

ASSESSMENT OF IMPACTS OF THE ILLAWARRA COGENERATION PLANT (ICP) AT PORT KEMBLA STEELWORKS ON THE GREEN AND GOLDEN BELL FROG

Assessment prepared by

Gaia Research Pty Ltd

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Prepared for: BlueScope Steel Limited
PO Box 1854
Wollongong NSW 2500

Prepared by: Gaia Research Pty Ltd
PO Box 3109
NORTH NOWRA NSW 2541

Tel: 02 4446 0384
Fax: 02 4446 0384
Email: gaiaresearch@shoalhaven.net.au

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The findings of this report are based on the author's analysis and interpretation of survey results. Views and interpretations presented in the report are those of the author and not necessarily those of BlueScope Steel Limited

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EXECUTIVE SUMMARY

Fauna and flora surveys were conducted at BlueScope Steel Limited, part Lot 1 DP 606434 and part Lot 1 DP 606430 Port Kembla (the “Subject Area”) in relation to a proposed amendment to the approved Illawarra Cogeneration Plant (ICP) project. One threatened species, the Green and Golden Bell Frog *Litoria aurea* may inhabit the area. Although many other threatened species of fauna are known to occur within 5 kilometres of the Subject Site (the area of land where the ICP is to be located) the Green and Golden Bell Frog (GGBF) is the only species considered in this assessment because the Subject Site is highly modified and unsuitable for other threatened species. No endangered ecological communities currently listed in the *Threatened Species Conservation Act (1995)* were located within the areas to be disturbed. The potential impact on GGBF is also considered under the *Environment Protection and Biodiversity Conservation Act 1999*.

The construction phase of the ICP project will necessitate the removal of the vegetation in several weed infested areas. No species of native trees will be removed. No GGBF were detected on the Subject Site during this survey. The action will not have a significant impact on the GGBF but adds to the cumulative loss of habitat for this species.

Definition of terms

Within this report the following terms are defined.

- **Subject Site** means the area directly affected by the proposal (the ICP site).
- **Subject area** means the Subject Site and any additional area, which may be affected by the proposal.
- **Local population** of resident fauna species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area.

1 INTRODUCTION

1.1 Background

This report was commissioned by BlueScope Steel Limited to assess and document the impact of the construction of the Illawarra Cogeneration Plant (ICP) on the Green and Golden Bell Frog (GGBF) *Litoria aurea* within Lot 1 DP 606434 and Lot 1 DP 606430, Port Kembla (“the Subject Area”) (**Figures 1 and 2**). The Subject Area is approximately 742 hectares in size but the area of impact is much less than this and is termed the Subject Site. The Subject Site is highly disturbed and is primarily a weed infested exotic grassland. However, there are a few native regrowth trees beside Allan’s Creek. The area of native vegetation to be removed by the Project is negligible. The Subject Site is zoned Heavy Industrial 4B under the Wollongong Local Environmental Plan 1990.

This report was prepared by Mr Garry Daly, Director of Gaia Research Pty Ltd, a member of the Green and Golden Bell Frog recovery team. Mr Daly has worked with BlueScope Steel Limited and the Department of Environment and Climate Change (DECC) on mapping habitat for this species in the Port Kembla area (Gaia Research 2008) and has worked with the community and industry on the conservation of the GGBF in this area.

1.2 The Project

The Project is to construct and operate the ICP, which includes a 225 MW condensing steam turbine generator at Bluescope Steel Limited at Port Kembla. This report is an examination of the habitat in areas that may be affected by the modification of the existing development consent for the ICP (**Figure 2**). The proposed modifications to the development consent (DA 767/01A) include:

- Proposed use of three boilers and retaining and utilising the No.25 Boiler to generate approximately 1,100 tonnes per hour of steam.
- Proposed relocation of the gas holder from south of the No.5 Blast Furnace to north of Allan’s Creek. Including re-sizing of the gas holder from 40m x 70 m with a capacity of 40,000m³ to dimensions 65m x 65m with a capacity of 120,000m³;
- Proposed use of a once-through salt water cooling system instead of a closed circuit cooling tower.
- Proposed consolidation of the ICP footprint;
- Proposed relocation of the high voltage substation and associated power cables; and
- Proposed relocation of construction lay-down areas.

