

**NEWCASTLE COAL INFRASTRUCTURE GROUP RAIL FLYOVER MODIFICATION
ENVIRONMENTAL ASSESSMENT**

RESPONSES TO SUBMISSIONS – PART C

NEWCASTLE COAL INFRASTRUCTURE GROUP
COAL EXPORT TERMINAL RAIL FLYOVER MODIFICATION

ADDITIONAL DETAIL IN RELATION TO BIODIVERSITY IMPACTS

(In Response to a Request from the NSW Department of Planning and Infrastructure)



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OVERVIEW

This report provides additional detail relating to the monthly bird surveys that have been conducted by the Hunter Bird Observers Club in the areas known as Swan and Wader Ponds over the past 13 years.

Key points:

- Newcastle Coal Infrastructure Group (NCIG) purchased bird monitoring data for Swan Pond from the Hunter Bird Observers Club at the cost of \$15,000;
- the monitoring data contains thirteen years of monthly count data;
- five threatened birds were recorded at Swan Pond between 1999 and 2003 and three threatened birds at Swan Pond and/or Wader Pond between 2003 and 2012;
- all threatened species recorded at Swan Pond and/or Wader Pond were already assessed in the Threatened Species Assessment for the Rail Flyover Modification (June 2012);
- the Rail Flyover Modification would not result in the complete loss of Swan Pond, instead Swan Pond would continue to provide habitat to birds;
- a linear strip of Saltmarsh (1.32 hectares), including a portion Swan Pond, on the west of the existing rail embankment would be removed for the Rail Flyover Modification;
- Figures 1, 5 and 6 show the wider extent of Swan Pond and habitat as mapped by independent sources;
- the Rail Flyover Modification area is a linear disturbance located adjacent to the existing rail; and
- NCIG would establish additional compensatory habitat for shorebirds in accordance with the existing conditions of approval.

1 INTRODUCTION

This report provides additional detail relating to the monthly bird surveys that have been conducted in the areas known as Swan and Wader Ponds by the Hunter Bird Observers Club over the past 13 years. Newcastle Coal Infrastructure Group (NCIG) purchased bird monitoring data for Swan Pond from the Hunter Bird Observers Club at the cost of \$15,000.

2 SWAN POND BIRD SURVEYS

Monthly bird surveys have been conducted in the areas known as Swan and Wader Ponds (Ash Island) by the Hunter Bird Observers Club between July 2003 and June 2012 (over 13 years). Swan and Wader Ponds are shown on Figure 1. During the initial period between July 1999 to July 2003 data for Swan Pond was counted and reported separately from Wader Pond. Subsequently, between August 2003 and June 2012, the counts for the two areas were combined by the Hunter Bird Observers Club.



Source: Herbert (2007)

Figure 1 – Location of Swan Pond and Wader Pond

Note: Herbert (2007) identified roosting areas at Swan Pond and Wader Pond.

The Hunter Bird Observers Club (1999-2012) provided a description of the methods used during the monitoring as re-produced in Sections 2.1 to 2.3.

2.1 SCOPE OF AREA SURVEYED

The data supplied covers the areas known as Swan and Wader Ponds (alternatively called Area E) (Figure 1) which are bisected by the track known as Wagtail Way. Birds using these areas regularly interchange. After an initial trial period it was not considered practical to report the numbers for the two areas separately.

2.2 COUNT METHODS

Birds were counted monthly as part of an estuary wide survey effort involving a number of teams surveying different areas at high tide when shorebirds and other species congregate in a limited number of areas. At low tide they are widely dispersed and population estimation is impracticable. Survey teams synchronise their efforts to prevent double-counting of birds.

Swan and Wader Ponds are counted using binoculars and telescope, from the perimeter tracks surrounding these areas and from Wagtail Way which bisects the areas. The core members of the team that survey Ash Island, including Swan and Wader Ponds, have been unchanged throughout the monitoring period.

2.3 COUNT ACCURACY

Birds frequenting Swan and Wader Ponds are seldom tightly packed and counts are accurate even when large numbers are present (e.g. $\pm 10\%$ or better). The main cause of disturbance is from raptors passing overhead, but when birds take flight they seldom leave the area.

The survey team is aware when numbers of a species are abnormally high and carefully check their counts. Furthermore all collated data is checked by the team after data-base entry to eliminate any errors being introduced during data handling.

