwit, and this species has been recorded within 2 km of the study area inside the entrance of Wallis Lake (NPWS, 2006).

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The proposed dredge site provides a small area of potential foraging habitat for the Black-tailed Godwit. This area of foraging habitat is considered negligible in relation to the species mobility and foraging range and also the foraging areas available in the local area and region. The study area also does not contain any high tide roost areas for the species. The proposed development will not impact upon breeding habitat for this species. The potential habitats within the study area represent a minor percentage of suitable foraging habitat occurring in the locality and could not be considered an important area of habitat for the species.

The area of potential foraging habitat impacted upon as a result of the proposed development is therefore considered negligible and the proposal is unlikely to have an adverse effect on the life cycle of the Black-tailed Godwit such that a viable local population is likely to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Black-tailed Godwit are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Black-tailed Godwit.

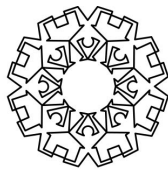
- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.



(d) In relation to the habitat of a threatened species, population or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the action proposed, and

The proposed dredge area represents potential foraging habitat at low tide for the Black-tailed Godwit however when this is considered in the context of the available habitat within Wallis Lake and other sites such as Farquhar Inlet and Kooragang Wetlands, the loss of this area of potential foraging habitat is insignificant.

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

As discussed in part (a), the area of potential habitat for the species proposed to be removed or modified within the study area could not be considered an important area of habitat.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

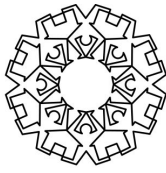
There is currently no critical habitat identified for any populations of the Black-tailed Godwit under Section 3 of the *Threatened Species Conservation Act (1995)*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared for the Black-tailed Godwit and no threat abatement plans are applicable to this species.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.



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It is considered that the proposal would not enhance any of the remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)*.

2.15 WALLUM FROGLET (*Crinia tinnula*)

The habitat of the Wallum Froglet is generally confined to the acid swamps of the 'Wallum' country, but is also known to occur in disturbed or regenerating habitats where abiotic parameters are appropriate (Cogger 2000, Tyler 1994, Lewis 1996, G. Czechura pers. comm, B. Campbell pers obs.). The essential habitat requirements for this species are primarily determined by the water quality of these habitats, as it requires strongly acidic water (pH 3.4 – 5.4) conditions to spawn.

The Wallum Froglet was detected adjoining the cleared areas of the Swamp Sclerophyll forest along the pipeline route near the stockpile site during the surveys.

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The area of habitat to be modified for the stockpile is considered to be negligible in relation to the area of suitable wallum habitat adjoining the pipeline route and stockpile site. The area of wallum habitat affected by the placement and maintenance of the pipes is also considered negligible in relation to the large areas of suitable habitat adjoining the study area and also occurring in the locality.

The proposal is therefore unlikely to have an adverse effect on the life cycle of the Wallum Froglet such that a viable local population is likely to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Wallum Froglet are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Wallum Froglet.

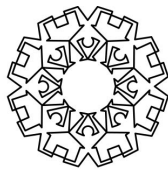
- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.



(d) In relation to the habitat of a threatened species, population or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the action proposed, and

No known habit of the species will be removed however areas of known and potential habitat occurring along the proposed pipeline route will be disturbed by the installation and maintenance of the pipes. These disturbances are unlikely to cause a significant impact to the species or its habitat and will be localised to foot traffic around the pipes.

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

Potential habitat for this species on either side of the pipeline route will not become isolated as sections of the pipes occurring in known Wallum Froglet habitat will be raised, ensuring that this species can move underneath the pipes.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The study area represents a small area of habitat for the Wallum Froglet in relation to the area of suitable habitat adjoining the study area and also occurring in the locality.

The area of potential breeding habitat likely to be impacted upon as a result of the proposal is considered negligible.

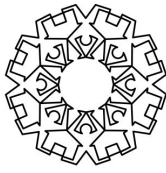
The habitat proposed to be modified or removed could therefore not be considered an important area of habitat for the Wallum Froglet or considered important to the long term survival of the population of the species occurring in the locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

There is currently no critical habitat identified for any populations of the Wallum Froglet under Section 3 of the *Threatened Species Conservation Act (1995)*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared for the Wallum Froglet and no threat abatement plans are applicable to the proposal for the species.



- (g) **Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. Given that the majority of the study area has previously been cleared, only a small amount of regrowth vegetation occurring (approximately .5 ha) within the stockpile site will be removed. The removal of habitat resources provided by this vegetation is considered negligible to the available habitat adjoining the study area and also occurring in the locality.

Invasion of native plant communities by exotic perennial grasses has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*.

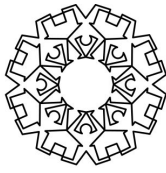
The stockpile site and some areas of the pipeline route currently contain a number of exotic perennial grass species including *Andropogon virginicus*, and *Setaria* sp.

It is unlikely that the operations on the stockpile site and placement or operation of the pipeline will exacerbate this key threatening process. The proposed maintenance of the pipeline may contribute weed invasion, however this would not be expected to be significant in this habitat. A weed management plan will be prepared as part of the overall Environmental Management Strategy for the project.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

2.16 BRUSH-TAILED PHASCOGALE (*Phascogale tapoatafa*)

The Brush-tailed Phascogale has a patchy distribution around the coast of mainland Australia (NPWS, 1999). The Brush-tailed Phascogale is a largely arboreal species that primarily occurs in dry forests and woodlands with an open or sparse ground cover of herbs, grasses shrubs and leaf litter and a moderate density of trees and shrubs in the midstratum (NPWS, 2000; NPWS, 1999; Soderquist 1995). Males have a home range of up to 100 ha, while females occupy a home range of 20 to 60 ha (NPWS, 1999). This species feeds upon invertebrates such as spiders, beetles and cockroaches, and occasionally small vertebrates. Nectar from flowering eucalypts is also an important dietary component (NPWS, 2000). The Brush-tailed Phascogale is dependent on tree hollows for breeding



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and shelter, and may utilise numerous hollows within its home range (NPWS, 2000; NPWS, 1999). This species generally prefers hollows that are 25-40 mm wide (Ayers et al., 1996).

The Brush-tailed Phascogale is known to occur within the study area and adjoining habitats (Cumberland Ecology, 2006).

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

As the majority of pipeline route and stockpile site is cleared, only a small area of foraging habitat and less than 5 hollow bearing trees will be removed as a result of the proposal. When this area is considered in relation to the species mobility, large home range and the large area of suitable habitat adjoining the study area, the area of habitat impacted is considered negligible. The proposal is therefore unlikely to have an adverse effect on the life cycle of the Brush-tailed Phascogale such that a viable local population of the species is likely to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Brush-tailed Phascogale are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Brush-tailed Phascogale.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

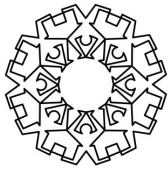
- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.

- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

Less than 5 trees have the potential to contain suitable hollows for denning and a small area of young regrowth less than 0.5 ha within the stockpile site will be removed



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II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

No areas of habitat for the Brush-tailed Phascogale will become fragmented or isolated from other areas of habitat as a result of the proposal.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The proposed pipeline route and stockpile site contains very limited potential denning habitat and represents a small area of foraging habitat for the Brush-tailed Phascogale in relation to this species home range and the area of suitable habitat adjoining the study area and the locality.

The habitat proposed to be removed or modified could therefore not be considered an important area of habitat for this species, or considered important to the long term survival of the population of Brush-tailed Phascogale occurring in the locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

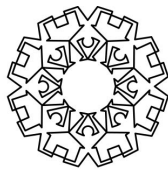
There is currently no critical habitat identified for any populations of Brush-tailed Phascogale under Section 3 of the *Threatened Species Conservation Act (1995)*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared for the Brush-tailed Phascogale and no threat abatement plans are applicable to the proposal for this species.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.



Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. Given that the majority of the study area is cleared, the actual amount of the native vegetation proposed to be removed will be limited to a small amount of regrowth vegetation occurring at some locations within the stockpile site. The removal of habitat resources provided by this vegetation is considered negligible to the available habitat adjoining the study area and also occurring in the locality.

Invasion of native plant communities by exotic perennial grasses has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*.

The stockpile site and some areas of the pipeline route currently contain a number of exotic perennial grass species including *Andropogon virginicus*, and *Setaria* sp.

It is unlikely that the operations on the stockpile site and placement or operation of the pipeline will exacerbate this key threatening process. The proposed maintenance of the pipeline may contribute weed invasion, however this would not be expected to be significant in this habitat. A weed management plan will be prepared as part of the overall Environmental Management Strategy for the project.

The removal of dead trees and dead wood is listed on Schedule 3 of the *Threatened Species Conservation Act 1995* as a KTP. The proposal would involve the removal of dead trees and dead wood from the stockpile site. The dead wood and timber represents potential foraging or denning habitat for the Brush-tailed Phascogale.

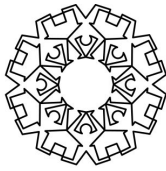
Despite this the removal of a small amount of dead trees and dead wood from the study area is unlikely to have a significant impact upon the Brush-tailed Phascogale. In addition, as discussed, less than 5 potential den trees were observed within the stockpile site.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

2.17 EASTERN CHESTNUT MOUSE (*Pseudomys gracilicaudatus*)

The Eastern Chestnut Mouse occurs from north eastern Queensland along the coast and ranges to central NSW (NPWS, 2000). In NSW, the Eastern Chestnut Mouse is more often found in heathland and is most common in wet heath and swampy areas, where it colonises regenerating areas of vegetation following a fire (Monamy and Fox, 2000). The Eastern Chestnut Mouse has been observed to reach maximum population density in heathland that is regenerating after fire (Strahan, 1998). Nests may be constructed of grass above ground, or be part of a burrow complex. Home ranges are generally less than 0.5 ha, however, some individuals have been known to move up to 250 m (Strahan, 1998; NPWS 2000).

Although this species is more commonly found in wet heathland, the Swamp Sclerophyll Forest adjoining the pipeline route, particularly the understorey components, provide habitat for the Eastern Chestnut Mouse. This species has been recorded within 10 km of the study area (NPWS, 2006) and is considered likely to occur within the study area and adjoining habitats.



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- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

Only a small area within the area of the proposed stockpile site represents potential habitat for this species. This area is however considered negligible to the area of potential habitat occurring in the Swamp Sclerophyll Forest adjoining the study area. In addition, this area of potential habitat is highly disturbed and is not considered to provide good quality habitat for the species.

The majority of the proposed pipeline route does not contain suitable ground cover and is therefore not considered to provide limited habitat for the Eastern Chestnut Mouse. The Eastern Chestnut Mouse is however, likely to traverse the pipeline route while utilising Swamp Sclerophyll Forest communities adjoining either side of the pipeline route.

Given that the small area of potential habitat to be removed from the stockpile site, and that the pipes will be raised at sections adjoining by suitable habitat for the species to allow movement, the proposed development is unlikely to disrupt the lifecycle of the species such that a viable population of Eastern Chestnut Mouse is likely to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Eastern Chestnut Mouse are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Eastern Chestnut Mouse.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable

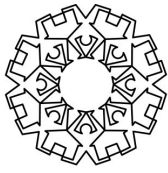
- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable

- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

Approximately 0.5 ha of potential foraging habitat occurring at the stockpile site for the species will be removed for the proposal.



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II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

Potential habitat for this species on either side of the pipeline route will not become isolated as the pipes will be raised at sections to allow movement between areas of suitable habitat.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The area of potential habitat proposed to be removed or modified is considered negligible to the area of potential habitat occurring in the Swamp Sclerophyll Forest adjoining the study area. In addition, this area of potential habitat is highly disturbed regrowth and is not considered to provide good quality habitat for the species.

The habitat proposed to be modified is therefore not considered to be an important area of habitat for the species, or considered important to the long term survival of the population of Eastern Chestnut Mouse occurring in the locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

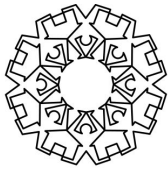
There is currently no critical habitat identified for any populations of Eastern Chestnut Mouse under Section 3 of the *Threatened Species Conservation Act 1995*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared for the Eastern Chestnut Mouse and no threat abatement plans are applicable to the proposal for this species.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.



GEOLYSE

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. Given that the majority of the study area is cleared, the amount of the native vegetation proposed to be removed will be limited to a small amount of regrowth vegetation occurring at some locations within the stockpile site. The removal of habitat resources provided by this vegetation is considered negligible to the available habitat adjoining the study area and also occurring in the locality.

Invasion of native plant communities by exotic perennial grasses has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*.

The stockpile site and some areas of the pipeline route currently contain a number of exotic perennial grass species including *Andropogon virginicus*, and *Setaria* sp.