The area affected by the above works is the Subject Site. Under the *Threatened Species Conservation Act 1995* (TSC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) surveys for species/ecological communities listed under these Acts must be conducted and an assessment of the impact of the proposal on those species/ecological communities must be undertaken prior to consent being granted. This report applies the relevant portions of the above Acts to listed species / ecological communities that may occur or were detected on or adjacent to the Subject Site.

1.3 Study Objectives

The objectives of the study were to:

- assess the Subject Site and Study area for threatened species and endangered ecological communities as listed under State and Commonwealth legislation;
- assess the local and regional significance of select threatened species that were either detected on or adjacent to the site or may utilise the site based on known habitat preference;
- identify fauna habitat of conservation significance;
- apply the seven part test in Section 5A of the EP&A Act, as amended by the TSC Act to determine whether there is likely to be a significant impact on threatened species or their habitat and endangered ecological communities and
- apply Parts 3 and 7 of the EPBC Act to determine whether there is likely to be a significant impact on a matter of national environmental significance.

1.4 Description of Subject Site

The Subject Site (Wollongong1: 25,000 topographic map 34° 26' S 150° 54' E AMG 306253 6182374, altitude 20 m AHD) is situated on the south coast of NSW, four kilometres south of the city of Wollongong. The Subject Site originally had thin clayey soils derived from Gwynneville Group (Hazelton *et al.*, 1990) but is highly disturbed. The soils are shallow brown podsols and exposed rock is of volcanic origin.

The endemic vegetation within the Subject Site has been cleared but historically may have supported tall open forest (probably Forest Red Gum/Bangalay woodlands). However, the site has been highly modified as indicated by the areas of deposited material. The site now is vegetated primarily by exotic grasses and weeds. There are small areas of revegetating native bush beside Allans Creek.

1.5 Previous surveys for GGBF conducted at Port Kembla

A number of studies have been conducted on GGBF in the Port Kembla area with most concentrated around Coomaditchy Lagoon (Figure 1). Counts of animals beside Coomaditchy Lagoon ranged between 0-63 adults in one study (van de Mortel & Goldingay 1998) to 0 to 60 in another (Goldingay & Lewis 1999). Yet a capture-recapture study (pit tagging) indicated a population exceeding 340 adult frogs (Goldingay & Newell 2005). A study at the Brick and Block site has been conducted since 2000 and is ongoing. During that period the number of adult frogs has declined from about 100 to 50 adult frogs. So far over 250 GGBF have been micro-chipped to identify individual frogs and to determine population size (C. Wade unpub. data).

On 13 November 2007 nocturnal searches were conducted at 18 sites within the Port Kembla area including searches within Port Kembla Steelworks. Forty five adult GGBF were detected during that survey but none were found in land managed by Port Kembla Steelworks. Eight

adult GGBF were detected at the Cleary Bros. pond within the ‘builders tip’ site. Inspections made some time after that date indicated that breeding had occurred at this site. The Cleary Bros site is only about 300 hundred metres from Port Kembla Steelworks land and approximately one kilometre from the Subject Site.

The Green and Golden Bell Frog *Litoria aurea* is listed as an Endangered Species under Schedule 1 of the NSW *Threatened Species Conservation Act 1995*. At the national level, the species is listed as Vulnerable under Schedule 1 Part 2 of the *Environment Protection and Biodiversity Conservation Act 1999*.

