Appendix 16

Onshore flora and fauna study

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INPEX Browse Pty Ltd

Ichthys Gas Field Development Project: Onshore Flora and Fauna Study.

Final Report.

Prepared by GHD Pty. Ltd.
Prepared for INPEX Browse, Ltd.

INPEX document number:
C036-AH-REP-0028

August 2009

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1. Introduction

1.1 Overview

INPEX Browse, Ltd (INPEX) propose to develop the natural gas and associated condensate contained in the Ichthys Field in the Browse Basin at the western edge of the Timor Sea approximately 200km of Western Australia's Kimberley coast. The field is about 850 km west-south-west of Darwin in the Northern Territory (Figure 1) and encompasses an area of approximately 800km2 (out of the 3041 km2 in the permit area) with water depths ranging from 90 to 340 m (Figure 2).

The two reservoirs which make up the field are estimated to contain 12.8 tcf (trillion cubic feet) of sales gas and 527MMbbl (million barrels) of condensate. INPEX will process the gas and condensate to produce liquefied natural gas (LNG), liquefied petroleum gas (LPG) and condensate for export to overseas markets.

For the Ichthys Gas Field Development Project (the Project), the company plans to install offshore facilities for the extraction of the natural gas and condensate at the Ichthys Field and a subsea gas pipeline from the field to onshore facilities at Blaydin Point in Darwin Harbor in the Northern Territory. A two-train LNG plant, an LPG fractionation plant, a condensate stabilisation plant and a product loading jetty will be constructed at a site zoned for development on Blaydin Point. Around 85% of the condensate will be extracted and exported directly from the offshore facilities while the remaining 15% will be processed at and exported directly from the offshore facilities while the remaining 15% will be processed at and exported from Blaydin Point.

In May 2008 INPEX referred its proposal to develop the Ichthys Field to the Commonwealth's Department of the Environment, Water, Heritage and the Arts (DEWHA) and the Northern Territory's Department of Natural Resources, Environment, the Arts and Sport (NRETAS). The Commonwealth and Northern Territory ministers responsible for environmental matters both determined that the Project should be formally assessed at the environmental impact statement (EIS) level to ensure that potential impacts associated with the Project are identified and appropriately addressed.

Assessment will be undertaken in accordance with the Environmental Protection and Biodiversity Conservation Act 1999 (Cwth) (EPBC Act) and the Environmental Assessment Act (NT) (EA Act). It was agreed that INPEX should submit a single EIS document to the two responsible government departments for assessment.

INPEX has commissioned GHD to undertake dry and wet season flora and fauna surveys at Lot 1814 and associated mangrove area at Middle Arm, Darwin Harbour:

The objective of this work was to undertake surveys to characterise flora and fauna at Lot 1814, Middle Point and associated mangrove area. The area surveyed included sampling of the principal terrestrial and mangrove habitats of the area enclosed by the yellow line in Figure 1. The terrestrial samples were taken from the area to the south of Blaydin Point, the areas adjacent to the road leading to Wickham Point, and habitats located between these areas. Mangrove habitats were sampled in Blaydin Point area.

The final report is required to be of a standard suitable to form part of the flora and fauna component of a Public Environmental Report (PER) or Environmental Impact Statement (EIS). The standard is based on GHD's understanding of NRETAS, Division of Environment, Heritage and the Arts' (former Environment

Protection Agency (EPA) Program) general requirements on other PER and EIS projects. This report may not meet the Terms of Reference of the PER / EIS guidelines as they are not known at this stage.

This final report provides INPEX with the results of late dry season and late wet season flora and fauna surveys and details:

- Information on the flora and fauna of the general area and region of the study site;
- Information on the flora and fauna of the study site and associated mangrove areas;
- Information on species and ecological communities listed as threatened under the *Territory Parks and Wildlife Conservation Act 2000* (TPWC Act);
- Information on matters listed as being of National Environmental Significance under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- An assessment of the local, regional and national significance of the habitats and flora and fauna of the study site; and
- An evaluation of the habitat characteristics likely to be of importance in the maintenance of the area's biodiversity.

Figure 1 Position of Ichthys Field in the Browse Basin

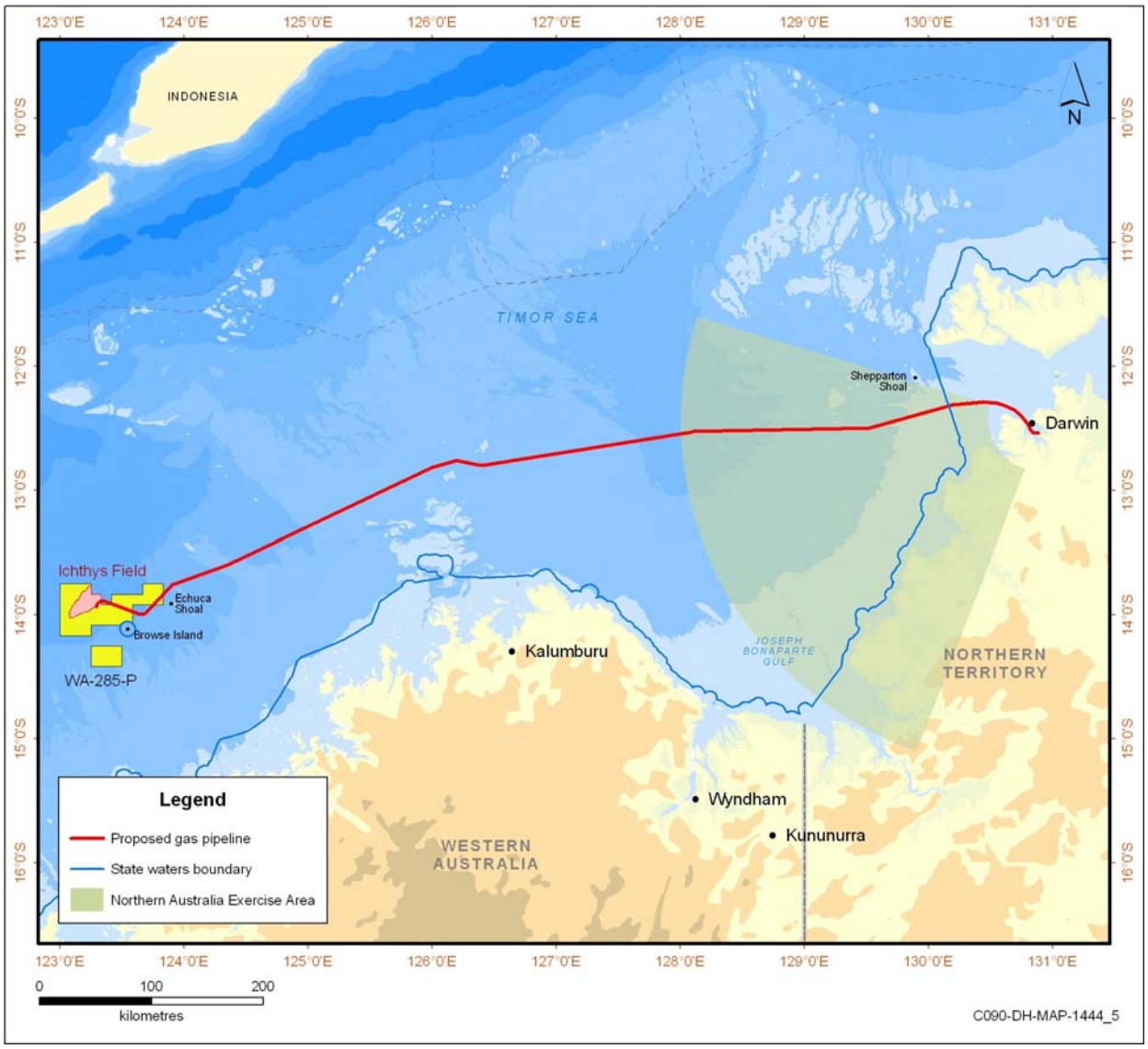
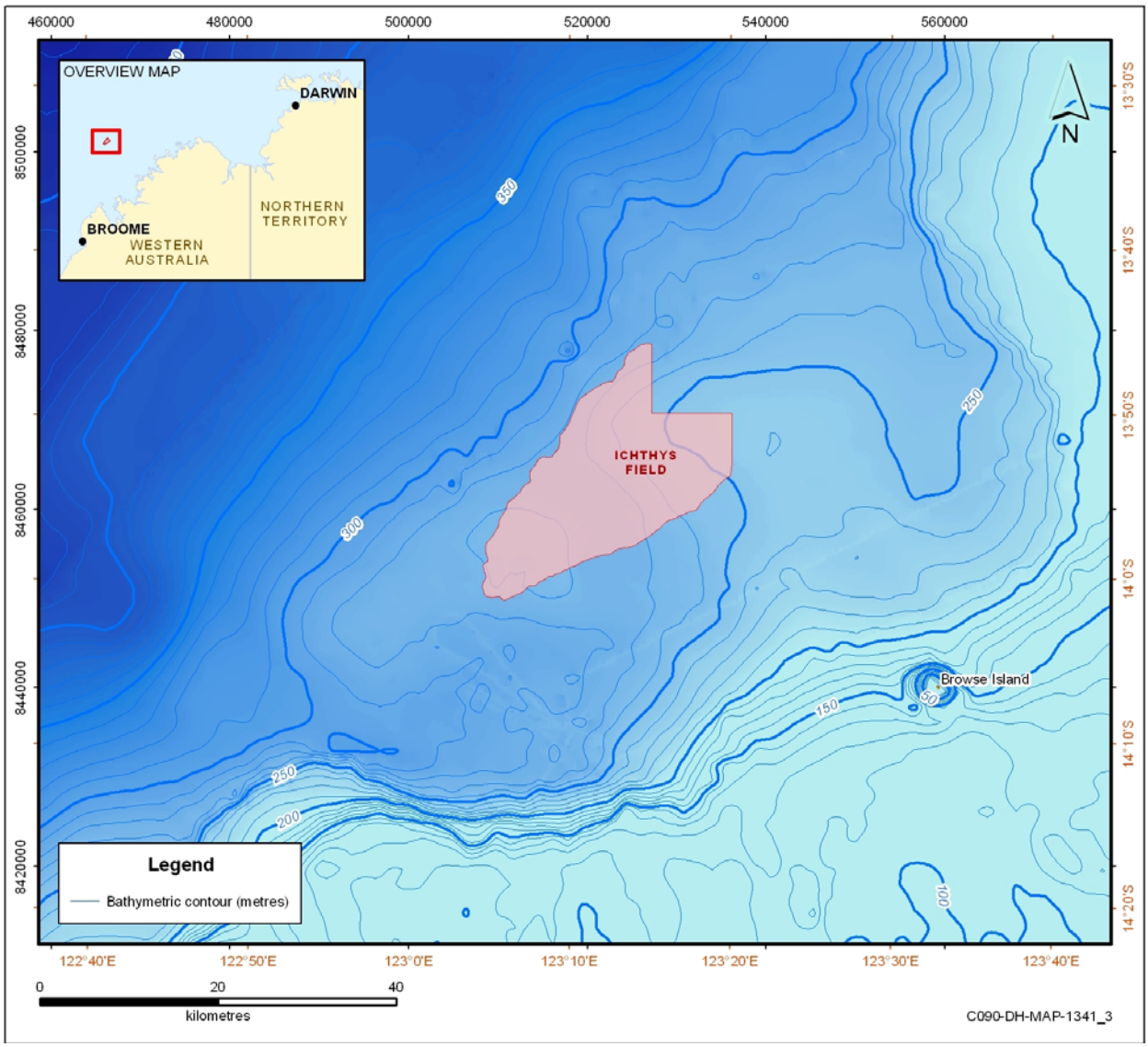


Figure 2 Chart of the Ichthys Field and the Browse Basin Area



GHD Pty Ltd. 2009. *Ichthys Gas Field Development Project: onshore fauna and flora study.* Report prepared for INPEX Browse, Ltd., Perth, Western Australia.

2. Background Information

2.1 Climate

The climate of Darwin has two distinct seasons, the dry and the wet. The dry season extends from May to September, and is characterised by warm, dry days and cooler nights. The coolest months of the year are June and July, with the daily temperature ranging from 19 to 30^0C. The wet season extends from October to April, with most rain falling between December and March. High humidity, thunderstorms and occasional cyclones are characteristic of the wet season. The hottest months of the year are October and November, with the daily temperatures ranging from 25 to 33^0C (Bureau of Meteorology 2007).

Darwin has an average rainfall of 1,669 mm with approximately 110 rain days per year (Bureau of Meteorology 2007).

Figure 3 shows the locality of Blaydin Point.

2.2 Terrestrial Flora

Vegetation communities in the Blaydin Point area have been mapped on at least three occasions:

- A 1:10,000 vegetation map (from 1:12,000 aerial photography) of Wickham Point, which included a portion of the current study area (Dames and Moore 1997);
- 1:25,000 Remnant Vegetation Survey – Litchfield Shire Municipality (Brock, 1995); and
- 1:25,000 Mangrove Mapping Darwin Harbour (Brocklehurst and Edmeades, 1996).

These mapping efforts are in broad agreement as to the location and nature of vegetation type in the area, although there is significant variance in some instances.

The Northern Territory Herbarium Records (NRETAS Flora Records) contain 421 records of plants in the Blaydin Point area, including a two kilometre buffer area (Appendix A). Search results indicate the presence of 226 plant species, only one of which is listed under the TPWC Act as being threatened with extinction. This species, the cycad *Cycas armstrongii*, is recorded as 'Vulnerable'.

The EPBC Act Protected Matters Search Tool (EPBC Search Tool) was examined to determine whether there was potential for additional threatened species or threatened ecological communities to occur in the area. No additional threatened species of plant or ecological community is recorded for the area.

The inter-tidal zone extending from Blaydin Point is vegetated by mangroves. The *Darwin Harbour Regional Plan of Management* (Darwin Harbour Advisory Committee 2003) provides a goal for the level of protection of mangrove forests. It does not provide mechanisms for protection of mangroves in Darwin Harbour. Much of the mangrove habitat on Middle Point is zoned for "conservation" under the Northern Territory Planning Scheme.

2.3 Terrestrial Fauna

A search of the NRETAS Fauna Atlas (NT Fauna Atlas) was conducted for Blaydin Point including a two kilometre buffer area. Search results indicate 5,012 faunal records of a total 272 vertebrate species. These include five species of frog (five records), 17 species of reptile (88 records), 224 species of bird (4,843 records), and 26 species of mammal (76 records) (Appendix B). The records include the

introduced cane toad, cat, pig, rock dove and Asian house gecko. The Parks and Wildlife Commission of the NT eradicated the rock dove following the two recordings of this species.

One species recorded in the project area, the northern quoll *Dasyurus hallucatus*, is listed as threatened under the TPWC and EPBC Acts, and is included in Appendix C which compiles all the species listed under the TPWC Act and / or the EPBC Act as either recorded from the area or potentially occurring in the area. The numbers of NT Fauna Atlas records of frogs, reptiles and mammals are low and likely to under represent the past and possibly current diversity of these groups in the project area. This may be due to several factors, including the indetectability of some fauna species at particular times of the year (e.g. species that are not active during the dry season), species that are naturally relatively rare, or under-sampling for these particular groups. The number of NT Fauna Atlas records of birds is likely to be sufficient to provide a reasonably accurate representation of the area's species richness.

The EPBC Search Tool lists additional threatened terrestrial species as potentially occurring in the area (three species of bird and one species of mammal, which are also included in Appendix C). The additional species of mammal (the water mouse *Xeromys myoides*) may possibly occur within a two-kilometre boundary around the proposed development area. The marine species are not assessed as part of this project as there are not significant areas of habitat for breeding or nesting within the project area, and furthermore, an incorporation of all species within the Darwin Harbour would be required for a complete assessment. The other species are regarded as not likely to occur in the area, because the development area is not within the recorded range of the species and the appropriate habitat is not present in the study area.

The EPBC Search Tool results identified additional migratory species (23 birds) potentially occurring in the area, as shown in Appendix C.

1:50,000

0 0.25 0.5 1 1.5 2

Kilometres (at A4)

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 52

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INPEX BROWSE PTY LTD
FLORA AND FAUNA SURVEYS

Job Number	43-21287
Revision	RevA
Date	10 July 2008

Locality Map

Figure 3

G:\43\21287\CADD\GIS\PROJECTS\DRAFT REPORT\Figure 1 Locality Map.mxd

66 Smith Street Darwin NT 0810 Australia T 61 8 8982 0100 F 61 8 8981 1075 E drw@ghd.com.au Wwww.ghd.com.au

Data source: Aerial Photography supplied by INPEX Browse Pty Ltd. Aerial Photograph of the study area captured 2007. Roads supplied by the NTG. Study area created by GHD Pty Ltd (B.McGinley).

Site No	Habitat	Easting	Northing	Flora / Fauna
11	Ceriops Closed Forest	705575	8612625	Flora and Fauna
12	Monsoon Vine Forest	705525	8612975	Flora and Fauna
13	Monsoon Vine Forest	709025	8615225	Flora
14	*Eucalyptus miniata/E. tetrodonta* Woodland	708086.68	8615451.04	Flora
17	Mixed Species Low Open Woodland	706675	8611975	Flora
18	*Eucalyptus miniata/E. tetrodonta* Woodland	706425	8611825	Flora
20	Melaleuca Open Woodland	705075	8613475	Flora

* only assessed in the wet season sampling regime (when water was present)

In addition to these assessments additional surveys were undertaken by two GHD botanists from the 14–18 July 2008 to assess the distribution of introduced plant species within the study area.

Observations of weed species distribution was undertaken along roads, tracks and areas of historical and contemporary disturbance on Blaydin Point and Middle Point (excluding the Conoco Phillips Site). Where weed species were encountered the following data was recorded:

- Species identification;
- Location using handheld GPS;
- Stage of lifecycle;
- Abundance/density;
- Extent of the infestation;
- Possible sources of weed seed (e.g. transport corridor vectors, clearing for drillpads/establishment of borehole);
- Information on the surrounding area; and
- Evaluation of level of threat of future infestation.

3.2 Vegetation Mapping

Vegetation communities were identified using available vegetation mapping data to develop a pre-verification vegetation map of the study area. Available data were the:

- 1:25,000 Remnant Vegetation Survey – Litchfield Shire Municipality (Brock, 1995);
- 1:25,000 Mangrove Mapping Darwin Harbour (Brocklehurst and Edmeades, 1996); and
- Aerial photography (provided by INPEX).

Verification of data was conducted as described in Section 4.1 and NRETAS' 1:25 000 Remnant Vegetation Survey updated to better delineate and describe the communities identified during the field survey.

Site No	Habitat	Easting	Northing	Flora / Fauna
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- Aerial photography (provided by INPEX).

Verification of data was conducted as described in Section 4.1 and NRETAS' 1:25 000 Remnant Vegetation Survey updated to better delineate and describe the communities identified during the field survey.

The updates included replacement of the 1:25,000 Remnant Vegetation Map's (Brock, 1995) delineation of salt flats and mangrove communities by those from the Darwin Harbour mangrove mapping (Brocklehurst and Edmeades, 1996). The Darwin Harbour mangrove mapping was more accurate.

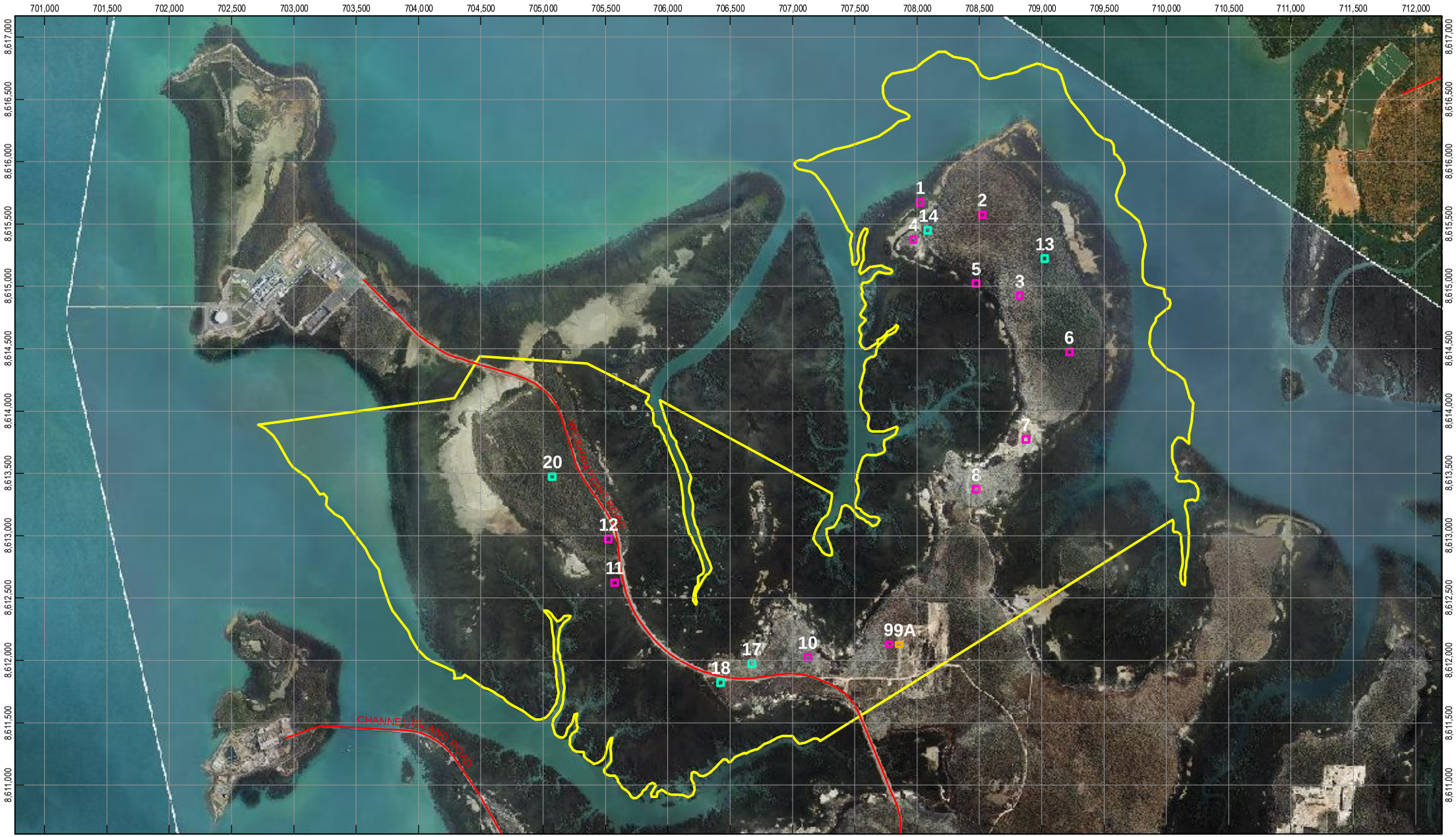
Similarly, the Community 0 (generalised woodland community) delineated in the Darwin Harbour mangrove mapping was regarded as being better described in the 1:25,000 Remnant Vegetation Map.

Vegetation units from both sources of data had overlapping boundaries once they were combined in a GIS. The 1:25 000 Remnant Vegetation Survey data was used in areas of data overlap. This was because the aerial photography confirmed that it more accurately represented the vegetation unit boundaries.

Communities not obviously indicated in the source data were added to the map for verification during the flora survey. Placement of the sampling sites allowed for testing of the vegetation stratification provided by the preliminary vegetation map.

Community descriptions were updated for each of the communities identified and verified during the survey. The descriptions are a combination of the existing community descriptions and new descriptions depending upon the accuracy of the source data and information collected during the flora surveys.

The output of the vegetation community mapping is a thematic map with accompanying community descriptions.



1:40,000

0 0.375 0.75 1.5

Kilometres (at A4)

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 52

N

LEGEND

- Flora Survey
- Fauna Survey
- Flora and Fauna Survey
- Study Area
- Major Roads

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FLORA NAD FAUNA SURVEYS

Job Number	43-21287
Revision	RevA
Date	10 July 2008

Flora and Fauna Survey Locations

Figure 4

G:\43\21287\CADD\GIS\PROJECTS\DRAFT REPORT\Figure 2_FLORA_FAUNA_SURVEY_LOCATIONS.mxd

66 Smith Street Darwin NT 0800 Australia T 61 8 8982 0100 F 61 8 8981 1075 dwnmail@ghd.com.au www.ghd.com.au

Data source: Aerial photography supplied by INPEX Browse Pty Ltd. Aerial photography of the study area captured in 2007. Roads data supplied by NTG. Other data created by GHD (B McGinley).

3.3 Flora

3.3.1 Site Selection

A total of 17 flora sites were selected. Twelve quadrats were surveyed for flora and fauna, one for fauna only, and five for flora only.

3.3.2 Vegetation Structure

Systematic surveys were undertaken at each of the flora quadrats during both the dry and wet season surveys. Structural information was recorded in accordance with the methods identified in NRETAS' guidelines for sampling flora (Brocklehurst *et al.*, 2007). This included:

- Landscape position;
- Slope;
- Aspect;
- Impact extent/duration of disturbance (fire, pig, cow/horse/donkey, weeds and any other disturbance);
- Soil texture;
- Ground cover using a 100 m point-intercept method where the type of ground cover at 1m intervals is recorded (for example bare ground, rock, litter, hummock grass, perennial grass, annual grass, sedge, other forbs or logs >5 cm diameter);
- Percentage cover at various height classes (>10 m, 5-10 m, 3-5 m, 1-3 m, 0.5-1 m and 0-0.5 m);
- Coverage of canopy; and
- Stand basal area (using a Basal Area Factor Gauge this determines the relative density of woody vegetation).

The vegetation structure was grouped using Multidimensional Scaling (MDS) based on a site species presence/absence comparison. These communities were then described based on the National Vegetation Information System (NVIS) classification system (Brocklehurst e*t al.,* 2007).

3.3.3 Floristics

Floristic information was recorded in accordance with the methods identified in the Northern Territory Biodiversity Conservation Monitoring Unit survey procedures for sampling flora (Brocklehurst *et al.*, 2007). This included:

- List of species present;
- Average heights of each species; and
- Relative cover of each species within the plot.

Floristic samples collected in the field were pressed and quarantined at the NT Herbarium for one week prior to identification procedures. This was undertaken adherent to Parks and Wildlife Commission of the Northern Territory permit number 28438.

3.3.4 Taxonomy and Nomenclature

Field identifications of floral species were based on Wightman and Andrews (1989), Dunlop *et al.*, (1995), and Wightman (2006).

Pressed samples were held at the NT Herbarium for identification. Identifications were conducted using the public reference collection, with the assistance of herbarium staff. Identifications were aided by Wheeler *et al.*, (1992), Dunlop *et al.,* (1995), Cowie *et al*., (2000), Booth *et al*., (2001), Maslin (2001), Sharp and Simon, (2002), CSIRO (2006) and Wightman (2006).

3.4 Vertebrate Fauna

3.4.1 Site Selection

Thirteen fauna sites were established in the project area, including one (site 9A) that was surveyed (avifauna surveys and nocturnal searches only) during the wet season sampling regime only. This site is an old borrow scrape that held water during the wet season. It was the only sizeable body of standing water in the area and had frogs and birds not recorded elsewhere. The location and vegetation of each site is provided in Table 1 with location shown in Figure 2.