It is unlikely that the operations on the stockpile site and placement or operation of the pipeline will exacerbate this key threatening process. The proposed maintenance of the pipeline may contribute weed invasion, however this would not be expected to be significant in this habitat. A weed management plan will be prepared as part of the overall Environmental Management Strategy for the project.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal

2.18 SQUIRREL GLIDER (*Petaurus norfolcensis*)

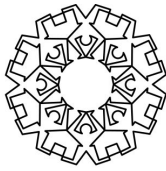
The Squirrel Glider is distributed in eastern Australia from northern Queensland, through eastern NSW to Victoria (NPWS, 2000). The Squirrel Glider occurs in dry sclerophyll forest and woodland (Strahan, 1998). This species feeds upon nectar, pollen, flowers, insects, and sap of particular eucalypts (Strahan, 1998; NPWS, 1999). The Squirrel Glider dens in hollow bearing trees, and often dens in family groups (Strahan, 1998; NPWS, 2000). Home ranges have been estimated as between 0.65 to 8.55 ha, with movements tending to be greater for males (NPWS, 1999).

The Squirrel Glider is known to occur within the study area and adjoining habitats (Cumberland Ecology, 2006).

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The proposed pipeline route and stockpile site contains limited foraging and denning resources for the Squirrel Glider. The habitat resources proposed to be removed or modified is considered negligible to the area of suitable habitat adjoining the study area.

The proposal is therefore unlikely to have an adverse effect on the life cycle of the Squirrel Glider such that a viable local population of the species is likely to be placed at risk of extinction.



GEOLYSE

- (a) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

The Squirrel Glider on the Barrenjoey Peninsula, north of Bushrangers Hill, and the Squirrel Glider in the Wagga Wagga Local Government Area are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)*. The study area is located well outside the range of the either of these populations and therefore the proposal will not impact upon any listed Endangered Populations of Squirrel Glider.

- (b) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.

- (c) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

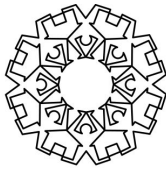
Less than 5 potential den trees and a small area of young regrowth less than 0.5 ha within the stockpile site will be removed

- II. **Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

No areas of habitat for the Squirrel Glider will become fragmented or isolated from other areas of habitat as a result of the proposal.

- III. **The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

The proposed pipeline route and stockpile site contains only limited potential denning habitat and represents a small area of low quality foraging habitat for the Squirrel Glider. Habitat for the species adjoining the proposed pipeline route and stockpile site will not become fragmented or isolated from other areas of habitat as a result of the proposal. Further, no known denning habitat will be removed or modified as a result of the proposal.



GEOLYSE

The habitat proposed to be removed or modified could therefore not be considered an important area of habitat for this species, or considered important to the long term survival of the population of Squirrel Gliders occurring in the locality.

- (d) **Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);**

There is currently no critical habitat identified for any populations of Squirrel Glider under Section 3 of the *Threatened Species Conservation Act 1995*.

- (e) **Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;**

No draft recovery plans or final recovery plans have been prepared for the Squirrel Glider and no threat abatement plans are applicable to the proposal for this species.

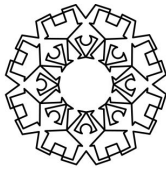
- (f) **Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. Given that the majority of the study area is cleared, the amount of the native vegetation proposed to be removed will be limited to a small amount of regrowth vegetation occurring at some locations within the stockpile site. The removal of habitat resources provided by this vegetation is considered negligible to the available habitat adjoining the study area and also occurring in the locality.

Invasion of native plant communities by exotic perennial grasses has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*.

The stockpile site and some areas of the pipeline route currently contain a number of exotic perennial grass species including *Andropogon virginicus*, and *Setaria* sp.



GEOLYSE

It is unlikely that the operations on the stockpile site and placement or operation of the pipeline will exacerbate this key threatening process. The proposed maintenance of the pipeline may contribute weed invasion, however this would not be expected to be significant in this habitat. A weed management plan will be prepared as part of the overall Environmental Management Strategy for the project.

The removal of dead trees and dead wood is listed on Schedule 3 of the *Threatened Species Conservation Act 1995* as a KTP. The proposal would involve the removal of dead trees and dead wood from the stockpile site. The dead wood and timber represents potential foraging or denning habitat for the Squirrel Glider.

Despite this the removal of a small amount of dead trees and dead wood from the study area is unlikely to have a significant impact upon the Squirrel Glider. In addition, as discussed, less than 5 potential den trees were observed within the stockpile site

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

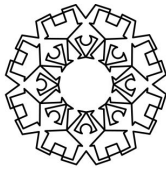
2.19 KOALA (*Phascolarctos cinereus*)

The Koala feeds almost entirely on the foliage of specific Eucalypts; however, within the species' range differences in preferred feed tree species occur. While State Environmental Planning Policy 44 – Koala Habitat protection (SEPP 44) lists 10 feed tree species, studies have identified that a variety of Eucalypt species occurring within any locality may be utilised and Koalas have been recorded feeding on over 69 Eucalypt species (NPWS, 2000). Males may have a home range of up to 40 ha which usually overlap the home range of a number of females (Phillips, 1994).

The study area contains appropriate feed trees for the Koala, however there were no Koalas, or evidence of Koalas (eg Koala scats) identified during the surveys. Despite this, the Koala is considered as likely to browse in the study area given that the subject land contains a large amount of suitable feed trees, and this species has been recorded within 3 km to the east and west of the site.

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The removal of approximately 20 potential feed trees from the stockpile site is therefore considered negligible to the amount of suitable feed trees occurring in the adjoining Swamp Sclerophyll Forest. The proposal is therefore unlikely to have an adverse effect on the life cycle of the Koala such that a viable local population of the species is likely to be placed at risk of extinction.



GEOLYSE

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

Two populations of Koala are listed as Endangered Populations on Schedule 1 on the *Threatened Species Conservation Act 1995*. These Koala populations are: the Hawks Nest and Tea Gardens population; and the Koala population in the Pittwater Local Government Area. The study area is located well outside the range of the either of these populations and therefore the proposal will not impact upon any listed Endangered Populations of the Koala.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.

- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

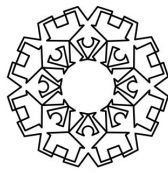
Approximately 20 potential feed trees will be removed as a result of the proposal however surveys indicated that the trees have not recently been utilised by Koalas.

- II. **Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

No areas of habitat for the Koala will become fragmented or isolated from other areas of habitat as a result of the proposal.

- III. **The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

The proposed removal of approximately 20 potential feed trees (*Eucalyptus robusta*) is considered negligible in relation to this species home range and the amount of feed trees occurring in the habitat adjoining the study area. In addition, the surveys identified zero activity levels around the trees proposed to be removed.



GEOLYSE

The potential habitat proposed to be removed could therefore not be considered an important area of habitat for the Koala or considered important to the long term survival of the population of the species occurring in the locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

There is currently no critical habitat identified for any populations of Koala under Section 3 of the *Threatened Species Conservation Act 1995*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

A draft recovery plan has been prepared for the Koala. The objectives of this recovery plan are detailed below.