1.6 Profile of the GGBF key population at Port Kembla and BlueScope

The consequences of being listed as a threatened species under both state and national legislation has been that a recovery plan has been prepared (DECC 2005). The draft recovery plan lists the Port Kembla population of GGBF as a key population within the state. Consequently a management plan has been completed for this population (DECC 2007). The management plan lists actions that should be undertaken to aid in the recovery of this key population and an assessment of the habitat has been undertaken and recommendations for specific sites within the Port Kembla area (Gaia Research 2008). The following assessment is consistent with recommendations from all of the above three reports.

The GGBF has been detected on land managed at Port Kembla Steelworks from 1996-1999 within a drainage channel (**Table 1**). The site where the GGBF had been previously found is a concreted canal with a pond located at one end. The stream runs roughly west to east. The site is surrounded by weeds such as Bitou Bush and shows signs of previous high disturbance. Water can be pumped from this pond to other areas at Port Kembla Steelworks. The pond has permanent water and an overflow pipe leads to a box culvert. The box culvert receives water from the confluence of two arms of the catchment, the second runs south-east towards Five Islands Road. Water from this second easement originates from run-off of Five Islands Road and presumably the Cleary Bros builders refuse. A section of the second arm has concreted sides and floor, while areas beside Five Islands Road is not lined with concrete and have banks. Cumbungi is a common emergent macrophytic plant in the drainage channels. There is also a small area to the north of site five, beside Railcorp land that contains a pond and beds of Cumbungi.

Diurnal searches of the site were conducted at this site on 9 August 2007, 4 and 6 September 2007 and 12 October 2007. On 13 December 2007 nocturnal searches were conducted at BlueScope Steel at site 5 and the broader drainage line. The survey involved spotlight searches for frogs, tadpoles and fish and recognition of calls. Searches were aided with 50 w spotlights. No GGBF were detected during these surveys.

Table 1 Counts of GGBF at the Port Kembla Steel-works site.

Eastings	Northing	Tenure	Year/Date	Population size	Source
306373	6183030	Freehold	Jan. 1999	5	Goldingay & Lewis 1999
306373	6183030	Freehold	Nov 1998	30	Goldingay & Lewis 1999
306373	6183030	Freehold	Jan. 1997	79	Goldingay & Lewis 1999
306373	6183030	Freehold	19.2.96	5	van de Mortel & Goldingay 1998

Figure 1 Subject Area and historic occurrences of GGBF (green dots)