3.4.2 Trapping Methods

Systematic trapping was undertaken at each site over a period of three nights during each survey. Trapping sampled small non-volant mammals, reptiles and amphibians.

Traps set at each site were:

- Pit traps – four 10 L buckets established in each quadrat. Each bucket was bisected by a 6 m aluminium drift-net fence. Pit-fall traps were left at each site for three days and checked each morning and afternoon. This provided a total of 144 pit-fall trap days across the study area;
- Funnel traps – four funnel traps were used at each site (two placed on either side of the drift-net on two of the pit-fall traps). Funnel traps were left for three days at each site, resulting in a total of 144 funnel trapping days across the study area;
- Cage traps – four cage traps were used at each site. One cage trap was placed in each of the four corners of the site and baited with a universal bait (a mixture of peanut butter, rolled oats and sardines). Cages were set at each site for three nights, resulting in a total of 144 cage trap nights across the study site;
- Elliot traps – twenty medium Elliot traps were located in each site. Five traps were placed approximately 6 m apart on each of the four sides of the quadrat. Traps were baited with universal bait. Traps were left at each site for three nights, resulting in a total Elliott trap effort of 720 trap nights across the study site; and
- Hair tubes – twenty hair tubes were used at each site (five hair tubes along each side of the survey quadrat). These were deployed for three days and nights at each site, resulting in a total of 720 hair tube trap days.

Traps were checked early each morning and each afternoon. The majority of individuals trapped were identified to species in the field and released at the point of capture.

3.4.3 Avifauna Surveys

Bird surveys were undertaken in a 100 m x 100 m quadrat centred on the core 50 m x 50 m quadrat used for trapping. Eight daylight and two nocturnal bird counts were conducted in each quadrat (two observers). Daylight surveys were conducted early morning and late afternoon each day. Each survey comprised a count of all birds using the quadrat – birds observed merely flying overhead, or in the general vicinity (in the same vegetation type), of the quadrat were recorded as incidental observations. Accessory data on nests, both active and recently abandoned, and breeding activity were identified and recorded.

3.4.4 Diurnal Active Searching

Ten-minute active searches were repeated five times at each quadrat to locate reptiles, frogs and traces of other wildlife (eg. scats, tracks and diggings)(two observers). Searches were undertaken in the morning and afternoon. Searching involved over-turning rocks and logs, raking through leaf litter, and looking under bark and in rock crevices. The numbers of individuals of each species observed were recorded. Scats were collected for analysis by a specialist subcontractor, Georgeanna Story of Scats About. Bones or other signs were recorded if they could be positively identified to species.

3.4.5 Nocturnal Searching

Nocturnal searches were undertaken at each site once during the survey for a period of 15 minutes (two observers). Spotlights were used to locate arboreal and terrestrial species. Active searches were conducted as described above.

3.4.6 Data Analysis

The mean abundance and species richness (i.e. the number of species) of birds, reptiles, mammals and amphibians were calculated for each site. Simple correlation analyses were used to identify possible relationships between these values and measurements of local landscape structure (obtained from Section 3.3.2). Landscape indices used in the correlations were:

1. The relative proportion of weeds;
2. Canopy height;
3. Canopy cover;
4. Percentage of vegetation cover at the following height intervals (0 – 0.5 m, 0.5 -1 m, 1 – 3 m and > 3 m);
5. A combined index of vegetation strata complexity, calculated using the Simpson's Diversity equation (Zar, 1996), based on the vegetation cover values at the height intervals outlined above;
6. Relative proportion of ground cover composed of a) bare ground, b) leaf litter, c) grass and d) woody debris; and
7. A combined index of ground habitat complexity, calculated using the Simpson's Diversity equation based on the ground cover values outlined above.

t-tests were used to compare seasonal changes in the mean abundance and species richness of birds, reptiles, mammals and amphibians.

3.4.7 Bat Surveys

Echolocation calls were recorded at each of the fauna survey sites (Table 1).

The echolocation calls of insectivorous bats were recorded using ultrasonic detectors (Anabat II Bat Detectors®) coupled with Compact Flash Zero Crossing Analysis Interface Modules (CF ZCAIMS; Titley Electronics, Ballina NSW®) and stored on compact flash memory cards for later computer analysis.

Prior to field placement, each detector was calibrated and set to operate at the same sensitivity level (i.e. at a level of 7, where the maximum is 10). Detectors were orientated at a 45 ° angle to the ground.

Calls collected during the field survey were identified using zero-crossing analysis and Analook software by visually comparing call traits. No reference calls were collected during the survey. A *Key to the Bat Calls of the Top End of the Northern Territory* (Milne, 2002) was used as a guide to call analysis. A conservative approach was taken when analysing calls due to the lack of reference calls, high level of intra-specific variability and inter-specific overlap in call characteristics.

A call was defined as a sequence of three or more consecutive pulses of similar frequency. Pulses separated from another sequence by a period of five seconds were considered to be separate calls. Due to variability in the quality of calls and the difficulty in distinguishing some species each call was assigned a confidence rating (see Mills *et al.*, 1996 & Duffy *et al.*, 2000) as summarised in Table 2.

Nomenclature for bats will follow that of Milne (2002) then Churchill (1998).

Table 2 Confidence ratings applied to bat calls detected by Anabat during the surveys within the project area.

Identification	Description
D - Definite	Species identification not in doubt.
PR - Probable	Call most likely to represent a particular species. There exists a low probability of confusion with species of similar call types.
PO - Possible	Call characteristics are comparable with the species, but there exists a reasonable probability of confusion with one or more similar species or quality or length of call prohibits a confident identification.
✓	Species group was recorded for that site.
-	Not recorded.
Species Group	Call made by one of two or more species. Call characteristics overlap making it too difficult to distinguish between species. *S.greyii / S.sanborni* *S.greyii / S.sanborni / C.nigrogriseus* *P.westralis / P. adamsi / M. schreibersii* *C. gouldii / M. loriae* *Pipistrellus spp.* *Nyctophilus spp.* The calls of *Nyctophilus geoffroyi*, *N. arnhemensis* and *N. bifax* cannot be distinguished during the analysis process and are therefore lumped together.

3.4.8 Taxonomy and Nomenclature

Field identifications of vertebrate species were based on Tyler and Davies (1986), Cogger (2000), Wilson and Swan (2003), Menkhorst and Knight (2001), Cole and Woinarski (2002), and Pizzey and Knight (2003).

4. Vegetation and Flora Results

4.1 Vegetation Mapping

4.1.1 Vegetation Communities

The vegetation groups surveyed were mostly consistent with the preliminary mapping, including corrections made to the existing mapping. These communities have been classified and renamed according to NVIS nomenclatural rules. Plot-based sampling occurred in eight vegetation communities and observational sampling occurred in six vegetation communities. Of the six vegetation communities where only observational sampling occurred, five of these are mangrove communities and one a melaleuca community delineating an ecotone between mangroves and terrestrial vegetation communities. The inconsistency in sampling techniques was due to the intertidal nature of the mangrove communities and access issues. These communities are marked with an asterisk in Table 3.

The vegetation communities sampled using both plot-based and observational survey techniques are broadly characterised in Table 3. Full species lists for the communities are provided in Appendix D. Broad characterisation has been made based on MDS of the eight terrestrial and mangrove communities where plot-based sampling was appropriate combined with extrapolation of observational data in the six communities where no plot based surveying occurred.

Table 3 Vegetation Community Types, Groupings and NVIS codes

Vegetation Community Type	Description	Representative Quadrat Nomenclature	NVIS Code
Woodland Communities			
2. Mixed Species Low Open Woodland	*Melaleuca nervosa, M. viridiflora, Grevillea pteridifolia, Lophostemon lactifluus* mixed species low woodland to low open woodland. Dense to mid dense sedgeland/grassland includes *Leptocarpus spathecus, Eriachne burkittii, E. triseta and Psuedopogonatherum spp*.	8, 10, 17	T6r
3. *Eucalyptus miniata/E. tetrodonta* Woodland	*Eucalyptus tetrodonta, E. miniata* woodland to low woodland, with mixed species mid stratum including *Cycas armstrongii* and grassland understorey.	2, 3, 9, 14, 18	T7i
12. *Corymbia bella/Melaleuca leucadendra* Transitional Open Forest*	Transitional open forest between terrestrial vegetation communities and mangrove communities. Dominated by *C. bella* and *M. leucadendra* contains elements of woodland and terrestrial forest communities.	NA	T7c*

Vegetation Community Type	Description	Representative Quadrat Nomenclature	NVIS Code
Melaleuca Communities with Monsoon Vine Forest Elements			
1. Melaleuca Open Woodland	*Melaleuca leucadendra, M. viridiflora* open woodland with *Acacia auriculiformis* and elements of monsoon vine forest such as *Flagellaria indica*.	20	T6r
7. Mixed Species Low Open Forest	*Melaleuca leucadendra, Acacia auriculiformis* open forest with dense mid storey characteristic of coastal monsoon vine forest such as *Canarium australianum* and *Strychnos lucida*.	4	T6c
Monsoon Vine Forest			
4. Closed Monsoon Vine Forest	Mixed species closed monsoon vine forest associated with permanent moisture. Closed canopy 20-25m tall dominated by evergreen species, including *Acacia auriculiformis, Calophyllum soulattri, Carpentaria acuminata, Horsfieldia australiana* and *Syzygium nervosum*.	6, 12, 13	T7d
Mangrove Communities			
5. Ceriops Closed Forest	*Ceriops australis* low closed forest.	5, 11	T6d
6. Avicennia/Ceriops Closed Forest	*Avicennia marina/Ceriops australis* closed-forest.	1	T6d
8. Sparse Samphire Shrubland	Saltflats with sparse samphires such as *Halosarcia halicnemoides* with low, very sparse mangrove species.	7	U1r
9. Rhizophora Closed Forest*	*Rhizophora* sp closed forest.	NA	T6d*
10. Rhizophora/Sonneratia Closed Forest*	*Sonneratia alba/Rhizophora stylosa/Camptostemon shultzii* closed forests in tidal creeks.	NA	T6d*
11. Transition Zone*	Preliminarily mapped as a transition zone between seaward mangrove elements (*Rhizophora/Sonneratia*) and mangroves in the higher end of the tidal level (*Ceriops australis*).	NA	NA*

Vegetation Community Type	Description	Representative Quadrat Nomenclature	NVIS Code
13. Sonneratia Closed Forest*	*Sonneratia alba* closed forest at seaward margin of mangrove communities.	NA	T6d*
14. Casuarina and Beach Open Woodland*	Beach vegetation on areas of sand including some mangrove species such as *Bruguiera exaristata* and *Ceriops australis*, also with *Ipomoea pes-caprae, Thespesia populneoides* and *Sesuvium portulacastrum*.	NA	T6r*

Note – Communities with NVIS codes marked by "*" denotes those communities not sampled by plot-based sampling.

MIDDLE POINT

PEAK HILL

BLAYDIN POINT

WICKHAM POINT

CHANNEL ISLAND

701,000 702,000 703,000 704,000 705,000 706,000 707,000 708,000 709,000 710,000

8,616,000 8,615,000 8,614,000 8,613,000 8,612,000 8,611,000

1:25,000

0 0.25 0.5 1

Kilometers

N

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 52

Melaleuca Communities
- 1- Melaleuca Open Woodland
- 2- Mixed Species Low Open Woodland

Monsoon Vine Forest
- 4- Closed Monsoon Vine Forest

Eucalyptus Communities
- 3- Eucalyptus miniata/E. tetrodonta Woodland

Mangrove Communities
- 5- Ceriops Closed Forest
- 6- Avicennia/Ceriops Closed Forest
- 7- Mixed Species Low Open Forest
- 8- Sparse Samphire Shrubland
- 9- Rhizophora Closed Forest
- 10- Rhizophora/Sonneratia Closed Forest
- 11- Transition Zone
- 12- Corymbia bella/Melaleuca leucadendra Transitional Open Forest
- 13- Sonneratia Closed Forest

Casuarina Communities
- 14- Casuarina and Beach Open Woodland

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FLORA AND FAUNA SURVEYS

Job Number	43-21287
Revision	A
Date	11 July 2008

1:25,000 Vegetation Community Types

Figure 5

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Data source: Cadastre, coastline and roads were supplied by the NTG. Vegetation units and study area were created by GHD (B McGinley). Vegetation units were derived from existing 1:25,000 Litchfield Shire Remnant Vegetation Survey, and 1:25,000 Mangrove Mapping - Darwin Harbour supplied by NTG Department of Natural Resources, Heritage and the Environment.

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MDS aims to find the 'natural groupings' of samples such that samples that cluster together are more similar to each other in terms of species composition than to samples in different clusters. MDS analysis was conducted in Primer. To obtain a MDS plot first a similarity matrix must be produced (Appendix E). This was calculated using the Bray-Curtis coefficient, with a presence/absence transformation. Transformations are required for datasets when more common species could potentially outweigh the rarer species when determining similarity between samples. Applying a transformation will define a balance between the contribution of common and rare species. A presence/absence transformation is the most severe transformation giving all species equal weighting within the ordination. The stress level of the MDS is a representation of how well the 2 dimensional plot represents the 3 dimensional plot from which it is generated. The closer to zero the figure, the more confidence one can have in the graphical, 2 dimensional representation. As the stress figure approaches 0.2 the visual representation of the relative plot position becomes less reliable.

The MDS showed a stress level of 0.05. This is considered to show a good to possibly excellent representation of the samples, with little or no real prospect of misinterpretation. Figure 6 demonstrates the MDS distribution of the 17 sites. The axes of the MDS plot are arbitrary as the plot is a two dimensional representation of a 3 dimensional figure which can be rotated through any axis.

With a good level of confidence demonstrated by the low stress value it can be seen that the further apart the sites are on the MDS plot, the more different are the floristics of the sites. The following trends can be observed in the MDS plot, complementing the Vegetation Community Type groupings:

- Only mangrove communities are on the right hand side of the middle;
- Woodland communities are clustered in the bottom left hand corner;
- Monsoon vine forest communities are clustered in the upper left corner; and
- Melaleuca communities with monsoon vine forest elements are plotted between the monsoon vine forest communities and the woodlands.

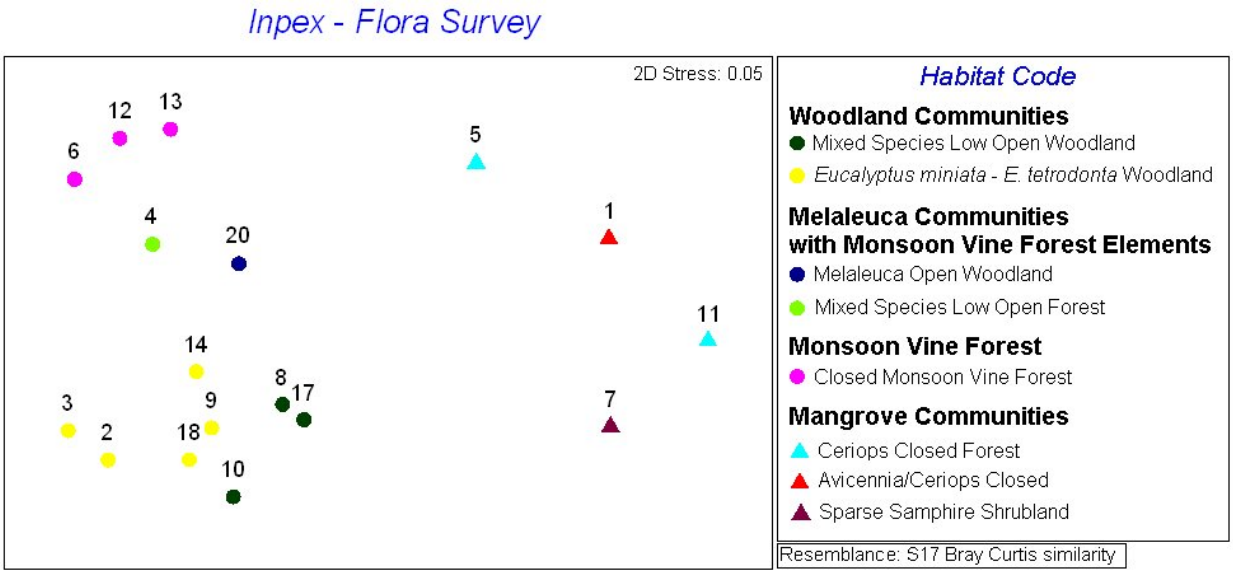

Figure 6 Multidimensional Scaling Plot of Sampled Sites

4.2 Flora

4.2.1 Floristics

NRETAS Flora Records for the study area and a 2 km buffer area contain 421 records for 226 species. This list contains one plant listed as threatened under NT Legislation (*Cycas armstrongii*), which was recorded only in vegetation community Type 3 – *Eucalyptus miniata/E. tetrodonta* Woodland

This study identified the following taxa detailed in Appendices E and F. This included:

- 196 taxa positively identified to species level;
- 28 taxa positively identified to genus level (species unclear);
- 21 taxa positively identified to family level (genus/species unclear); and
- 5 taxa where no positive identification was possible.

Not all specimens could be identified to species level. In some cases the individual encountered in the field may have been infertile, senescent or not providing sufficient and/or appropriate diagnostic material. For example, a dry, shrivelled, broken herb seen in the dry season would be recorded although it would be impossible to identify, or relate to herbs recorded in wet season. Not all samples examined by the NT herbarium staff were identified positively to species level.

Of the positively identified species, 109 are new flora records for the region.

The survey found only one species listed as threatened under NT or Commonwealth legislation: *Cycas armstrongii*. This species is listed as vulnerable under the TPWC Act.

4.2.2 Introduced Flora

During GHD's targeted survey of introduced taxa (supplementary to this report), twelve introduced species were identified within the Blaydin Point Project area and close surrounds (i.e Wickham Point Rd). These taxa are:

- *Andropogon gayanus* (Gamba Grass)*;*
- *Chloris inflata* (Purple Top Chloris)*;*
- *Crotalaria goreensis* (Gambia Pea);
- *Hibiscus sabdariffa* (Wild Rosella);
- *Hyptis suaveolens* (Horehound);
- *Lantana camara* (Lantana)*;*
- *Melinis repens* (Red Natal Grass);
- *Passiflora foetida* (Stinking Passionfruit);
- *Pennisetum pedicellatum* (Mission Grass);
- *Pennisetum polystachion* (Mission Grass);
- *Scoparia dulcis (*Scoparia)*;* and
- *Stylosanthes viscosa* (Stylo).

Records held by NRETAS identify a further fourteen exotic flora species known to occur within 2 km of the Blaydin Point study area. These species are:

- *Aristolochia indica*;
- *Calotropis procera* (Rubber Bush);
- *Desmanthus virgatus*;
- *Eragrostis amabilis*;
- *Evolvulus nummularis*;
- *Ipomoea quamoclit* (Morning Glory);
- *Jatropha gossypiifolia* (Bellyache Bush);
- *Merremia aegyptia* (Hairy Merremia);
- *Mitracarpus hirtus* (Berrimah Weed);
- *Peperomia pellucida*;
- *Sesamum indicum* (Sesame);
- *Solanum torvum* (Devils' Fig);
- *Sorghum bicolor*; and
- *Triumfetta rhomboidea*.

One species, *Tribulus cistoides* (Caltrop), listed in the flora records is a declared Class B/C weed despite being considered native (or at least a pre-European entrant to Australia as it was collected by Banks and Solander in north Queensland in 1770 (Cowie *pers. comm* 2008)).

5. Fauna Results

The survey of the terrestrial vertebrates recorded 148 species. The vertebrate species include nine species of mammal (including four species of microchiroptera), 106 species of bird, 22 species of reptile and 11 species of frog. This is compared to results from the Dames and Moore (1997) survey for the adjacent Conoco Phillips LNG plant EIS which found 15 species of mammal, 90 species of bird, 11 species of reptile and 11 species of frog. The vertebrates recorded in the Blaydin Point study include the exotic cane toad, the black rat and the feral pig.

Results are similar to those obtained from a survey in the Glyde Point area (GHD 2005). That survey recorded 83 species of terrestrial vertebrate including 5 mammals (no microchiropter), 49 birds, 20 species of reptile and nine species of frog.

This latter survey is instructive as it conforms, as does the current survey, to a general decline in mammals reported from across the Top End (Woinarski *pers. comm.*.).

It also indicates that the current survey provides results typical of the current status of terrestrial vertebrate biodiversity in coastal Top End habits.

For ease of interpretation the fauna is evaluated in relation a lumping of the quadrat according to vegetation and location. The lumping is as follows:

- Savanna – Quadrats 2, 3, 8, 9, and 10;
- Monsoon vine forest – Quadrat 6;
- Transition, terrestrial vegetation to mangrove – Quadrats 4 and 12;
- Tidal – Quadrats 7 and 11;
- Mangrove – Quadrats 1 and 5; and
- Ephemeral water (borrow scrape) – Quadrat 9A.

This is supplemented with quantitative analysis of the effects of the quadrats structural characteristics on species abundance and the abundance of each large taxonomic group.

5.1 Mammals

A total of five species of mammal were recorded during the dry and wet season surveys (excluding microchiropteran bats) (Appendix G). These were:

- Two macropods (agile wallaby *Macropus agilis* and antilopine wallaroo *Macropus antilopinus* (wet season only));
- Little red flying fox *Pteropus scapulatus*;
- Black rat *Rattus rattus* (introduced); and
- Feral pig *Sus scrofa* (introduced).

The results from the scat analyses identified only one species: the agile wallaby. There were no hairs collected from hair tubes.

5.1.1 Mammal Diversity in Different Habitat Types

Macropods primarily occurred in woodland savanna and tidal salt flats across the study area. Low numbers of macropods were recorded at Sites 2, 8 and 9. Scats and tracks were found at all open savanna woodland sites (Site 2, 3, 8, 9 and 10) and tidal flats (Site 7 and 11). The agile wallaby was regularly observed in savanna woodland while travelling between sites.

One species of fruit bat, the little red flying-fox, was observed in the project area. This species was observed feeding in flowering eucalypts in the southern sections of the project area (Sites 8 and 9). No roosting colonies were observed at the time of surveying.

Feral pigs were observed in mangroves at Site 1. Pig wallows and diggings were observed in mud and sand substrates at the interface between the mangrove and monsoon vine forest near Site 4. The results differ slightly from recent surveys conducted at Wickham Point, which acknowledge that pigs occur locally, but did not record evidence of recent pig activity and suggested that the risks of environmental damage by this species are low (URS, 2005). The results of the current survey suggest that feral pigs may be relatively abundant within the mangrove fringes at Blaydin Point and could have the potential to cause localised environmental degradation if left unmanaged.

The single capture of one black rat was made at site 4, a closed monsoon vine forest.

5.1.2 Relationship Between Mammal Abundance and Habitat Structure

Mammal abundance and species richness were not significantly correlated with any of the measured habitat indices. Although numerous studies have shown that mammal diversity often increases with vegetation complexity and cover (Lindenmayer *et al.*, 1994; Catling and Burt, 1995; Maisonneuve and Rioux, 2001 and Woinarski, Fisher and Milne, 1999 (for Northern Territory Top End vertebrates)), the low level of mammal abundance and species richness in the project area meant there was insufficient power to detect a significant difference among sites.

5.2 Bats

5.2.1 Anabat Survey Results – Dry Season Survey

The echolocation calls were recorded for a single night at seven of the 12 sites within the project area, for a total of approximately 80 hours survey effort. Approximately 812 files were recorded of which approximately 243 (30%) were bat calls of some description.

Analysis revealed the definite presence of one bat species (*Mormopterus loriae ridei*) within the project area and the probable presence of another four bat species (Table 4).

Generally calls were poor quality. Files often consisted of short sequences of few pulses. Pulses often lacked sufficient detail to enable definite and in most cases probable identification. Consequently many calls were lumped into species groupings (Table 4).

5.2.2 Anabat Survey Results – Wet Season Survey

The echolocation calls were recorded for a single night at 11 of the 12 sites within the project area, for a total of approximately 116.5 hours survey effort. Approximately 1605 Anabat sequence files were recorded of which approximately 964 (60%) were bat calls of some description. No data was recorded at sites 6 or 9A.

Analysis revealed the definite presence of three bat species (*Chaerephon jobensis, Saccolaimus flaviventris* and *Pipistrellus adamsi*) within the project area and the probable presence of another three bat species (Table 4).

Despite the majority of calls being good quality, lack of reference call information prohibited many files being identified to species level. At least 65% (626) of the files identified as bat calls were identified to one of the six species groups (Table 4).

None of the species recorded as definite, probable or possible is listed as threatened with extinction under the TPWC Act or the EPBC Act. There are only two such species in the northern part of the Northern Territory: *Saccopaimus saccolaimus* and *Hipposideros inornata*.

Table 4 Anabat Survey Results

Species	Season	1	2	3	4	5	6	7	8	9	10	11	12
Chaerephon jobensis Northern freetail bat	Dry	-	-	-	-	-	-	-	-	-	-	PR	-
	Wet	D	-	D	D	PR	-	D	PR	-	-	PR	PR
Saccolaimus flavivientris Yellow-bellied sheathtail bat	Dry	-	-	-	-	-	-	-	-	-	-	-	PR
	Wet	D	PR	D	D	D	-	D	D	PR	-	D	-
Saccolaimus flavivientris/C. jobensis Northern freetail bat or yellow-bellied sheathtail bat	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	Wet	✓	-	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
Taphozous kapalgensis Arnhem sheathtail bat	Dry	-	PR	-	-	-	-	-	-	-	-	-	-
	Wet	-	-	-	-	-	-	-	-	-	-	-	-
Mormopterus beccarii Beccari's sheathtail bat	Dry	-	-	-	-	-	-	-	-	-	-	PO	-
	Wet	PR	-	-	PO	-	-	PR	-	-	-	-	-
Mormopterus loriae ridei Little northern freetail bat	Dry	D	-	-	-	PO	PR	-	-	-	PR	-	-
	Wet	PR	-	-	PR	-	-	PO	-	-	-	-	PR

GHD Pty Ltd. 2009. *Ichthys Gas Field Development Project: onshore fauna and flora study.* Report prepared for INPEX Browse, Ltd., Perth, Western Australia.