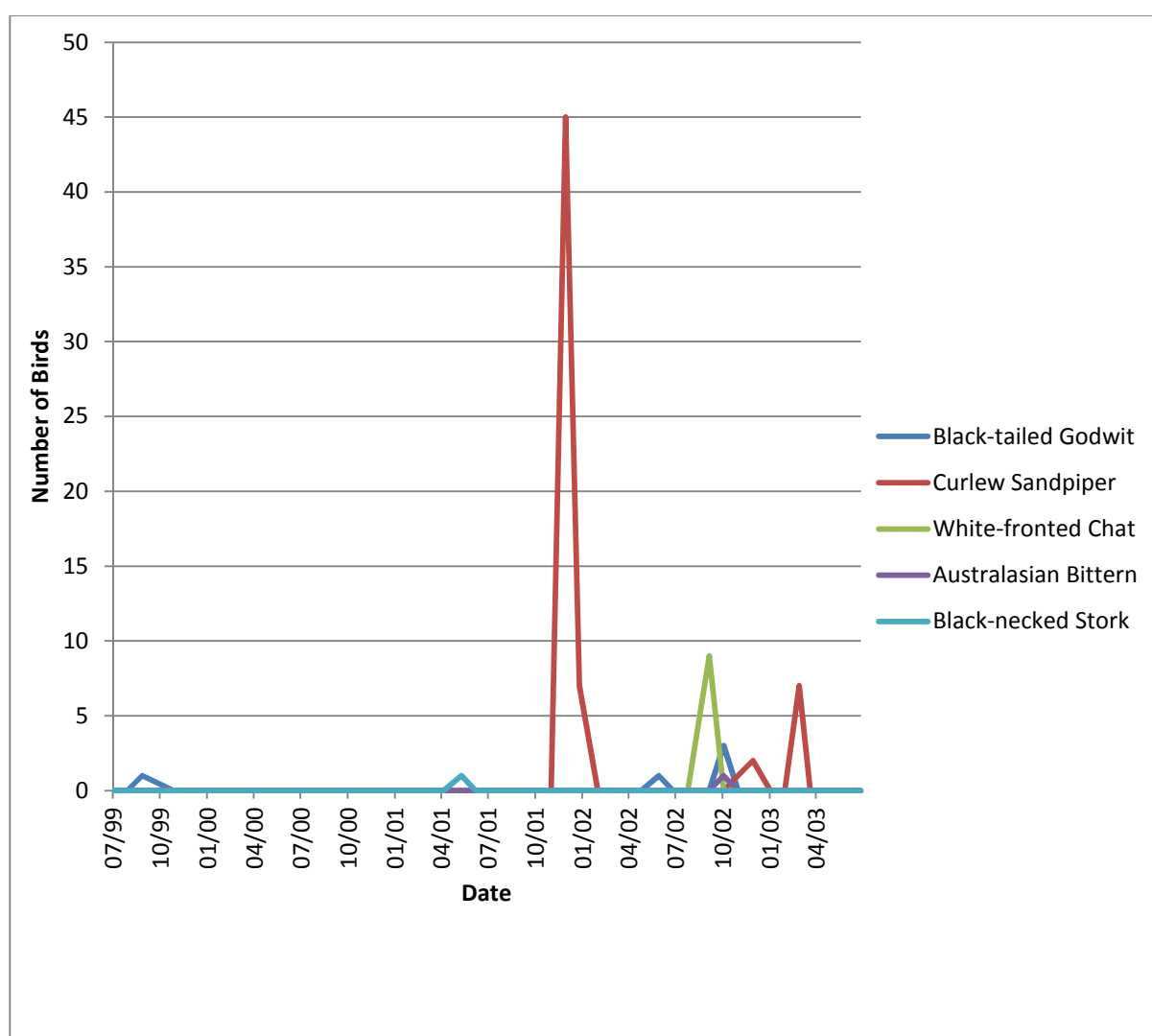
*Some species are cryptic and small numbers may be missed when foraging amongst vegetation potentially causing under-estimation of population size for some species (e.g. crakes and bitterns), usually small for the numerous species (e.g. Sharp-tailed Sandpiper *Calidris acuminata*).*

3 THREATENED SPECIES RECORDED

3.1 SWAN POND 1999-2003

Five threatened birds were recorded at Swan Pond between 1999 and 2003 (Figure 2). Less than 10 birds of any one species were generally recorded in any monitoring period, with a spike of 45 Curlew Sandpipers (*Calidris ferruginea*) recorded in December 2001. Up to three Black-tailed Godwits (*Limosa limosa*) were recorded each year except in 2000 (Figure 2).

A single Black-necked Stork (*Ephippiorhynchus asiaticus*) and a single Australasian Bittern (*Botaurus poiciloptilus*) were recorded in May 2001 and October 2002, respectively (Figure 2). These were the only sightings of these species in the 13 year dataset for Swan Pond/Wader Pond. Nine White-fronted Chats (*Epthianura albifrons*) were recorded on one monitoring event between 1999 and 2003 (i.e. in September 2002).



