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Identification of Vegetation, Bird and Frog Values and their Hydrological Requirements for input into the Lake Moodemere Environmental Watering Plan

DRAFT
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1.0 INTRODUCTION

1.1 Project Context and Objectives

Australian Ecosystems was engaged by the North East Catchment Management Authority to undertake flora and fauna surveys and report on rare and threatened species occurrence and wetland vegetation condition within Lake Moodemere of north eastern Victoria (Figure 1, page 2); the results contributing to the development of an Environmental Watering Plan for Lake Moodemere and Sunday Creek. The purpose of the study was to provide advice on optimal hydrological requirements for Ecological Vegetation Classes (EVCs) and threatened flora and fauna species recorded within the study area.

The core objectives of the project were to:

- Confirm the project area that is appropriate for the investigation with consideration of information recommended for input into the development of an Environmental Watering Plan.
- Identify, describe and map (where appropriate) the floristic communities and fauna species of Lake Moodemere and Sunday Creek – highlighting any Victorian Rare or Threatened (VROT) species – with particular emphasis, respectively, on flora species likely to be impacted on by an altered hydrology regime, and frogs and birds.
- Assess wetland vegetation condition
- Provide a list of species (flora, frog and bird) and vegetation communities relevant to the project area (additional to those determined from the on-ground surveys) – from information data bases – noting each species' or communities' hydrological requirements
- Advise on management recommendations for minimum and optimum species' requirements

Figure 1 Location of Lake Moodemere study area

Map prepared by Ana Backstrom, August 2011

Vicmap Imagery - Aerial Photography 2009-10 Landcover 50cm
from DSE/DPI Corporate Geospatial Library

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2.0 METHODOLOGY

2.1 Review of Existing Information

Preliminary to the field survey, to ascertain an overview of the previously recorded biodiversity values of the study area, the following informationsources were reviewed:

Flora and vegetation information sources:

- DSE (2005) Advisory List of Rare or Threatened Plants in Victoria – 2005. Victorian Department of Sustainability and Environment, East Melbourne, Victoria
- Adair, R., Cheal, D. and White, M. (2008) Advisory List of environmental weeds in the Inland Plains bioregions of Victoria. Victorian Department of Sustainability and Environment, East Melbourne. Victoria
- DSE (2011b) 2005 and pre-1750 (pre European settlement) Ecological Vegetation Class mapping, Biodiversity Interactive Maps Website
- DSE (2010b) *Victorian Flora Database* The State of Victoria, Department of Sustainability and Environment (accessed via the 'Flora Information System', [2011, May] - © Viridans Biological Databases). The contribution of the Royal Botanical Gardens to the database is acknowledged
- DSEWPC (2011) Environment Protection and Biodiversity Conservation Act (1999) Protected Matters Search Tool Website
- DSE (2011a) Ecological Vegetation Classes by Bioregion – Victorian Riverina

Fauna data sources:

- DSE (2007) Advisory List of Rare or Threatened Vertebrate Fauna in Victoria - 2007. Victorian Department of Sustainability and Environment, East Melbourne Victoria
- DSE (2010a) *Victorian Fauna Database*, The State of Victoria, Department of Sustainability and Environment (accessed via the 'Atlas of Victorian Wildlife', [2011, May] - © Viridans Biological Databases)
- DSEWPC (2011) Environment Protection and Biodiversity Conservation Act (1999) Protected Matters Search Tool Website

2.2 Ecological Assessment

2.2.1 Vegetation Surveys

The vegetation of the wetland was reconnoitred on foot and by canoe with the aid of a high resolution aerial photograph to identify the extent of each EVC, which was mapped onto the aerial photo with the assistance of a hand held GPS. A 30 x 30 metre quadrat was established within each EVC (Figure 2, page 6). Flora species present and the projective cover of each (to the nearest 5% cover, with a minimum of 1%), was recorded for each quadrat. This data was used to describe each EVC present within the study area. The condition of each EVC was determined using the Index to Wetland Condition methodology.

Photographs were taken from the south-west corner of each quadrat to provide a pictorial representation of each EVC. Incidental observations of rare and/or threatened flora, fauna and bird rookeries/nest sites were recorded and referenced with a handheld GPS.