Species	Season	1	2	3	4	5	6	7	8	9	10	11	12
Scotorepens greyii /S.sanborni Broad-nosed bats	Dry	✓	-	-	-	-	-	-	-	-	PR	-	-
	Wet	✓	✓	-	-	-	-	✓	-	-	-	✓	✓
S.greyii/S.sanborni/ Chalinolobus nigrogriseus	Dry	✓	✓	-	-	-	-	-	-	-	-	-	-
Broad-nosed bats or hoary wattled bat	Wet	✓	✓	✓	✓	✓	-	✓	✓	✓	-	-	✓
Pipistrellus adamsi Cape York pipistrelle	Dry	-	-	-	-	-	-	-	-	PR	-	-	-
	Wet	PR	PR	PR	-	PR	-	PR	PR	D	-	-	PR
Pipistrellus spp. Unidentified pipistrelle	Dry	✓	-	-	-	-	-	-	-	✓	-	-	-
	Wet	✓	-	✓	-	✓	-	✓	-	✓	-	✓	-
P.westralis/ M. schreibersii Northern pipistrelle or common bent-wing bat	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	Wet	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
P.westralis/P. adamsi/ M. schreibersii Pipistrelle or common bent-wing bat	Dry	-	✓	-	-	-	-	-	-	✓	-	-	✓
	Wet	-	✓	✓	-	-	-	-	-	-	-	-	✓
Myotis macropus Southern myotis	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	Wet	-	-	-	-	-	-	PR	-	-	-	-	-
Nyctophilus spp. Long-eared bat	Dry	✓	-	-	-	-	-	-	-	-	-	-	-
	Wet	✓	-	-	-	-	-	-	✓	-	-	-	-

Species	Season	1	2	3	4	5	6	7	8	9	10	11	12
C. gouldii/M. loriae	Dry	✓	-	-	-	-	-	-	-	-	✓	-	-
Gould's wattled bat or little northern freetail bat	Wet	✓	-	-	✓	-	-	-	-	-	-	-	-
Total species D		3	0	2	2	1	0	2	1	1	0	1	0
Total species PR		3	3	1	1	2	1	3	2	2	2	2	4

D – definite, PR – probable, PO – possible, ✓ – species group was recorded for that site

5.3 Birds

A total of 106 bird species from 43 families were recorded from the project area during the dry and wet season surveys (Appendex G). The abundance of birds was higher during the wet season surveys with 1409 birds counted (95 species) compared with 564 birds (67 species) in the dry season. The tree martin *Hirundo nigricans* was the most abundant species during the wet season surveys with 310 sightings (none were recorded during the dry season surveys). Although abundant, this species was not widely distributed across the study area. Most tree martins were recorded at one location, adjacent to the borrow scrape at Site 9A. Honeyeaters (Family Meliphagidae) were the most abundant bird group recorded within the study area, accounting for 33% of all birds recorded during both surveys. Among the honeyeaters, the red-headed honeyeater *Myzomela erythrocephala*, brown honeyeater *Lichmera indistincta*, white-throated honeyeater *Melithreptus albogularis* and dusky honeyeater *Myzomela obscura* were the most abundant with 155, 153, 137 and 58 records respectively. The rainbow bee-eater *Merops ornatus* was also abundant across the study area with 89 observations.

5.3.1 Bird Diversity in Different Habitat Types

Bird data were separated into those recorded in six broad vegetation types (i.e. savannah woodland, mangrove, mangrove fringe, tidal salt flat/low mangrove, monsoon vine forest and the borrow scrape). The greatest number of bird species was recorded in savannah woodland (56), followed by mangroves (41), the borrow scrape(40), mangrove fringes (40), monsoon vine forest (36) and tidal flats (25).

Bird species that were abundant in the savannah woodland included the brown honeyeater, red-headed honeyeater, white-throated honeyeater, dusky honeyeater, rainbow bee-eater, red-winged parrot *Aprosmictus erythropterus*, red-tailed black cockatoo *Calyptorhynchus banksii*, white-bellied cuckoo shrike *Coracina papuensis*, weebill *Smicornis brevirostris*, peaceful dove *Geopelia placida*, bar-shouldered dove *Geopelia humeralis* and red-backed fairy wren *Malurus melanocephalus*. These species are all relatively common in low savannah woodland in the Darwin region.

Bird species that were most abundant in the mangroves were the mangrove gerygone *Gerygone levigaster*, white-throated honeyeater, brown honeyeater, white-gaped honeyeater *Lichenostormus unicolor*, varied triller *Lalage sueurii*, whimbrel *Numenius phaepus* and rainbow bee-eater. Mangrove specialists such as the cicadabird *Coracina tenuirostris*, black butcherbird *Cracticus quoyi* and white-breasted whistler *Pachycephala lanioides* were present.Several raptor species (black kite *Milvus migrans*, brown goshawk *Accipiter fasciatus* and whistling kite *Haliastur sphenurus*) were observed hunting above the mangroves.

Bird species abundant in the interface between mangroves and terrestrial habitat included the varied triller, large-tailed nightjar *Caprimulgus macrurus*, red-headed honeyeater, white-throated honeyeater and great bowerbird *Chlamydera nuchalis*. Orange-footed scrubfowl *Megapodius reinwardt* occurred in this habitat type with individuals observed at Site 12 and a prominent mound located at Site 4.

The monsoon vine forest (Site 6) represented a relatively unique bird habitat within the study area, supporting birds such as the little shrike-thrush *Colluricincla boweri*, yellow oriole *Oriolus flavocinctus*, figbird *Sphecotheres viridis*, rainbow pitta *Pitta iris*, green-backed gerygone *Gerygone palpebrosa*, weebill and orange-footed scrubfowl. The borrow scrape and surrounding grasslands adjacent to Site 9 (Site 9A) provided habitat for wetland and grassland birds. Species abundant at this location were the tree martin *Hirundo nigricans*, grey teal *Anas gracilis*, white-breasted woodswallow *Artamus*

leucorynchus, rainbow bee-eater, rainbow lorikeet *Trichoglossus rubritorquatus* and double-barred finch *Taeniopygia bichenovii*. Species only found at this location included wetland birds (marsh sandpiper *Tringa stagnatilis*, great egret *Ardea alba*, white-faced heron *Egretta novaehollandiae*, black-fronted dotterel *Elseyornis melanops*, masked lapwing *Vanellus miles*, red-kneed dotterel *Erythrogonys cinctus*, black-necked stork *Ephippiorhynchus asiaticus*) and grassland birds (the golden-headed cisticola *Cisticola exilis* and chestnut-breasted mannikin *Lonchura castaneothorax*).

Only 25 bird species were observed in the tidal salt flats/low mangrove vegetation. Abundance was generally low. The more frequently encountered species were the mangrove gerygone, mangrove robin *Eopsaltria pulverulenta*, mangrove grey fantail *Rhipidura phasiana*, brown honeyeater, rainbow bee-eater and bar-shouldered dove.. Similar low-levels of bird diversity were recorded in surveys of tidal flats at Middle Arm and East Arm (URS 2001).

5.3.2 Relationship Between Bird Diversity and Landscape Structure

Bird abundance and species richness were significantly correlated with several habitat structural complexity indices (Figure 7). Bird abundance and species richness were most closely correlated with the proportion of vegetation cover at height 0 - 0.5 m (correlation r = 0.89 and 0.79). Bird abundance and species richness were also positively correlated with the proportion of grass cover (correlation r = 0.84 and 0.74), the relative abundance of woody debris (correlation r = 0.71 and 0.58) and relative canopy height (correlation r = 0.63 and 0.67). Bird abundance and species richness were negatively associated with the proportion of bare ground (correlation r = - 0.79 and - 0.79). The results are largely influenced by the inclusion of tidal flats (Site 7 and 11) that were dry throughout much of the survey period and subsequently devoid of bird life. The tidal areas have low levels of understorey and ground level vegetation complexity and are likely to offer less diversity of resources compared to the more structurally complex savannah woodland and monsoon rainforest habitat.

5.4 Reptiles

A total of 230 reptiles from 22 species were recorded from the project area during the dry and wet season surveys (Appendix G). Reptile species included nine skinks (Family Scincidae), three geckos (Family Gekkonidae), three dragons (Family Agamidae), two rear-fanged snakes (Family Colubridae), one front-fanged snake (Family Elapidae), one goanna (Family Varanidae), one python (Family Boidae), one legless lizard (Family Pygopodidae) and one blind snake (Family Typhlopidae). The more abundant species were the frill-neck lizard *Chlamydosaurus kingii*, Bynoe's gecko *Heteronotia binoei* and the zigzag velvet gecko *Oedura rhombifer*, with 49, 33 and 24 individuals encountered respectively. Skinks were abundant with the striped rainbow skink *Carlia gracilis, C. munda,* two-spined rainbow skink *C. amax,* arboreal snake-eyed skink *Cryptoblepharus plagiocephalus,* and *Ctenotus essingtonii* found in relatively high numbers at all savanna woodland sites.

5.4.1 Reptile Diversity in Different Habitat Types

The vast majority of reptiles (19 species and 76% of all individuals captured) were recorded from savannah woodland habitats (Appendix G). This figure is biased by a disproportionate survey effort. Reptiles abundant in savanna woodland were the frill-neck lizard, Bynoe's gecko, zigzag velvet gecko, striped rainbow skink, two-spined rainbow skink, arboreal snake-eyed skink and the skink *Ctenotus essingtonii*. The spotted tree monitor *Varanus scalaris* was recorded three times in this vegetation type.

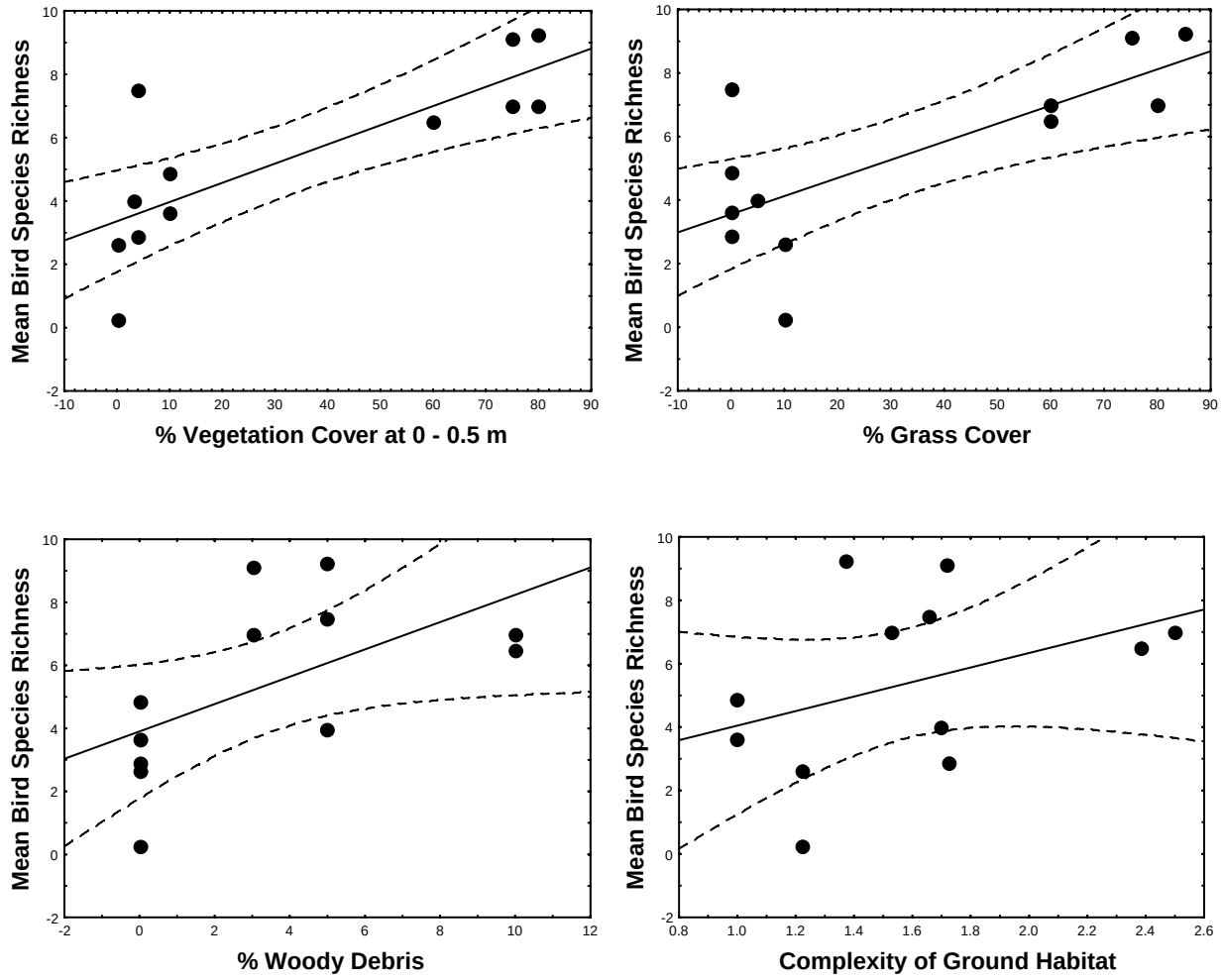

Figure 7 Correlations Between Bird Species Richness and Indices of Habitat Structure

The interface between mangrove and terrestrial habitats provide records of 12 species. These were the slender rainbow skink, two-spined rainbow skink, zigzag velvet gecko, eastern two-lined dragon *Diporiphora bilineata*, northern water dragon *Lophognathus temporalis*, eastern striped skink *Ctenotus robustus*, Bynoe's gecko, arboreal snake-eyed skink and *Ctenotus essingtonii*.

Eight reptile species were recorded within the monsoon vine thicket. With the exception of the northern water dragon, all (i.e. the striped rainbow skink, *Carlia munda,* two-spined rainbow skink*,* arboreal snake-eyed skink*,* zigzag velvet gecko, *Ctenotus essingtonii* and frill-neck lizard) were generalist species that present in the savanna woodland and mangrove fringe habitats.

The remaining habitats (mangrove, tidal flat and borrow scrape) supported low reptile abundance and species richness. These habitats have the potential to support a more unique assemblage of reptile species that are unlikely to occur in other parts of the project area. Freshwater lagoons accommodated the keelback snake *Tropidonophis mairii*.

5.4.2 Relationship Between Reptile Diversity and Landscape Structure

Reptile abundance and species richness were significantly correlated with a number of habitat structure measures (Figure 8). Reptile abundance and species richness were negatively correlated with the proportion of bare ground (correlation r = - 0.9, r = - 0.9) and positively correlated with the relative level of grass cover (correlation r = 0.82, r = 0.81), woody debris (correlation r = 0.82, r = 0.79) and an overall index of ground habitat complexity (correlation r = 0.66, r = 0.59). The results are consistent with published research on determinants of reptile diversity. Many studies have found that reptile diversity increases with the structural complexity of ground-level habitats, increasing with the diversity of microhabitats and ecological niches available to accommodate different species (Kitchener *et al.,* 1980; Hadden and Westbrooke, 1996; Jellinek *et al.,* 1994; Hodgkison *et al.,* 2007). Across the study site, areas of savanna woodland had higher ground-level complexity than tidal flats and mangroves and therefore tended to support a higher abundance and species richness of reptiles.

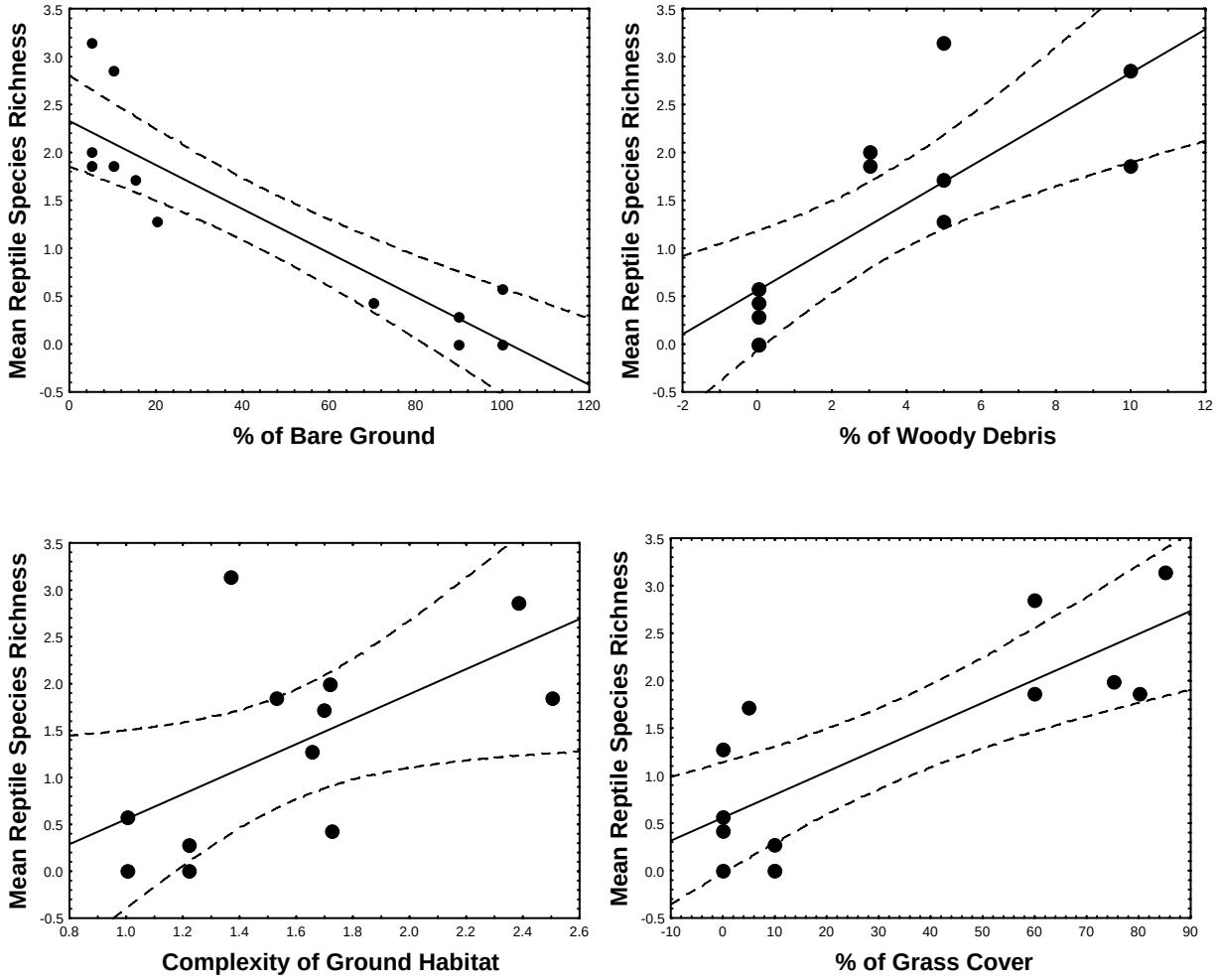

Figure 8 Correlations Between Reptile Species Richness and Indices of Habitat Structure

5.5 Amphibians

A total of 150 amphibians from ten species were recorded in the wet and dry season surveys (Appendix G). The most abundant amphibian species were the floodplain toadlet *Uperoleia inundata* (55), northern dwarf tree frog *Litoria bicolor* (35), bilingual frog *Crinia bilingua* (16), rocket frog *Litoria nasuta* and laughing frog *Litoria rothii* (15), cane toad *Chaunus (Bufo) marinus* (6), Tornier's frog *Litoria tornieri* (3), the Northern Territory frog *Austrochaperina adelphe* (2), giant rocket frog *Litoria wotjulumensis* (1), long-footed frog *Cyclorana longipes* (1) and stonemason toadlet *Uperoleia lithomoda* (1).

5.5.1 Amphibian Diversity in Different Habitat Types

The more widely occurring species were the laughing frog and the cane toad. Many additional cane toads were observed on the tracks throughout the study area when travelling between sites. Toads were observed in savanna woodland, monsoon vine thicket, mangrove fringes and in the vicinity of freshwater lagoons. Tornier's frog and the Northern Territory frog were found exclusively in the savannah woodland.

The seasonal borrow scrape (Site 9A) provides foraging and breeding habitat for a range of amphibians. The northern dwarf tree frog, rocket frog, floodplain toadlet and bilingual frog were recorded from sedges along the edges of the water body. No species of conservation significance was recorded.

A similar assemblage of amphibian species was recorded in surveys conducted at Middle Arm (URS, 2001). Some species recorded in the dry season were not recorded during the wet season survey. This is likely to be associated with breeding activity triggered by rains in November 2007.

5.5.2 Relationship Between Amphibian Diversity and Landscape Structure

Frog abundance was not significantly correlated with any of the habitat characteristics measured on site. However, frog species richness was significantly correlated with the relative proportion of grass cover (correlation r = 0.6). This result is partly attributed to the inclusion of tidal flats and mangroves: areas devoid of grass cover that offer low value to amphibians as a result of their high salinity levels. The correlation with grass may therefore be partly an artefact of salinity levels, which would exclude most amphibian species from the tidal and mangrove habitats. Grassy habitats adjacent to the seasonal waterbody at Site 9A also represented high value frog habitat supporting a number of frog species.

6. Significant Species and Ecological Communities

6.1 Ecological Communities

6.1.1 Ecologically Significant Communities

No significant ecological community was recorded during the field survey. None of these vegetation communities is listed as threatened under the EPBC Act, and the Northern Territory legislation does not provide for the listing of ecological communities. Northern Territory legislation provides for the listing of Essential Habitats. None has been declared.

6.1.2 Monsoon Vine Forests

Two areas of monsoon vine forest (MVF) were not mapped prior to the investigations. Prior to survey mapping suggested one was an open *Eucalyptus tetrodonta* and *E. miniata* woodland to low woodland, and the other a *Melaleuca leucadendra, M. cajuputi, M. viridiflora* open to closed forest freshwater swamp with occasional *Acacia auriculiformis* (Brock, 1995). Field surveys demonstarted that these areas are MVF.

Reduction in MVF area has been predicted to result in regional declines in populations of frugivorous birds (Bach and Price 1999). For example, a 50% reduction in the area of MVF in the Darwin area has been predicted to cause an 83% reduction in the regional population of rose-crowned fruit-dove. Predictions of this sort are backed up by observations of declines in frugivorous birds as an apparent consequence of loss of rainforest habitat (Frith 1952; Diamond *et al.* 1987). Loss of seed dispersal mechanisms may be a critical factor in determining the long-term conservation status of MVF plant species.

The predicted consequences of loss of MVF in the Top End are based on estimates for percentages of MVF cover within 50 kilometres of a rainforest patch. An area 50 kilometres in radius around the Blaydin Point rainforests includes the GunnPoint, Glyde Point and Point stevens area, downstream areas of the Adelaide River and floodplain, Black Jungle and Fogg Dam, Humptydoo, all of Darwin and much of the Darwin rural area, the Cox Peninsula, Bynoe Harbour westawards to Indian Island, and the upper Finnis River area. This area encloses significant areas of natural MVF (e.g. in the riparian zone of the lower Adelaide River drainage, Fogg Dam area, Gunn Point, glyde point, Point Stevens, Black Jungle, Fogg Dam, upper finnis River, Indian Island and the Darwin and Darwin Harbour area), as well as extensive plantings of tropical fruit-bearing trees (e.g. *Carpentaria cunninghami*) in the Darwin suburbs and adjacent rural areas. The latter are capable of supporting only some of the rainforest frugivores. The area of rainforest on Blaydin Point and the adjacent area near Wickham Point are a relatively small fraction of the MVF within the 50 kilometres radius area (NRETAS Rainforest Database).

The significance of any possible decline in frugivorous birds resulting from loss of the Blaydin Point MVF is difficult to evaluate. This is because of the past history of MVF loss in the Darwin region. Panton (1993) found that approximately 60% of the MVF in the Darwin region had been lost since the end of the World War II. This occurred as a result of a combination of the effects of clearing, fire and weed intrusion. The area of Panton's study was less than that enclosed by a 50 km radius around Blaydin Point.

Loss of the Blaydin Point MVF would not result in an observable impact on frugivorous birds, if assessed according to the existing patterns of MVF abundance and distribution in the area of 50 km radius around

Blaydin Point (Bach and Price 1999). The level of impact from loss of the Blaydin Point MVF in association with losses since World War II is not easily assessed in the absence of more detailed information on the data included in Panton's (1993) study, and an assessment of MVF distribution and abundance in the area within 50 km of Blaydin Point now, and at the end of World War II.

6.1.3 Eucalypt Communities

The open eucalypt woodland and forest communities are well represented in the Darwin area and across the Darwin Coastal Bioregion (NRETA 2005). The open eucalypt communities are also well represented in conservation reserves in the bioregion (NRETA 2005).

6.1.4 Mangroves

The area of mangroves in the Blaydin Point to Wickham Point area is small relative to the 27,350 ha of mangroves present in Darwin Harbour. Approximately 8.1% of the Northern Territory's 1,409.8 km^2 of mangrove forest is within managed reserves (NRETA 2005). Reserved mangroves in Darwin Harbour are located in Charles Darwin National Park, which maintains approximately 4% of the mangrove area within the harbour.

Total leaf drop productivity for Darwin Harbour as been estimated at 124,533.24 t/year (NRETA 2008). If the mangroves in the Blaydin Point area are assumed to have an average productivity, they are unlikely to provide a significant proportion of the harbour's leaf drop productivity.

The Northern Territory government has no target for conservation of mangroves in Darwin Harbour (Darwin Harbour Advisory Committee 2003; DIPE 2006). Nor does the Northern Territory's land clearing guidelines preclude the clearing of mangroves. The majority of mangroves in the Blaydin Point area and around the harbour in general are zoned as conservation under the NT Planning Scheme.

6.1.5 Patterns of Species Richness

The savanna woodland communities dominated by eucalypts are the most species rich communities in the study area. This is true for plants, birds, reptiles and frogs. The exception to this is the species richness of mammals. Mammals were too few in species to determine which community was the more species rich. The high species in savanna woodland habitats relative to the MVF is in keeping with observations on the species richness of monsoon forest patches. These patches are often small, and occupied by a relatively few species often represented by few individual plants (Russell Smith and Lee, 1992). The richness of the MVF vegetation of a region is maintained by a relatively large contribution from differences in the species composition of different patches.

The significance of the observation of more species occurring in the savannas is diminished by most of the vertebrate species having a relatively plastic habitat requirement. The juxtapositioning of different habitat types provides fauna with opportunities to exploit seasonal presence/abundances of resources in particular habitats at particular times of year (Bach and Price 2005). The probable dependence of species on multiple habitat types may account for some of the apparent bias towards savannah in terms of species richness. Another contributing factor is likely to be related to savanna being the largest area of habitat around Blaydin Point, and across the Top End.

The savanna woodlands of the Darwin Coastal Bioregion are well reserved in Northern Territory parks and reserves (NRETA 2005).

6.1.6 The Community of Mammals

No small or mid-sized ground mammals were captured during the wet season sampling, and only one species (the introduced black rat) in the dry season sampling. The consistently low trapping results and the absence of hair in hair tubes or secondary traces (i.e. diggings, scats or burrows) indicate that the project area is relatively depauperate in small ground-dwelling mammals. The Environmental Impact Statement (EIS) for the development of the Darwin LNG Plant (Dames and Moore 1997) listed the capture of two small mammals; one *Melomys burtoni* and one *Isoodon macrurus*. This study expended significantly more effort than the 1997 study. Dames and Moore used only two nights per site in a trapping session and a total of 450 trap nights with Elliot traps, and 33 with large traps compared to GHD's 720 trap nights with Elliot traps and 144 with large traps). Neither study can be said to have produced large catches of small mammals.

Other local studies have recorded the relative abundance of rodents and small dasyurids around Darwin Harbour. Northern brown bandicoots *Isoodon macrourus* were reportedly abundant in similar habitats at Middle Arm (URS, 2001). The northern quoll, *Melomys burtoni* and *Sminthopsis bindi* were recorded from Middle Arm in 2001 (URS, 2001) from 320 trap nights. No traces of either species were detected in the dry or wet season surveys of Blaydin Point.

The low abundance of small mammals might be associated with recent fire history. Much of the project area was extensively burnt in the past 12 to 18 months, removing much of the understorey and possible food sources for small mammals. This may have contributed to the low mammal numbers. It would not explain the absence of mammals from unburnt monsoon vegetation (such as Sites 12 and 6), which contained abundant leaf litter and potential food sources for small mammals.