Objective 1: To conserve Koalas in their existing habitat

Objective 2: To rehabilitate and restore Koala habitat and populations.

Objective 3: To develop a better understanding of the conservation biology of Koalas.

Objective 4: To ensure that the community has access to factual information about the distribution, conservation and management of Koalas at a national, state and local scale.

Objective 5: To manage captive, sick or injured Koalas and orphaned wild koalas to ensure consistent and high standards of care.

Objective 6: To manage over-browsing to prevent both Koala starvation and ecosystem damage in discrete patches of habitat.

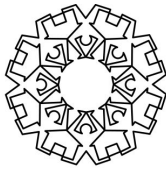
Objective 7: To co-ordinate the implementation of the Koala Recovery Plan across NSW.

The removal of any potential Koala habitat is not consistent with objectives 1 and 2 of the Draft Recovery Plan prepared for the Koala.

Approximately 20 Swamp Mahogany (*Eucalyptus robusta*) which is a SEPP 44 feed tree will be removed from the stockpile site. The removal of this small number of feed trees is considered negligible with regards to the amount of feed trees adjoining the study area and occurring in the locality.

The remaining objectives of the recovery plan prepared for the Koala are not relevant to the proposal.

No threat abatement plans are applicable to the proposal for this species.



GEOLYSE

- (g) **Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The proposed removal of approximately 20 feed trees is considered negligible to the available habitat adjoining the study area and also occurring in the locality.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

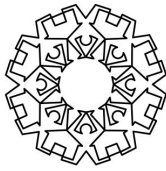
2.20 GREY-HEADED FLYING-FOX (*Pteropus poliocephalus*)

The Grey-headed Flying-fox occurs in a range of habitats including subtropical and temperate rainforests, dry and wet sclerophyll forests, Banksia woodland, heaths and Melaleuca swamps (Duncan et al, 1999; NPWS, 2001). The Grey-headed Flying-fox is a frugivorous and nectivorous species that feeds upon a variety of flowering and fruiting plants, feeding upon the blossoms of eucalypts, angophoras, tea-trees, and banksias, and the fruits of figs and palms (Strahan, 1998). This species may travel hundreds of kilometres in response to food availability, and may often feed upon orchids and trees in urban gardens (NPWS, 2001).

The Grey-headed Flying-fox roosts in large colonies of up to tens of thousands, often known as 'camps'. The camps are generally located within 20 km of a regular food source, and often situated in the exposed branches of emergent tree within riparian rainforest, mangroves, and a variety of sclerophyll forest types including Paperbark and Casuarina Forests (Duncan et al, 1999; NPWS, 2001). These colonies are also known to occur in urban parks and gardens (B. Campbell *pers. comm*, G. Richards *pers comm*).

The Grey-headed Flying-fox was observed traversing the study area at night, and also foraging in some trees within the site. In addition, there are numerous records of this species within the locality (NPWS, 2006).

There were no camp sites observed during the surveys, and no camp sites have been recorded in the adjoining habitats.



GEOLYSE

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

As the majority of the proposed development site is currently cleared, the proposed development would result in the removal of a small number of Eucalypts and Melaleucas which would provide foraging resources for the Grey-headed Flying-fox. This small number of trees is considered to provide a negligible amount of foraging resources compared to the large areas of forest adjoining the proposed development area.

The proposal is therefore unlikely to have an adverse effect on the life cycle of the Grey-headed Flying-fox such that a viable local population of the species is likely to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Grey-headed Flying-fox are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Grey-headed Flying-fox.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.

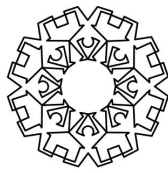
- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

Less than 20 trees in the early stages of maturity will be removed as a result of the proposed development which is considered a very minor loss of habitat resources for the species.

- II. **Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal.



III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

In consideration to the small amount of foraging habitat to be impacted upon, and as no camp sites will be impacted, the habitat proposed to be removed could not be considered an important area of habitat for the species.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

There is currently no critical habitat identified for any populations of the Grey-headed Flying-foxes under Section 3 of the *Threatened Species Conservation Act 1995*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared under the *TSC Act* for the Grey-headed Flying-fox and no threat abatement plans are applicable to the proposal for this species.

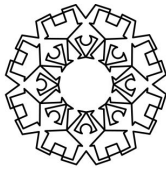
(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. Given that the majority of the study area is clear, the actual amount of the native vegetation proposed to be removed will be limited to a small amount of regrowth vegetation occurring at some locations within the stockpile site. The removal of habitat resources provided by this vegetation is considered negligible to the available habitat adjoining the study area and also occurring in the locality.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

2.21 COMMON BLOSSOM-BAT (*Sycnoycteris australis*)

The Common Blossom-bat occurs in coastal areas of north eastern NSW and eastern Qld, and is also widely distributed in New Guinea (NPWS, 2000; Strahan, 1998). The Common Blossom-bat usually roosts in rainforest and feeds upon nectar and pollen in adjacent heathland and paperbark swamps (NPWS, 2000). The Common Blossom-bat roosts individually in the foliage of trees, often Cabbage Palms, and may frequently change between roost sites that are usually located within 50 m of each other. The Common Blossom-bat has been recorded to travel up to 4 km from a roost site to feed, and usually return to the same limited area for feeding which may often be only several hundred square metres (Strahan, 1998; NPWS, 2000; NPWS, 2005).



GEOLYSE

The Swamp Sclerophyll Forest within and adjoining the study area represents potential foraging habitat for the Common Blossom-bat, and this species has been recorded within 1 km of the study area (Kendall and Kendall 2000 in de Groot & Benson Pty Ltd 2003). This species may also roost in the Swamp Sclerophyll Forest however, this does not represent typical roosting habitat for the species.

- (a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The proposed pipeline route and stockpile site contains limited foraging resources for the Common Blossom-bat. The small amount of nectar resources provided by the trees proposed to be removed from the stockpile site is considered negligible to the available nectar resources in the adjoining habitats and locality. No roosting habitat will be removed or modified as a result of the proposal.

The proposal is therefore unlikely to have an adverse effect on the life cycle of the Common Blossom-bat such that a viable local population of the species is likely to be placed at risk of extinction.

- (b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Common Blossom-bat are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the Common Blossom-bat.

- (c) In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable

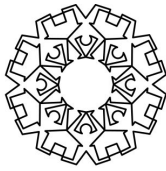
- II. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable

- (d) In relation to the habitat of a threatened species, population or ecological community:**

- I. The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

Less than 20 trees in the early stages of maturity will be removed as a result of the proposed development and only 4 of these are Melaleucas. This represents a negligible loss of foraging resources for the species.