2.2.2 Bird Surveys

A 30 minute timed transect was conducted within each wetland EVC/habitat type (commencing from an established point; Figure 2, page 6) to record waterbird species, their numbers and breeding activity such as courtship, nest building or chick feeding. The bird-survey transect involved a slow walk around the wetlands edge, taking care not to disturb nesting birds, and the distance covered was estimated and recorded. All birds within visual range of the transect-line were recorded; if birds were observed flying over the wetland and not observed landing this was noted. Birds seen or heard while conducting other activities at the wetland were recorded as incidental observations.

2.2.3 Frog Surveys

A 30 minute timed frog transect was carried out within each inundated wetland EVC/habitat type (commencing from an established point; Figure 2, page 6), focused on identifying calling frogs. An attempt was made to estimate approximate numbers of each species heard. The size of the frog populations were grouped as - less than 10 calling males, between 10 and 100 calling males or over 100 calling males. To maximize the detection of amphibian species the wetland was visited at night several times during the course of the study, as frogs are generally most active between dusk and dawn.

A 30 minute active search for frogs and reptiles in suitable habitats, such as under debris or at the base of tussocks, was conducted within each EVC around the wetland. All species detected during the active search were recorded as incidental observations.

2.3 Plant Taxonomy

Plant taxonomy in this report follows the Flora Information System (Department of Sustainability and Environment, East Melbourne, Victoria), with consideration to the Census of Victoria Vascular Plants (Walsh and Stajsic, 2007). An asterix (*) denotes exotic species and hash sign (#) denotes indigenous species occurring outside of their natural range.