This hypothesis is at variance to observations on the frog, reptile and bird communities. The 1997 Dames and Moore study on Middle Arm recorded seven species of native frog, ten non-crocodilian native reptiles, 90 native birds and 6 native mammals. This is compared to the nine native frogs, 18 native reptiles, 106 native birds and only 2 native mammals recorded in this study. This suggests that the low mammals abundance and species richness is related in some way to mammals as a taxon, rather than some general ecological change acting on biodiversity as a whole.

The unlikelihood of fire as a causal factor is supported by observations on the importance of habitat attributes to the abundance and species richness of reptiles and birds. The major habitat component associated with higher levels of reptile and bird abundance and species richness was one or more forms of ground cover. Higher levels of ground cover were associated with higher levels of abundance and species richness. Levels of ground cover impact similarly on mammals (e.g. Lindenmayer *et al.*, 1994; Catling and Burt, 1995; Maisonneuve and Rioux, 2001 and Woinarski, Fisher and Milne, 1999 (for Northern Territory Top End vertebrates)). Either fire is not the variable responsible for the decline in mammals, or mammals are in some manner particularly susceptible to impacts from loss of cover due to fire.

The northern quoll previously occurred in the Blaydin Point with a 2 km boundary (14 records between 1990 – 2001). However no trace of the species was detected in the dry or wet season surveys. The absence of the northern quoll from the current surveys may be partly attributed to the recent invasion by the cane toad *Bufo marinus,* which occurred since the 2001 URS surveys of Middle Arm.

Cane toads are thought to be associated with a recent decline of northern quolls across northern Australia (Van Dam *et al*., 2002; Freeland, 2004; Woinarski *et al.,* 2008) and may explain their absence

from the project area. The presence of cane toads however is unlikely to explain the absence of other small mammals.

Other factors that may influence the low species number include the increasing level of isolation of the Balydin Point area from the growth of industrial and urban areas, exotic predators (e.g. there are records of cats in the area) (Woinarski *et al.*, 2007) and exotic disease (e.g. Freeland 1994).

6.2 Flora of Conservation Significance

Only one significant species of flora was recorded during the dry season survey at Blaydin Point. This was *Cycas armstrongii*.

6.2.1 *Cycas armstrongii*

The vulnerable *Cycas armstrongii* is endemic to the NT. It is locally abundant across the western Top End region, the Cobourg Peninsula and the Tiwi Islands. It is listed as vulnerable because of its poor representation in conservation reserves (approximately 1%), and because it's preferred habitat of deep loamy soils is favoured for agriculture, horticulture and forestry (NRETA, 2006). Supplementary to land clearing, the most significant threat to the population of *C. armstrongii* is fire. Adult stems suffer mortality in fires with higher than average temperatures (i.e. those fuelled by high litter loads produced by introduced grass species such as *Andropogon gayanus* (Gamba Grass) and *Pennisetum polystachion (*Mission Grass). Fire also reduces seed viability (NRETA, 2006).

This species was observed in the study area throughout the *Eucalyptus miniata / E. tetrodonta* woodland vegetation community type (Figure 5).

6.3 Introduced Flora of Significance

Most of the Blaydin Point Project area was found to be relatively free of weeds. The exceptions to this were several weed-infested areas located in the middle of the site. These large weed infestations occur in areas that have been subject to historic land clearing and disturbance.

Blaydin Point has been accessed continuously by vehicle since at least during World War II. In recent times it has been used by fishers and others seeking recreation. The large area of disturbance in the centre of the area results from development of a shallow borrow pit some time ago. These activities and disturbances have lead to colonisation and spread of a number of significant weeds.

Flora species found in the study area and are classified as declared noxious weeds in the NT (*Weed Management Act 2001* (WMA)), Weeds of National Significance (WONS), weeds of potential national significance (potential WONS) (DEWHA 2008) or are considered serious weeds of savanna woodlands (NRETA 2007) include the following.

6.3.1 *Andropogon gayanus* (serious weed of savanna woodlands)

Examples of *Andropogon gayanus* in the study area are scattered and isolated and at present this species is not considered to pose a significant environmental risk. If individuals of this species were to proliferate there is potential for the ground and middle story layers of the area's woodlands to be altered. NRETAS is concerned that this species and *Pennisetum spp* may cause excessive fire frequencies and intensities that alter the northern savannas (including the tree layer) (NRETA 2007).

6.3.2 *Calotropis procera* (serious weed of savanna woodlands)

This species was not encountered in GHD surveys.

6.3.3 *Hyptis suaveolens* (declared Class B/C weed in the NT, serious weed of savanna woodlands and potential WONS)

Individuals of this species were observed across the site with their distribution suggesting there is a potential of spread through the lower storey of the woodlands. This species has been known to be an aggressive invader of native vegetation and is a well established weed of the roadsides of the Top End. The risk of this species spreading across the entire site is significant due to its ability to readily adhere to humans, animals and vehicles. It provides a further a risk in that once it is established in the disturbed soils of a roadside, it will be able to advance into surrounding vegetation.

6.3.4 *Jatropha gossypiifolia* (declared Class B/C weed in the NT)

This species was not encountered in GHD surveys.

6.3.5 *Lantana camara* (WONS and declared Class B/C weed in the NT)

This species is listed as a WONS by the Commonwealth Department of Environment, Water, Heritage and the Arts. It is a declared weed by the NT Government listed under the WMA.

It is widespread in the south east of Australia and only isolated populations are known from the Top End of the Northern Territory. *L. camara* was only found in Site 4 as a small patch of 11 individuals growing within vegetation community type 7 (Mixed Species Low Open Forest).

6.3.6 *Passiflora foetida* (serious weed of savanna woodlands)

There is no pattern to the distribution of *Passiflora foetida* across the study area. In no places does it occur at high density or frequency although the largest number of individuals were seen at the northern end of the eastern clearing. This species can form dense mats that can smother native vegetation. This species' seed is dispersed by fauna, especially birds (Smith 2002) and has been in the area for presumably a number of years. At this time it is not considered to be a high environmental risk.

6.3.7 *Pennisetum polystachion* (declared Class B/C weed in the NT and potential WONS)

Pennisetum polystachion is the most prevalent weed observed within the study area. It is most common along roadsides and areas of previous disturbance, although it was also observed as scattered individuals and isolated patches. The greatest environmental risk that this species poses is that provided by the high densities found in the eastern and western cleared areas situated in the middle of the site. Along with *Andropogon gayanus,* this species is responsible for NRETAS concern that excessive fire frequency and intensity may lead to exotic grasses replacing the northern savannas (including the tree layer) (NRETA 2007). These individuals are able to fuel fires altering the vegetation structure surrounding the areas of historical disturbance. Field observation recorded large amounts of seed distributed in dense mats underneath this vegetation and occasionally on the roads.

Blaydin Point is accessed by passing through weed infested clearings. There is a significant risk that this species could be spread from the clearing along the newly created road immediately north, the new causeway transecting the salt-flat, the roadsides on Blaydin Point and throughout the new clearings into the monsoon vine forest. An increase in fire frequency and intensity along the new roads that have cut

into the monsoon vine forest on Blaydin Point may have a significant negative environmental impact on the vegetation community. Fires can open up the canopy leading to the spread of flammable weeds, leaving vine forest patches more vulnerable to hot, late dry season fires (Wightman and Andrews 1989).

6.3.8 *Tribulus cistoides* (native, however is a declared Class B/C weed in the NT)

This species was not encountered in GHD surveys.

6.3.9 Management

Under the WMA the above declared Class B/C weeds, must be managed with respect to the following means:

- B) Reasonable effort must be made to reduce the growth or spread of infestation; and
- C) Not to be introduced into the Territory.

6.4 Significant Species of Fauna

No significant fauna species were recorded at Blaydin Point during the wet or dry season surveys. A number of threatened or migratory species are identified in the NT Fauna Atlas (Appendix B) as occurring in the project area with a 2 km buffer. Additionally, a number of species listed under the EPBC Act are predicted to occur in the same area, according to the EPBC Search Tool. These species and the likelihood of their occurrence in the project area are detailed in the following sections.

6.4.1 Northern Quoll

The northern quoll *Dasyurus hallucatus* has been recorded across the Top End of the Northern Territory and as far south as Alexandria, NT. In recent times the species has experienced a marked contraction in range (Braithwaite and Griffiths, 1994). This has been attributed to numerous potential causal factors including changes in fire regime, vegetation structure, disease and competition with feral cats (Woinarski *et al*., 2001). The decline of the northern quoll has been exacerbated by the recent invasion of the Northern Territory by the cane toad *Bufo marinus,* and the subsequent increase in quoll fatalities due to poisoning (Van Dam *et al*., 2002; Freeland, 2004; Woinarski *et al.*, 2008). Some northern quolls survive the cane toad invasion and populations persist (Woinarski *et al.,* 2008). The recent invasion of Kakadu National Park by the cane toad coincided with a dramatic decline in the abundance of the northern quoll in invaded areas (Burnett, 1997).

The northern quoll was previously recorded from savannah woodland and mangrove fringes at nearby Middle Arm (URS, 2001). There are also 14 records of northern quolls in the project area between 1990 and 2001. Despite the presence of suitable quoll habitat at Blaydin Point, no traces of the northern quoll were detected in the dry or wet season surveys. The cane toad is currently well established, occurring in most habitats within the study area. It is possible that the northern quoll previously occurred at Blaydin Point and has experienced localised declines following the arrival of cane toads. The failure to detect quolls in the recent surveys does not suggest the species does not occur at Blaydin Point. Quolls are relatively secretive and can go undetected in trapping surveys.

6.4.2 Monitors

Two monitors are known from previous data from the area: the sand goanna *Varanus gouldii* and floodplain monitor *Varanus panoptes*. These species were not recorded during the surveys. The floodplain monitor is listed as threatened under the TPWC Act as it is considered by NRETAS to be threatened by the cane toad.

The floodplain monitor was studied in the Borroloola region during invasion by the cane toad (Freeland and Kerin 2008). The monitor's population crashed within five months of the toad's invasion, with dead individuals found throughout area. The population subsequently increased and remained stable at approximately 25% of its former abundance over the subsequent two and a half years of the study. Six of eight floodplain monitors from areas without cane toads attacked live cane toads when they were presented to them. All these monitors died, and the cane toad survived. This included one monitor that had survived prior ingestion of a small cane toad and a consequential long period of semi-consciousness, only to attack a larger cane toad and die the following day. The monitors that did not attack the cane toads survived, having shown no interest in the toxic food item. One of these monitors was provided with a live *Litoria torneri,* which it promptly consumed (Freeland and Kerin 2008). These observations, together with observations of captive varanids from areas with toads avoiding live toads when they are presented, suggest that the invasion causes strong natural selection, leading to a significant change in the behaviour of the varanid population. It is to be expected that linkage disequilibria will result in low and erratic population sizes as the evolution of the new behaviour occurs.

The sand goanna existed in Freeland and Kerin's (2008) study area prior to the arrival of the cane toad. It was not as abundant as the floodplains monitor, and was present in too few numbers to allow quantitative analysis of the impact on the cane toad's invasion. It continued to be recorded throughout the study of the first three years of the cane toad's invasion. A captive sand monitor from a cane toad infested area was tested in captivity by providing it with a live cane toad as food. The gonnna ignored the cane toad. A captive sand monitor from an area without cane toads attacked a cane toad when it was presented. The varanid died.

Griffiths and McKey (2007) reported continuing survival of a population of the water monitor, *Varanus mertensi.*

The future conservation status of the monitors will be dictated by the above evolutionary interaction with the cane toad, and is not expected to be affected by the proposed development.

The spotted tree monitor *Varanus scalaris* was a new record for the project area with three individuals sighted during the wet season survey. This species is not listed as threatened under the EPBC Act or TPWC Act.

6.4.3 Water Mouse

The water mouse *Xeromys myoides* has not been recorded from the area and signs of its presence were not observed during these surveys. If it is present, the removal of mangroves for the proposed development will have a relatively minor negative impact on its habitat availability. Darwin Harbour has approximately 2,000 hectares of mangrove habitat, and there are other large areas of the habitat around the Northern Territory coast.

6.4.4 Black-footed Tree Rat

The black-footed tree rat *Mesembriomys gouldii* is a large rabbit-sized rat with a shaggy appearance. They are found in areas of higher rainfall from the Kimberley to Cape York Peninsula. This species inhabits open forests and woodlands. It is also found in urban areas of Darwin (Cole & Woinarski, 2002).

This species is listed as Near Threatened under the TPWC Act. There is one historical record of the black-footed tree rat from the project area. It was not observed during the wet or dry season survey.

6.4.5 Western Chestnut Mouse

The western chestnut mouse *Pseudomys nanus* is a small nocturnal rodent. It is found throughout the higher rainfall areas of northern Australia from the Kimberley to western Queensland. Its range extends as far south as the Granites mine site in the Tanami Desert. The western chestnut mouse is distributed throughout much of the NT, favouring creekside vegetation, densely vegetated plains, gravely rises and rocky outcrops (Cole & Woinarski, 2002).

This species is listed as Near Threatened under the TPWC Act. There are two records of the western chestnut mouse from 2001. It was not observed during these surveys.

6.4.6 Pale Field-rat

The pale field-rat *Rattus tunneyi* is a small nocturnal rodent. It is found in higher rainfall areas of northern Australia from the Kimberley to south-eastern Queensland. It is widespread across the Top End and is more common in dense vegetation along creeks. It shelters in extensive shallow burrows during the day and feeds on roots, grass stems and seeds. In the NT the breeding season occurs during the dry season (Cole & Woinarski, 2002).

This species is listed as near threatened under the TWPC Act. The range of the pale field-rat formerly extended into arid and semi-arid areas and temperate south-western Australia. There is one record of the pale field-rat in the project area in 2001. It was not recorded during these surveys.

6.4.7 Saltwater Crocodile

The saltwater crocodile *Crocodylus porosus* occurs in Darwin Harbour. The Parks and Wildlife Commission of the Northern Territory conduct a crocodile removal program in Darwin Harbour. Saltwater crocodiles are actively sought (trapping and spotlighting) and removed to farms. Attempts are made to remove all crocodiles reported from the harbour. Approximately 200 crocodiles are removed from the harbour each year (Parks and Wildlife Commission of the Northern Territory *pers. comm.*).

There is one record of an estuarine crocodile (1989) from the immediate Middle Point area. No crocodiles were observed during these surveys.

6.4.8 Waterbirds

The project area does not contain breeding rookeries or extensive areas of wetland suitable for any of the waterbird species recorded in the area (Chatto, 2000). It is unlikely that any significant breeding could occur. The area of habitat within the project area is small relative to Darwin Harbour habitats, and even smaller in relation to far larger and more suitable habitat along the coast and in the floodplains adjacent to Darwin. These latter areas maintain waterbird rookeries (Chatto, 2000).

The waterbird populations in the area are not classifiable as being 'ecologically important' and the area cannot be classified as being 'important habitat' as defined by the EPBC Guidelines on significance.

Seventeen waterbird species were recorded during the wet and dry season surveys including the great egret, little egret, white-faced heron, nankeen night heron *Nycticorax caledonicus*, grey teal, Radjah shelduck *Tadorna radjah* and black-necked stork. The great egret is classified as a marine and migratory species and protected under the EPBC Act. The little egret, nankeen night heron and Radjah shelduck are also considered to be marine species and subsequently protected under the EPBC Act.

6.4.9 Raptors

Five raptor species were recorded from the project area in the dry and wet season surveys. These were the brahminy kite *Haliastur indus*, black kite, whistling kite, brown goshawk and white-bellied sea-eagle *Haliaeetus leucogaster*. All except the black kite are listed as marine species and are protected under the EPBC Act. The white-bellied sea-eagle is also listed as a migratory species under the EPBC Act.

All historical records from the area indicate that raptors are common in appropriate habitat across the Top End with all but two of these being classified by NRETAS as being of 'Least Concern' under the TPWC Act. The red goshawk *Erythrotriorchis radiatus* is listed as Vulnerable under the TPWC Act and EPBC Act and the square tailed kite *Lophoictinia isura* as Near Threatened under the TPWC Act (not listed under the EPBC Act). These species were not recorded in the project area during the surveys. There are no historical records of the red goshawk from the area and only one record of the square-tailed kite.

The red goshawk is a large reddish-brown hawk. It has dark streaks down the breast and strong yellowish feet and legs. It hunts mainly for medium sized birds and occurs across much of northern Australia. It generally occurs in taller forests in high rainfall areas. Its nests are made of sticks, are basket shaped and are typically placed in large trees near watercourses. The project area does not seem to provide habitat characteristics ideal for red goshawk foraging or breeding.

The existing development at Wickham Point, the areas of borrow pit and the associated infrastructure (roads and power lines dissecting the peninsular) also militate against the area providing suitable habitat for the species.

6.4.10 Migrant Shorebirds

Five species of migrant shorebirds were recorded during the surveys (the lesser sand plover *Charadrius mangolus*, Pacific golden plover *Pluvialis fulva*, eastern curlew *Numenius madagascariensis*, whimbrel *Numenius phaeopus* and marsh sandpiper). All are listed as marine and migratory species under the EPBC Act.

Chatto's (2003) long term study of shorebird distribution and abundance along the entire NT coastline demonstrated significant areas for shorebirds east from Darwin to Tree Point, and on islands off Bynoe Harbour. No significant areas for shorebirds were identified within Darwin Harbour.

The study area cannot be defined as 'important habitat' for shorebirds, and nor can the shorebird populations of the area be identified as belonging to 'ecologically important' populations.

6.4.11 Sea Birds

Chatto's (2000) investigation of major congregations of seabirds along the NT coast failed to identify Darwin Harbour as a significant site for seabirds. Although a range of seabirds will periodically occur within the study area, the study area cannot be defined as 'important habitat' for seabirds, and nor can the seabird populations of the area be identified as belonging to 'ecologically important' populations.

6.4.12 Gouldian Finch

The Gouldian finch *Erythrura gouldiae* is a small bird with a purple chest, yellow breast, green back and a pale blue upper collar (mature adults). This species is commonly found in wooded eucalypt hills from February to October and in lowland drainages in the wet season.

It is listed as Endangered under the TPWC Act and the EPBC Act. The Gouldian finch is restricted to isolated areas mostly within the NT and the Kimberley, WA.

This species has not been recorded in the study area and there is an absence of suitable breeding habitat to support this species.

6.4.13 Partridge Pigeon

The partridge pigeon *Geophaps smithii smithii* is a medium sized ground dwelling pigeon that occurs across the Top End of the NT and the Kimberley, WA. It is grey-brown in colour, with a red face and a white leading edge to the wing. The partridge pigeon may occur in large groups around water sources in the late dry season.

The species is listed as Vulnerable under the TPWC Act and the EPBC Act. It occurs mainly in lowland eucalypt forests and woodlands, with grassy understoreys.

This species has not been recorded in the study area and there is an absence of suitable habitat to support the species.

6.4.14 Rainbow Bee-eater

The rainbow bee-eater is a very common bird in the Top End. It is listed as a migratory species under the EPBC Act. There are 69 records (1978-2001) of this species in the area. It was observed 89 times during this survey in the project area.

6.4.15 Fork-tailed Swift

It is likely that the fork-tailed swift will occasionally fly over the project area.

The fork-tailed swift is listed as a migratory species under the EPBC Act. There are five records of the fork-tailed swift (1984-1990). It was not recorded in the project area during this survey.

6.4.16 Barn Swallow

The barn swallow is an occasional migrant to the Top End. This species may occur in the project area, although it usually prefers to forage in areas of open habitat.

The barn swallow is listed as a migratory species under the EPBC Act. There are three records of the barn swallow (1986-1990). It was not recorded in the project area during these surveys.

6.4.17 Derby White-browed Robin

It is assumed that the only historic record (1980) from the project area is the subspecies *Poecilodryas superciliosa cerviniventris* that is known to occur from Derby, WA, to Bourketown, Queensland. It was not recorded during these surveys. It is unlikely that the population of the Derby white-browed robin could be classed as an 'ecologically important population' or the habitat in the study area classed as an 'important habitat'.

The Derby white-browed robin is listed as migratory under the EPBC Act and as Near Threatened under the TPWC Act.

6.4.18 Melville Cicadabird

It is assumed that the 14 historic records (1980-1990) from the project area are the subspecies *Coracina tenuirostris melvillensis* which is the northern sub species. This subspecies is known to occur across the northern parts of Australia from the Kimberley to Cape York Peninsular. It is sedentary and moderately common across northern NT.

This species is listed as migratory under the EPBC Act. The Melville cicadabird was recorded three times during the current surveys.

6.4.19 Bush Stone-curlew

The bush stone-curlew *Burhinus grallarius* has a wide distribution across Australia. In northern Australia it is commonly found in open woodlands, lightly timbered country, mallee and mulga – anywhere with a groundcover of small sparse shrubs, grass or litter of twigs.

It is listed as Near Threatened under the TPWC Act. There are five records (1990-2002) of the bush stone curlew in the project area and it was recorded twice during these surveys.

6.4.20 Beach Stone-curlew

The beach stone curlew *Esacus neglectus* was thought to be experiencing declines in the Northern Territory. However recent monitoring suggests the species numbers and habitats on islands are relatively secure. Nevertheless, the species is considered vulnerable to disturbance. One individual was observed on the salt flat at Site 7. A breeding pair was also observed on the foreshore at the northern end of Blaydin Point.

This species is listed as of least concern under the TPWC Act and as a marine species under the EPBC Act. There are 33 historic records (1986 – 2001) of this species within the project area.

7. Conclusions

The survey recorded 196 species of plant, 109 of which are new records for the area. Survey of the terrestrial vertebrates recorded 148 species. The vertebrate species include nine mammals (including four species of microchiroptera), 106 birds, 22 reptiles and 11 frogs. This is compared to results from the Dames and Moore (1997) survey for the adjacent Conoco Phillips LNG plant EIS which found 164 species of plant, 15 mammals, 90 birds, 11 reptiles and 11 frogs. The vertebrates recorded in this study include the exotic cane toad, the black rat and the feral pig. A separate survey located 12 species of introduced plant.

Only one species of plant is considered threatened with extinction under Northern Territory and/or Commonwealth legislation. This is *Cycas armstrongii* which remains poorly reserved in conservation areas although abundant in the Darwin region.

None of the vertebrates recorded is listed as threatened with extinction. Several species are listed as migratory under the EPBC Act, although none is considered to have “significant habitat” or a “significant population” in the area (as defined under the EPBC Guidelines on Significance). Several species are recorded in the EPBC Search Tool for Protected Matters of National Environmental Significance as possibly occurring in the area. These species have habitat requirements that are not available in the Blaydin Point area.

The ecological communities were defined using vegetation mapping. The communities exhibited characteristic plant species compositions and vegetation structures, and were associated with different animal communities. The animal species are however often distributed across the vegetation communities exhibiting limited habitat specificity. The eucalypt savannas are the more species rich communities for both animals and plants. This is associated with the eucalypt savannas occupying a larger area of the point than other habitats types, and being the most widespread community across the Top End. Large, extensive areas of habitat often harbour higher species richnesses than smaller areas.

The ecological and conservation significance of the monsoon vine forest of the area is difficult to assess, given the loss of at least 60% of this vegetation type in the Darwin area since the end of World War II. The area of monsoon vine forest on Blaydin Point is relatively small and its loss would not be expected to impact observably of bird dispersers of seeds of monsoon forest plants, compared to the current situation. Data are not available to assess the cumulative impact in relation to loss of rainforest since World War II.

The mangrove communities of the area are typical of those surrounding Darwin Harbour. Loss of some relatively small areas would not be expected to impact significantly on the area or productivity of mangroves in Darwin Harbour. The Northern Territory government does not have a target for the conservation of mangrove in Darwin Harbour.

A change seems to have occurred in the status of the mammal community of the area. There has been a significant reduction in abundance and species richness since the Dames and Moore survey reported in 1997. While the prevalence of fire may have increased in association with the expansion of weeds in the area, this does not seem to have impacted on the reptile or bird communities, which have not experienced diminution (other than large bodied varanids that may have succumbed during the cane toad invasion) and are most species rich in areas with extensive ground cover of plants. The decline is peculiar to mammals. It is unlikely to be associated with the arrival of the cane toad, other than the possible loss of the northern quoll. Possible explanations include increasing isolation from adjacent areas, feral cats or an exotic disease.

The areas biodiversity is typical of coastal areas in the Darwin area.