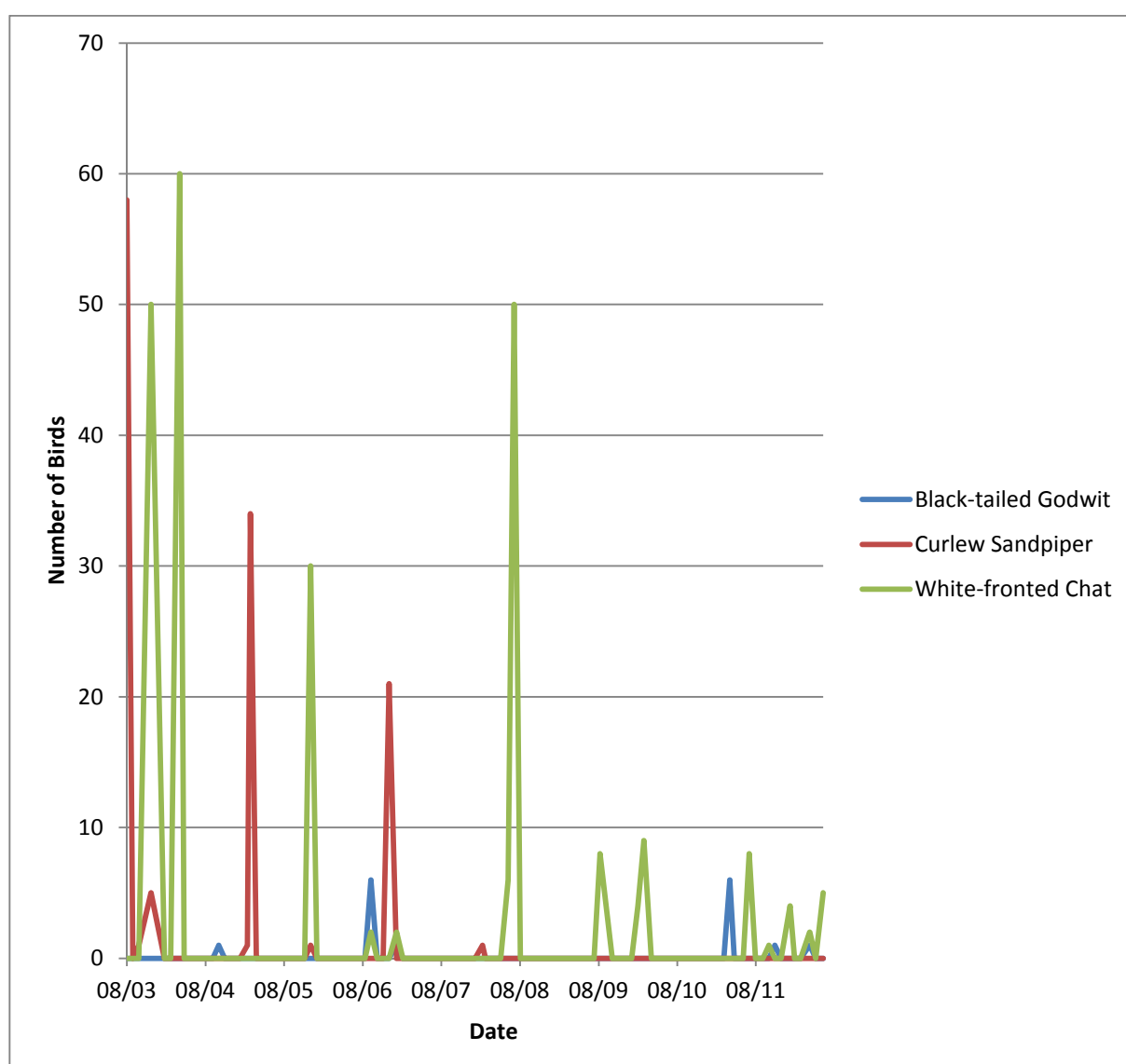
Source: Hunter Bird Observers Club (1999-2012)

Figure 2 Monitoring Data – Swan Pond 1999-2003

3.2 SWAN POND AND WADER POND 2003-2012

Between August 2003 and June 2012, the counts for Swan Pond and Wader Pond were combined by the Hunter Bird Observers Club. The number of birds of each species is greater in this dataset with the exception of the Black-necked Stork and Australasian Bittern which were not recorded.