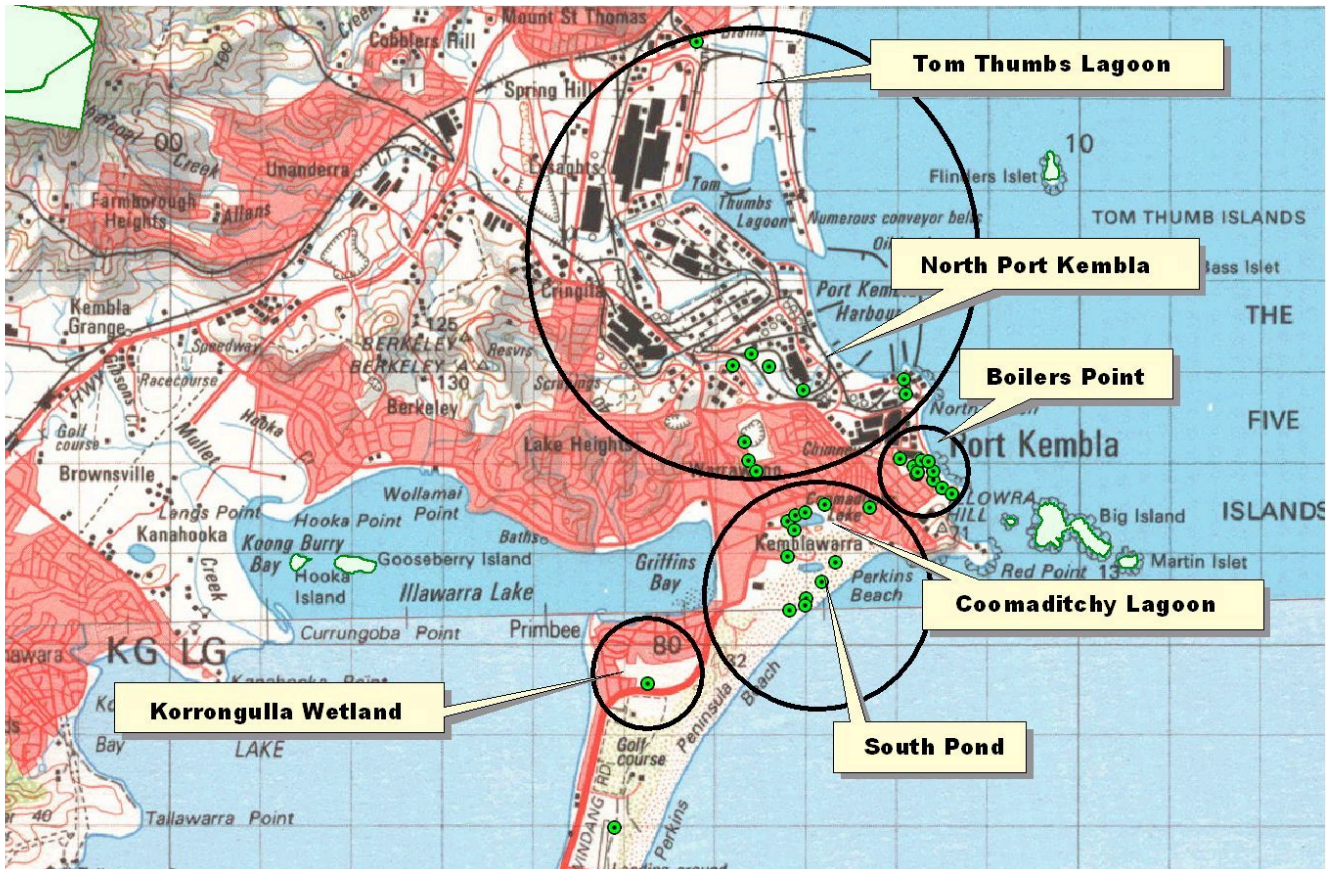
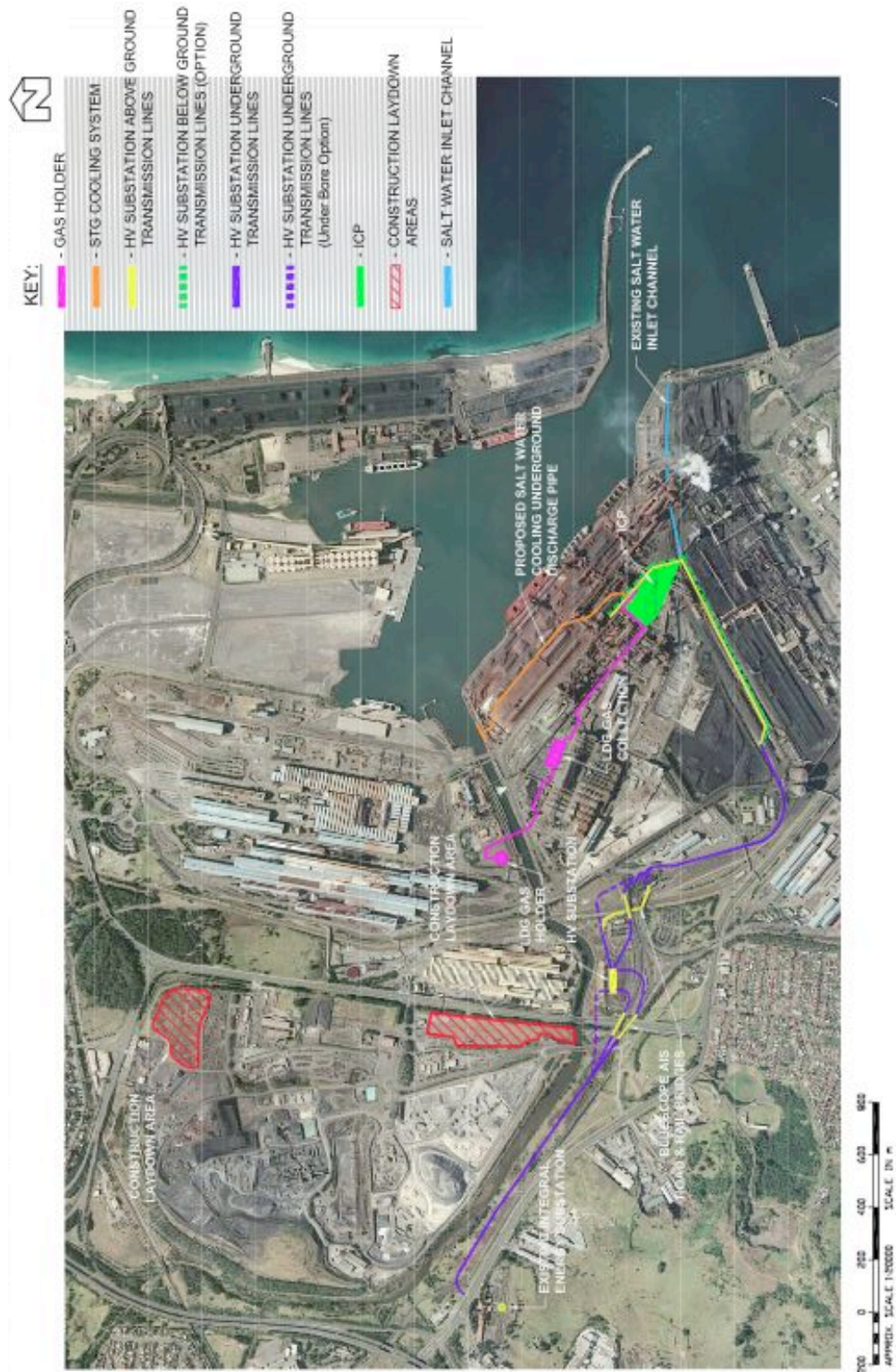