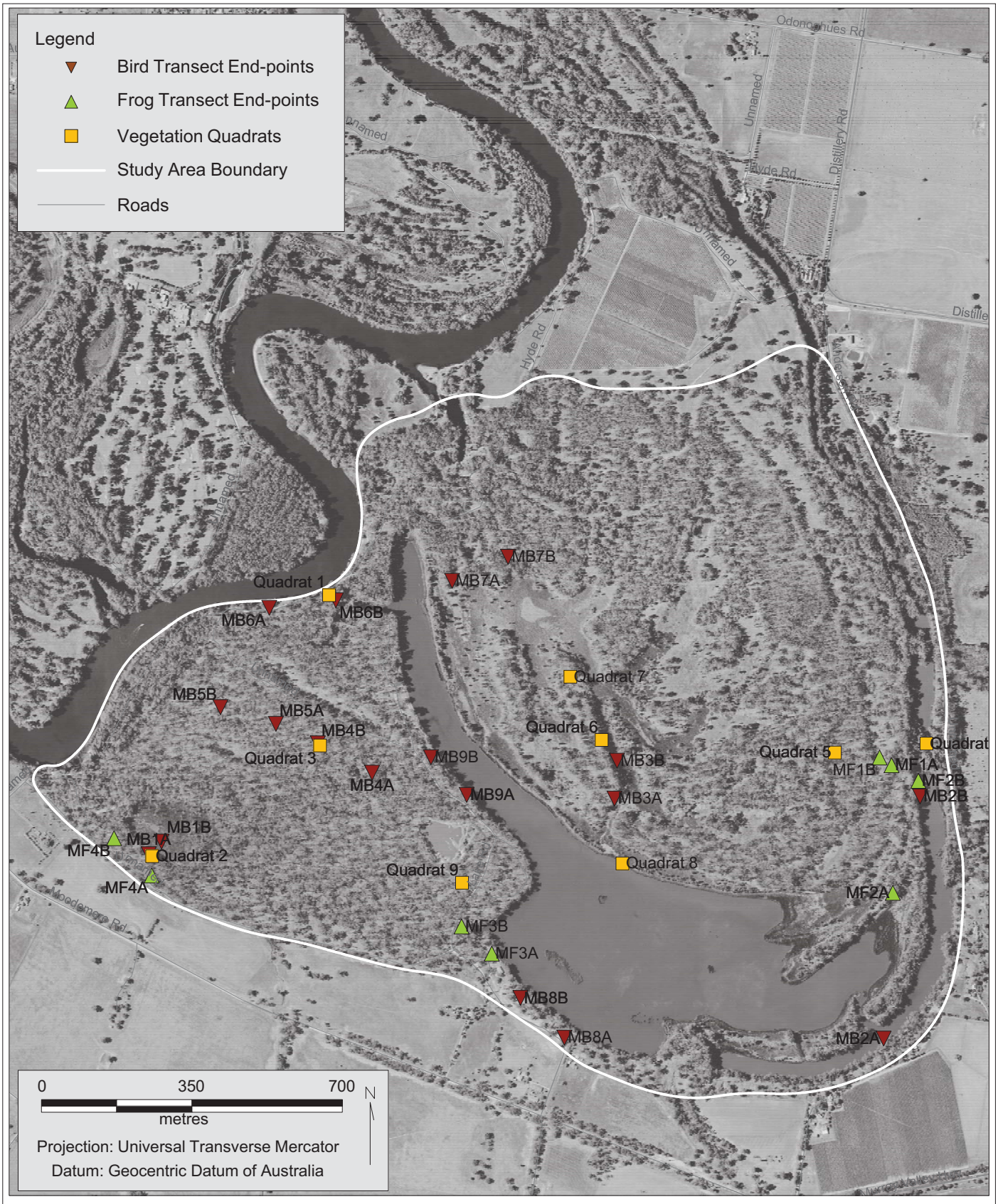

Figure 2 Location of vegetation survey quadrats, frog transects and bird transects within Lake Moodemere

Map prepared by Ana Backstrom, August 2011

Vicmap Imagery - Aerial Photography 2009-10 Landcover 50cm from DSE/DPI Corporate Geospatial Library

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3.0 ECOLOGICAL VEGETATION CLASSES

Ten Ecological Vegetation Classes (EVCs) were identified in and directly adjacent to Lake Moodemere and Sunday Creek. Two of these EVCs – Plains Woodland and Riverine Grassy Woodland – are not flood dependant, and therefore, beyond being mapped (Figure 3, page 8) and described here, are not discussed further in this report. One other EVC, Floodway Pond Herbland, was not observed at Lake Moodemere, however, this vegetation type would be likely to develop on the bed of the lake and its associated wetlands if water levels were allowed to draw down. It is described in the following section for completeness (page 18), but not discussed further in this report.

Table 1 Wetland Ecological Vegetation Classes (EVCs) occurring at Lake Moodemere assessed using the Index of Wetland Condition methodology

Ecological Vegetation Class	EVC Number	Bioregional Conservation Status in Victorian Riverina	IWC Biota Score	Condition Category
Floodplain Riparian Woodland	56	Vulnerable	14.9	Moderate
Rushy Riverine Swamp	804	Depleted	15.3	Moderate
Floodway Pond herbland/Riverine Swamp Forest Complex	945	Depleted	18.6	Excellent
Tall Marsh	821	Depleted	17.5	Good
Riverine Swampy Woodland	815	Vulnerable	14	Moderate
Aquatic Herbland	653	Depleted	5	Very poor
Grassy Riverine Forest	106	Depleted	11.9	Poor
Sedgy Riverine Forest	816	Vulnerable	14.9	Moderate

Figure 3 Distribution of Ecological Vegetation Classes (EVCs) within the Lake Moodemere study area

Map prepared by Ana Backstrom, August 2011

Vicmap Imagery - Aerial Photography 2009-10 Landcover 50cm from DSE/DPI Corporate Geospatial Library

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3.1 Aquatic Herbland (EVC 653)

Photograph 1 Aquatic Herbland, Hut Lake, Barmah Forest (D. Cook, 2005)
Note: **Historically this type of vegetation occurred at Lake Moodemere, however it has been displaced by ecologically inappropriate hydrological regimes**

Semi-permanent to seasonal wetland vegetation dominated by herbaceous aquatic species (typically with at least rootstocks tolerant of dry periods). A canopy of *Eucalyptus camaldulensis* River Red-gum may be present, but is generally confined to a fringing zone. Dominant species include *Myriophyllum spp.*Water Milfoil*, Triglochin procera s.l.* Common Water Ribbons*,* variously with *Ludwigia peploides* subsp. *Montevidensis* Clove-strip*, Nymphoides* spp. Marshwort*, Ranunculus inundatus* Buttercup. Often occurs in mosaic or complex with other wetland EVCs.