II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

In consideration to the small amount of foraging habitat to be impacted upon, and as no roost sites will be impacted, the habitat proposed to be removed or modified could not be considered an important area of habitat for the species.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

There is currently no critical habitat identified for any populations of the Common Blossom-bat under Section 3 of the *Threatened Species Conservation Act 1995*.

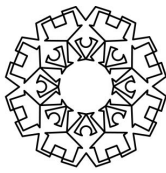
(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared under the *TSC Act* for the Common Blossom-bat and no threat abatement plans are applicable to the proposal for this species.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. Given that the majority of the study area is cleared, the amount of the native vegetation proposed to be removed will be limited to a small amount of regrowth vegetation occurring at some locations within the stockpile site. The removal of habitat resources provided by this vegetation is considered negligible to the available habitat adjoining the study area and also occurring in the locality.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal



2.22 INSECTIVOROUS BATS

Eastern Freetail-bat (*Mormopterus norfolkensis*)

As the taxonomic revision of the *Mormopterus* genus has not been finalised, there is some uncertainty regarding the habitat and distribution of *Mormopterus norfolkensis*. Similarly, little is known about the biology of this species. Despite this, the species has been recorded from a variety of habitats including Woodland, Dry and Wet sclerophyll forests and has been recorded foraging along a river within Rainforest (Strahan, 1998; Churchill, 1998). It is believed that the Eastern Freetail-bat is primarily a tree roosting species however, it has been recorded within the roof of a hut (Strahan, 1998).

Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)

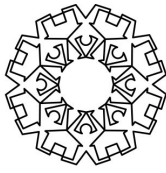
The Yellow-bellied Sheathtail-bat occurs across northern Australia, north of the Tropic of Capricorn, extending south through eastern NSW to Victoria and SA. There are only a few scattered records of this species in NSW (NPWS, 2000). The Yellow-bellied Sheathtail-bat occurs in a wide range of habitats, and primarily roost in tree hollows, however is known to roost in abandoned Sugar Glider nests and have also been observed roosting on the walls of buildings in broad daylight (Churchill, 1998; Strahan, 1998).

Greater Broad-nosed Bat (*Scoteanax rueppellii*)

The Greater Broad-nosed Bat is known to occur in a wide variety of habitat types including grazing land, heathland, melaleuca swamps, woodlands, rainforest and wet and dry sclerophyll Forests. Roost sites of the Greater Broad-nosed Bat have been located in hollow tree trunks and branches, as well as the roofs of old buildings. It generally prefers roosts with entrance diameters which are slightly larger than the size of the animals' body. These roosts have been located in mature remnant trees in grazing land, Melaleucas in Swamp forests and in dry Sclerophyll forest (B. Campbell pers obs, Churchill, S., 1998).

Southern Myotis (*Myotis macropus*)

This species is currently under taxonomic revision and therefore a definitive statement about this species is difficult. Despite this, the Southern Myotis is thought to have occurred along the east coast of Australia from south east Queensland to Victoria and South Australia, and also along inland waterways of the Murray and Darling River Systems (Duncan et al., 1999). This species is generally found roosting near bodies of still or slowly moving water where they almost exclusively forage, catching aquatic insects and small fish by raking the surface with its specialised and relatively large claws (NPWS, 2000; Strahan, 1998; Duncan et al., 1999). This species roosts in colonies that may occur in tree hollows, caves, mines, tunnels, amongst dense foliage of vegetation, and disused birds nests, or underneath bridges and buildings. The Southern Myotis has also been recorded using nest boxes (NPWS, 2000; Duncan, 1999).



Little Bentwing-bat (*Miniopterus australis*)

The Little Bentwing-bat occurs along the east coast of Australia from north eastern Queensland to the central coast of NSW (NPWS, 2000; NPWS, 2005). This species has been noted to predominantly forage between the canopy and the understorey within well timbered habitats including moist and dry sclerophyll forest, woodlands, rainforest, *Melaleuca* swamps, and dense coastal banksias (Strahan, 1998; NPWS, 2005; NPWS, 2000).

The Little Bentwing-bat is considered as a cave obligate species which roosts by day in caves, tunnels, and mines. This species forms maternity colonies in summer in roost sites which have an extremely high humidity, and these roosts are often shared with the Eastern Bentwing-bat (NPWS, 2005; NPWS, 2000; Strahan, 1998).

Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*)

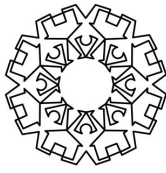
The Eastern Bentwing-bat occurs in eastern Australia from north Queensland to far south east SA. In NSW they are found along the coast and western slopes, including high elevations of the Great Dividing Range (NPWS, 2000). This species predominantly forages above the tree canopy in a range of well timbered habitats including rainforest, paperbark swamps, heaths, woodlands and sclerophyll forests (Strahan, 1998; NPWS, 2000).

Like the Little Bentwing-bat, the Eastern Bentwing-bat is also considered as a cave obligate species, only known to roost in caves, tunnels, mines and closed stormwater drains (NPWS, 2005; NPWS, 2000; Strahan, 1998). The Eastern Bentwing-bat has specific requirements for roost caves throughout the year including roosts for over wintering, acclimatisation caves, and in particular maternity caves. Maternity caves generally have domed rooves in which the young are left. These sites reach high temperatures and high levels of humidity and act as a 'humidicrib'. These maternity colonies are often shared with the Little Bentwing-bat.

Assessment

During the Anabat surveys the Little Bentwing-bat (*Miniopterus australis*), Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*), Eastern Freetail-bat (*Mormopterus norfolkensis*), and Southern Myotis (*Myotis macropus*) were recorded within the study area. The study area is also considered to provide appropriate habitat for the Greater Broad-nosed Bat (*Scoteanax rueppellii*) and Yellow-bellied Sheath-tail-bat (*Saccolaimus flaviventris*).

The area of the proposed stockpile site also contains a small number of potential roost sites for the hollow dependant microchiropteran bats; however, not contain potential roosting habitat for the cave obligate species, the Little or Eastern Bentwing-bats given the lack of caves or similar structures.



GEOLYSE

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The proposed pipeline route and stockpile site represents a small area of known or potential foraging habitat for Threatened insectivorous bat species in relation to these species mobility and home range and also area of suitable habitat adjoining the study area. In addition, the habitat resources occurring in these areas are very limited as the majority of pipeline route and stockpile site is cleared. Only a small number of potential roost trees occurring at the stockpile site will be removed.