Three threatened birds were recorded at Swan Pond and/or Wader Pond between 2003 and 2012 (Figure 3). These were the same species recorded in the dataset between 1999 and 2003. The patterns of occurrence differ widely between species with both seasonal and annual variations in abundance. The Curlew Sandpiper was last recorded in December 2006 (21 birds) (Figure 3). Up to six Black-tailed Godwits were recorded (2006 and 2011) (Figure 3). There is a marked increase in White-fronted Chats recorded at Swan Pond and/or Wader Pond (Figure 3) compared to the earlier data (Figure 2). Up to 58 Curlew Sandpipers have been recorded at Swan Pond and/or Wader Pond (Figure 3).



Source: Hunter Bird Observers Club (1999-2012)

Figure 3 Monitoring Data – Swan Pond and/or Wader Pond 2003-2012

3.3 THREATENED SPECIES OCCURRENCE IN THE HUNTER

The text in this section is reproduced in full from Herbert (2007). This information helps put the records at Swan Pond and Wader Pond in context of the wider occurrence of the species.

3.3.1 Black-necked Stork

The Black-necked Stork is occasionally observed at widespread locations throughout the Hunter Estuary, usually as a single bird, less often as a pair or as three or four birds, and only for short periods.

Recorded at:

*Ash Island (4), i.e. Cobbans Overflow (2) and Tadpole Waters (2)
Bedminster Swamp (2)
Deep Pond (1)
Grahamstown Dam (1)
Hexham Swamp (1)
Hunter Wetlands Centre (3)
Irrawang Swamp (3)
Lenaghans Wetland (2)
Milhams Pond (2)
Pambalong Nature Reserve (2)
Phoenix Flats (1)
Seaham Swamp (3)
Swan Pond (1) and adjacent area north of Bellfrog Track
Tomago Wetland (1)
Wader Pond (1)
Woodberry Swamp (3)*

3.3.2 Australasian Bittern

Australasian Bitterns, although very large birds, are solitary and cryptic, hence rarely observed. However, there is sufficient habitat in the Hunter Estuary to support a significant population. Sightings are uncommon and are usually of single birds. Most sightings of Australasian Bitterns have been recorded from Hexham Swamp and associated wetlands, Ash Island and Kooragang Island. Wetlands where bitterns have not been observed but where suitable bittern habitat exists include Seaham Swamp Nature Reserve, Irrawang Swamp, Newline Road Swamp, Pambalong Nature Reserve, Lenaghans Wetland, Market Swamp, Antennae Wetland and Woodberry Swamp.

Recorded at:

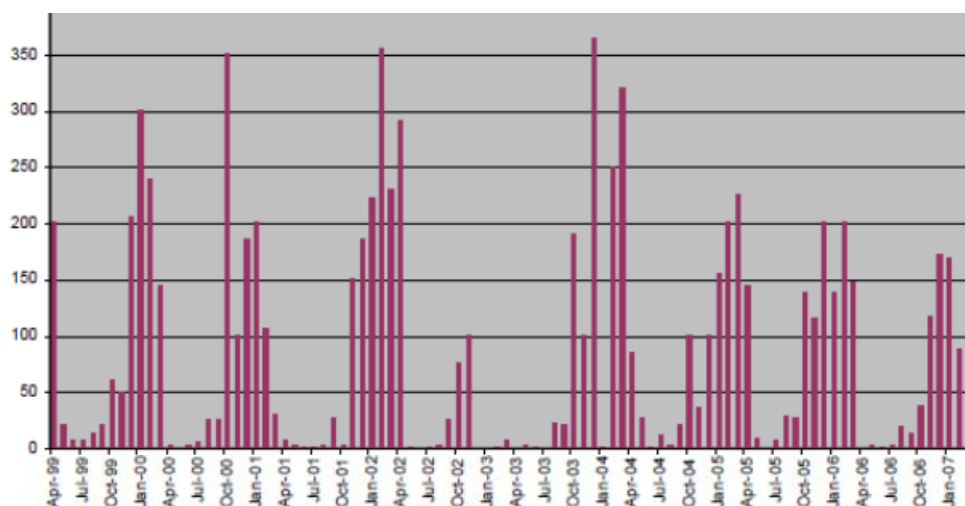
*BHP Moat (1)
Big Pond (1)
Hexham Swamp (6)
Hunter Wetlands Centre (1)
Juncus Swamp (5)
Newcastle University Wetland (1)
Newcastle Wetlands Reserve (1)
Swan Pond, recorded in adjacent areas to northeast, Bittern Corner (1), and northwest, Typha Swamp (1)
Wader Pond (1)
Tank Paddock (1)
Tomago Wetlands (1)*

3.3.3 Black-tailed Godwit

Black-tailed Godwits confine their activities to the saline parts of the Hunter Estuary. They begin arriving in the Hunter Estuary during August, with the main influx in October, and then depart during the following April. Up to 192 birds were present during the 2006/07 summer and up to three birds over-wintered during 2006. At present nearly all Black-tailed Godwits use the main daytime high tide roosts at the Kooragang Dykes and Stockton Sandspit. During the early 1990s, Fullerton Cove Beach was an important roost for Black-tailed Godwits, however, they have not been recorded at that site since monthly surveys commenced in April 1999. At night it is presumed that they use Windeyers Reach Nocturnal Roost. Black-tailed Godwits forage mainly at Fullerton Cove, Kooragang Dyke Ponds 2, 3 and 4, and Stockton Sandspit. A few birds have also been observed at Deep Pond, Swan Pond and Hexham Swamp.

