

# **ADDITIONAL INFORMATION**

## **PART 3A ENVIRONMENTAL ASSESSMENT**

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### **SHELL COVE BOAT HARBOUR PRECINCT BOOLLWARROO PARADE CITY OF SHELLHARBOUR**

*prepared by*

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## 1. Introduction

Australand Corporation Pty Limited is applying to the Minister for Planning under Part 3A of the EP&A Act 1979 for approval for development of the Shell Cove Boat Harbour precinct. Submission of the Concept Plan Application drew a response from the DECCW regarding several flora and fauna issues. This report deals with one of these issues, namely an assessment of the Green and Golden Bell Frog. This frog is listed as endangered under the NSW *Threatened Species Conservation Act 1995*.

## 2. The Site

The site is the land surrounding the proposed Shell Cove Boat Harbour; see **Figure 1**. The area of land involved is approximately 100 hectares and is generally low-lying land extending a short distance inland from the coast. The land is either un-grazed or lightly grazed farmland or part of the abandoned Shellharbour Golf Course.

There are no stands of natural vegetation or areas of natural habitat on the site. Other than the exotic grassland that covers almost the entire site, there are scattered native and exotic trees on the old golf course and wetland vegetation along the drains, in small dams and on the edges of Shellharbour Swamp. Numerous previous surveys and studies prepared for the Shell Cove project describe in detail the flora and fauna of the area in general, much of this work covered the current site.



**Figure 1. The Site at Shell Cove.**  
(The orange-coloured area is the Shell Cove Boat Harbour Precinct.)

### 3. *The Green and Golden Bell Frog*

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The Green and Golden Bell Frog is listed as endangered under the NSW *Threatened Species Conservation Act 1995*. The species has been reduced to generally isolated and highly separated populations occurring in localised favourable sites; these are often degraded areas that support artificial freshwater wetland habitat that are fish free.

Name: *Litoria aurea*

Common name: Green and Golden Bell Frog

Status: Endangered in NSW; vulnerable under Commonwealth legislation.

Habitat:

Green and Golden Bell Frogs occur in freshwater streams, swamps, lagoons, dams, soaks and ponds, preferably with bullrushes or spikerushes. However, today they often occur on highly disturbed sites, e.g. disused industrial sites, brick pits and landfill areas. The absence of exotic fish is paramount for successful breeding to occur. Frogs can forage widely, even in a single night, although the breeding habitat is usually very localised.

Records in Shellharbour:

The Green and Golden Bell Frog records in the Shellharbour district are concentrated between Warilla in the north and the Minnamurra River in the south (NSW Wildlife Atlas records); some of these records are very old. The species is mainly known from Killalea Lagoon, on the southern edge of the Shell Cove precinct, although there have been no recent records from that location.

In the 1980s, the species was observed several times in the drain immediately south of the houses on the southern edge of Shellharbour village. There have been no records of this frog in that area, or anywhere else on the Shell Cove site, since then despite several surveys for the species in that area since 1995.

The frogs observed in the above drain were most probably wandering from the then extant Killalea Lagoon population; they cannot successfully breed there or anywhere else nearby as the drains are full of the exotic Plague Minnow *Gambusia holbrooki*.

### 4. *Habitat Survey Results*

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The wetland habitats were re-surveyed in June/July 2010 to determine the suitability of the habitats on the site for the Green and Golden Bell Frog. Previous surveys could not locate any frogs of this species and established that the wetlands in the area were not suitable for the species to breed because of the abundance of introduced fish.

A summary of the habitats in the area that could potentially be utilised by the frog is presented in **Table 1**. The complex of drains and dams in the far northern part of the site, directly south of Shellharbour village, supports abundant emergent wetland vegetation, particularly a thick growth of Cumbungi *Typha orientalis*. The surveys also confirmed that Plague Minnow *Gambusia holbrooki* is abundant in the area.