Figure 2

Detail of development. Figure courtesy CH2M HILL



1.7 Threatened Fauna and Flora in the Locality

Records from DECC's Atlas of NSW Wildlife and the author's records indicate the threatened species listed in **Table 1** have been found within five kilometres of the Subject Site.

Table 2
Threatened Terrestrial Fauna and Flora Recorded within 5kms of Subject Site

Threatened Species / Ecological Community	Scientific Name	TSC Act Schedule
Osprey	<i>Pandion haliaetus</i>	2
Black Bittern	<i>Ixobrychus flavicollis</i>	2
Barking Owl	<i>Ninox connivens</i>	2
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	2
Hooded Plover	<i>Thinornis rubricollis</i>	1
Sooty Oystercatcher	<i>Haematopus fuliginosus</i>	2
Pied Oystercatcher	<i>Haematopus longirostris</i>	2
Green and Golden Bell Frog	<i>Litoria aurea</i>	1
Bangalay Forest on coastal sands		
Swamp Oak Floodplain Forest		

2 METHODS

2.1 Fauna Assessment

2.1.1 Introduction

Surveys for GGBF have been conducted at the Port Kembla Steelworks as part of the assessment of habitat and dispersal corridors for GGBF (Gaia Research 2008). Aspects of that assessment will be used for this report. Targeted diurnal searches were conducted for the GGBF on the 17 March 2008. In particular searches were conducted for frogs and tadpoles at:

- Underground transmission lines between Allans Creek and the rail lines (adjacent to Five Islands Rd),
- Three construction lay-down areas (two opposite Springhill Works around 21 Area, and one behind the Export Warehouse).
- 18 Area HV Substation
- Salt water channel along Ash Rd and Lift Pumps on Christy Drive.
- Proposed Gas Holder location next to Shellharbour roofing.
- ICP salt water discharge point at Allan's Creek

Visual assessments of potential habitat were also undertaken as drive transects past the ICP site and underground transmission lines from 18 Area to the existing gas holders (**Figure 2**).