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Appendix A

NRETAS Flora Records for Study Area Plus 2km Buffer

NRETA Flora Records for Study Area Plus 2km Buffer

FAMILY	NAMEINFRA
ACANTHACEAE	*Acanthus ilicifolius*
ACANTHACEAE	*Hypoestes floribunda var. indeterminate*
ADIANTACEAE	*Cheilanthes fragillima*
ADIANTACEAE	*Cheilanthes tenuifolia*
ANACARDIACEAE	*Buchanania obovata*
ANNONACEAE	*Cyathostemma glabrum*
ANNONACEAE	*Miliusa traceyi*
APOCYNACEAE	*Alstonia actinophylla*
APOCYNACEAE	*Alyxia spicata*
APOCYNACEAE	*Ichnocarpus frutescens*
APOCYNACEAE	*Parsonsia velutina*
APOCYNACEAE	*Tabernaemontana orientalis*
APOCYNACEAE	*Wrightia pubescens subsp. pubescens*
ARECACEAE	*Livistona humilis*
ARISTOLOCHIACEAE	*Aristolochia holtzei*
ARISTOLOCHIACEAE	*Aristolochia indica**
ASCLEPIADACEAE	*Calotropis procera**
ASCLEPIADACEAE	*Cynanchum carnosum*
ASCLEPIADACEAE	*Gymnanthera oblonga*
ASCLEPIADACEAE	*Marsdenia connivens*
ASCLEPIADACEAE	*Marsdenia geminata*
ASCLEPIADACEAE	*Secamone elliptica*
ASCLEPIADACEAE	*Tylophora cinerascens*
ASCLEPIADACEAE	*Tylophora flexuosa*
ASTERACEAE	*Blumea saxatilis*
ASTERACEAE	*Pleurocarpaea denticulata*
ASTERACEAE	*Pterocaulon serrulatum var. indeterminate*
AVICENNIACEAE	*Avicennia marina var. eucalyptifolia*

FAMILY	NAMEINFRA
BIGNONIACEAE	*Dolichandrone filiformis*
BOMBACACEAE	*Bombax ceiba*
BOMBACACEAE	*Camptostemon schultzii*
BORAGINACEAE	*Cordia subcordata*
BORAGINACEAE	*Heliotropium ventricosum*
BURSERACEAE	*Canarium australianum*
CAESALPINIACEAE	*Bauhinia binata*
CAESALPINIACEAE	*Erythrophleum chlorostachys*
CAESALPINIACEAE	*Peltophorum pterocarpum*
CAPPARACEAE	*Capparis sepiaria*
CELASTRACEAE	*Denhamia obscura*
CHENOPODIACEAE	*Halosarcia halocnemoides subsp. indeterminate*
COMBRETACEAE	*Lumnitzera racemosa*
COMMELINACEAE	*Cartonema parviflorum*
CONVOLVULACEAE	*Evolvulus nummularis**
CONVOLVULACEAE	*Ipomoea eriocarpa*
CONVOLVULACEAE	*Ipomoea graminea*
CONVOLVULACEAE	*Ipomoea pes-caprae subsp. brasiliensis*
CONVOLVULACEAE	*Ipomoea quamoclit**
CONVOLVULACEAE	*Jacquemontia paniculata*
CONVOLVULACEAE	*Merremia aegyptia*
CONVOLVULACEAE	*Operculina brownii*
CYCADACEAE	*Cycas armstrongii*
CYPERACEAE	*Bulbostylis barbata*
CYPERACEAE	*Fimbristylis cymosa*
CYPERACEAE	*Fimbristylis dichotoma*
CYPERACEAE	*Fimbristylis polytrichoides*
CYPERACEAE	*Fimbristylis sp. Darwin (M.Lazarides 4251)*
DAVALLIACEAE	*Nephrolepis hirsutula*

FAMILY	NAMEINFRA
DILLENIACEAE	*Pachynema junceum*
DIOSCOREACEAE	*Dioscorea transversa*
EBENACEAE	*Diospyros calycantha*
EBENACEAE	*Diospyros compacta*
EBENACEAE	*Diospyros cordifolia*
ELAEOCARPACEAE	*Elaeocarpus arnhemicus*
ERIOCAULACEAE	*Eriocaulon cinereum*
ERIOCAULACEAE	*Eriocaulon spectabile*
ERIOCAULACEAE	*Eriocaulon tortuosum*
EUPHORBIACEAE	*Antidesma ghesaembilla*
EUPHORBIACEAE	*Breynia cernua*
EUPHORBIACEAE	*Bridelia tomentosa*
EUPHORBIACEAE	*Croton argyratus*
EUPHORBIACEAE	*Croton arnhemicus*
EUPHORBIACEAE	*Croton habrophyllus*
EUPHORBIACEAE	*Drypetes deplanchei*
EUPHORBIACEAE	*Excoecaria ovalis*
EUPHORBIACEAE	*Flueggea virosa subsp. melanthesoides*
EUPHORBIACEAE	*Glochidion xerocarpum*
EUPHORBIACEAE	*Jatropha gossypiifolia*
EUPHORBIACEAE	*Macaranga involucrata var. mallotoides*
EUPHORBIACEAE	*Petalostigma quadriloculare*
FABACEAE	*Abrus precatorius subsp. precatorius*
FABACEAE	*Canavalia papuana*
FABACEAE	*Clitoria australis*
FABACEAE	*Dalbergia candenatensis*
FABACEAE	*Desmodium heterocarpon var. strigosum*
FABACEAE	*Desmodium pullenii*
FABACEAE	*Indigofera linifolia*

FAMILY	NAMEINFRA
FABACEAE	*Pycnospora lutescens*
FABACEAE	*Tephrosia juncea*
FABACEAE	*Tephrosia nematophylla*
FABACEAE	*Tephrosia remotiflora*
FABACEAE	*Vigna radiata var. sublobata*
FLACOURTIACEAE	*Flacourtia territorialis*
FLAGELLARIACEAE	*Flagellaria indica*
GENTIANACEAE	*Canscora diffusa*
HERNANDIACEAE	*Gyrocarpus americanus*
LAURACEAE	*Cassytha filiformis*
LAURACEAE	*Cryptocarya cunninghamii*
LAURACEAE	*Litsea glutinosa*
LECYTHIDACEAE	*Planchonia careya*
LILIACEAE	*Protasparagus racemosus*
LILIACEAE	*Thysanotus banksii*
LOGANIACEAE	*Mitrasacme secedens*
LOGANIACEAE	*Strychnos lucida*
LORANTHACEAE	*Amyema mackayensis subsp. cycnei-sinus*
LYTHRACEAE	*Pemphis acidula*
MALVACEAE	*Abelmoschus moschatus subsp. tuberosus*
MALVACEAE	*Hibiscus meraukensis*
MALVACEAE	*Hibiscus sabdariffa*
MALVACEAE	*Hibiscus tiliaceus*
MALVACEAE	*Thespesia populneoides*
MELIACEAE	*Dysoxylum acutangulum subsp. foveolatum*
MELIACEAE	*Xylocarpus moluccensis*
MENISPERMACEAE	*Tinospora smilacina*
MIMOSACEAE	*Acacia auriculiformis*
MIMOSACEAE	*Acacia holosericea*

FAMILY	NAMEINFRA
MIMOSACEAE	*Acacia oncinocarpa*
MIMOSACEAE	*Desmanthus virgatus**
MORACEAE	*Trophis scandens subsp. scandens*
MYRSINACEAE	*Aegiceras corniculatum*
MYRTACEAE	*Corymbia bleeseri*
MYRTACEAE	*Corymbia foelscheana*
MYRTACEAE	*Corymbia polycarpa*
MYRTACEAE	*Corymbia polysciada*
MYRTACEAE	*Eucalyptus miniata*
MYRTACEAE	*Eucalyptus tectifica*
MYRTACEAE	*Eucalyptus tetrodonta*
MYRTACEAE	*Melaleuca cajuputi subsp. indeterminate*
MYRTACEAE	*Melaleuca leucadendra*
MYRTACEAE	*Melaleuca viridiflora*
MYRTACEAE	*Osbornia octodonta*
MYRTACEAE	*Verticordia cunninghamii*
NYCTAGINACEAE	*Pisonia aculeata*
OLEACEAE	*Jasminum aemulum*
OLEACEAE	*Jasminum didymum subsp. didymum*
OLEACEAE	*Jasminum molle*
OLEACEAE	*Notelaea sp. Elcho Island (C.R.Dunlop 7597)*
ONAGRACEAE	*Ludwigia hyssopifolia*
ONAGRACEAE	*Ludwigia octovalvis*
OPILIACEAE	*Opilia amentacea*
PANDANACEAE	*Pandanus spiralis*
PASSIFLORACEAE	*Adenia heterophylla subsp. australis*
PASSIFLORACEAE	*Passiflora foetida**
PEDALIACEAE	*Sesamum indicum**
PIPERACEAE	*Peperomia pellucida**

FAMILY	NAMEINFRA
PITTOSPORACEAE	*Auranticarpa melanosperma*
PLUMBAGINACEAE	*Aegialitis annulata*
POACEAE	*Aristida macroclada subsp. indeterminate*
POACEAE	*Eragrostis amabilis*
POACEAE	*Eragrostis cumingii*
POACEAE	*Mnesithea rottboellioides*
POACEAE	*Paspalidium rarum*
POACEAE	*Pennisetum polystachion subsp. polystachion*
POACEAE	*Sorghum bicolor*
POACEAE	*Thaumastochloa striata*
POACEAE	*Themeda arguens*
POLYGALACEAE	*Polygala eriocephala*
POLYGALACEAE	*Polygala longifolia*
POLYGALACEAE	*Polygala orbicularis var. orbicularis*
PROTEACEAE	*Banksia dentata*
PROTEACEAE	*Grevillea decurrens*
PROTEACEAE	*Grevillea pteridifolia*
PROTEACEAE	*Hakea arborescens*
PROTEACEAE	*Stenocarpus verticis*
RHAMNACEAE	*Alphitonia excelsa*
RHAMNACEAE	*Ziziphus oenopolia*
RHIZOPHORACEAE	*Bruguiera exaristata*
RHIZOPHORACEAE	*Bruguiera gymnorhiza*
RHIZOPHORACEAE	*Bruguiera parviflora*
RHIZOPHORACEAE	*Ceriops australis*
RHIZOPHORACEAE	*Ceriops tagal*
RHIZOPHORACEAE	*Rhizophora stylosa*
RUBIACEAE	*Aidia racemosa*
RUBIACEAE	*Cyclophyllum schultzii f. indeterminate*

FAMILY	NAMEINFRA
RUBIACEAE	*Dentella dioeca*
RUBIACEAE	*Gardenia megasperma*
RUBIACEAE	*Guettarda speciosa*
RUBIACEAE	*Knoxia stricta*
RUBIACEAE	*Mitracarpus hirtus*
RUBIACEAE	*Pavetta brownii var. brownii*
RUBIACEAE	*Psydrax odorata subsp. arnhemica*
RUBIACEAE	*Scyphiphora hydrophylacea*
RUTACEAE	*Boronia lanceolata*
RUTACEAE	*Glycosmis trifoliata*
RUTACEAE	*Micromelum minutum*
RUTACEAE	*Zanthoxylum parviflorum*
SANTALACEAE	*Exocarpos latifolius*
SAPINDACEAE	*Allophylus cobbe*
SAPINDACEAE	*Cupaniopsis anacardioides*
SAPINDACEAE	*Distichostemon hispidulus var. indeterminate*
SAPINDACEAE	*Dodonaea platyptera*
SAPINDACEAE	*Ganophyllum falcatum*
SAPOTACEAE	*Mimusops elengi*
SAPOTACEAE	*Pouteria sericea*
SCHIZAEACEAE	*Schizaea dichotoma*
SCROPHULARIACEAE	*Buchnera linearis*
SCROPHULARIACEAE	*Buchnera tetragona*
SCROPHULARIACEAE	*Lindernia lobelioides*
SCROPHULARIACEAE	*Lindernia scapigera*
SCROPHULARIACEAE	*Stemodia lythrifolia*
SMILACACEAE	*Smilax australis*
SOLANACEAE	*Solanum torvum**
SONNERATIACEAE	*Sonneratia alba*

FAMILY	NAMEINFRA
STERCULIACEAE	*Helicteres hirsuta*
STERCULIACEAE	*Helicteres isora*
STERCULIACEAE	*Helicteres sp. Darwin (S.T.Blake 16793)*
STERCULIACEAE	*Sterculia quadrifida*
TACCACEAE	*Tacca leontopetaloides*
THELYPTERIDACEAE	*Cyclosorus interruptus*
THYMELAEACEAE	*Thecanthes punicea*
TILIACEAE	*Grewia breviflora*
TILIACEAE	*Triumfetta rhomboidea*
ULMACEAE	*Celtis philippensis*
ULMACEAE	*Trema tomentosa var. indeterminate*
VERBENACEAE	*Clerodendrum costatum*
VERBENACEAE	*Clerodendrum inerme*
VERBENACEAE	*Clerodendrum tatei*
VERBENACEAE	*Lantana camara*
VERBENACEAE	*Premna acuminata*
VERBENACEAE	*Premna odorata*
VERBENACEAE	*Premna serratifolia*
VERBENACEAE	*Vitex acuminata*
VERBENACEAE	*Vitex glabrata*
VERBENACEAE	*Vitex rotundifolia*
VITACEAE	*Ampelocissus acetosa*
VITACEAE	*Cayratia maritima*
ZYGOPHYLLACEAE	*Tribulus cistoides***

* = denotes introduced species.

** = denotes considered native (or at least a pre-European entrant), however gazetted in the NT as a noxious weed (Cowie *pers. comm* 2008; Smith 2002).

Appendix B

NT Fauna Atlas Records for Study Area Plus 2 km Buffer

NT Fauna Atlas Records, Year Collected and TPWC/EPBC 2007 Status

FAMILY	*Full Name*	Common Name	YEAR	2007_ TPWCA	2007_ EPBCA
Amphibians					
Hylidae	*Cyclorana australis*	Giant Frog	1992	DD	
Hylidae	*Litoria caerulea*	Green Tree-frog	1992	LC	
Hylidae	*Litoria nasuta*	Rocket Frog	1992	LC	
Hylidae	*Litoria rubella*	Red Tree-frog	1992	LC	
Bufonidae	*Bufo marinus*	Cane Toad	1996	Introduced	
Reptiles					
Crocodylidae	*Crocodylus johnstoni*	Freshwater Crocodile	1989	LC	
Crocodylidae	*Crocodylus porosus*	Saltwater Crocodile	1986	LC	
Gekkonidae	*Hemidactylus frenatus*	Asian House Gecko	2001	Introduced	
Gekkonidae	*Heteronotia binoei*	Bynoe's Gecko	1994	LC	
Pygopodidae	*Lialis burtonis*	Burton's Legless Lizard	2000	LC	
Agamidae	*Chlamydosaurus kingii*	Frilled Lizard	1992	LC	
Agamidae	*Diporiphora bilineata*	Two-Lined Dragon	2000	LC	
Varanidae	*Varanus gouldii*	Sand Goanna	1997	LC	
Varanidae	*Varanus panoptes*	Floodplain Monitor	1990	VU	
Scincidae	*Carlia gracilis*	Slender Rainbow Skink	2001	LC	
Scincidae	*Carlia munda*	Striped Rainbow Skink	1990	LC	
Scincidae	*Carlia rufilatus*	Red-Sided Rainbow Skink	1990	LC	
Scincidae	*Cryptoblepharus plagiocephalus*	Aboreal Snake-Eyed Skink	1990	LC	
Scincidae	*Ctenotus robustus*	Robust Ctenotus	2001	LC	
Scincidae	*Morethia storri*	Storr's Snake-Eyed Skink	2001	LC	
Scincidae	*Tiliqua scincoides*	Common Blue-Tongued Lizard	2000	DD	
Typhlopidae	*Ramphotyphlops*	Northern Blind Snake	2001	LC	

FAMILY	*Full Name*	Common Name	YEAR	2007_ TPWCA	2007_ EPBCA
	diversus				
Boidae	*Antaresia childreni*	Children's Python	2001	DD	
Boidae	*Liasis fuscus*	Water Python	1990	LC	
Boidae	*Morelia spilota*	Carpet Python	2000	LC	
Colubridae	*Dendrelaphis punctulatus*	Green Tree Snake	1996	DD	
Colubridae	*Fordonia leucobalia*	White-bellied Mangrove Snake	1990	LC	
Colubridae	*Myron richardsonii*	Richardson's Mangrove Snake	1984	LC	
Colubridae	*Tropidonophis mairii*	Keelback	1992	LC	
Elapidae	*Demansia papuensis*	Papaun Whip Snake	1990	DD	
Elapidae	*Demansia vestigiata*	Black Whip Snake	1992	DD	
Elapidae	*Furina ornata*	Orange-naped Snake	2000	LC	
Elapidae	*Pseudonaja nuchalis*	Western Brown Snake	2000	LC	
Elapidae	*Cryptophis pallidiceps*	Northern Small-eyed Snake	1997	DD	
Elapidae	*Vermicella annulata*	Bandy Bandy	1990	LC	
Aves					
Megapodiidae	*Megapodius reinwardt*	Orange-footed Scrubfowl	1999	LC	
Phasianidae	*Coturnix ypsilophora*	Brown Quail	1987	LC	
Phasianidae	*Coturnix chinensis*	King Quail	1984	LC	
Anseranatidae	*Anseranas semipalmata*	Magpie Goose	1984	LC	
Anatidae	*Dendrocygna arcuata*	Wandering Whistling-Duck	1987	LC	
Anatidae	*Dendrocygna eytoni*	Plumed Whistling-Duck	1984	LC	
Anatidae	*Tadorna radjah*	Radjah Shelduck	1987	LC	
Anatidae	*Nettapus pulchellus*	Green Pygmy-Goose	1986	LC	
Anatidae	*Anas superciliosa*	Pacific Black Duck	1986	LC	
Anatidae	*Anas gracilis*	Grey Teal	1984	LC	

FAMILY	*Full Name*	Common Name	YEAR	2007_ TPWCA	2007_ EPBCA
Anatidae	*Malacorhynchus membranaceus*	Pink-eared Duck	2002	LC	
Anatidae	*Aythya australis*	Hardhead	1984	LC	
Podicipedidae	*Tachybaptus novaehollandiae*	Australasian Grebe	2002	LC	
Anhingidae	*Anhinga melanogaster*	Darter	1994	LC	
Phalacrocoracidae	*Phalacrocorax melanoleucos*	Little Pied Cormorant	1999	LC	
Phalacrocoracidae	*Phalacrocorax varius*	Pied Cormorant	1998	LC	
Phalacrocoracidae	*Phalacrocorax sulcirostris*	Little Black Cormorant	1999	LC	
Phalacrocoracidae	*Phalacrocorax carbo*	Great Cormorant	1985	LC	
Pelecanidae	*Pelecanus conspicillatus*	Australian Pelican	1999	LC	
Ardeidae	*Egretta novaehollandiae*	White-faced Heron	2002	LC	
Ardeidae	*Egretta garzetta*	Little Egret	1998	LC	
Ardeidae	*Egretta sacra*	Eastern Reef Egret	1984	LC	
Ardeidae	*Ardea sumatrana*	Great-billed Heron	1995	LC	
Ardeidae	*Ardea picata*	Pied Heron	1986	LC	
Ardeidae	*Ardea alba*	Great Egret	2002	LC	
Ardeidae	*Ardea intermedia*	Intermediate Egret	1984	LC	
Ardeidae	*Ardea ibis*	Cattle Egret	1994	LC	
Ardeidae	*Butorides striatus*	Striated Heron	1986	LC	
Ardeidae	*Nycticorax caledonicus*	Nankeen Night Heron	2002	LC	
Ardeidae	*Ixobrychus flavicollis*	Black Bittern	1992	DD	
Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	1984	LC	
Threskiornithidae	*Threskiornis molucca*	Australian White Ibis	1994	LC	
Threskiornithidae	*Threskiornis spinicollis*	Straw-necked Ibis	1990	LC	
Threskiornithidae	*Platalea regia*	Royal Spoonbill	1986	LC	
Ciconiidae	*Ephippiorhynchus asiaticus*	Black-necked Stork	1994	LC	

FAMILY	*Full Name*	Common Name	YEAR	2007_ TPWCA	2007_ EPBCA
Accipitridae	*Pandion haliaetus*	Osprey	1994	LC	
Accipitridae	*Elanus axillaris*	Black-shouldered Kite	1978	LC	
Accipitridae	*Lophoictinia isura*	Square-tailed Kite	1990	NT	
Accipitridae	*Hamirostra melanosternon*	Black-breasted Buzzard	2001	LC	
Accipitridae	*Milvus migrans*	Black Kite	1999	LC	
Accipitridae	*Haliastur sphenurus*	Whistling Kite	1990	LC	
Accipitridae	*Haliastur indus*	Brahminy Kite	2000	LC	
Accipitridae	*Haliaeetus leucogaster*	White-bellied Sea-eagle	1987	LC	
Accipitridae	*Circus assimilis*	Spotted Harrier	1988	LC	
Accipitridae	*Accipiter fasciatus*	Brown Goshawk	1992	LC	
Accipitridae	*Accipiter novaehollandiae*	Grey Goshawk	1984	LC	
Accipitridae	*Accipiter cirrhocephalus*	Collared Sparrowhawk	1992	LC	
Accipitridae	*Aquila audax*	Wedge-tailed Eagle	1986	LC	
Accipitridae	*Hieraaetus morphnoides*	Little Eagle	1999	LC	
Falconidae	*Falco berigora*	Brown Falcon	1985	LC	
Falconidae	*Falco longipennis*	Australian Hobby	1988	LC	
Falconidae	*Falco subniger*	Black Falcon	1986	LC	
Falconidae	*Falco cenchroides*	Nankeen Kestrel	1990	LC	
Rallidae	*Gallirallus philippensis*	Buff-banded Rail	1999	LC	
Rallidae	*Porzana pusilla*	Baillon's Crake	1984	DD	
Rallidae	*Porzana tabuensis*	Spotless Crake	1993	DD	
Rallidae	*Porzana cinerea*	White-browed Crake	1984	LC	
Rallidae	*Eulabeornis castaneoventris*	Chestnut Rail	1992	LC	
Rallidae	*Fulica atra*	Eurasian Coot	1984	LC	
Scolopacidae	*Gallinago stenura*	Pin-tailed Snipe	1985	DD	
Scolopacidae	*Gallinago megala*	Swinhoe's Snipe	1985	DD	

FAMILY	*Full Name*	Common Name	YEAR	2007_ TPWCA	2007_ EPBCA
Scolopacidae	*Limosa limosa*	Black-tailed Godwit	1985	LC	
Scolopacidae	*Limosa lapponica*	Bar-tailed Godwit	1994	LC	
Scolopacidae	*Numenius minutus*	Little Curlew	1984	LC	
Scolopacidae	*Numenius phaeopus*	Whimbrel	1987	LC	
Scolopacidae	*Numenius madagascariensis*	Eastern Curlew	1987	LC	
Scolopacidae	*Tringa stagnatilis*	Marsh Sandpiper	1985	LC	
Scolopacidae	*Tringa nebularia*	Common Greenshank	1987	LC	
Scolopacidae	*Xenus cinereus*	Terek Sandpiper	1986	LC	
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	1986	LC	
Scolopacidae	*Heteroscelus brevipes*	Grey-tailed Tattler	1987	LC	
Scolopacidae	*Arenaria interpres*	Ruddy Turnstone	1994	LC	
Scolopacidae	*Calidris tenuirostris*	Great Knot	1994	LC	
Scolopacidae	*Calidris canutus*	Red Knot	1984	LC	
Scolopacidae	*Calidris alba*	Sanderling	1986	LC	
Scolopacidae	*Calidris ruficollis*	Red-necked Stint	1987	LC	
Scolopacidae	*Calidris melanotos*	Pectoral Sandpiper	1984	DD	
Scolopacidae	*Calidris acuminata*	Sharp-tailed Sandpiper	2000	LC	
Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	1984	LC	
Scolopacidae	*Limicola falcinellus*	Broad-billed Sandpiper	1987	NE	
Scolopacidae	*Phalaropus lobatus*	Red-necked Phalarope	1987	NE	
Jacanidae	*Irediparra gallinacea*	Comb-crested Jacana	1977	LC	
Burhinidae	*Burhinus grallarius*	Bush Stone-curlew	2000	NT	
Burhinidae	*Esacus neglectus*	Beach Stone-curlew	1986	LC	
Haematopodidae	*Haematopus longirostris*	Pied Oystercatcher	1995	LC	
Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt	1987	LC	
Recurvirostridae	*Recurvirostra novaehollandiae*	Red-necked Avocet	1987	LC	
Charadriidae	*Pluvialis fulva*	Pacific Golden Plover	1986	LC	

FAMILY	*Full Name*	Common Name	YEAR	2007_ TPWCA	2007_ EPBCA
Charadriidae	*Pluvialis squatarola*	Grey Plover	1994	LC	
Charadriidae	*Pluvialis squatarola*	Grey Plover	1987	LC	
Charadriidae	*Charadrius dubius*	Little Ringed Plover	1986	NE	
Charadriidae	*Charadrius ruficapillus*	Red-capped Plover	1984	LC	
Charadriidae	*Charadrius mongolus*	Lesser Sand Plover	1985	LC	
Charadriidae	*Charadrius leschenaultii*	Greater Sand Plover	1984	LC	
Charadriidae	*Charadrius veredus*	Oriental Plover	1985	LC	
Charadriidae	*Elseyornis melanops*	Black-fronted Dotterel	1984	LC	
Charadriidae	*Erythrogonys cinctus*	Red-kneed Dotterel	1987	LC	
Charadriidae	*Vanellus miles*	Masked Lapwing	1987	LC	
Glareolidae	*Glareola maldivarum*	Oriental Pratincole	1984	LC	
Glareolidae	*Stiltia isabella*	Australian Pratincole	1984	LC	
Laridae	*Larus novaehollandiae*	Silver Gull	1995	LC	
Laridae	*Sterna nilotica*	Gull-billed Tern	1987	LC	
Laridae	*Sterna caspia*	Caspian Tern	1984	LC	
Laridae	*Sterna bengalensis*	Lesser Crested Tern	1986	LC	
Laridae	*Sterna bergii*	Crested Tern	1984	LC	
Laridae	*Sterna hirundo*	Common Tern	1986	LC	
Laridae	*Sterna albifrons*	Little Tern	1995	LC	
Laridae	*Chlidonias hybridus*	Whiskered Tern	2002	LC	
Laridae	*Chlidonias leucopterus*	White-winged Black Tern	1994	LC	
Columbidae	*Columba livia*	Rock Dove	1986	Introduced	
Columbidae	*Chalcophaps indica*	Emerald Dove	1998	LC	
Columbidae	*Phaps chalcoptera*	Common Bronzewing	1992	LC	
Columbidae	*Geopelia cuneata*	Diamond Dove	1986	LC	
Columbidae	*Geopelia placida*	Peaceful Dove	1990	LC	
Columbidae	*Geopelia humeralis*	Bar-shouldered Dove	2001	LC	

FAMILY	*Full Name*	Common Name	YEAR	2007_ TPWCA	2007_ EPBCA
Columbidae	*Ptilinopus regina*	Rose-crowned Fruit-dove	1986	LC	
Columbidae	*Ducula bicolor*	Pied Imperial Pigeon	2002	LC	
Cacatuidae	*Calyptorhynchus banksii*	Red-tailed Black-cockatoo	2000	NT\LC	
Cacatuidae	*Cacatua roseicapilla*	Galah	1997	LC	
Cacatuidae	*Cacatua sanguinea*	Little Corella	1990	LC	
Cacatuidae	*Cacatua galerita*	Sulphur-crested Cockatoo	2001	LC	
Cacatuidae	*Nymphicus hollandicus*	Cockatiel	1986	LC	
Psittacidae	*Trichoglossus haematodus*	Rainbow Lorikeet	1986	LC	
Psittacidae	*Psitteuteles versicolor*	Varied Lorikeet	1987	LC	
Psittacidae	*Aprosmictus erythropterus*	Red-winged Parrot	1998	LC	
Psittacidae	*Platycercus venustus*	Northern Rosella	2001	LC	
Cuculidae	*Cuculus saturatus*	Oriental Cuckoo	1987	LC	
Cuculidae	*Cacomantis variolosus*	Brush Cuckoo	1984	LC	
Cuculidae	*Chalcites basalis*	Horsfield's Bronze-Cuckoo	1990	LC	
Cuculidae	*Chalcites minutillus*	Little Bronze-Cuckoo	1987	LC	
Cuculidae	*Eudynamys scolopacea*	Common Koel	1989	LC	
Centropodidae	*Centropus phasianinus*	Pheasant Coucal	1987	LC	
Strigidae	*Ninox novaeseelandiae*	Boobook Owl	2001	LC	
Podargidae	*Podargus strigoides*	Tawny Frogmouth	1995	LC	
Caprimulgidae	*Eurostopodus argus*	Spotted Nightjar	1990	LC	
Caprimulgidae	*Caprimulgus macrurus*	Large-tailed Nightjar	1992	LC	
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar	1997	LC	
Apodidae	*Apus pacificus*	Fork-tailed Swift	1984	LC	
Alcedinidae	*Alcedo azurea*	Azure Kingfisher	1999	LC	