**Table 1**  
**Summary of Habitat Surveys on the Site**

Location	Type	Notes
<u>Northern Area (all linked hydrologically, at least at high water levels).</u>		
Main Drain, immediately south of the houses in Shellharbour village.	Dug drain, about 3-4 metres wide.	Dense growth of <i>Typha</i> plus numerous weeds. <i>Gambusia</i> abundant.
Deep dam.	Moderately large dam, overflows to minor drains.	Dense growth of <i>Typha</i> around edge. <i>Gambusia</i> abundant.
Minor drains.	Small drains, with links to main drain and above dam.	Very dense growth of <i>Typha</i> , with a few other wetland plants, including weeds. <i>Gambusia</i> abundant.
<u>Southern Area (small farm dams).</u>		
Small dams (2).	Stock dams, with some grazing occurring.	Edge trampled by stock; fringe of wetland plants, particularly <i>Typha</i> and <i>Eleocharis sphacelata</i> . <i>Gambusia</i> not seen, but probably present.

## 5. The Assessment Process under Part 3A

### Guidelines for Threatened Species Assessment

Guidelines that identify matters relevant to the assessment of potential impact on threatened species, populations or ecological communities of proposed development under Part 3A of the *Environmental Planning and Assessment Act 1979* (NSW) have been prepared by the Department of Environment and Conservation (now Department of Environment and Climate Change) and the Department of Primary Industries (DEC 2005).

The *Guidelines for Threatened Species Assessment* identifies the following objectives in regard to conserving threatened species, etc.:

- 1 "Maintain or improve biodiversity values (i.e. there is 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 nor ecological community.
- 6 Protect aspects of the environment that are matters of national environmental significance."

Note that matters of national environmental significance (NES) are those matters listed under the *Environment Protection & Biodiversity Conservation Act 1999* (Commonwealth); these matters are not listed under state legislation.

The *Guidelines* outline a broad five-step process for assessing impacts on threatened species. Note that 'threatened species' refers here to species, populations and communities listed as threatened under the *Threatened Species Conservation Act 1995* (NSW) or the *Fisheries Management Act 1994* (NSW).

As this project is being assessed under Part 3A of the *EP&A Act*, this investigation and report therefore follow the *Guidelines* where relevant. Note that the only species requiring assessment here is the Green and Golden Bell Frog.

#### Step 1 – Preliminary Assessment

“The main purpose of a preliminary assessment is to determine the likelihood of the study area and subject site supporting threatened species” (*Guidelines*, page 2). As noted in the *Guidelines*, this step is primarily a ‘desktop’ study, using existing information, literature and data bases to identify relevant threatened species. The *Guidelines* state that the following matters should be included in the preliminary assessment:

- a description of the location and nature of the proposed development;
- a description of dominant vegetation types;
- a description of habitat features;
- a list of threatened species that are known or likely to occur within the study area;
- an assessment of which of the threatened species that are known or likely to occur are likely to be directly or indirectly affected by the proposal provides a list of factors for consideration in identifying adverse impacts. This list is not necessarily exhaustive and is not development-specific.” (*Guidelines*, page 3)

The presence of the Green and Golden Bell Frog on the site was identified previously, in the 1980s. There have apparently been no records of the frog on the site or nearby for about 25 years, despite several surveys.

#### Step 2 – Field Survey and Assessment

As noted in the *Guidelines*, “the required intensity and extent of survey will vary greatly depending upon the species likely to be present, size of the development area, the level of biological and habitat diversity on the site, and the type and complexity of vegetation on the site.” (*Guidelines*, page 3)

The *Guidelines* point out the need “to ensure that a reliable assessment of the presence or absence of threatened species can be made” (*Guidelines*, page 3). It is also noted that consideration needs to be given to the relevance of climatic or seasonal conditions for the target species.

Where relevant, the survey methods set out in the document titled *Threatened Species Survey & Assessment: Guidelines for Developments and Activities* (DECC 2004) should be followed. As noted above, the level of the survey will very much depend upon site conditions.

The outcome of Step 2 should be that adequate field surveys are undertaken for all target species identified in Step 1 such that confident statements can be made regarding the potential for the presence of the species on the subject site. In some instances, the precautionary principle should be adopted and the presence of a species assumed for the purposes of impact assessment.