In addition a search was conducted off-site for tadpoles of the GGBF. The second search was undertaken to ascertain if tadpoles were still present in the general Port Kembla area. The rationale being that if tadpoles were present at one site then they should be also present at other sites if the species present used the ponds for breeding.

3 RESULTS

No GGBF were detected on the Subject Site but tadpoles were found elsewhere in the Port Kembla area. Potential refuge and breeding habitat for the GGBF exists at several locations on the Subject Site. The following is an assessment of each site visited:

- Underground transmission lines between Allan's Creek and the rail lines (adjacent to Five Islands Rd)

This site has a freshwater drainage line that has part of its catchment south of Five Islands Road. The water is reticulated under Five Islands Road and from there is an open channel that flows into Allan's Creek. The channel north of Five Islands Road is vegetated with Cumbungi. No species of fish or amphibian were observed.

Between the rail line and Allan's Creek there is a swampy area that supports areas of Cumbungi *Typha orientalis* and Native Reed *Phragmites australis*. The vegetation beside Allan's Creek has a small area of Swamp Oak *Casuarina glauca*.

- Three construction lay-down areas (two opposite Springhill Works around 21 Area, and one behind the Export Warehouse).

These sites support areas of grassland and exotic weeds. The site behind the Export Warehouse has two sediment control ponds that were surveyed for GGBF. No tadpoles or frogs were detected. A high level of clarity and presence of dragonflies and other aquatic insects indicated that the water quality was high.

- 18 Area HV Substation

This was a highly disturbed site and supported weeds and grasses. The surrounding area was also highly disturbed and there was a low probability of GGBF existing at this site.

- Salt water channel along Ash Rd and Lift Pumps on Christy Drive.

This site was highly disturbed and the water saline. The area has many vehicles passing through it and the probability of GGBF existing in this area is remote.

- Proposed Gas Holder location next to Shellharbour roofing.

Beside this site is a freshwater detention pond. The pond has areas of Cumbungi around it and the drainage channel. The surface aquatic plant Duck Weed *Spirodela* spp. was observed on the pond. No amphibians were detected during the search.

- ICP salt water discharge point at Allan's Creek

This site was highly disturbed and the water is saline. The area has many vehicles passing through it and the probability of GGBF using the water way is remote.

4 ASSESSMENT OF IMPACTS

4.1 Preliminary Impact Assessment

Based on habitat, previous data and field observations during the course of this assessment one threatened species, the GGBF may occur on the Subject Site. The GGBF will be considered in detail below

4.2 Detailed Impact Assessment

Section 5A of the EP & A Act, as amended by the TSC Act, sets out the factors to be considered in deciding whether there is likely to be a significant effect on threatened species, populations or communities and or their habitat as a result of a development.

The factors of assessment:

- (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 factor relates to those species listed in Part 1 and Part 4 of Schedule 1 and Part 1 of Schedule 1A and Part 1 of Schedule 2 of the TSC Act, and Part 1 and Part 4 of Schedule 4 of the *Fisheries Management Act 1994* (FM Act).

No species listed in Part 1 and Part 4 of Schedule 1 of the TSC Act were detected. However one species the GGBF listed on Part 1 of Schedule 1 has been detected nearby.