The area of potential habitat impacted upon as a result of the proposal is therefore considered negligible to the area of suitable habitat occurring in the locality. The proposal is therefore unlikely to have an adverse effect on the life cycle of the subject Threatened insectivorous bats such that a viable local population of any species is likely to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the threatened insectivorous bat are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to threatened insectivorous bats.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

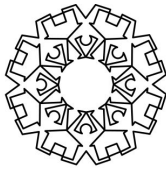
- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable.

- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

Less than 5 trees within the stockpile site are considered to have the potential to contain suitable hollows for roosting. In addition, potential and known foraging habitat occurring along the proposed pipeline route will be disturbed by the installation and maintained of the pipes. These disturbances are unlikely to cause a significant impact to the species'.



GEOLYSE

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

No areas of habitat for the Threatened insectivorous bats will become fragmented or isolated from other areas of habitat as a result of the proposal.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The proposed development would result in the removal of very limited potential roosting habitat only a small area of foraging habitat for Threatened insectivorous bats occurring in the locality.

The proposed development will also not become fragmented or isolated from other areas of habitat as a result of the proposal.

The habitat proposed to be removed or modified could therefore not be considered an important area of habitat for this species, or considered important to the long term survival of the population of any Threatened insectivorous bats occurring in the locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

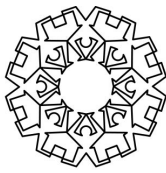
There is currently no critical habitat identified for any populations of threatened insectivorous bats under Section 3 of the *Threatened Species Conservation Act 1995*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared for the Threatened insectivorous bats under the *TSC Act* and no threat abatement plans are applicable to the proposal for these species.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.



Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. Given that the majority of the study area is cleared, the amount of the native vegetation proposed to be removed will be limited to a small amount of regrowth vegetation occurring at some locations within the stockpile site. The removal of habitat resources provided by this vegetation is considered negligible compared to the extent available habitat adjoining the study area and locality.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

2.23 GREEN TURTLE (*Chelonia mydas*)

The Green Turtle has been recorded in coastal waters of all Australian states; however, this species predominantly occurs in tropical and subtropical waters, with some individuals straying into temperate waters, including coastal waters of NSW north coast (Cogger et al., 1993; NPWS, 2000). This species migrates great distances between foraging grounds and nesting beaches, where they lay eggs in holes dug in beaches throughout their range. In Australia, major nest sites are known in the Great Barrier Reef and the Gulf of Carpentaria and WA (DEH, 2005, Cogger et al, 1993). The Green Turtle has been noted to be carnivorous when young; however, as adults, this species primarily feeds upon seagrass and algae, and may also consume fish egg cases, jellyfish and sponges (DEH, 2005, NPWS, 2000).

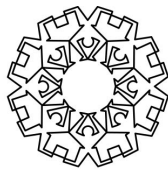
The Green Turtle is known to forage within Wallis Lake, however the species is unlikely to nest in any areas of Wallis Lake. The dredge site and estuarine environment around the length of pipeline route within Wallis Lake represents potential foraging habitat for the Green Turtle. Despite this, the area of potential foraging habitat proposed to be modified is negligible in relation to the foraging areas available in Wallis Lake (NPWS, 2006).

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

The proposed dredge site (at high tide) and estuarine environment around the length of pipeline route within Wallis Lake represents potential foraging habitat for the Green Turtle. This area of foraging habitat is however, considered negligible in relation to the foraging areas available in Wallis Lake and locality. The proposal is therefore unlikely to have an adverse effect on the life cycle of the Green Turtle such that a viable local population is likely to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

No populations of the Green Turtle are listed as Endangered Populations under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable to the species



GEOLYSE

(c) In the case of a critically endangered or endangered ecological community, whether the action proposed:

I. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

Not applicable.

II. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;

Not applicable.

(d) In relation to the habitat of a threatened species, population or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the action proposed, and

Approximately 8 ha of potential foraging habitat occurring at the proposed dredge site will be modified which is not considered to be an important foraging area for the species. In addition, this modification is likely to result in the area becoming more suitable for the Green Turtle.

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

No areas of habitat for the species will become fragmented or isolated from other areas of habitat as a result of the proposal.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

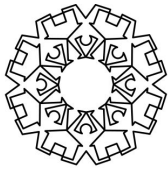
In consideration to the small area of foraging habitat to be removed and as the proposal is unlikely to impact upon known or potential nesting habitat, the habitat proposed to be modified could not be considered an important area of habitat for the species

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

There is currently no critical habitat identified for any populations of the Green Turtle under Section 3 of the *Threatened Species Conservation Act (1995)*.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared for the Green Turtle and no threat abatement plans are applicable to the proposal for this species.



GEOLYSE

- (g) **Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Anthropogenic climate change is listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* as a Key Threatening Process. The use of machinery during the preparation of the stockpile and oyster lease, and also during the operation of the dredge and processing of the sand will make a contribution to anthropogenic climate change through release of greenhouse gas emissions associated with use of fossil fuels. In addition, the clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels and the clearing and/or modification of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is negligible in the context of other activities in the region.

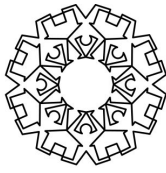
Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*. This KTP is relevant to this species as the proposal includes dredging operations. The proposal will alter flow regimes however this will provide additional areas of seagrass in deeper water which is more accessible to the species than currently exists. Therefore the proposal will not significantly contribute to, or increase the impacts of this KTP upon this species or its habitat.

Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments has been identified as a KTP in Schedule 3 of the *Threatened Species Conservation Act (1995)*. Aquaculture has been identified as contributing to this KTP, and cases of entanglement with and ingestion of marine debris have been recorded with the Green Turtle. Given that the proposal includes aquaculture, this KTP is considered relevant to the species as a result of the proposal. Despite this, the proposal is unlikely to generate fishing gear, packaging materials, convenience items and raw plastics which are identified by the Scientific Committee as a major component of anthropogenic marine debris. The proposed oyster farm is therefore unlikely to significantly contribute to, or increase the impacts of this KTP upon this species or its habitat.

It is considered that remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act (1995)* are not relevant to this species or its habitat as result of the proposal.

2.24 SWAMP SCLEROPHYLL FOREST ON COASTAL FLOODPLAINS

A summary of the ecology and biology of this EEC has been provided in **Table 3.4** of the Flora and Fauna Study and Assessment report and is not reproduced here.



GEOLYSE

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

Swamp Sclerophyll Forest on Coastal Floodplains is listed as an Endangered Ecological Community under Part 3 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

Swamp Sclerophyll Forest on Coastal Floodplains is not listed as an Endangered Population under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

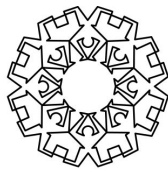
The proposal will result in the removal of 0.5 hectare (approx.) of highly modified swamp sclerophyll forest (Pasture Grassland – Sedgeland and Low Woodland disturbance ecotypes of vegetation community no. 1) to construct settlement ponds 2 and 3 at the proposed stockpile site. Both these areas are subject to continued disturbance (slashing, weed invasion) and their loss through direct removal would not be expected to place the local swamp sclerophyll forest at North Tuncurry at risk of extinction.