Recorded at:

Deep Pond (3), foraging and loafing
Fish Fry Flats
Fullerton Cove, main foraging area
Fullerton Cove Beach (1), roosting
Hexham Swamp (2), foraging
Kooragang Dykes (364), roosting (Figure 4)
Kooragang Dyke Ponds 2, 3 and 4, foraging and roosting
Stockton Sandspit (425), foraging and roosting
Swan Pond (6), loafing
Teal Waters, loafing
Windeyers Reach Nocturnal Roost



Source: Herbert (2007)

Figure 4 Example of Black-tailed Godwit Numbers Recorded at Kooragang Dykes

3.3.4 Curlew Sandpiper

Curlew Sandpipers are found throughout the Hunter Estuary mostly in saline habitats, and often in large numbers. They begin arriving as early as August and into September, and most of them have departed by mid-March. During 2006/07 a maximum of 276 birds was recorded. Curlew Sandpipers rarely over-winter in the Hunter Estuary. They forage mainly on Ash Island ponds, Deep Pond, Fullerton Cove (1,500), North Arm Sandflats, Stockton Sandspit and in the past, at Big Pond.

Recorded at:

Ash Island (69)
Big Pond (200)
Deep Pond (450)
Fern Bay (50)
Fish Fry Flats
Fullerton Cove (1,500)
Fullerton Cove Beach (50)
Hunter Wetlands Centre (1-5)
Kooragang Dykes (461)
Melaleuca Swale
North Arm Sandflats (50), foraging
Pambalong Nature Reserve (6-20)
Sharpies Flat (1)
Stockton Sandspit (400)
Stockton Sewage Treatment Works (1,500, 1993), no longer viable
Throsby Creek (6-20)

3.3.5 White-fronted Chat

White-fronted Chats inhabit coastal wetlands in the Hunter Region and are often seen in small flocks throughout the Hunter Estuary.

Recorded at:

Antennae Wetland (10)
Ash Island (80)
BHP Moat (20)
Big Pond (40)
Deep Pond (14)
Fern Bay (1)
Fullerton Cove
Grahamstown Dam (1-5)
Hexham Swamp (6)
Hunter Wetlands Centre
Kooragang Dykes (8)
Kooragang Island (40+)
Long Pond (3)
Market Swamp (5+)
Milhams Pond (5)
Newcastle Wetlands Reserve (1-5)
Pambalong Nature Reserve (1-5)
Phoenix Flats (40)
Sharpies Flat (10)
Stockton Sandspit (24)
Swan Pond (9)
Tarro Swamp (1-5)
Tomago (1-5)
Wader Pond (6)

3.4 SUMMARY

All threatened species recorded at Swan Pond and/or Wader Pond were included in the Threatened Species Assessment for the Rail Flyover Modification (NCIG, 2012). A summary of the threatened species recorded at Swan Pond and/or Wader Pond is provided in Table 1.

Table 1
Threatened Species Recorded at Swan Pond and/or Wader Pond

Scientific Name	Common Name	Conservation Status ¹	Was the Species Previously Assessed?	Description of the Record(s)/Assessment
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E	Yes	<p>A single bird was recorded at Swan Pond once in May 2001 (Figure 2). The bird has not been recorded in the monthly monitoring over the past 11 years at Swan Pond.</p> <p>Limited habitat for this species would be removed by the Modification. Habitat is present in freshwater wetlands and surrounding areas of permanent water. Limited foraging habitat is present on saltmarsh.</p> <p>Based on the small amount of habitat disturbance and the availability of proximal habitat external to the Modification disturbance areas (e.g. Figure 5), it is considered that the Modification would not have a significant impact on the locally available habitat for the Black-necked Stork.</p>
<i>Botaurus poeciloptilus</i>	Australasian Bittern	E	Yes	<p>The Australasian Bittern inhabits temperate freshwater wetlands and occasionally estuarine reedbeds (NSW Scientific Committee, 2009).</p> <p>A single bird was recorded at Swan Pond once in October 2002 (Figure 2). The bird has not been recorded in the monthly monitoring over the past 10 years at Swan Pond.</p> <p>Limited habitat for this species would be removed by the Modification. Australasian Bittern habitat within the Rail Flyover Modification is associated with 0.13 hectares (ha) of freshwater wetland located in a narrow man-made drainage channel that is intermittently inundated with water from Deep Pond.</p> <p>Based on the small amount of habitat disturbance and the availability of proximal habitat external to the Modification disturbance areas, it is considered that the Modification would not have a significant impact on the locally available habitat for the Australasian Bittern.</p>