Green and Golden Bell Frog

The GGBF was once one of the most commonly encountered frogs on the east coast (White and Pyke 1996, DEC 2005) and southern tablelands of New South Wales (Osborne *et al.* 1996). However, since the 1970's the species has declined in distribution and abundance and now occurs in fragmented populations, primarily along the eastern seaboard from eastern Victoria to northern NSW. In 1996 *Litoria aurea* was known at only 51 sites within New South Wales (NSW) but by 2006 the species had further declined so that only 41 sites (White and Pike in press) remain. The majority of the populations occur in coastal wetlands. Some of the largest populations exist in the Wollongong and Nowra local government areas (Daly 1996, Daly *et al.*, in press, Goldingay and Lewis 1999).

Within the Wollongong Local Government Area two populations of GGBF are known to exist, one at Port Kembla and the other centred near Woonona. Both populations are in decline with loss of habitat being the main reason for the decline. The main threats exist for the species include loss of habitat from development, loss of habitat and predation by introduced fish (Carp

Cyprinus carpio, Plague Minnow *Gambusia holbrooki* and Yabbies *Cherax destructor*), mortality associated with the frog fungus chytrid *Batrachochytrium dendrobatidis* fungus and collisions with moving vehicles.

The species distribution and propensity to utilise ponds and drainage lines created by humans often puts populations at risk from anthropogenic disturbances. Few populations occur in relatively 'natural environments' (Bungulung NP, Meroo National Park and Nadgee Nature Reserve) and many historic locations where the frog was abundant have been destroyed for urban development and flood mitigation.

The GGBF breed from late winter to early autumn but generally between September and February and lay from 20000 to 11500 (average 3700) eggs in ponds (still water). The eggs hatch in 2-5 days and tadpole development takes 6-12 weeks.

GGBF utilise a constructed pond at Cleary Bros. (CB) about a kilometre from the areas affected by the current proposal (Gaia Research 2008) and were known from the subject area in a pond in the concreted canal at the back of Steelhaven between 1996 and 1999.

Summary

The existing habitat on site is potential breeding, refuge and foraging habitat for the GGBF. There is a need to minimise damage to the area beside Allan's Creek, retain existing ponds in the lay-down area and next to Shellharbour roofing.

(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 endangered populations listed in Part 2 of Schedule 1 of the TSC Act or Part 2 of Schedule 4 of the FM Act, were found on site.

(c) in the case of an endangered ecological community or critically 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**
- (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,**

Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions is listed on the TSC Act (1995) as an endangered ecological community. In the

Comprehensive Regional Assessment of southern New South Wales (Thomas et al. 2000), this community includes 'Coastal Wet Heath Swamp Forest' (forest ecosystem 24), 'South Coast Swamp Forest' complex (forest ecosystem 25) and those parts of 'Ecotonal Coastal Swamp Forest' (forest ecosystem 27) dominated by *Casuarina glauca*. *Casuarina glauca* occurs in patches beside Allan's Creek adjacent to Five Islands Rd. The areas of trees are small and not considered of adequate size to constitute 'South Coast Swamp Forest'.

The transmission line easement that forms part of the IPC Project will be located between Five Islands Road and Allen's Creek on land that is highly disturbed. Therefore the proposal will not substantially and adversely modify native vegetation. No endangered ecological communities listed under Part 3 of Schedule 1 of the TSC Act or Part 3 of Schedule 4 of the FM Act, and no critically endangered ecological communities listed under Part 2 of Schedule 1A of the TSC Act or Part 2 of Schedule 4A of the FM Act will be impacted by the proposal.

(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**
- (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**
- (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,**

- i) The extent of habitat alteration associated with the proposed work is minimal.
- ii) The proposed action will not further fragment the existing habitat.
- iii) The existing bushland within the Subject Site is not critically important to the long-term survival of threatened species in the locality.