The proposal has the potential to indirectly impact upon swamp sclerophyll forest habitats recorded within the study area due to possible soil compaction, altered hydrology regimes, increased human activity and pipeline spillage. The potential direct and indirect impacts as well as management measures to mitigate against these potential impacts are discussed in full in Section 6 and 7 of the terrestrial ecology report and are not reproduced here.

Based on the impact assessment and management measures proposed, the local occurrence of this EEC is not expected to be placed at risk of extinction as a result of the proposal.

- II. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

As per 1.



GEOLYSE

(d) In relation to the habitat of a threatened species, population or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the action proposed, and

As per (c) 1.

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The proposal would not result in further fragmentation or isolation of swamp sclerophyll forest habitat in the locality

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The majority of the highly modified swamp sclerophyll forest (0.5 ha) proposed for removal at the stockpile site is subject to repeated and continued disturbance and is unlikely to return to a near natural state without a change in landuse (and assisted rehabilitation). Given the extent of high quality swamp sclerophyll forested remnants in the North Tuncurry locality (including SEPP 14 wetland), the removal of these swamp sclerophyll disturbance ecotypes as a result of the proposal is not considered to represent an important component of the EEC.

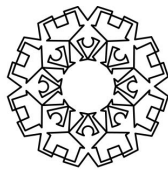
The remaining Swamp Sclerophyll Forest remnants recorded within the study area that may be subject to potential indirect impacts are considered to represent an important component of this EEC in the Forster-Tuncurry locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

There is currently no critical habitat identified for the Swamp Sclerophyll Forest EEC.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared under the *TSC Act* for the Swamp Sclerophyll Forest and no threat abatement plans are applicable to the proposal for this EEC.



GEOLYSE

- (g) **Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Anthropogenic Climate Change is listed on Schedule 3 of the *Threatened Species Conservation Act 1995* as a Key Threatening Process. The use of machinery during construction and clearing of some vegetation may make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels. The clearing of a small area of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is considered to be negligible given the relatively small amount of clearing required.

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act 1995* as a Key Threatening Process. The impact of the proposal on clearing of native vegetation as well as measures to mitigate against predicted impacts have been addressed in Section 6 and 7 of this report and are not reproduced here.

It is not considered that the proposal would result in the operation of, or increase the impact of, any of the remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act 1995*.

2.25 SWAMP OAK FOREST ON COASTAL FLOODPLAINS

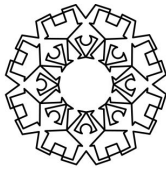
A summary of the ecology and biology of this EEC has been provided in **Table 3.4** of the Flora and Fauna Study and Assessment report and is not reproduced here.

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

Swamp Sclerophyll Forest on Coastal Floodplains is listed as an Endangered Ecological Community under Part 3 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

Swamp Sclerophyll Forest on Coastal Floodplains is not listed as an Endangered Population under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable.



GEOLYSE

(c) In the case of a critically endangered or endangered ecological community, whether the action proposed:

I. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

Both the proposed dredge and return pipelines would be placed strategically within existing cleared property boundary lines and former horse trails (bare mudflats) that fringe a Swamp Oak Forest remnant recorded within the study area. Consequently, no Swamp Oak Forest habitat would be directly removed as part of the proposal.

The proposal has the potential to indirectly impact upon Swamp Oak Forest habitat recorded within the study area due to possible altered hydrology regimes, increased human intrusion and pipeline spillage. The potential indirect impacts as well as management measures to mitigate against these potential indirect impacts are discussed in full in Section 6 and 7 of the terrestrial ecology report and are not reproduced here.

Based on the management measures proposed, the local occurrence of this EEC is not expected to be placed at risk of extinction.

II. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;

As per 1.

(d) In relation to the habitat of a threatened species, population or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the action proposed, and

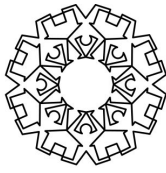
As per (c) 1.

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The proposal would not result in further fragmentation or isolation of Swamp Oak Forest habitat in the locality.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The Swamp Oak Forest remnant recorded within the study area that may be subject to potential indirect impacts is considered to represent an important component of this EEC in the Forster-Tuncurry locality.



GEOLYSE

- (e) **Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);**

There is currently no critical habitat identified for the Swamp Sclerophyll Forest EEC.

- (f) **Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;**

No draft recovery plans or final recovery plans have been prepared under the *TSC Act* for the Swamp Oak Forest and no threat abatement plans are applicable to the proposal for this EEC.

- (g) **Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Anthropogenic Climate Change is listed on Schedule 3 of the *Threatened Species Conservation Act 1995* as a Key Threatening Process. The use of machinery during construction and clearing of some vegetation may make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels. The impact of the proposal on anthropogenic climate change however is considered to be negligible given that no clearing of this remnant would be required.

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act 1995* as a Key Threatening Process. The impact of the proposal on clearing of native vegetation as well as measures to mitigate against predicted impacts have been addressed in Section 6 and 7 of this report and are not reproduced here.

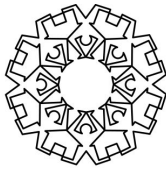
It is not considered that the proposal would result in the operation of, or increase the impact of, any of the remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act 1995*.

2.26 COASTAL SALTMARSH

A summary of the ecology and biology of this EEC has been provided in **Table 3.4** of the Flora and Fauna Study and Assessment report and is not reproduced here.

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

Coastal Saltmarsh is listed as an Endangered Ecological Community under Part 3 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable.



GEOLYSE

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

Coastal Saltmarsh is not listed as an Endangered Population under Part 2 of Schedule 1 of the *Threatened Species Conservation Act (1995)* and therefore this part of the Section 5A assessment is not applicable.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

The proposal has the potential to indirectly impact upon saltmarsh habitat recorded within the study area due to possible soil compaction, altered hydrology regimes, increased human intrusion and pipeline spillage.

In order to minimise the potential indirect impacts to the saltmarsh habitat, the proposed dredge pipeline would be strategically placed within a former horse trail (bare mudflat) that bisects the majority of the extent of the saltmarsh habitat in the study area. As a result, the dredge pipeline would only need to be placed within a 75-100 metre section of relatively undisturbed saltmarsh.

The potential indirect impacts as well as management measures to mitigate against these potential indirect impacts are discussed in full in Section 6 and 7 of the terrestrial ecology report.