Table 1 (Continued)
Threatened Species Recorded at Swan Pond and/or Wader Pond

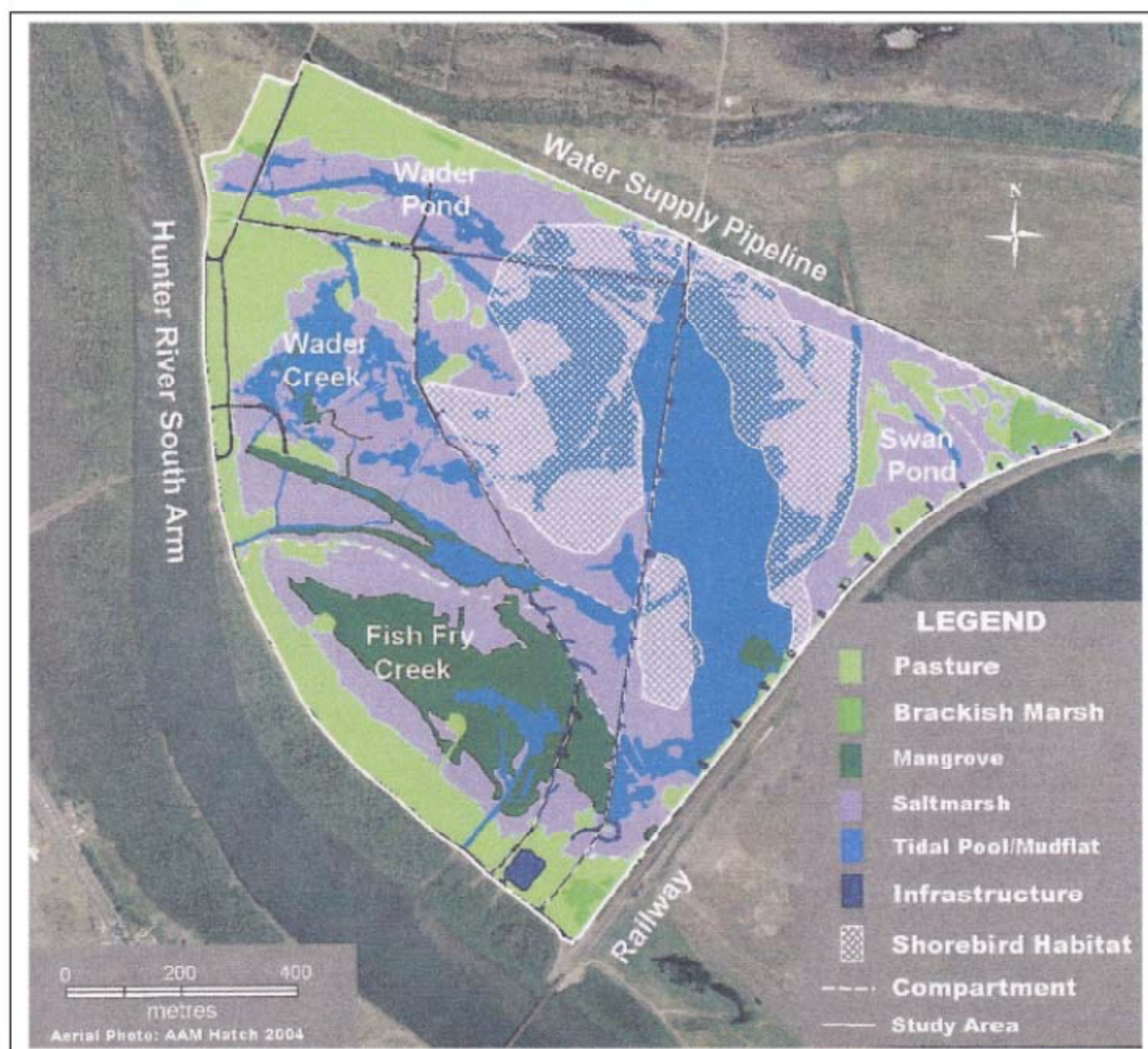
Scientific Name	Common Name	Conservation Status ¹	Was the Species Assessed?	Description of the Record(s)
<i>Limosa limosa</i>	Black-tailed Godwit	V	Yes	Up to six Black-tailed Godwits have been recorded at Swan Pond and/or Wader Pond in any one monitoring event (Figures 2 and 3). Limited foraging habitat would be removed by the Modification (1.45 ha). Based on the small amount of habitat disturbance and the availability of proximal habitat external to the Modification disturbance areas (e.g. Figure 5), it is considered that the Modification would not have a significant impact on the locally available habitat for the Black-tailed Godwit.
<i>Calidris ferruginea</i>	Curlew Sandpiper	E	Yes	<i>Curlew Sandpipers are found throughout the Hunter Estuary mostly in saline habitats, and often in large numbers (up to 1,500 birds)</i> (Herbert, 2007; Section 3.3.4). Limited foraging habitat would be removed by the Modification (1.45 ha). Based on the small amount of habitat disturbance and the availability of proximal habitat external to the Modification disturbance areas (e.g. Figure 5), it is considered that the Modification would not have a significant impact on the locally available habitat for the Curlew Sandpiper.
<i>Epthianura albifrons</i>	White-fronted Chat	V	Yes	<i>White-fronted Chats inhabit coastal wetlands in the Hunter Region and are often seen in small flocks throughout the Hunter Estuary</i> (Herbert, 2007; Section 3.3.5). Up to 58 Curlew Sandpipers have been recorded at Swan Pond and/or Wader Pond (Figure 3). Limited habitat would be removed by the Modification (1.45 ha). Based on the small amount of habitat disturbance and the availability of proximal habitat external to the Modification disturbance areas (e.g. Figure 5), it is considered that the Modification would not have a significant impact on the locally available habitat for the White-fronted Chat.