FAMILY	*Full Name*	Common Name	YEAR	2007_ TPWCA	2007_ EPBCA
Alcedinidae	*Alcedo pusilla*	Little Kingfisher	1992	LC	
Halcyonidae	*Dacelo leachii*	Blue-winged Kookaburra	1990	DD	
Halcyonidae	*Todiramphus macleayii*	Forest Kingfisher	1998	LC	
Halcyonidae	*Todiramphus pyrrhopygia*	Red-backed Kingfisher	2001	LC	
Halcyonidae	*Todiramphus sanctus*	Sacred Kingfisher	1999	LC	
Halcyonidae	*Todiramphus chloris*	Collared Kingfisher	1987	LC	
Meropidae	*Merops ornatus*	Rainbow Bee-eater	1986	LC	
Coraciidae	*Eurystomus orientalis*	Dollarbird	1987	LC	
Pittidae	*Pitta iris*	Rainbow Pitta	1998	LC	
Climacteridae	*Climacteris melanura*	Black-tailed Treecreeper	2001	LC	
Maluridae	*Malurus melanocephalus*	Red-backed Fairy-wren	1992	LC	
Pardalotidae	*Pardalotus striatus*	Striated Pardalote	2001	LC	
Pardalotidae	*Smicrornis brevirostris*	Weebill	1999	LC	
Pardalotidae	*Gerygone levigaster*	Mangrove Gerygone	1986	LC	
Pardalotidae	*Gerygone magnirostris*	Large-billed Gerygone	1985	LC	
Pardalotidae	*Gerygone chloronotus*	Green-backed Gerygone	1990	LC	
Meliphagidae	*Philemon buceroides*	Helmeted Friarbird	1992	LC	
Meliphagidae	*Philemon argenticeps*	Silver-crowned Friarbird	1985	LC	
Meliphagidae	*Philemon citreogularis*	Little Friarbird	1998	LC	
Meliphagidae	*Entomyzon cyanotis*	Blue-faced Honeyeater	2001	LC	
Meliphagidae	*Manorina flavigula*	Yellow-throated Miner	1990	LC	
Meliphagidae	*Lichenostomus unicolor*	White-gaped Honeyeater	1990	LC	
Meliphagidae	*Melithreptus albogularis*	White-throated Honeyeater	2001	LC	
Meliphagidae	*Lichmera indistincta*	Brown Honeyeater	2001	LC	
Meliphagidae	*Ramsayornis fasciatus*	Bar-breasted	1992	LC	

FAMILY	*Full Name*	Common Name	YEAR	2007_ TPWCA	2007_ EPBCA
		Honeyeater			
Meliphagidae	*Conopophila albogularis*	Rufous-banded Honeyeater	1987	LC	
Meliphagidae	*Conopophila rufogularis*	Rufous-throated Honeyeater	1990	LC	
Meliphagidae	*Myzomela obscura*	Dusky Honeyeater	1986	LC	
Meliphagidae	*Myzomela erythrocephala*	Red-headed Honeyeater	1989	LC	
Petroicidae	*Microeca flavigaster*	Lemon-bellied Flycatcher	1979	LC	
Petroicidae	*Peneoenanthe pulverulenta*	Mangrove Robin	2002	LC	
Petroicidae	*Poecilodryas superciliosa*	White-browed Robin	1980	NT	
Pomatostomidae	*Pomatostomus temporalis*	Grey-crowned Babbler	1999	LC	
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	1990	LC	
Pachycephalidae	*Pachycephala melanura*	Mangrove Golden Whistler	1999	LC	
Pachycephalidae	*Pachycephala simplex*	Grey Whistler	1986	LC	
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler	2001	LC	
Pachycephalidae	*Pachycephala lanioides*	White-breasted Whistler	1986	LC	
Pachycephalidae	*Colluricincla megarhyncha*	Little Shrike-thrush	2002	LC	
Pachycephalidae	*Colluricincla harmonica*	Grey Shrike-thrush	2001	LC	
Dicruridae	*Myiagra ruficollis*	Broad-billed Flycatcher	2002	LC	
Dicruridae	*Myiagra rubecula*	Leaden Flycatcher	2000	LC	
Dicruridae	*Myiagra alecto*	Shining Flycatcher	1987	LC	
Dicruridae	*Myiagra inquieta*	Restless Flycatcher	1990	LC	
Dicruridae	*Grallina cyanoleuca*	Magpie-lark	1999	LC	
Dicruridae	*Rhipidura dryas*	Arafura Fantail	1985	LC	

FAMILY	*Full Name*	Common Name	YEAR	2007_ TPWCA	2007_ EPBCA
Dicruridae	*Rhipidura phasiana*	Mangrove Grey Fantail	1999	LC	
Dicruridae	*Rhipidura rufiventris*	Northern Fantail	1986	LC	
Dicruridae	*Rhipidura leucophrys*	Willie Wagtail	1999	LC	
Dicruridae	*Dicrurus bracteatus*	Spangled Drongo	1986	LC	
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	1984	LC	
Campephagidae	*Coracina papuensis*	White-bellied Cuckoo-shrike	1990	LC	
Campephagidae	*Coracina tenuirostris*	Cicadabird	1987	LC	
Campephagidae	*Lalage sueurii*	White-winged Triller	1999	LC	
Campephagidae	*Lalage leucomela*	Varied Triller	1986	LC	
Oriolidae	*Oriolus flavocinctus*	Yellow Oriole	1987	LC	
Oriolidae	*Oriolus sagittatus*	Olive-backed Oriole	2001	LC	
Oriolidae	*Sphecotheres viridis*	Figbird	1998	LC	
Artamidae	*Artamus leucorynchus*	White-breasted Woodswallow	2002	LC	
Artamidae	*Artamus personatus*	Masked Woodswallow	2001	LC	
Artamidae	*Artamus minor*	Little Woodswallow	1990	LC	
Artamidae	*Cracticus quoyi*	Black Butcherbird	2002	LC	
Artamidae	*Cracticus argenteus*	Silver-backed Butcherbird	1977	LC	
Artamidae	*Cracticus torquatus*	Grey Butcherbird	2001	LC	
Artamidae	*Cracticus nigrogularis*	Pied Butcherbird	1990	LC	
Corvidae	*Corvus orru*	Torresian Crow	1990	LC	
Ptilonorhynchidae	*Chlamydera nuchalis*	Great Bowerbird	1984	LC	
Alaudidae	*Mirafra javanica*	Singing Bushlark	1986	LC	
Motacillidae	*Anthus novaeseelandiae*	Richard's Pipit	1979	LC	
Motacillidae	*Motacilla flava*	Yellow Wagtail	1986	NE	
Passeridae	*Taeniopygia bichenovii*	Double-barred Finch	1985	LC	
Passeridae	*Poephila acuticauda*	Long-tailed Finch	2002	LC	

FAMILY	*Full Name*	Common Name	YEAR	2007_ TPWCA	2007_ EPBCA
Passeridae	*Poephila personata*	Masked Finch	1990	LC	
Passeridae	*Neochmia phaeton*	Crimson Finch	1986	LC	
Passeridae	*Lonchura castaneothorax*	Chestnut-breasted Mannikin	2000	LC	
Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird	1999	LC	
Hirundinidae	*Hirundo rustica*	Barn Swallow	1986	NE	
Hirundinidae	*Hirundo neoxena*	Welcome Swallow	1986	LC	
Hirundinidae	*Hirundo nigricans*	Tree Martin	1979	LC	
Hirundinidae	*Hirundo ariel*	Fairy Martin	2002	LC	
Sylviidae	*Acrocephalus australis*	Clamorous Reed-Warbler	1999	NT	
Sylviidae	*Megalurus timoriensis*	Tawny Grassbird	1984	LC	
Sylviidae	*Cisticola juncidis*	Zitting Cisticola	1990	LC	
Sylviidae	*Cisticola exilis*	Golden-headed Cisticola	1990	LC	
Zosteropidae	*Zosterops luteus*	Yellow White-eye	1986	LC	
Mammals					
Dasyuridae	*Antechinus bellus*	Fawn Antechinus	2001	DD	
Dasyuridae	*Dasyurus hallucatus*	Northern Quoll	2001	CR	EN
Dasyuridae	*Planigale maculata*	Common Planigale	2001	LC	
Dasyuridae	*Sminthopsis virginiae*	Red-cheeked Dunnart	2001	DD	
Peramelidae	*Isoodon macrourus*	Northern Brown Bandicoot	1990	LC	
Macropodidae	*Macropus agilis*	Agile Wallaby	1997	LC	
Macropodidae	*Macropus antilopinus*	Antilopine Wallaroo	1990	LC	
Phalangeridae	*Trichosurus vulpecula arnhemensis*	Common Brushtail Possum	2001	LC	
Petauridae	*Petaurus breviceps*	Sugar Glider	1990	LC	
Pteropodidae	*Macroglossus minimus*	Northern Blossom-bat	2000	LC	
Pteropodidae	*Pteropus alecto*	Black Flying-fox	2001	LC	

FAMILY	*Full Name*	Common Name	YEAR	2007_ TPWCA	2007_ EPBCA
Pteropodidae	*Pteropus scapulatus*	Little Red Flying-fox	2000	LC	
Vespertilionidae	*Miniopterus schreibersii*	Large Bent-winged Bat	2001	LC	
Vespertilionidae	*Myotis macropus*	Large-footed Myotis	2000	LC	
Vespertilionidae	*Nyctophilus arnhemensis*	Northern Long-eared Bat	2000	LC	
Molossidae	*Chaerephon jobensis*	Northern Free-tail Bat	2000	LC	
Molossidae	*Mormopterus loriae*	Little Free-tailed Bat	2000	LC	
Muridae	*Mesembriomys gouldii*	Black-footed Tree-rat	2001	NT	
Muridae	*Pseudomys delicatulus*	Delicate Mouse	2001	LC	
Muridae	*Pseudomys nanus*	Western Chestnut Mouse	2001	NT	
Muridae	*Rattus colletti*	Dusky Rat	1975	LC	
Muridae	*Rattus tunneyi*	Pale Field-rat	2001	NT	
Canidae	*Canis lupus*	Dingo	1994	LC	
Felidae	*Felis catus*	Cat	1990	Introduced	
Suidae	*Sus scrofa*	Pig	1990	Introduced	

Appendix C

Fauna Species listed on EPBC Act and TPWC Act for Study Area plus 2 km Buffer

Species Listed on the EPBC Act and TPWC Act for the Balydin Point Area (applying a 2 kilometre buffer of the project area)

** refers to the subspecies *Calyptorhynchus banksii graptogyne*

Family	Scientific Name	Common Name	EPBC Status	TPWC Status	Recorded - NRETA Data
Amphibians					
Hylidae	*Cyclorana australis*	Giant Frog	Not listed	Data Deficient	Yes
Reptiles					
Crocodylidae	*Crocodylus porosus*[1]	Saltwater Crocodile	Migratory and Marine	Not listed	Yes
Varanidae	*Varanus panoptes*	Floodplain Monitor	Not listed	Vulnerable	Yes
Scincidae	*Tiliqua scincoids*	Common Blue-Tongued Lizard	Not listed	Data Deficient	Yes
Boidae	*Antaresia childreni*	Children's Python	Not listed	Data Deficient	Yes
Colubridae	*Dendrelaphis punctulatus*	Green Tree Snake	Not listed	Data Deficient	Yes
Elapidae	*Demansia papuensis*	Papaun Whip Snake	Not listed	Data Deficient	Yes
Elapidae	*Demansia vestigiata*	Black Whip Snake	Not listed	Data Deficient	Yes
Elapidae	*Cryptophis pallidiceps*	Northern Small-eyed Snake	Not listed	Data Deficient	Yes
Birds					
Anatidae	*Dendrocygna arcuata*	Wandering Whistling-Duck	Migratory	Not listed	Yes
Anatidae	*Dendrocygna eytoni*	Plumed Whistling-Duck	Migratory	Not listed	Yes
Anatidae	*Tadorna radjah*	Radjah Shelduck	Migratory	Not listed	Yes
Anatidae	*Nettapus pulchellus*	Green Pygmy-Goose	Migratory	Not listed	Yes

Family	Scientific Name	Common Name	EPBC Status	TPWC Status	Recorded - NRETA Data
Anatidae	*Anas superciliosa*	Pacific Black Duck	Migratory	Not listed	Yes
Anatidae	*Anas gracilis*	Grey Teal	Migratory	Not listed	Yes
Anatidae	*Malacorhynchus membranaceus*	Pink-eared Duck	Migratory	Not listed	Yes
Anatidae	*Aythya australis*	Hardhead	Migratory	Not listed	Yes
Ardeidae	*Ixobrychus flavicollis*	Black Bittern	Marine	Data Deficient	Yes
Ardeidae	*Egretta sacra*	Eastern Reef Egret	Migratory	Not listed	Yes
Ardeidae	*Ardea alba*	Great Egret, White Egret	Migratory and Marine	Not listed	Yes
Ardeidae	*Ardea ibis*	Cattle Egret	Migratory and Marine	Not listed	Yes
Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	Migratory	Not listed	Yes
Accipitridae	*Pandion haliaetus*	Osprey	Migratory	Not listed	Yes
Accipitridae	*Elanus axillaris*	Black-shouldered Kite	Migratory	Not listed	Yes
Accipitridae	*Lophoictinia isura*	Square-tailed Kite	Migratory	Near Threatened	Yes
Accipitridae	*Hamirostra melanosternon*	Black-breasted Buzzard	Migratory	Not listed	Yes
Accipitridae	*Milvus migrans*	Black Kite	Migratory	Not listed	Yes
Accipitridae	*Haliastur sphenurus*	Whistling Kite	Migratory	Not listed	Yes
Accipitridae	*Haliastur indus*	Brahminy Kite	Migratory	Not listed	Yes
Accipitridae	*Haliaeetus leucogaster*	White-bellied Sea-eagle	Migratory and Marine	Not listed	Yes
Accipitridae	*Circus assimilis*	Spotted Harrier	Migratory	Not listed	Yes

Family	Scientific Name	Common Name	EPBC Status	TPWC Status	Recorded - NRETA Data
Accipitridae	*Accipiter fasciatus*	Brown Goshawk	Migratory	Not listed	Yes
Accipitridae	*Accipiter novaehollandiae*	Grey Goshawk	Migratory	Not listed	Yes
Accipitridae	*Accipiter cirrhocephalus*	Collared Sparrowhawk	Migratory	Not listed	Yes
Accipitridae	*Aquila audax*	Wedge-tailed Eagle	Migratory	Not listed	Yes
Accipitridae	*Hieraaetus morphnoides*	Little Eagle	Migratory	Not listed	Yes
Accipitridae	*Erythrotriorchis radiatus*	Red Goshawk	Vulnerable	Vulnerable	No
Rallidae	*Porzana pusilla*	Baillon's Crake	Marine	Data Deficient	Yes
Rallidae	*Porzana tabuensis*	Spotless Crake	Marine	Data Deficient	Yes
Scolopacidae	*Gallinago stenura*	Pin-tailed Snipe	Migratory and Marine	Data Deficient	Yes
Scolopacidae	*Gallinago megala*	Swinhoe's Snipe	Migratory and Marine	Data Deficient	Yes
Scolopacidae	*Limosa limosa*	Black-tailed Godwit	Migratory and Marine	Not listed	Yes
Scolopacidae	*Limosa lapponica*	Bar-tailed Godwit	Migratory and Marine	Not listed	Yes
Scolopacidae	*Numenius minutus*	Little Curlew / Little Whimbrel	Migratory and Marine	Not listed	Yes
Scolopacidae	*Numenius phaeopus*	Whimbrel	Migratory and Marine	Not listed	Yes
Scolopacidae	*Numenius madagascariensis*	Eastern Curlew	Migratory	Not listed	Yes
Scolopacidae	*Tringa stagnatilis*	Marsh Sandpiper	Migratory	Not listed	Yes
Scolopacidae	*Tringa nebularia*	Common Greenshank	Migratory	Not listed	Yes
Scolopacidae	*Xenus cinereus*	Terek Sandpiper	Migratory	Not listed	Yes
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	Migratory and Marine	Not listed	Yes

Family	Scientific Name	Common Name	EPBC Status	TPWC Status	Recorded - NRETA Data
Scolopacidae	*Heteroscelus brevipes*	Grey-tailed Tattler	Migratory	Not listed	Yes
Scolopacidae	*Arenaria interpres*	Ruddy Turnstone	Migratory and Marine	Not listed	Yes
Scolopacidae	*Calidris tenuirostris*	Great Knot	Migratory	Not listed	Yes
Scolopacidae	*Calidris canutus*	Red Knot	Migratory	Not listed	Yes
Scolopacidae	*Calidris alba*	Sanderling	Migratory and Marine	Not listed	Yes
Scolopacidae	*Calidris ruficollis*	Red-necked Stint	Migratory	Not listed	Yes
Scolopacidae	*Calidris melanotos*	Pectoral Sandpiper	Migratory and Marine	Data Deficient	Yes
Scolopacidae	*Calidris acuminata*	Sharp-tailed Sandpiper	Migratory	Not listed	Yes
Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	Migratory	Not listed	Yes
Scolopacidae	*Limicola falcinellus*	Broad-billed Sandpiper	Migratory	Not listed	Yes
Scolopacidae	*Phalaropus lobatus*	Red-necked Phalarope	Migratory	Not listed	Yes
Burhinidae	*Burhinus grallarius*	Bush Stone-curlew	Not listed	Near Threatened	Yes
Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt	Migratory	Not listed	Yes
Recurvirostridae	*Recurvirostra novaehollandiae*	Red-necked Avocet	Migratory	Not listed	Yes
Charadriidae	*Pluvialis fulva*	Pacific Golden Plover	Migratory	Not listed	Yes
Charadriidae	*Pluvialis squatarola*	Grey Plover	Migratory and Marine	Not listed	Yes
Charadriidae	*Charadrius dubius*	Little Ringed Plover	Migratory	Not listed	Yes
Charadriidae	*Charadrius ruficapillus*	Red-capped Plover	Migratory	Not listed	Yes

Family	Scientific Name	Common Name	EPBC Status	TPWC Status	Recorded - NRETA Data
Charadriidae	*Charadrius mongolus*	Lesser Sand Plover / Mongolian Plover	Migratory and Marine	Not listed	Yes
Charadriidae	*Charadrius leschenaultii*	Great Sand Plover / Large Sand Plover	Migratory and Marine	Not listed	Yes
Charadriidae	*Charadrius veredus*	Oriental Plover / Oriental Dotterel	Migratory and Marine	Not listed	Yes
Charadriidae	*Elseyornis melanops*	Black-fronted Dotterel	Migratory	Not listed	Yes
Charadriidae	*Erythrogonys cinctus*	Red-kneed Dotterel	Migratory	Not listed	Yes
Charadriidae	*Vanellus miles*	Masked Lapwing	Migratory	Not listed	Yes
Glareolidae	*Glareola maldivarum*	Oriental Pranticole	Migratory and Marine	Not listed	Yes
Laridae	*Sterna hirundo*	Common Tern	Migratory	Not listed	Yes
Laridae	*Sterna albifrons*	Little Tern	Migratory and Marine	Not listed	Yes
Laridae	*Chlidonias leucopterus*	White-winged Black Tern	Migratory	Not listed	Yes
Columbidae	*Geophaps smithii smithii*	Partridge Pigeon (eastern)	Vulnerable	Vulnerable	No
Cacatuidae	*Calyptorhynchus banksii*	Red-tailed Black-cockatoo	Endangered**	Near Threatened	Yes
Petroicidae	*Poecilodryas superciliosa*	White-browed Robin	Not listed	Near Threatened	Yes
Cuculidae	*Cuculus saturatus*	Oriental Cuckoo	Migratory	Not listed	Yes
Campephagidae	*Coracina tenuirostris melvillensis*	Melville Cicadabird	Migratory	Not listed	Yes
Apodidae	*Apus pacificus*	Fork-tailed Swift	Migratory and Marine	Not listed	Yes
Halcyonidae	*Dacelo leachii*	Blue-winged Kookaburra	Not listed	Data Deficient	Yes

Family	Scientific Name	Common Name	EPBC Status	TPWC Status	Recorded - NRETA Data
Meropidae	*Merops ornatus*	Rainbow Bee-eater	Migratory and Marine	Not listed	Yes
Petroicidae	*Poecilodryas superciliosa cerviniventris*	Derby White-browed Robin	Migratory	Not listed	Yes
Motacillidae	*Motacilla flava*	Yellow Wagtail	Migratory	Not listed	Yes
Passeridae	*Erythrura gouldiae*	Gouldian Finch	Endangered	Endangered	No
Dicruridae	*Rhipidura ruffrons*	Rufous Fantail	Migratory and Marine	Not listed	No
Hirundinidae	*Hirundo rustica*	Barn Swallow	Migratory and Marine	Not listed	Yes
Sylviidae	*Acrocephalus australis*	Clamorous Reed-Warbler	Marine	Near Threatened	Yes
Mammals					
Dasyuridae	*Dasyurus hallucatus*	Northern Quoll	Endangered	Critically Endangered	Yes
Dasyuridae	*Sminthopsis virginiae*	Red-cheeked Dunnart	Not listed	Data Deficient	Yes
Dasyuridae	*Antechinus bellus*	Fawn Antechinus	Not listed	Data Deficient	Yes
Muridae	*Mesembriomys gouldii*	Black-footed Tree-rat	Not listed	Near Threatened	Yes
Muridae	*Pseudomys nanus*	Western Chestnut Mouse	Not listed	Near Threatened	Yes
Muridae	*Rattus tunneyi*	Pale Field-rat	Not listed	Near Threatened	Yes
Muridae	*Xeromys myoides*	Water Mouse/False Water Rat	Vulnerable	Data deficient	No

Appendix D

Flora Taxa Recorded Within Vegetation Communities of the Study Area

There was only one listed species recorded. This was *Cycas armstrongii,* listed as Vulnerable under the TPWC Act and was recorded only in vegetation community Type 3 – *Eucalyptus miniata/E. tetrodonta* Woodland. This species is not listed on the EPBC Act.

Type 1 – Melaleuca Open Woodland

Family	Genus	Species
Acanthaceae	*Hypoestes*	*floribunda*
Adiantaceae	*Cheilanthes*	sp
Apocynaceae	*Tabernaemontana*	*orientalis*
Asclepiadaceae	*Gymnanthera*	*oblonga*
Asteraceae	*Blumea*	*saxatilis*
Cyperaceae	*Fuirena*	*ciliaris*
Cyperaceae	*Rhynchospora*	sp
Dioscoreaceae	*Dioscorea*	*transversa*
Euphorbiaceae	*Bridelia*	*tomentosa*
Euphorbiaceae	*Croton*	*arnhemicus*
Euphorbiaceae	*Flueggea*	*virosa*
Flagellariaceae	*Flagellaria*	*indica*
Goodeniaceae	*Goodenia*	*pumilo*
Goodeniaceae	*Goodenia*	sp. *Melville Island*
Lamiaceae	*Plectranthus*	*scutellarioides*
Lauraceae	*Cassytha*	*filiformis*
Loganiaceae	*Mitrasacme*	*nummularia*
Melastomataceae	*Memecylon*	*pauciflorum*
Mimosaceae	*Acacia*	*auriculiformis*
Mimosaceae	*Acacia*	*holosericea*
Myrtaceae	*Melaleuca*	*viridiflora*
Oleaceae	*Notolaea*	*microcarpa*
Pandanaceae	*Pandanus*	*spiralis*
Poaceae	*Dimeria*	*ornithopoda*
Poaceae	*Eragrostis*	*tenellula*

Family	Genus	Species
Poaceae	*Eriachne*	*burkittii*
Poaceae	*Eriachne*	*glauca*
Poaceae	*Germainia*	*truncatiglumis*
Poaceae	*Ischaemum*	*decumbens*
Poaceae	*Sporobolus*	*caroli*
Rubiaceae	*Gardenia*	**fucata/pyriformis*
Rubiaceae	*Psydrax*	*odorata*
Sterculiaceae	*Sterculia*	*quadrifida*
Verbenaceae	*Clerodendrum*	*inerme*
Vitaceae	*Ampelocissus*	*acetosa*

Type 2 – Mixed Species Low Open Woodland

Family	Genus	Species
Apocynaceae	*Wrightia*	*saligna*
Arecaceae	*Livistona*	*humilis*
Asclepiadaceae	*Gymnanthera*	*oblonga*
Asteraceae	*Blumea*	**integrifolia*
Asteraceae	*Elephantopus*	*scaber*
Asteraceae	*Pleurocarpaea*	*denticulata*
Bignoniaceae	*Dolichandrone*	*filiformis*
Boraginaceae	*Ehretia*	*saligna*
Caesalpiniaceae	*Erythrophleum*	*chlorostachys*
Capparaceae	*Capparis*	*umbonata*
Chenopodiaceae	*Halosarcia*	*halicnemoides*
Combretaceae	*Terminalia*	*ferdinandiana*
Commeliniaceae	*Cartonema*	*spicatum*
Convolvulaceae	*Evolvulus*	*alsinoides*
Convolvulaceae	*Ipomoea*	**abrupta/micrantha*

Family	Genus	Species
Convolvulaceae	*Ipomoea*	*graminea*
Cyperaceae	*Fimbristylis*	*littoralis*
Cyperaceae	*Rhynchospora*	sp
Droseraceae	*Drosera*	*petiolaris*
Euphorbiaceae	*Flueggea*	*virosa*
Fabaceae	*Flemingia*	*parviflora*
Fabaceae	*Vigna*	sp
Fabaceae	*Vigna*	*lanceolata*
Goodeniaceae	*Goodenia*	*holtzeana*
Lecythidaceae	*Planchonia*	*careya*
Liliaceae	*Thysanotus*	*chinensis*
Loganiaceae	*Mitrasacme*	sp
Loganiaceae	*Mitrasacme*	*gentianea*
Loganiaceae	*Mitrasacme*	*nummularia*
Malvaceae	*Sida*	*cordifolia*
Mimosaceae	*Acacia*	**leptocarpa*
Moraceae	*Ficus*	*aculeata*
Myrtaceae	*Eucalyptus*	sp
Myrtaceae	*Corymbia*	sp
Myrtaceae	*Corymbia*	*polysciadia*
Myrtaceae	*Eucalyptus*	*miniata*
Myrtaceae	*Melaleuca*	*nervosa*
Myrtaceae	*Melaleuca*	*viridiflora*
Myrtaceae	*Xanthostemon*	*paradoxus*
Pandanaceae	*Pandanus*	*spiralis*
Poaceae	*Eriachne*	*burkittii*
Poaceae	*Germainia*	*truncatiglumis*
Poaceae	*Heteropogon*	*contortus*
Poaceae	*Heteropogon*	*triticeus*

Family	Genus	Species
Poaceae	*Sorghum*	*intrans*
Poaceae	*Sorghum*	*timorense*
Poaceae	*Sporobolus*	*virginicus*
Poaceae	*Themeda*	*triandra*
Polygalaceae	*Polygala*	*longifolia*
Proteaceae	*Grevillea*	*decurrens*
Proteaceae	*Grevillea*	*pteridifolia*
Proteaceae	*Grevillea*	*refracta*
Proteaceae	*Persoonia*	*falcata*
Rubiaceae	*Spermacoce*	sp
Sapotaceae	*Pouteria*	sp
Scrophulariaceae	*Centranthera*	*cochinchinensis*
Scrophulariaceae	*Lindernia*	sp
Stackhousiaceae	*Stackhousia*	*intermedia*
Sterculiaceae	*Brachychiton*	*megaphyllus*
Sterculiaceae	*Helicteres*	sp. Darwin
Sterculiaceae	*Waltheria*	*indica*
Taccaceae	*Tacca*	*leontopetaloides*
Thymelaeaceae	*Thecanthes*	*punicea*
Vitaceae	*Ampelocissus*	*acetosa*
Xyridaceae	*Xyris*	*oligantha*

Type 3 – *Eucalyptus miniata/E. tetrodonta* Woodland

Family	Genus	Species
*Unidentified		*sp 21.35 (small woody herb/subshrub)
*Unidentified		*sp 23.9 (infertile woody herb/subshrub - poor material)
Acanthaceae	*Thunbergia*	*chinensis*
Adiantaceae	*Cheilanthes*	*sp