This EVC has been highly modified at Lake Moodemere by changes in hydrological regimes. According to historic accounts, Lake Moodemere supported an abundance of aquatic vegetation prior to being used as water storage for irrigation. This vegetation was likely to have been a combination of Aquatic Herbland and submerged species such as *Vallisneria americana* Eel Grass and *Potamogeton* Pondweed species. Prior to the level of the lake being kept high by water being pumped in from the Murray the water level would have naturally fluctuated from being full after floods to almost dry during periods of drought. This natural wetting and drying was necessary to maintain diverse aquatic vegetation communities.

With water levels being kept artificially high for the last 40 years vegetation within the lake has become highly modified. The main part of the lake is now open water devoid of aquatic macrophytes.

The wetlands associated with the lake, to its north-east, have also been affected by high water levels. Few Aquatic Herbland species, including *Triglochin multifructum* Northern Water-ribbons, now occur in this area, and it is currently dominated by dense *Juncus ingens*. Historical aerial photos show this area as being open; with scattered large Red Gums on its fringes. Although this area now has some characteristics of Rushy Riverine Swamp or Riverine Swamp Forest, for the purpose of Index of Wetland Condition assessment it is regarded as Aquatic Herbland.

Using the Index of Wetland Condition methodology this EVC scored only five for biota, indicating very poor condition. The only way to restore this EVC to better condition will be re-instate a more natural hydrological regime to the lake and its associated wetlands.

3.2 Floodplain Riparian Woodland (EVC 56)

Photograph 2 Floodplain Riparian Woodland, Lake Moodemere, July 2011 (D. Cook)

Floodplain Riparian Woodland occurs in riverine sites occurs as a tall eucalypt woodland to open forest of riparian verges, with a thick tussocky understorey, often with a shrub component. It typically occurs on higher sandy terraces on the inside banks of bends in the river. Some relatively undisturbed sites appear to be relatively species-poor with a virtually closed ground-layer.

Eucalyptus camaldulensis is the canopy species and there is often an open to dense smaller tree layer of *Acacia dealbata*. *Poa labillardierei* is typically dominant in the ground layer, however at Lake Moodemere large areas are dominated by *Carex bichenoviana*. Other common and sometimes locally dominant native understorey species include *Carex inversa*, *Hemarthria uncinata*, *Eulalia aurea*, *Paspalidium jubiflorum*, *Carex tereticaulis*, *Microlaena stipoides var. stipoides,* and *Juncus usitatus*. Herb species variously include *Senecio quadridentatus*, *Dichondra repens*, *Ranunculus lappaceus*, *Rumex brownii*, *Ranunculus pumilio ssp. pumilio* and *Geranium sp. 2*. High threat weeds of this EVC include **Phalaris aquatica*, **Paspalum dilatatum* and **Cynodon dactylon*.

Using the Index of Wetland Condition methodology this EVC scored 14.9 for biota, indicating that it is in moderate condition. The main factors affecting the condition of this EVC included

high weed cover, loss of understorey diversity and reduced cover of structural understorey dominants, which is likely to have been caused by historic cattle grazing.

3.3 Grassy Riverine Forest (EVC 106)

Photograph 3 Grassy Riverine Forest, Lake Moodemere, July 2011 (D. Cook)

Open eucalypt forest (to woodland) on flood prone riverine terraces, with grassy understorey dominated by species indicative of at least occasional flooding (notably *Paspalidium jubiflorum*), but also tolerant of sustained dry periods.

The tree layer comprises *E. camaldulensis* with *Paspalidium jubiflorum* dominant in the ground-layer, associated species include *Carex tereticaulis*, *Juncus usitatus*, *Carex inversa*, *Epilobium billardierianum var. cinereum*, *Persicaria prostrata*, *Rumex brownii, Dichondra repens* and *Ranunculus pumilio ssp. pumilio*. Weeds with a high cover in this EVC include **Bromus diandrus* and **Lolium rigidum*.

Using the Index of Wetland Condition methodology this EVC scored 11.9 for biota, indicating that it is in poor condition. The main factors affecting the condition of this EVC included high weed cover, loss of understorey diversity and reduced cover of structural understorey dominants, which is likely to have been caused by historic cattle grazing.