Based on the management measures proposed as well as the extant areas of saltmarsh habitat in the immediate locality, the local occurrence of this EEC is not expected to be placed at risk of extinction.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

As per 1.

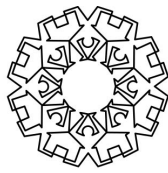
- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

As per (c) 1.

- II. **Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

The proposal would not result in further fragmentation or isolation of saltmarsh habitat in the locality.



GEOLYSE

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The saltmarsh habitat subject to the predicted potential indirect impacts is considered to represent an important component of this EEC in the Forster-Tuncurry locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

There is currently no critical habitat identified for the saltmarsh EEC.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared under the *TSC Act* for the Saltmarsh.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

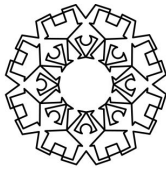
Anthropogenic Climate Change is listed on Schedule 3 of the *Threatened Species Conservation Act 1995* as a Key Threatening Process. The use of machinery during construction and clearing of some vegetation may make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels. The clearing of a small area of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is considered to be negligible given the relatively small amount of saltmarsh predicted to be impacted upon.

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act 1995* as a Key Threatening Process. The impact of the proposal on clearing of native vegetation as well as measures to mitigate against predicted impacts have been addressed in Section 6 and 7 of this report and are not reproduced here.

It is not considered that the proposal would result in the operation of, or increase the impact of, any of the remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act 1995*.

2.27 ASPERULA ASTHENES

A summary of the ecology and biology of this taxon has been provided in **Table 3.4** of the main Flora and Fauna report and is not reproduced here.



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- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

Whilst this species was not recorded during the present study, the proposal has the potential to indirectly impact upon its swamp sclerophyll forest habitat due to possible soil compaction, altered hydrology regimes, increased human intrusion and pipeline spillage.

The potential indirect impacts as well as management measures to mitigate against these potential indirect impacts are discussed in full in Section 6 and 7 of the terrestrial ecology report and are not reproduced here.

Based on the impact assessment and management measures proposed as well as the extant areas of suitable swamp sclerophyll forest habitat in the immediate locality, the local occurrence of this species' habitats is not expected to be placed at risk of extinction.

In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;

Not applicable.

- (b) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable

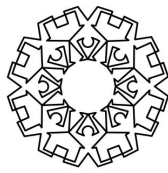
- (c) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

As per (a)

- II. **Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

The proposal would not result in further fragmentation or isolation of habitat for the species in the locality.



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III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The swamp sclerophyll forest habitat for the species subject to the predicted potential indirect impacts is considered to represent an important component of this habitat type in the Forster-Tuncurry locality.

(d) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

There is currently no critical habitat identified for the species.

(e) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

No draft recovery plans or final recovery plans have been prepared under the *TSC Act* for the species.

(f) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

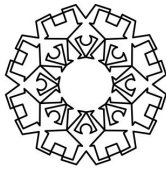
Anthropogenic Climate Change is listed on Schedule 3 of the *Threatened Species Conservation Act 1995* as a Key Threatening Process. The use of machinery during construction and clearing of some vegetation may make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels. The clearing of a small area of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is considered to be negligible given the relatively small amount of vegetation clearing proposed..

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act 1995* as a Key Threatening Process. The impact of the proposal on clearing of native vegetation as well as measures to mitigate against predicted impacts have been addressed in Section 6 and 7 of this report and are not reproduced here.

It is not considered that the proposal would result in the operation of, or increase the impact of, any of the remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act 1995*.

2.28 LINDERNIA ALSINOIDES

A summary of the ecology and biology of this taxon has been provided in **Table 3.4** of the main Flora and Fauna report and is not reproduced here.



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- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;**

Whilst the species was not recorded during the present study within the study area, the proposal has the potential to indirectly impact upon its habitat (swamp sclerophyll forest and fringes) due to possible soil compaction, altered hydrology regimes, increased human intrusion and pipeline spillage.

The potential indirect impacts as well as management measures to mitigate against these potential indirect impacts are discussed in full in Section 6 and 7 of the terrestrial ecology report and are not reproduced here.

Based on the impact assessment and management measures proposed as well as the extant areas of suitable swamp sclerophyll forest and fringing habitat in the immediate locality, the local occurrence of this specie's habitats is not expected to be placed at risk of extinction.

- (b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;**

Not applicable.

- (c) **In the case of a critically endangered or endangered ecological community, whether the action proposed:**

- I. **Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not applicable.

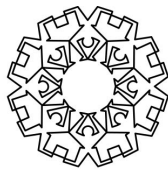
- II. **Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;**

Not applicable

- (d) **In relation to the habitat of a threatened species, population or ecological community:**

- I. **The extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

As per (a)



GEOLYSE

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The proposal would not result in further fragmentation or isolation of habitat for the species in the locality.

III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

The Swamp Sclerophyll Forest and fringing forest habitat for the species subject to the predicted potential indirect impacts is considered to represent an important component of this habitat type in the Forster-Tuncurry locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

Not applicable

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;

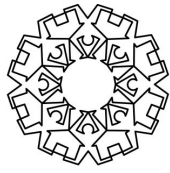
No draft recovery plans or final recovery plans have been prepared under the *TSC Act* for the species.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Anthropogenic Climate Change is listed on Schedule 3 of the *Threatened Species Conservation Act 1995* as a Key Threatening Process. The use of machinery during construction and clearing of some vegetation may make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels. The clearing of a small area of vegetation will also reduce the vegetation available for Carbon dioxide cycling. The impact of the proposal on anthropogenic climate change however is considered to be negligible given the relatively small amount of vegetation clearing proposed.

Clearing of native vegetation is listed on Schedule 3 of the *Threatened Species Conservation Act 1995* as a Key Threatening Process. The impact of the proposal on clearing of native vegetation as well as measures to mitigate against predicted impacts have been addressed in Section 6 and 7 of this report and are not reproduced here.

It is not considered that the proposal would result in the operation of, or increase the impact of, any of the remaining KTP's listed on Schedule 3 of the *Threatened Species Conservation Act 1995*.

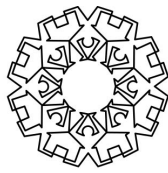


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Conclusion

3.1 CONCLUSION

With respect to the proposed mitigation measures, and due to the small area of clearing required, it is considered that the proposal will not have a significant effect on 'Threatened species, populations or ecological communities or their habitats within the locality' and therefore the preparation of a Species Impact Statement is not required.



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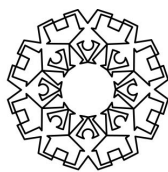
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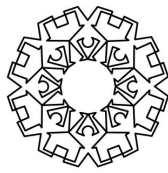
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