Family	Genus	Species
Ampelocissus	*Cayratia*	*trifolia*
Anacardaiceae	*Buchanania*	*obovata*
Apocynaceae	*Alstonia*	*actinophylla*
Apocynaceae	*Wrightia*	*saligna*
Arecaceae	*Livistona*	*humilis*
Asclepiadaceae	*Gymnanthera*	*oblonga*
Asclepiadaceae	*Tylophora*	*flexuosa*
Bignoniaceae	*Dolichandrone*	*filiformis*
Bixaceae	*Cochlospermum*	*fraseri*
Boraginaceae	*Ehretia*	*saligna*
Boraginaceae	*Heliotropium*	*ventricosum*
Caesalpiniaceae	*Erythrophleum*	*chlorostachys*
Capparaceae	*Capparis*	*umbonata*
Celastraceae	*Denhamia*	*obscura*
Combretaceae	*Terminalia*	*ferdinandiana*
Commeliniaceae	*Cartonema*	*spicatum*
Commeliniaceae	*Commelina*	*ensifolia*
Convolvulaceae	*Bonhamia*	sp
Convolvulaceae	*Evolvulus*	*alsinoides*
Convolvulaceae	*Ipomoea*	**abrupta/micrantha*
Convolvulaceae	*Ipomoea*	*graminea*
Cycadaceae	*Cycas*	*armstrongii*
Cyperaceae	*Cyperus*	*macrostachyos*
Cyperaceae	*Fimbristylis*	sp
Cyperaceae	*Fimbristylis*	*acicularis*
Cyperaceae	*Fuirena*	*ciliaris*
Cyperaceae	*Rhynchospora*	sp
Dilleniaceae	*Hibbertia*	sp
Droseraceae	*Drosera*	*lanata*

Family	Genus	Species
Eriocaulaceae	*Eriocaulon*	*depressum*
Euphorbiaceae	*Antidesma*	*ghesaembila*
Euphorbiaceae	*Bridelia*	*tomentosa*
Euphorbiaceae	*Croton*	*arnhemicus*
Euphorbiaceae	*Drypetes*	*deplanchei*
Euphorbiaceae	*Euphorbia*	Sp
Euphorbiaceae	*Flueggea*	*virosa*
Euphorbiaceae	*Glochidion*	*xerocarpum*
Euphorbiaceae	*Phyllanthus*	*minutiflorus*
Euphorbiaceae	*Poranthera*	*coerulea*
Fabaceae	*Desmodium*	sp.'Pine Ck.'
Fabaceae	*Flemingia*	*parviflora*
Fabaceae	*Jacksonia*	*dilatata*
Fabaceae	*Tephrosia*	sp
Fabaceae	*Tephrosia*	*juncea*
Fabaceae	*Vigna*	*lanceolata*
Fabaceae	*Vigna*	*vexillata*
Goodeniaceae	*Goodenia*	*holtzeana*
Goodeniaceae	*Goodenia*	sp. Melville Island
Hippocrataceae	*Salacia*	*chinensis*
Lecythidaceae	*Planchonia*	*careya*
Liliaceae	*Protasparagus*	*racemosus*
Liliaceae	*Thysanotus*	*banksii*
Loganiaceae	*Mitrasacme*	sp
Loganiaceae	*Mitrasacme*	*connata*
Loganiaceae	*Mitrasacme*	*nummularia*
Loganiaceae	*Strychnos*	*lucida*
Malvaceae	*Thespesia*	*populneoides*
Mimosaceae	*Acacia*	*holosericea*

Family	Genus	Species
Moraceae	*Ficus*	*aculeata*
Moraceae	*Ficus*	*opposita*
Myrtaceae	*Calytrix*	*exstipulata*
Myrtaceae	*Corymbia*	sp
Myrtaceae	*Corymbia*	*foelscheana*
Myrtaceae	*Corymbia*	*polysciadia*
Myrtaceae	*Eucalyptus*	*miniata*
Myrtaceae	*Eucalyptus*	*tetrodonta*
Myrtaceae	*Lophostemon*	*lactifluus*
Myrtaceae	*Melaleuca*	*leucadendra*
Myrtaceae	*Melaleuca*	*viridiflora*
Myrtaceae	*Xanthostemon*	*paradoxus*
Oleaceae	*Notolaea*	*microcarpa*
Pandanaceae	*Pandanus*	*spiralis*
Passifloraceae	*Passiflora*	*foetida*
Poaceae	*Aristida*	*exserta*
Poaceae	*Ectrosia*	*leporina*
Poaceae	*Enneapogon*	*pallidus*
Poaceae	*Eragrostis*	*cumingii*
Poaceae	*Eriachne*	*burkittii*
Poaceae	*Germainia*	*truncatiglumis*
Poaceae	*Heterachne*	*abortiva*
Poaceae	*Heteropogon*	*triticeus*
Poaceae	*Rottboellia*	*cochinchinensis*
Poaceae	*Sorghum*	*intrans*
Poaceae	*Sporobolus*	*caroli*
Poaceae	*Thaumastochloa*	*major*
Poaceae	*Themeda*	*triandra*
Polygalaceae	*Polygala*	sp

Family	Genus	Species
Proteaceae	*Grevillea*	*decurrens*
Proteaceae	*Grevillea*	*refracta*
Proteaceae	*Hakea*	*arborescens*
Proteaceae	*Persoonia*	*falcata*
Proteaceae	*Stenocarpus*	*cunninghamii*
Rhamnaceae	*Alphitonia*	*excelsa*
Rhamnaceae	*Colubrina*	*asiatica*
Rhamnaceae	*Ziziphus*	*oenopolia*
Rubiaceae	*Gardenia*	*megasperma*
Rubiaceae	*Spermacoce*	sp
Sapotaceae	*Pouteria*	sp
Scrophulariaceae	*Buchnera*	*linearis*
Scrophulariaceae	*Centranthera*	*cochinchinensis*
Scrophulariaceae	*Lindernia*	sp
Scrophulariaceae	*Lindernia*	*lobelioides*
Scrophulariaceae	*Scoparia*	*dulcis*
Smilacaceae	*Smilax*	*australis*
Stackhousiaceae	*Stackhousia*	*intermedia*
Sterculiaceae	*Brachychiton*	*diversifolius*
Sterculiaceae	*Brachychiton*	*megaphyllus*
Sterculiaceae	*Helicteres*	*hirsuta*
Sterculiaceae	*Helicteres*	sp. Darwin
Sterculiaceae	*Waltheria*	*indica*
Taccaceae	*Tacca*	*leontopetaloides*
Thymelaeaceae	*Thecanthes*	*punicea*
Verbenaceae	*Clerodendrum*	*inerme*
Verbenaceae	*Vitex*	*glabrata*
Vitaceae	*Ampelocissus*	*acetosa*
Xyridaceae	*Xyris*	*oligantha*

Type 4 – Closed Monsoon Vine Forest

Family	Genus	Species
Acanthaceae	*Hypoestes*	*floribunda*
Sterculiaceae	**Sterculia*	sp
Acanthaceae	*Hypoestes*	*floribunda*
Agavaceae	*Pleomele*	*angustifolia*
Annonaceae	*Miliusa*	*brahei*
Annonaceae	*Polyalthia*	*australis*
Apocynaceae	*Alstonia*	*actinophylla*
Apocynaceae	*Ichnocarpos*	*frutescens*
Aquifoliaceae	*Ilex*	*arnhemensis*
Asclepiadaceae	*Gymnanthera*	*oblonga*
Asclepiadaceae	*Secamone*	*elliptica*
Bombacaceae	*Bombax*	*ceiba*
Boraginaceae	*Cordia*	*dichotoma*
Burseraceae	*Canarium*	*australianum*
Celastraceae	*Denhamia*	*obscura*
Chrysobalanaceae	*Maranthes*	*corymbosa*
Combretaceae	*Terminalia*	*ferdinandiana*
Ebenaceae	*Diospyros*	sp
Ebenaceae	*Diospyros*	*cordifolia*
Elaeocarpaceae	*Elaeocarpus*	*arnhemicus*
Euphorbiaceae	*Croton*	*arnhemicus*
Euphorbiaceae	*Drypetes*	*deplanchei*
Euphorbiaceae	*Flueggea*	*virosa*
Fabaceae	*Abrus*	*precatorius*
Fabaceae	*Millettia*	*pinnata*
Fabaceae	*Stylosanthes*	sp
Flagellariaceae	*Flagellaria*	*indica*

Family	Genus	Species
Hippocrataceae	*Salacia*	*chinensis*
Lauraceae	*Cryptocarya*	*cunninghamii*
Lauraceae	*Cryptocarya*	*exfoliata*
Lauraceae	*Litsea*	*glutinosa*
Lecythidaceae	*Barringtonia*	*acutangula*
Liliaceae	*Protasparagus*	*racemosus*
Loganiaceae	*Fagraea*	*racemosa*
Loganiaceae	*Strychnos*	*lucida*
Melastomataceae	*Memecylon*	*pauciflorum*
Menispermaceae	*Pachygone*	*ovata*
Mimosaceae	*Acacia*	*auriculiformis*
Moraceae	*Ficus*	*scobina*
Myrtaceae	*Lophostemon*	*lactifluus*
Myrtaceae	*Melaleuca*	sp
Myrtaceae	*Syzygium*	*suborbiculare*
Oleaceae	*Notolaea*	*microcarpa*
Opiliaceae	*Opilia*	*amentacea*
Passifloraceae	*Adenia*	*heterophylla*
Rhamnaceae	*Ziziphus*	*oenopolia*
Rhizophoraceae	*Carallia*	*brachiata*
Rubiaceae	*Aidia*	*racemosa*
Rubiaceae	*Ixora*	*timorensis*
Rubiaceae	*Tarenna*	*australis*
Rubiaceae	*Tarenna*	*pentamera*
Rutaceae	*Micromelum*	*minutum*
Rutaceae	*Zanthoxylum*	*parviflorum*
Santalaceae	*Exocarpos*	*latifolius*
Sapindaceae	*Allophylus*	*cobbe*
Sapindaceae	*Cupaniopsis*	*anacardioides*

Family	Genus	Species
Smilacaceae	*Smilax*	*australis*
Sterculiaceae	*Sterculia*	*holtzei*
Sterculiaceae	*Sterculia*	*quadrifida*
Tiliaceae	*Grewia*	*breviflora*
Verbenaceae	*Clerodendrum*	*costatum*
Verbenaceae	*Clerodendrum*	*floribundum*
Vitaceae	*Ampelocissus*	*acetosa*

Type 5 – Ceriops Closed Forest

Family	Genus	Species
Avicenniaceae	*Avicennia*	*marina var. eucalyptifolia*
Rhizophoraceae	*Bruguiera*	*exaristata*
Rhizophoraceae	*Ceriops*	*tagal*
Rhizophoraceae	*Ceriops*	*australis*
Smilacaceae	*Smilax*	*australis*

Type 6 – Avicennia/Ceriops Closed Forest

Family	Genus	Species
Avicenniaceae	*Avicennia*	*marina var. eucalyptifolia*
Plumbaginaceae	*Aegialitis*	*annulata*
Rhizophoraceae	*Ceriops*	*australis*
Rhizophoraceae	*Rhizophora*	*stylosa*

Type 7 – Mixed Species Low Open Forest

Family	Genus	Species
Acanthaceae	*Hypoestes*	*floribunda*
Amaranthaceae	*Gomphrena*	*flaccida*
Arecaceae	*Livistona*	*humilis*

Family	Genus	Species
Asclepiadaceae	*Gymnanthera*	*oblonga*
Asteraceae	*Blumea*	*integrifolia*
Asteraceae	*Cyanthillium*	*cinereum*
Burseraceae	*Canarium*	*australianum*
Capparaceae	*Capparis*	*separia*
Combretaceae	*Terminalia*	*ferdinandiana*
Commeliniaceae	*Cartonema*	*spicatum*
Cyperaceae	*Fimbristylis*	sp
Euphorbiaceae	*Bridelia*	*tomentosa*
Euphorbiaceae	*Drypetes*	*deplanchei*
Euphorbiaceae	*Flueggea*	*virosa*
Fabaceae	*Abrus*	*precatorius*
Fabaceae	*Tephrosia*	*juncea*
Flagellariaceae	*Flagellaria*	*indica*
Goodeniaceae	*Goodenia*	*sp. Melville Island*
Lauraceae	*Cassytha*	*filiformis*
Liliaceae	*Protasparagus*	*racemosus*
Loganiaceae	*Strychnos*	*lucida*
Malvaceae	*Abelmoschus*	*manihot*
Menispermaceae	*Tinospora*	*smilacina*
Mimosaceae	*Acacia*	*auriculiformis*
Myrtaceae	*Melaleuca*	*leucadendra*
Myrtaceae	*Melaleuca*	*viridiflora*
Oleaceae	*Jasminum*	sp
Poaceae	*Aristida*	*holanthera*
Poaceae	*Eragrostis*	*rigidiuscula*
Poaceae	*Eriachne*	*avenacea*
Poaceae	*Eriachne*	*pallescens*
Rhamnaceae	*Alphitonia*	*excelsa*

Family	Genus	Species
Rhamnaceae	*Ziziphus*	*oenopolia*
Rubiaceae	*Pavetta*	*brownii*
Rubiaceae	*Spermacoce*	sp
Santalaceae	*Exocarpos*	*latifolius*
Sapindaceae	*Allophylus*	*cobbe*
Scrophulariaceae	*Buchnera*	*linearis*
Smilacaceae	*Smilax*	*australis*
Sterculiaceae	*Brachychiton*	*diversifolius*
Sterculiaceae	*Sterculia*	*quadrifida*
Verbenaceae	*Lantana*	*camara*

Type 8 – Sparse Samphire Shrubland

Family	Genus	Species
Chenopodiaceae	*Halosarcia*	*halicnemoides*
Combretaceae	*Lumnitzera*	*racemosa*
Ebenaceae	*Diospyros*	*compacta*
Poaceae	**Sporobolus*	**virginicus*
Rhizophoraceae	*Ceriops*	*australis*

Type 9 – Rhizophora Closed Forest

Family	Genus	Species
Rhizophoraceae	*Rhizophora*	*stylosa*

Type 10 – Rhizophora/Sonneratia Closed Forest

Family	Genus	Species
Rhizophoraceae	*Rhizophora*	*stylosa*
Sonneratiaceae	*Sonneratia*	*alba*

Type 12 – *Corymbia bella/Melaleuca leucadendra* Transitional Open Forest

Family	Genus	Species
Cyperaceae	*Elaeocharis*	sp
Myrtaceae	*Melaleuca*	*leucadendra*
Myrtaceae	*Corymbia*	*bella*
Poaceae	*Heteropogon*	*triticeus*

Type 13 – Sonneratia Closed Forest

Family	Genus	Species
Plumbaginaceae	*Aegialitis*	*annulata*
Rhizophoraceae	*Ceriops*	*australis*
Sonneratiaceae	*Sonneratia*	*alba*

Type 14 – Casuarina and Beach Open Woodland

Family	Genus	Species
Aizoaceae	*Sesuvium*	*portulacastrum*
Avicenniaceae	*Avicennia*	*marina var. eucalyptifolia*
Convulvulaceae	*Ipomoea*	*pes-caprae*
Malvaceae	*Thespesia*	*populneoides*
Rhizophoraceae	*Bruguiera*	*exaristata*
Rhizophoraceae	*Ceriops*	*australis*

Introduced taxa recorded from GHD's Introduced Flora Surveys (2008)

Family	Species Name	Common Name
Fabaceae	*Crotalaria goreensis*	Gambia pea****
Fabaceae	*Stylosanthes viscosa*	Shrubby stylo, seca****
Lamiaceae	*Hyptis suaveolens*	Hyptis, horehound****
Malvaceae	*Hibiscus sabdariffa*	Rosella****
Passifloraceae	*Passiflora foetida*	Wild Passion Fruit****
Poaceae	*Andropogon gayanus*	Gamba grass*
Poaceae	*Chloris inflata*	Purpletop chloris*
Poaceae	*Melinis repens*	Red natal grass*
Poaceae	*Pennisetum pedicellatum*	NA
Poaceae	*Pennisetum polystachion*	Mission grass*
Scrophulariaceae	*Scoparia dulcis*	Scoparia***
Verbenaceae	*Lantana camara*	Lantana****

* = Source: Ausgrass – Grasses of Australia (Sharp and Simon 2002).

** = Source: Flora of the Darwin Region (Dunlop *et al* 1995).

*** = Source: Florabase – The West Australian Flora (Western Australian Herbarium 1998 -).

**** = Source: Weeds of the Wet/Dry Tropics of Australia (Smith 2002).

Appendix E

Similarity Matrix Comparing Sampled Plots

Similarity Matrix of Sampled Sites

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
1																	
2	0																
3	0	40															
4	0	11.11111	14.63415														
5	28.57143	0	0	4													
6	0	7.017544	8.955224	25.31646	0												
7	20	0	0	0	0	0											
8	0	16.94915	20.28986	12.34568	0	3.030303	5										
9	0	32.87671	33.73494	16.84211	0	5	0	51.21951									
10	0	27.11864	14.49275	7.407407	0	0	0	26.47059	41.46341								
11	33.33333	0	0	0	0	0	25	0	0	0							
12	0	3.921569	3.278689	24.65753	0	41.37931	0	3.333333	2.702703	0	0						
13	0	0	5.797101	22.22222	5.405405	33.33333	0	5.882353	2.439024	0	0	36.66667					
14	0	34.48276	24.74227	23.85321	3.076923	12.76596	0	31.25	36.36364	25	0	4.545455	14.58333				
17	0	21.05263	14.92537	12.65823	0	6.25	0	39.39394	30	36.36364	0	0	0	29.78723			
18	0	24.39024	23.91304	15.38462	0	6.741573	0	30.76923	43.80952	41.75824	0	7.228916	4.395604	26.89076	22.47191		
20	0	13.33333	5.714286	24.39024	0	20.89552	0	23.18841	24.09639	8.695652	0	22.95082	17.3913	26.80412	17.91045	15.21739	

Appendix F

Flora Taxa Presence/Absence Matrix Within Sampled Quadrats

GHD Pty Ltd. 2009. *Ichthys Gas Field Development Project: onshore fauna and flora study.* Report prepared for INPEX Browse, Ltd., Perth, Western Australia.

Species/Site Presence/Absence

Family	Genus	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
*Acanthaceae	**Hypoestes*	**floribunda*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
*Proteaceae		*sp MF269 (poor material)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*
*Sterculiaceae	**Sterculia*	*sp	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
*Unidentified		*sp 21.35 (small woody herb/subshrub)	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	✓	*
*Unidentified		*sp 23.9 (infertile woody herb/subshrub)	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Acanthaceae	*Hypoestes*	*floribunda*	*	*	*	✓	*	*	*	*	*	*	*	✓	*	*	*	*	✓
Acanthaceae	*Thunbergia*	*chinensis*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Adiantaceae	*Cheilanthes*	*sp	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	✓
Agavaceae	*Pleomele*	*angustifolia*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
Amaranthaceae	*Gomphrena*	*flaccida*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Ampelocissus	*Cayratia*	*trifolia*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Anacardaiceae	*Buchanania*	*obovata*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Annonaceae	*Miliusa*	*brahei*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*
Annonaceae	*Polyalthia*	*australis*	*	*	*	*	*	✓	*	*	*	*	*	*	✓	*	*	*	*
Apocynaceae	*Alstonia*	*actinophylla*	*	*	✓	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
Apocynaceae	*Ichnocarpos*	*frutescens*	*	*	*	*	*	*	*	*	*	*	*	✓	✓	*	*	*	*
Apocynaceae	*Tabernaemontana*	*orientalis*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓
Apocynaceae	*Wrightia*	*saligna*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	✓	*

Family	Genus	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
Aquifoliaceae	*Ilex*	*arnhemensis*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
Arecaceae	*Livistona*	*humilis*	*	*	✓	✓	*	*	*	✓	✓	✓	*	*	*	✓	*	✓	*
Asclepiadaceae	*Gymnanthera*	*oblonga*	*	*	*	✓	*	✓	*	*	*	*	*	*	*	✓	✓	*	✓
Asclepiadaceae	*Secamone*	*elliptica*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
Asclepiadaceae	*Tylophora*	*flexuosa*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Asteraceae	*Blumea*	**integrifolia*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*
Asteraceae	*Blumea*	*integrifolia*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Asteraceae	*Blumea*	*saxatilis*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓
Asteraceae	*Cyanthillium*	*cinereum*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Asteraceae	*Elephantopus*	*scaber*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*
Asteraceae	*Pleurocarpaea*	*denticulata*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	✓	*	*
Avicenniaceae	*Avicennia*	*marina var. eucalyptifolia*	✓	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*
Bignoniaceae	*Dolichandrone*	*filiformis*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	✓	*	*
Bixaceae	*Cochlospermum*	*fraseri*	*	*	✓	*	*	*	*	*	*	*	*	*	*	✓	*	✓	*
Bombacaceae	*Bombax*	*ceiba*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
Boraginaceae	*Cordia*	*dichotoma*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
Boraginaceae	*Ehretia*	*saligna*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	✓	*
Boraginaceae	*Heliotropium*	*ventricosum*	*	✓	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Burseraceae	*Canarium*	*australianum*	*	*	*	✓	*	✓	*	*	*	*	*	✓	✓	*	*	*	*

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Family	Genus	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
Caesalpiniaceae	*Erythrophleum*	*chlorostachys*	*	✓	*	*	*	*	*	*	✓	✓	*	*	*	✓	*	✓	*
Capparaceae	*Capparis*	*separia*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Capparaceae	*Capparis*	*umbonata*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	✓	✓	*
Celastraceae	*Denhamia*	*obscura*	*	*	*	*	*	✓	*	*	*	*	*	*	✓	✓	*	*	*
Chenopodiaceae	*Halosarcia*	*halicnemoides*	*	*	*	*	*	*	✓	✓	*	*	*	*	*	*	*	*	*
Chrysobalanaceae	*Maranthes*	*corymbosa*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
Combretaceae	*Lumnitzera*	*racemosa*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*
Combretaceae	*Terminalia*	*ferdinandiana*	*	✓	✓	✓	*	✓	*	✓	✓	✓	*	*	*	✓	✓	✓	*
Commeliniaceae	*Cartonema*	*spicatum*	*	*	*	✓	*	*	*	✓	✓	✓	*	*	*	✓	✓	✓	*
Commeliniaceae	*Commelina*	*ensifolia*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Convolvulaceae	**Bonhamia*	*sp	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Convolvulaceae	*Evolvulus*	*alsinoides*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	✓	*
Convolvulaceae	*Ipomoea*	**abrupta/micrantha*	*	*	*	*	*	*	*	✓	✓	*	*	*	*	*	*	✓	*
Convolvulaceae	*Ipomoea*	*graminea*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	✓	✓	*
Cycadaceae	*Cycas*	*armstrongii*	*	✓	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cyperaceae	*Cyperus*	*macrostachyos*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Cyperaceae	*Fimbristylis*	*sp 22.36	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Cyperaceae	*Fimbristylis*	*sp 22.5	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Cyperaceae	*Fimbristylis*	*acicularis	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*

Family	Genus	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
Cyperaceae	*Fimbristylis*	*littoralis*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*
Cyperaceae	*Fuirena*	*ciliaris*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	✓
Cyperaceae	*Rhynchospora*	*sp	*	*	*	*	*	*	*	✓	✓	*	*	*	*	✓	✓	✓	✓
Cyperaceae		*sp 22.48 (poor material)	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Cyperaceae		*sp MF279 (poor material)	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*
Dilleniaceae	*Hibbertia*	*sp	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Dioscoreaceae	*Dioscorea*	*transversa*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓
Droseraceae	*Drosera*	*lanata*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*
Droseraceae	*Drosera*	*petiolaris*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*
Ebenaceae	*Diospyros*	*sp [A]	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
Ebenaceae	*Diospyros*	*sp [B]	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
Ebenaceae	*Diospyros*	*compacta*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*
Ebenaceae	*Diospyros*	*cordifolia*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
Elaeocarpaceae	*Elaeocarpus*	*arnhemicus*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
Eriocaulaceae	*Eriocaulon*	*depressum*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*
Euphorbiaceae	*Antidesma*	*ghesaembila*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Euphorbiaceae	*Bridelia*	*tomentosa*	*	✓	✓	✓	*	*	*	*	✓	*	*	*	*	✓	*	✓	✓
Euphorbiaceae	*Croton*	*arnhemicus*	*	*	*	*	*	✓	*	*	*	*	*	✓	✓	*	*	✓	✓
Euphorbiaceae	*Drypetes*	*deplanchei*	*	✓	*	✓	*	✓	*	*	*	*	*	✓	*	*	*	✓	*

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Family	Genus	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
Euphorbiaceae	*Euphorbia*	*sp (unidentified)	*	✓	✓	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Euphorbiaceae	*Flueggea*	*virosa*	*	*	*	✓	*	*	*	✓	*	*	*	*	✓	✓	*	*	✓
Euphorbiaceae	*Glochidion*	*xerocarpum*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Euphorbiaceae	*Phyllanthus*	*minutiflorus*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Euphorbiaceae	*Poranthera*	*coerulea*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Euphorbiaceae		*sp MF276 (poor material)	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*
Fabaceae	*Abrus*	*precatorius*	*	*	*	✓	*	*	*	*	*	*	*	✓	✓	*	*	*	*
Fabaceae	*Desmodium*	sp. 'Pine Ck'	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Fabaceae	*Flemingia*	*parviflora*	*	*	✓	*	*	*	*	*	✓	✓	*	*	*	*	*	✓	*
Fabaceae	*Jacksonia*	*dilatata*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*
Fabaceae	*Millettia*	*pinnata*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*
Fabaceae	*Stylosanthes*	*sp 21.i12	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*
Fabaceae	*Tephrosia*	*sp 22.5/22.29	*	✓	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Fabaceae	*Tephrosia*	*sp 23.11	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	*Tephrosia*	*juncea*	*	✓	✓	✓	*	*	*	*	*	*	*	*	*	✓	*	*	*
Fabaceae	*Vigna*	*sp	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*
Fabaceae	*Vigna*	*lanceolata*	*	*	*	*	*	*	*	✓	*	*	*	*	*	✓	*	*	*
Fabaceae	*Vigna*	*vexillata*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*
Fabaceae		*sp 22.38 (infertile sample)	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*