Guidelines for undertaking frog surveys were prepared by the Department of Environment and Climate Change (DECC, 2009); the document is entitled *Threatened species survey and assessment guidelines: field survey methods for fauna. Amphibians*. The guidelines identify the following survey methods:

“Combination of tadpole surveys, call surveys (this species has a distinctive call) and active searching both during the day and night. Small areas of habitat (less than 0.3 hectares) should be surveyed for a minimum of one hour on three separate occasions during the species’ activity period. Larger areas, which may include whole wetlands and lagoon margins, are more difficult to survey and require a minimum of three separate four-hourly searches during the species’ activity period (EIA guidelines). Surveyors should be aware this species is known to actively avoid torchlight and at such times will readily dive or swim off to another location (EIA guidelines). This species has been known to respond to call playback or a well-rehearsed imitation call (by an experienced surveyor) (EIA guidelines). August–February (Lemckert and Mahony 2008), preferably after rain. Breeding often peaks after heavy rains in January to February (Anstis 2002). Males mainly call between September and January, although frogs will take advantage of favourable conditions and can be heard calling outside these

times (EIA guidelines). Larval life span of between 2.5 and 11 months (average 3 months) (Anstis 2002)."

There have been previous targeted surveys for the Bell Frog in the study area and nearby. Those surveys were undertaken at appropriate times of the year to locate the species, using the above techniques. Several habitat assessments have been carried out over the past 15 years and the presence of the Bell Frog on or near the site has not been confirmed for over 25 years.

Given the time for year that the current work was carried out (June/July 2010), the Bell Frog was not likely to be found. A habitat survey and assessment was therefore undertaken on the site. The survey involved investigating all freshwater wetlands within the site. Notes were made on the habitat at each location and whether the introduced Plague Minnow was present. The survey results are summarised in **Table 1**.

A targeted survey and assessment by Dr Arthur White, an expert on the Bell Frog, in 1995 (Kevin Mills & Associates 1995) reached the following conclusions:

"The widespread occurrence of *Gambusia* greatly diminishes the number of potential habitat areas in the Shellharbour district for Green and Golden Bell Frogs. The proposed Shell Cove Boatharbour site does not offer secure breeding sites for Green and Golden Bell Frogs and has very limited refuge habitat. It appears that Green and Golden Bell Frogs have ventured into this area during a dispersal period prior to reproducing, but have not remained because of the unsuitability of the habitats."

A survey by Kevin Mills & Associates (2005) also failed to locate the species on the Boat Harbour site.

The above comments by Arthur White are equally applicable today. Little has changed in the area since that time in terms of the wetland habitats. As found in this survey, the wetlands in the area contain abundant *Gambusia*, making them unsuitable for breeding by the Bell Frog. The Recovery Plan for the Bell Frog (DEC 2005) and almost all documents dealing with this frog discuss the negative impact that this introduced fish has on the Bell Frog.

The presence of the Bell Frog at Killalea Lagoon, just to the south of the Shell Cove precinct, was well known in the 1980s-early 1990s. The paper by Goldingay and Lewis (1999) reports that Bell Frogs were heard calling at Killalea in 1994. The Commonwealth DEWHA web site dealing with this frog states that the population of this frog at Killalea Lagoon is "probably extinct". The Draft Recovery Plan for the Bell Frog (DEC 2005) states the population in the Bass Point-Killalea area "is only irregularly detected in the Killalea Lagoon area".

Given all of the above evidence, there seems little likelihood of the Bell Frog turning up on the Shell Cove site today and even less likelihood of it breeding within the Boat Harbour area.

### Step 3 – Evaluation of Impact

This step involves identifying the potential magnitude and extent of the impact, if any, the development will have on each of the target species.