Conservation status under NSW *Threatened Species Conservation Act, 1995* and Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999*.

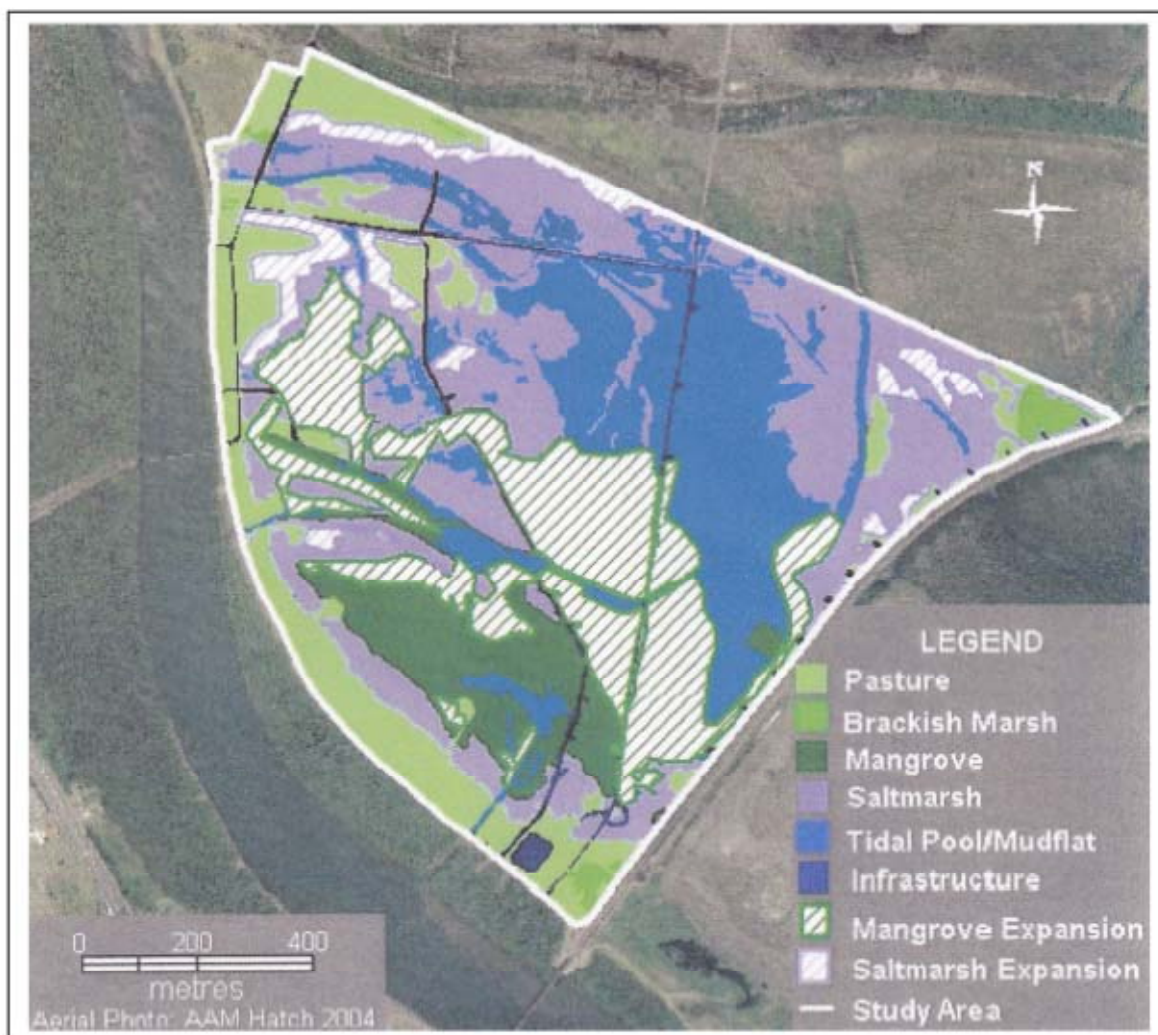
V – Vulnerable; E – Endangered.