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

The DECC website was searched for critical habitat listed in the Register of Critical Habitat kept by the Director General of Department of Environment and Climate Change. Currently (January 2008) critical habitat has been declared for Little Penguin population at Sydney's North Harbour, Mitchell's rainforest snail in Scotts Island Nature Reserve, Wollemi Pine and Gould's Petrel. There are two recommendations for critical habitat one for the Eastern suburbs Banksia scrub endangered ecological community and the Bomaderry Zieria within the Bomaderry Creek bushland.

The proposal shall not have an adverse effect on critical habitat.

(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 GGBF (DEC 2005). The draft recovery plan lists the Port Kembla population of Green and Golden Bell Frog (GGBF) as a key population within the State. Consequently a management plan has been completed for this population (DECC 2007) to satisfy Action 11.3.4 of the draft recovery plan. The main objectives of both plans are to gain a better understanding of how many frogs remain, where they are and protect and create additional habitat so that the population persists and improves. Any action to remove potential habitat is inconsistent with the draft recovery plan or any management plans.

(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.

The proposed action will not require the disturbance of an area of wetland vegetation beside Allan's Creek. The removal of native vegetation is considered a key threatening process under Part 4 of the TSC Act. Based on the current data the proposal will not have a significant effect on threatened species within the Subject Site.

4.3 EPBC Act (1999)

Under Part 3 and 7 of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), any action that has, or is likely to have, a significant impact on a matter of National Environmental Significance (NES), is subject to a referral and assessment process and may progress only with the approval of the Commonwealth Minister for Environment. An action is defined as a project, development, undertaking, activity (or series of activities), or alterations to any of these. The EPBC Act currently identifies seven matters of national environmental significance.

- World Heritage properties.
- National Heritage places.
- Ramsar wetlands of international importance.
- Listed threatened species and ecological communities.
- Listed migratory species.
- Commonwealth marine areas.
- Nuclear actions.

The GGBF is listed under this EPBC Act. However, the action is not considered significant and a referral to the department of the Environment, Water, Heritage and the Arts under the EPBC Act is not warranted. By applying the Commonwealth's criteria for significance the development is unlikely to, have a significant impact on a listed threatened species or community and does not need to be referred to the Commonwealth Minister for the Environment.

5 DISCUSSION

The objective of this assessment is to provide information to enable decision makers to ensure that developments deliver the following environmental outcomes as specified by DEC and DPI (2005) guidelines.

1. Maintain or improve biodiversity values (i.e. no net impact on threatened species or native vegetation).
2. Conserve biological diversity and promote ecologically sustainable development.
3. Protect areas of high conservation value (including areas of critical habitat).
4. Prevent the extinction of threatened species.
5. Protect the long-term viability of local populations of a species, population or ecological community.
6. Protect aspects of the environment that are matters of national environmental significance.
7. Be consistent with the draft Recovery Plan for the GGBF

The measures that would be implemented to mitigate adverse impacts associated with the Project include the retention of the emergent macrophytes within the site. This will retain refuge habitat for the GGBF.

6 BIODIVERSITY OFFSET STRATEGY

No bio-diversity offsets are proposed for this project.

7 CONCLUSIONS

The site contains areas of weed infested land, two sediment control ponds (lay-down area), an ephemeral wetland (beside Allan's Creek) and a pond (near Shellharbour roofing) that provides potential breeding and refuge habitat for the endangered GGBF. The recommendations provided below are intended to conserve existing habitat.

8 RECOMMENDATIONS

The broad recommendations are as follows.

- The existing soakage area/wetland beside Allan's Creek will be protected during the construction of the ICP. Heavy machinery will be confined to a limited area.
- The existing ponds at the lay-down area and beside the proposed Gas Holder location next to Shellharbour roofing shall be retained.

- No herbicides are to be used in the adjacent area, except during winter when most GGBF are under cover and not basking. If herbicides are to be used to control weeds such as Bitou Bush, then Bio-active herbicides are recommended.

Acknowledgements

I thank Ms G. Knight for showing me around the site. Ms J. Roberts of CH2M HILL kindly provided **Figure 2**.

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