The *Guidelines* suggest that "impacts will be more significant if:

- areas of high conservation value are affected;
- individual animals and/or plants and/or subpopulations that are likely to be affected by the proposal play an important role in maintaining the long-term viability of the species, population or ecological community;
- habitat features that are likely to be affected by the proposal play an important role in maintaining the long-term viability of the species, population or ecological community;
- the duration of impacts are long-term;
- the impacts are permanent and irreversible." (*Guidelines* page 4)

The proposed Boat Harbour precinct works will not remove 'areas of high conservation value' for the Bell Frog. As noted above, the wetland habitats in the area contain abundant introduced fish and are of no value

for breeding. There have been no records of the frog in the area since the mid-1980s, despite several surveys in the area. It is unlikely that individual animals or subpopulations of the Bell Frog would be affected by the proposal. The habitat features that are likely to be affected by the proposal do not play an important role in maintaining the long-term viability of the species in the locality. In summary, it is very unlikely that the proposed works will impact in a negative way on the Bell Frog.

#### Step 4 – Avoid, mitigate and then offset

Where there is a potential to impact on threatened species, this should be addressed through, firstly, avoiding the impact; this may mean making some changes to the proposed development. If avoidance is not possible, then some form of mitigation may be required. Finally, if neither avoidance nor mitigation is possible, then some form of offset or compensation will be required. This could entail the rehabilitation of similar habitat nearby.

It is concluded that there is no significant habitat in the study area for the Bell Frog. There is therefore no need to avoid, mitigate or offset any impact upon this species. It is noted that several stormwater basins have been constructed within the green corridors through the Shell Cove precinct. These ponds replace the existing fresh wetlands in the area, although these too contain Plague Minnow and are not likely to be important to the Bell Frog for breeding.

#### Step 5 – Key thresholds

The *Guidelines* state that the development application needs to contain a justification of the preferred option based on the following 'key thresholds'.

*whether or not the proposal, including actions to avoid or mitigate impacts or compensate to prevent unavoidable impacts will maintain or improve biodiversity values*

In terms of benefit or disadvantage to the Bell Frog, the proposal will be neutral. Important Bell Frog habitat is not likely to be impacted.

*whether or not the proposal is likely to reduce the long-term viability of a local population of the species, population or ecological community*

The proposal is not likely to reduce the long-term viability of a local population of the Bell Frog; no such population is likely to occur within the footprint of the proposed development.

*whether or not the proposal is likely to accelerate the extinction of the species, population or ecological community or place it at risk of extinction*

Given the above, the proposal is not likely to accelerate the extinction of the species.

*whether or not the proposal will adversely affect critical habitat*

There is no critical habitat on the site for the Bell Frog.

### **Conclusion**

The outcome of the above assessment is that the proposed development of the Sell Cove Boat Harbour project is not likely to have a significant impact upon the Green and Golden Bell Frog.

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## 6. References

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Department of Environment and Conservation (DEC) (2004). Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities. Working Draft. Prepared by the NSW NPWS and SMEC Australia.

Department of Environment and Conservation (DEC) (2005). Draft Recovery Plan. Green and Golden Bell Frog *Litoria aurea* (Lesson 1829) Recovery Plan. The Department, February.

Department of Environment and Climate Change (DECC) (2009). Threatened species survey and assessment guidelines: field survey methods for fauna. Amphibians. The Department, Sydney, April.

Goldingay, R. & B. Lewis (1999). Development of a conservation strategy for the Green and Golden Bell Frog *Litoria aurea* in the Illawarra Region of New South Wales. *Australian Zoologist* 31(2), December.

Kevin Mills & Associates Pty Limited (1995). Ecological Survey and Assessment, Shell Cove Boatharbour, Shellharbour. Prepared for Walker Corporation, Mascot, June, 78p.

Kevin Mills & Associates (2005). Potential Impact on Threatened Fauna, Shell Cove Boatharbour, City of Shellharbour. Australand, December.

National Parks & Wildlife Service (NPWS). NSW Wildlife Atlas. Computer database of species records, various contributors, periodically updated.

New South Wales (1979). *Environmental Planning & Assessment Act 1979*. NSW Government, Sydney.

New South Wales (1995). *Threatened Species Conservation Act 1995*. NSW Government, Sydney.

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**Appendix 1**  
**Photographs**

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Plate 1. The main drain south of the houses in Shellharbour village.



Plate 2. Typical small drain in the northern part of the site.



Plate 3. A small stock dam in the far south of the site.



Plate 4. The large dam in the northern part of the site.