Family	Genus	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
Fabaceae		*sp 22.53 (infertile sample)	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae		*sp 22.9 (poor specimen)	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Fabaceae		*sp 23.14 (infertile sample)	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Flagellariaceae	*Flagellaria*	*indica*	*	*	*	✓	*	✓	*	*	*	*	*	✓	✓	*	*	*	✓
Goodeniaceae	*Goodenia*	*holtzeana*	*	*	*	*	*	*	*	*	✓	✓	*	*	*	*	*	✓	*
Goodeniaceae	*Goodenia*	*pumilo*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓
Goodeniaceae	*Goodenia*	sp. Melville Island	*	*	*	✓	*	*	*	*	✓	*	*	*	*	✓	*	*	✓
Hippocrataceae	*Salacia*	*chinensis*	*	*	*	*	*	*	*	*	*	*	*	*	✓	✓	*	*	*
Lamiaceae	*Plectranthus*	*scutellarioides*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓
Lauraceae	*Cassytha*	*filiformis*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	✓
Lauraceae	*Cryptocarya*	*cunninghamii*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
Lauraceae	*Cryptocarya*	*exfoliata*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
Lauraceae	*Litsea*	*glutinosa*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
Lecythidaceae	*Barringtonia*	*acutangula*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
Lecythidaceae	*Planchonia*	*careya*	*	*	*	*	*	*	*	✓	✓	*	*	*	*	✓	*	*	*
Liliaceae		*infertile sample	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Liliaceae	*Protasparagus*	*racemosus*	*	*	✓	✓	*	*	*	*	*	*	*	*	✓	*	*	*	*
Liliaceae	*Thysanotus*	*banksii*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Liliaceae	*Thysanotus*	*chinensis*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*

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Family	Genus	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
Loganiaceae	*Fagraea*	*racemosa*	*	*	*	*	*	*	*	*	*	*	*	✓	✓	*	*	*	*
Loganiaceae	*Mitrasacme*	*sp	*	✓	*	*	*	*	*	✓	✓	✓	*	*	*	*	*	✓	*
Loganiaceae	*Mitrasacme*	*connata*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Loganiaceae	*Mitrasacme*	*gentianea*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*
Loganiaceae	*Mitrasacme*	*nummularia*	*	*	*	*	*	*	*	✓	✓	*	*	*	*	*	*	*	✓
Loganiaceae	*Strychnos*	*lucida*	*	*	*	✓	*	✓	*	*	*	*	*	✓	✓	✓	*	*	*
Malvaceae	**Sida*	**cordifolia*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*
Malvaceae	*Abelmoschus*	*manihot*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Malvaceae	*Thespesia*	*populneoides*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Melastomataceae	*Memecylon*	*pauciflorum*	*	*	*	*	*	✓	*	*	*	*	*	✓	*	*	*	*	✓
Menispermaceae	*Pachygone*	*ovata*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
Menispermaceae	*Tinospora*	*smilacina*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Mimosaceae	*Acacia*	**leptocarpa*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	✓	*	*
Mimosaceae	*Acacia*	*auriculiformis*	*	*	*	✓	*	✓	*	*	*	*	*	✓	✓	*	*	*	✓
Mimosaceae	*Acacia*	*holosericea*	*	✓	*	*	*	*	*	*	*	*	*	*	*	✓	*	✓	✓
Moraceae	*Ficus*	*aculeata*	*	*	✓	*	*	*	*	✓	*	*	*	*	*	*	✓	*	*
Moraceae	*Ficus*	*opposita*	*	✓	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Moraceae	*Ficus*	*scobina*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
Myrtaceae	**Eucalyptus/ Corymbia*	*sp (unidentified)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*

Family	Genus	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
Myrtaceae	*Calytrix*	*exstipulata*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Myrtaceae	*Corymbia*	*sp (unidentified)	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*
Myrtaceae	*Corymbia*	*sp 22.1 (poor material)	*	*	✓	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Myrtaceae	*Corymbia*	*foelscheana*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*
Myrtaceae	*Corymbia*	*polysciadia*	*	*	✓	*	*	*	*	✓	✓	*	*	*	*	*	*	✓	*
Myrtaceae	*Eucalyptus*	*miniata*	*	✓	✓	*	*	*	*	*	✓	✓	*	*	*	✓	*	*	*
Myrtaceae	*Eucalyptus*	*tetrodonta*	*	✓	✓	*	*	*	*	*	✓	*	*	*	*	✓	*	✓	*
Myrtaceae	*Lophostemon*	*lactifluus*	*	*	*	*	*	*	*	*	✓	*	*	✓	*	*	*	✓	*
Myrtaceae	*Melaleuca*	*sp	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
Myrtaceae	*Melaleuca*	*leucadendra	*	*	*	✓	*	*	*	*	*	*	*	*	*	✓	*	*	*
Myrtaceae	*Melaleuca*	*nervosa	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*
Myrtaceae	*Melaleuca*	*viridiflora	*	*	*	✓	*	*	*	✓	✓	*	*	*	*	*	✓	*	✓
Myrtaceae	*Syzygium*	*suborbiculare	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
Myrtaceae	*Xanthostemon*	*paradoxus	*	*	*	*	*	*	*	*	✓	✓	*	*	*	*	*	✓	*
Oleaceae	**Jasminum*	*sp	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Oleaceae	*Notolaea*	*microcarpa	*	*	*	*	*	*	*	*	*	*	*	*	✓	✓	*	*	✓
Opiliaceae	*Opilia*	*amentacea	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
Pandanaceae	*Pandanus*	*spiralis	*	✓	*	*	*	*	*	✓	✓	✓	*	*	*	✓	✓	✓	✓
Passifloraceae	*Adenia*	*heterophylla	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*

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Family	Genus	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
Passifloraceae	*Passiflora*	*foetida*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Plumbaginaceae	*Aegialitis*	*annulata*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Poaceae	*Sporobolus	*virginicus	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*
Poaceae	*Aristida*	*exserta*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Poaceae	*Aristida*	*holanthera*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Poaceae	*Dimeria*	*ornithopoda*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓
Poaceae	*Ectrosia*	*leporina*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	✓	*
Poaceae	*Enneapogon*	*pallidus*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Poaceae	*Eragrostis*	*cumingii*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	✓	*
Poaceae	*Eragrostis*	*rigidiuscula*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Poaceae	*Eragrostis*	*tenellula*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓
Poaceae	*Eriachne*	*avenacea*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Poaceae	*Eriachne*	*burkittii*	*	*	*	*	*	*	*	✓	✓	✓	*	*	*	✓	✓	✓	✓
Poaceae	*Eriachne*	*glauca*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓
Poaceae	*Eriachne*	*pallescens*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Poaceae	*Germainia*	*truncatiglumis*	*	✓	*	*	*	*	*	✓	✓	✓	*	*	*	✓	✓	*	✓
Poaceae	*Heterachne*	*abortiva*	*	*	*	*	*	*	*	*	✓	*	*	*	*	✓	*	*	*
Poaceae	*Heterachne*	*gulliveri*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Poaceae	*Heteropogon*	*contortus*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*

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Family	Genus	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
Poaceae	*Heteropogon*	*triticeus*	*	✓	*	*	*	*	*	*	*	✓	*	*	*	✓	✓	✓	*
Poaceae	*Ischaemum*	*decumbens*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓
Poaceae	*Rottboellia*	*cochinchinensis*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Poaceae	*Sorghum*	*intrans*	*	*	✓	*	*	*	*	*	✓	✓	*	*	*	*	*	*	*
Poaceae	*Sorghum*	*timorense*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*
Poaceae	*Sporobolus*	*caroli*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	✓
Poaceae	*Sporobolus*	*virginicus*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*
Poaceae	*Thaumastochloa*	*major*	*	✓	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Poaceae	*Themeda*	*triandra*	*	*	*	*	*	*	*	✓	✓	✓	*	*	*	✓	✓	*	*
Poaceae		*infertile sample	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Poaceae		*sp A	*	*	*	*	*	*	*	✓	✓	*	*	*	*	*	*	*	*
Poaceae		*sp B	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*
Poaceae		*sp C	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Poaceae		*Unidentified 21.i21	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*
Poaceae		*Unidentified 22.1	*	*	✓	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Poaceae		*Unidentified 23.16	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
Polygalaceae	*Polygala*	*sp	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Polygalaceae	*Polygala*	*longifolia*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*
Proteaceae	*Grevillea*	*decurrens*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	✓	*

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Family	Genus	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
Proteaceae	*Grevillea*	*pteridifolia*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*
Proteaceae	*Grevillea*	*refracta*	*	*	*	*	*	*	*	*	✓	✓	*	*	*	*	*	✓	*
Proteaceae	*Hakea*	*arborescens*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Proteaceae	*Persoonia*	*falcata*	*	✓	*	*	*	*	*	✓	✓	*	*	*	*	*	*	*	*
Proteaceae	*Stenocarpus*	*cunninghamii*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Rhamnaceae	*Alphitonia*	*excelsa*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	✓	*
Rhamnaceae	*Colubrina*	*asiatica*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Rhamnaceae	*Ziziphus*	*oenopolia*	*	*	*	✓	*	✓	*	*	*	*	*	*	*	✓	*	*	*
Rhizophoraceae	*Bruguiera*	*exaristata*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*
Rhizophoraceae	*Carallia*	*brachiata*	*	*	*	*	*	✓	*	*	*	*	*	*	✓	*	*	*	*
Rhizophoraceae	*Ceriops*	**tagal*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*
Rhizophoraceae	*Ceriops*	*australis*	✓	*	*	*	*	*	✓	*	*	*	✓	*	*	*	*	*	*
Rhizophoraceae	*Rhizophora*	*stylosa*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Rubiaceae	*Aidia*	*racemosa*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*
Rubiaceae	*Gardenia*	**fucata/pyriformis*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓
Rubiaceae	*Gardenia*	*megasperma*	*	✓	✓	*	*	*	*	*	✓	*	*	*	*	*	*	✓	*
Rubiaceae	*Ixora*	*timorensis*	*	*	*	*	*	✓	*	*	*	*	*	✓	✓	*	*	*	*
Rubiaceae	*Pavetta*	*brownii*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Rubiaceae	*Psydrax*	*odorata*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓

Family	Genus	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
Rubiaceae	*Spermacoce*	*sp	*	✓	✓	✓	*	*	*	*	✓	*	*	*	*	✓	✓	*	*
Rubiaceae	*Tarenna*	*australis*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*
Rubiaceae	*Tarenna*	*pentamera*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*
Rubiaceae		*sp MF 368 (poor material)	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Rubiaceae		*sp MF 371 (poor material)	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Rutaceae	*Micromelum*	*minutum*	*	*	*	*	*	✓	*	*	*	*	*	✓	*	*	*	*	*
Rutaceae	*Zanthoxylum*	*parviflorum*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
Santalaceae	*Exocarpos*	*latifolius*	*	*	*	✓	*	✓	*	*	*	*	*	✓	✓	*	*	*	*
Sapindaceae	*Allophylus*	*cobbe*	*	*	*	✓	*	✓	*	*	*	*	*	*	*	*	*	*	*
Sapindaceae	*Cupaniopsis*	*anacardioides*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
Sapotaceae	*Pouteria*	*sp	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	✓	*
Scrophulariaceae	*Buchnera*	**linearis*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*
Scrophulariaceae	*Buchnera*	*linearis*	*	*	✓	✓	*	*	*	*	✓	*	*	*	*	*	*	✓	*
Scrophulariaceae	*Centranthera*	*cochinchinensis*	*	*	*	*	*	*	*	✓	✓	*	*	*	*	*	*	*	*
Scrophulariaceae	*Lindernia*	*sp	*	*	*	*	*	*	*	✓	*	*	*	*	*	✓	✓	✓	*
Scrophulariaceae	*Lindernia*	*lobelioides*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*
Scrophulariaceae	*Scoparia*	*dulcis*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	*	*	*
Smilacaceae	*Smilax*	*australis*	*	*	*	✓	✓	*	*	*	*	*	*	*	✓	✓	*	*	*
Stackhousiaceae	*Stackhousia*	*intermedia*	*	*	*	*	*	*	*	*	✓	✓	*	*	*	*	✓	*	*

GHD Pty Ltd. 2009. *Ichthys Gas Field Development Project: onshore fauna and flora study.* Report prepared for INPEX Browse, Ltd., Perth, Western Australia.

Family	Genus	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18	20
Sterculiaceae	*Brachychiton*	*diversifolius*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	✓	*
Sterculiaceae	*Brachychiton*	*megaphyllus*	*	✓	✓	*	*	*	*	✓	✓	✓	*	*	*	✓	✓	*	*
Sterculiaceae	*Helicteres*	*hirsuta*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Sterculiaceae	*Helicteres*	sp. Darwin	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*	✓	*
Sterculiaceae	*Sterculia*	*holtzei*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
Sterculiaceae	*Sterculia*	*quadrifida*	*	*	*	✓	*	✓	*	*	*	*	*	✓	*	*	*	*	✓
Sterculiaceae	*Waltheria*	*indica*	*	*	✓	*	*	*	*	✓	✓	*	*	*	*	*	*	✓	*
Taccaceae	*Tacca*	*leontopetaloides*	*	*	*	*	*	*	*	✓	✓	*	*	*	*	✓	*	✓	*
Thymelaeaceae	*Thecanthes*	*punicea*	*	✓	*	*	*	*	*	*	*	✓	*	*	*	✓	*	*	*
Tiliaceae	*Grewia*	*breviflora*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*
Ulmaceae	*Trema*	*tomentosa*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Verbenaceae	*Clerodendrum*	*costatum*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*
Verbenaceae	*Clerodendrum*	*floribundum*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*	*	*
Verbenaceae	*Clerodendrum*	*inerme*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	✓
Verbenaceae	*Lantana*	*camara*	*	*	*	✓	*	*	*	*	*	*	*	*	*	*	*	*	*
Verbenaceae	*Vitex*	*glabrata*	*	*	*	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
Vitaceae	*Ampelocissus*	*acetosa*	*	*	✓	*	*	✓	*	✓	✓	*	*	✓	✓	✓	*	✓	✓
Xyridaceae	*Xyris*	*oligantha*	*	*	✓	*	*	*	*	✓	*	*	*	*	*	*	✓	*	*

Appendix G

Fauna Taxa Recorded Within Quadrats of the Study Area

Family	Species	Common Name	Conservation Status - Migratory	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10	Site 11	Site 12	Site 9A	Total
Amphibians																	
Bufonidae	*Bufo marinus* (introduced)	Cane Toad							1		3	1			1		6
Hylidae	*Cyclorana longipes*	Long Footed Frog										1					1
Hylidae	*Litoria bicolour*	Northern Dwarf Tree Frog										10				25	35
Hylidae	*Litoria nasuta*	Rocket Frog									2	1	2			10	15
Hylidae	*Litoria rothii.*	Laughing Frog			1	1	1				4	1	1		6		15
Hylidae	*Litoria tornieri*	Tornier's Frog									2	1					3
Hylidae	*Litoria wotjulumensis*	Giant Rocketfrog			1												1
Microhylidae	*Sphenophryne adelphe*	Northern Territory Frog										2					2
Myobatrachidae	*Ranidella bilingua*											6				10	16
Myobatrachidae	*Uperoliea inundata*	Floodplain Gungan									7	8				40	55
Myobatrachidae	*Uperoliea lithomoda*	Stonemason Gungan										1					1
Reptiles																	
Agamidae	*Chlamydosaurus kingii*	Frill-neck Lizard				2	1		5		18	14	9				49
Agamidae	*Diporiphora bilineata*	Two-lined Dragon													2		2
Agamidae	*Lophognathus temporalis*	Northern Water Dragon			4	3	2		1				2				12
Boidae	*Liasis olivaceus olivaceus*	Olive Python			1							1			1		3
Colubridae	*Boiga irregularis*	Brown Tree Snake				1											1
Colubridae	*Tropidonophis mairii*	Keelback														1	1
Elapidae	*Rhinoplocephalus pallidiceps*	Northern Small-eyed Snake										1					1
Gekkonidae	*Gehyra australis*	Northern Dtella											3				3
Gekkonidae	*Heteronotia binoei*	Bynoe's gecko			9	9	1				5	6	2	1			33
Gekkonidae	*Oedura rhombifer*				11	1	3		1		3	3	2				24
Pygopodidae	*Lialis burtonis*	Burton's Snake-lizard			1												1
Scincidae	*Carlia amax*					2	2		2		1	2	3		1		13
Scincidae	*Carlia gracilis*	Slender Rainbow Skink		1	2		9		6		2						20
Scincidae	*Carlia munda*	Striped Rainbow Skink		2			1		2		4	3	3				15
Scincidae	*Cryptoblepharus plagiocephalus*	Aboreal Snake-Eyed Skink			6	4	1		1		1	1	1	1			16
Scincidae	*Ctenotus robustus*	Eastern Striped Skink					1										1

Family	Species	Common Name	Conservation Status - Migratory	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10	Site 11	Site 12	Site 9A	Total
Scincidae	*Ctenotus essingtonii*	Port Essingtons Ctentous			2	7	2		1		4		1	2			19
Scincidae	*Glaphyromorphus douglasi*	Orange-sided Bar-lipped Skink			1	2					1		3				7
Scincidae	*Morethia boulengeri*										2						2
Scincidae	*Morethia storii*												1				1
Typhlopidae	*Ramphotyphlops ligatus*				1						1						2
Varanidae	*Varanus scalaris*	Spotted Tree Monitor		1	1						1		1				4
Aves																	
Accipitridae	*Accipiter fasciatus*	Brown Goshawk		1			1									2	4
Accipitridae	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	✓														
Accipitridae	*Haliastur indus*	Brahminy Kite	✓									1		1		2	4
Accipitridae	*Milvus migrans*	Black kite		2													2
Accipitridae	*Haliastur sphenurus*	Whistling Kite		1												1	2
Alcedinidae	*Todiramphus chloris*	Collared kingfisher						1									1
Anatidae	*Anas gracilis*	Grey teal														5	5
Anatidae	*Tadorna radjah*	Radjah Shelduck	✓							2							2
Ardeidae	*Ardea alba*	Great Egret	✓	1												1	2
Ardeidae	*Egretta garzetta*	Little egret		2													2
Ardeidae	*Egretta novaehollandiae*	White-faced heron														1	1
Ardeidae	*Nycticorax caledonicus*	Nankeen Night Heron		2							2	1		3		19	27
Artamidae	*Artamus minor*	Little Woodswallow															
Artamidae	*Cracticus nigrogularis*	Pied Butcherbird										2	1			1	4
Artamidae	*Cracticus quoyi*	Black Butcherbird		4			1	4	4								13
Artamidae	*Cracticus torquatus*	Grey Butcherbird			1												1
Burhinidae	*Esacus neglectus*	Beach Stone-curlew		1													1
Burhinidae	*Burhinus grallarius*	Bush Stone-curlew					1				1						2
Burhinidae	*Esacus neglectus*	Beach stone-curlew								1							1
Cacatuidae	*Cacatua galerita*	Sulphur-crested Cockatoo			7	2			1							1	11
Cacatuidae	*Calyptorhynchus banksii*	Red-tailed Black-Cockatoo			4		3				2					4	13
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-Shrike									4		2			1	7

Family	Species	Common Name	Conservation Status - Migratory	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10	Site 11	Site 12	Site 9A	Total
Campephagidae	*Coracina papuensis*	White-bellied Cuckoo-Shrike		2	15	5	2		6		5	15	7			1	58
Campephagidae	*Coracina tenuirostris melvillensis*	Melville Cicadabird		1								1		1			3
Campephagidae	*Lalage leucomela*	Varied Triller		4			6	3	7					2	23	1	46
Caprimulgidae	*Caprimulgus macrurus*	Large-tailed Nightjar					5		1						3		9
Centropodidae	*Centropus phasianinus*	Pheasant Coucal													1		1
Charadriidae	*Charadrius mongolus*	Lesser Sand Plover	✓							2							2
Charadriidae	*Elseyornis melanops*	Black-fronted dotteral														3	3
Charadriidae	*Erythrogonys cinctus*	Red-kneed dotteral														3	3
Charadriidae	*Pluvialis fulva*	Pacific Golden Plover	✓							2							2
Charadriidae	*Vanellus miles*	Masked Lapwing	✓									2				3	5
Ciconiidae	*Ephippiorhynchus asiaticus*	Black-necked stork														1	1
Columbidae	*Chalcophaps indica*	Emerald dove					2										2
Columbidae	*Ducula bicolor*	Pied Imperial-Pigeon				1			5					1	1		8
Columbidae	*Geopelia humeralis*	Bar-shouldered Dove		2		1	11	1	1		5	14	4	4		7	50
Columbidae	*Geopelia striata*	Peaceful Dove		1		4	1	1	2		8	16	8			3	44
Columbidae	*Ptilinopus regina*	Rose-crowned Fruit-Dove							3						2		5
Coraciidae	*Eurystomus orientalis*	Dollarbird							2								2
Cuculidae	*Chalcites basalis*	Horsfield's Bronze-Cuckoo							1								1
Cuculidae	*Chrysococcyx minutillus*	Little Bronze-Cuckoo															
Cuculidae	*Eudynamys scolopacea*	Common Koel				2							1				3
Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird			6	6	1	1	1		2	5					22
Dicruridae	*Dicrurus bracteatus*	Spangled Drongo			5	11	1		2		1		1	2	2		25
Dicruridae	*Grallina cyanoleuca*	Magpie-Lark			2						1	5			1	3	12
Dicruridae	*Myiagra rubecula*	Leaden Flycatcher		2		1	1	1	1		1	2	3	1	3	1	17
Dicruridae	*Rhipidura leucophrys*	Willie Wagtail									1		2			6	9
Dicruridae	*Rhipidura phasiana*	Mangrove grey fantail												1			1
Dicruridae	*Myiagra ruficollis*	Broad-billed Flycatcher					2										2
Dicruridae	*Rhipidura rufifrons*	Rufous Fantail	✓						1					1			2
Dicruridae	*Rhipidura rufiventris*	Northern Fantail				1		1				1	1		2		6

Family	Species	Common Name	Conservation Status - Migratory	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10	Site 11	Site 12	Site 9A	Total
Falconidae	*Falco berigora*	Brown Falcon								1							1
Fringillidae	*Lonchura castaneothorax*	Chestnut-breasted mannikin														4	4
Halcyonidae	*Dacelo leachii*	Blue-winged Kookaburra			5	3											8
Halcyonidae	*Todiramphus sanctus*	Sacred Kingfisher		1			2					2	3				8
Halcyonidae	*Todiramphus macleayii*	Forest Kingfisher				8			1		5	2				1	17
Hirundinidae	*Hirundo nigricans*	Tree martin		2								2		1		305	310
Laridae	*Sterna nilotica*	Gull-billed Tern		2													2
Maluridae	*Malurus melanocephalus*	Red-backed Fairy-wren									26		2				28
Megapodiidae	*Megapodius reinwardt*	Orange-footed Scrubfowl		3		1	1		2						3		10
Meliphagidae	*Conopophila albogularis*	Rufous-banded Honeyeater		1			6									1	8
Meliphagidae	*Entomyzon cyanotis*	Blue-faced Honeyeater											8				8
Meliphagidae	*Lichenostomus unicolor*	White-gaped Honeyeater		2		5	1	4			2	5	3				22
Meliphagidae	*Lichmera indistincta*	Brown Honeyeater		2	10	38		5			32	18	30	9	7	2	153
Meliphagidae	*Manorina flavigula*	Yellow-throated Miner			2												2
Meliphagidae	*Melithreptus albogularis*	White-throated Honeyeater		2	48	32	15	5	9		2	11	13				137
Meliphagidae	*Myzomela erythrocephala*	Red-headed Honeyeater		10	23	30	12	1	15		26	5	3		30		155
Meliphagidae	*Myzomela obscura*	Dusky Honeyeater		3	10	3		2	3		29	7	1				58
Meliphagidae	*Philemon argenticeps*	Silver-crowned Friarbird			9	3	3	1			6	4	2				28
Meliphagidae	*Philemon buceroides*	Helmeted Friarbird			3	2	2		2		1		1				11
Meliphagidae	*Philemon citreogularis*	Little Friarbird			17	2		2	2		1	23	25		1		73
Meliphagidae	*Ramsayornis fasciatus*	Bar-breasted Honeyeater														1	1
Meliphagidae	*Manorina flavigula*	Yellow-throated Miner				2											2
Meropidae	*Merops ornatus*	Rainbow Bee-eater	✓	8	4	5	8	6	1	4	9	9	9	2	4	20	89
Motacilidae	*Anthus novaeseelandiae*	Richard's Pipit	✓							2							2
Oriolidae	*Oriolus flavocinctus*	Yellow Oriole			5	9	4		12			3					33
Oriolidae	*Oriolus sagittatus*	Olive-backed oriole										1	1				2
Oriolidae	*Sphecotheres viridis*	Figbird			2	1			6		1					1	11
Pachycephalidae	*Colluricincla harmonica*	Grey Shrike-thrush				1			4			1					6
Pachycephalidae	*Colluricincla megarhyncha*	Little Shrike-thrush				4			10		3						17

Family	Species	Common Name	Conservation Status - Migratory	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10	Site 11	Site 12	Site 9A	Total
Pachycephalidae	*Pachycephala lanioides*	White-breasted whistler		1					1								2
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler					3									1	4
Pardalotidae	*Gerygone chloronota*	Green-backed Gerygone		3			2	3	6					2	3		19
Pardalotidae	*Gerygone laevigaster*	Mangrove Gerygone		10				2						13	1		26
Pardalotidae	*Pardalotus striatus*	Striated Pardalote									7	5	5				17
Pardalotidae	*Sericornis magnirostris*	Large-billed Scrubwren						2	4								6
Pardalotidae	*Smicrornis brevirostris*	Weebill				8		3	6		4	7	3				31
Passeridae	*Neochmia phaeton*	Crimson Finch										2				1	3
Passeridae	*Poephila acuticauda*	Long-tailed Finch									11						11
Passeridae	*Taeniopygia bichenovii*	Double-barred Finch		1							2				11	22	36
Petroicidae	*Eopsaltria pulverulenta*	Mangrove robin												4			4
Petroicidae	*Microeca flavigaster*	Lemon-bellied Flycatcher		1			5		3								9
Phasianidae	*Coturnix ypsilophora*	Brown Quail										2				1	3
Pittidae	*Pitta iris*	Rainbow Pitta							5								5
Podargidae	*Podargus strigoides*	Tawny Frogmouth							1		1						2
Psittacidae	*Aprosmictus erythropterus*	Red-winged Parrot			7	14	4					3	2			1	31
Psittacidae	*Trichoglossus haematodus*	Rainbow Lorikeet			6	8			3		9	10				6	42
Ptilonorhynchidae	*Chlamydera nuchalis*	Great Bowerbird				1	4		8	1		2		1	9	1	27
Scolopacidae	*Numenius madagascariensis*	Eastern Curlew	✓	3													3
Scolopacidae	*Numenius phaeopus*	Whimbrel	✓	6													6
Scolopacidae	*Tringa stagnatilis*	Marsh sandpiper														1	1
Strigidae	*Ninox novaeseelandiae*	Southern Boobook			1		1										2
Sylviidae	*Cinclorhamphus mathewsi*	Rufous songlark											1			3	4
Sylviidae	*Cisticola exilis*	Golden-headed Cisticola														3	3
Threskiornithidae	*Threskiornis molucca*	Australian White Ibis		4						1							5
Zosteropidae	*Zosterops lutea*	Yellow White-eye		12			3							1			16
Mammals																	
Macropodidae	*Macropus agilis*	Agile Wallaby			3						9	1	1				14
Macropodidae	*Macropus antilopinus*	Antilopine Wallaroo														1	1

Family	Species	Common Name	Conservation Status - Migratory	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10	Site 11	Site 12	Site 9A	Total
Muridae	*Rattus rattus* (introduced)	Black Rat					1										1
Pteropodidae	*Pteropus scapulatus*	Little Red Flying Fox			2	1					3	5			2		13
Suidae	*Sus scrofa* (introduced)	Wild Pig		2													2

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