The Rail Flyover Modification would not result in the complete loss of Swan Pond, instead Swan Pond would continue to provide habitat to birds. A linear strip of Saltmarsh (1.32 ha) on the west of the existing rail embankment would be removed for the Rail Flyover Modification. Figures 1, 5 and 6 show the wider extent of Swan Pond and habitat as mapped by independent sources. The Rail Flyover Modification area is a linear disturbance located adjacent to the existing rail.

Encroachment of mangrove vegetation into saltmarsh habitat is a recognised issue for shorebird habitation (Harding *et al.*, 2007). Howe (2008) predicted mangrove expansion into Swan Pond without intervention (Figure 6).



Source: Howe (2008) in Hunter-Central Rivers Catchment Management Authority (2011)
Figure 5 Vegetation Map and Shorebird Habitat



Source: Howe (2008) in Hunter-Central Rivers Catchment Management Authority (2011)

Figure 6 Predicted Future Expansion of Mangroves into Shorebird Habitat

4 SHOREBIRD COMPENSATORY HABITAT

NCIG has existing Project Approval conditions requiring the establishment of shorebird compensatory habitat. Condition 2.20 (b) (ii) Schedule 2 of the Project Approval (06_0009) states:

The Proponent shall develop and submit for the approval of the Director-General, a Compensatory Habitat and Ecological Monitoring Program to detail how habitat and ecological values lost as a result of the project will be off-set, and how ecological monitoring will be undertaken to inform on-going ecological management. The Program shall be developed in consultation with the DECC, and shall include, but not necessarily be limited to:

- a) ecological surveys, following detailed design of the project, to identify and quantify the extent and types of habitat that would be lost or degraded as a result of the project;*
- b) provision for establishment of compensatory habitat for each relevant component of the project as follows, unless otherwise agreed by the Director-General:*

...

- ii) for migratory shore bird habitat lost as a result of the filling in of parts of Deep Pond and the construction of the optional rail spur, establishment of compensatory habitat in a location agreed by the Director-General, in consultation with the DECC, equivalent to no less than twice the area of habitat identified under a), with commencement of compensatory habitat works prior to the commencement of construction of the optional rail spur.*

The Rail Flyover Modification would result in the removal of 1.32 ha of saltmarsh habitat and 0.13 ha of freshwater wetland.

A shorebird compensatory habitat would be provided that is expected to:

- be in a location agreed by the Director-General and is expected to be located on Kooragang Island given the past consultation with NSW National Parks and Wildlife Service;
- be an incremental increase in the shorebird compensatory habitat which will be established to satisfy Condition 2.20 (b) (ii);
- be equivalent to no less than twice the area of habitat removed (1.45 ha x 2) would be created (i.e. 2.9 ha of shorebird habitat);
- adjacent to a larger area of existing shorebird habitat to expand the area available to shorebirds;
- targeted towards an area that is known to have previously been habitat for shorebirds on Kooragang Island;
- include managing existing threats (such as mangrove encroachment) to provide shorebird habitat;
- be designed to provide enduring habitat for shorebirds;
- be managed to preserve it as shorebird habitat for the life of the NCIG Coal Export Terminal; and
- be beyond existing requirements and not already funded under another scheme.

In 2009, NCIG commenced compensatory habitat works on Kooragang Island with the installation of a hydraulic control structure (culvert) on Creek 5 to commence “*reversal of the trend of mangrove encroachment into Ash Island Area E*” consistent with NSW Department of Environment and Climate Change (now OEH) *Kooragang Island: Threatened Species Offsets Framework*.

5 REFERENCES

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