3.4 Floodway Pond Herbland/Riverine Swamp Forest Complex (EVC 945)

Photograph 4 Floodway Pond Herbland/Riverine Swamp Forest Complex, Lake Moodemere, July 2011 (D. Cook)

Tall open eucalypt forest (to woodland) of highly flood-prone areas, to 30 or more in height with (generally species-poor) understorey dominated by obligate wetland species (or opportunistic annuals during sustained dry periods).

Where present the tree layer comprises *Eucalyptus camaldulensis*, with a ground-layer variously dominated by *Eleocharis acuta*, aquatic herbs, or sometimes bare mud and leaf litter. In some areas *Eucalyptus camaldulensis* is confined to a fringing zone. Associated species include *Lachnagrostis filiformis*, *Ludwigia peploides subsp. montevidensis, Myriophyllum crispatum, Azolla filiculoides, Elatine gratioloides, Senecio runcinifolius, Persicaria prostrata, Alternanthera denticulata, Callitriche umbonata, Cardamine moirensis*, *Ranunculus pumilio*, *Ranunculus inundatus, Triglochin multifructum* and *Centipeda cunninghamii*. When flooded there is generally low weed cover, but as water recedes annual species such as **Lolium rigidum* can proliferate.

Using the Index of Wetland Condition methodology this EVC scored 18.6 for biota, indicating that it is in excellent condition.

3.5 Riverine Swampy Woodland (EVC 815)

Photograph 5 Riverine Swampy Woodland, Lake Moodemere, July 2011 (D. Cook)

This EVC occurs as a woodland to open woodland of sites which are relatively elevated but still prone to intermittent shallow inundation. The ground-layer is grassy to sedgy - herbaceous, with species indicative of periodic water-logging (and with floristic affinities to Plains Grassy Wetland). The tree layer comprises *E. camaldulensis* with ground-layer species including *Austrodanthonia duttoniana*, *Amphibromus nervosus*, *Eleocharis acuta*, *Eleocharis pusilla*, *Lobelia concolor*, *Wahlenbergia fluminensis*, *Mentha diamenica*, *Craspedia paludicola*, *Helichrysum aff. rutidolepis* and *Ranunculus lappaceus*. Sparse tussocks of *Carex tereticaulis* are present. Weeds with a high cover in this EVC include **Lolium rigidum, *Bromus diandrus* and **Hypochoeris radicata*.

Using the Index of Wetland Condition methodology this EVC scored 14 for biota, indicating that it is in moderate condition. The main factors affecting the condition of this EVC included high weed cover, loss of understorey diversity and reduced cover of structural understorey dominants, which is likely to have been caused by historic cattle grazing and to some extent changes in flooding regime due to river regulation.

3.6 Rushy Riverine Swamp (EVC 804)

Photograph 6 Rushy Riverine Swamp, Lake Moodemere, July 2011 (D. Cook)

This EVC is a collective label for various zones of vegetation associated with grassy species co-dominating in mosaic or association with components of tall rushland and aquatic herbs.

Eucalyptus camaldulensis is present around the verge with the ground-layer dominated by *Juncus ingens* in a mosaic with *Lachnagrostis filiformis*. Additional aquatics which can be present include *Azolla filiculoides*, *Ludwigia peploides subsp. montevidensis* and *Landoltia punctata*.

Using the Index of Wetland Condition methodology this EVC scored 15.3 for biota, indicating that it is in moderate condition. The main factor affecting the condition of this EVC is change in flooding regime due to river regulation. This is indicated by dead River Red Gums which have drowned due to prolonged flooding.

3.7 Sedgy Riverine Forest (EVC 816)

Photograph 7 Sedgy Riverine Forest, Lake Moodemere, July 2011 (D. Cook)

This EVC occurs as a forest (to woodland) of riverine terraces prone to flooding during larger events. The understorey is dominated by larger sedges (to sedgy-herbaceous or sedgy-grassy in character), with floristics with some affinities to Red Gum Swamp. The tree layer comprises *E. camaldulensis*, with the ground-layer dominated by *Carex tereticaulis*. At Lake Moodemere associated species variously include *Eleocharis acuta*, *Eleocharis pusilla, Paspalidium jubiflorum*, *Eulalia aurea*, *Juncus amabilis*, *Lobelia concolor*, *Marselia costulifera*, *Ludwigia peploides subsp. montevidensis*, *Wahlenbergia fluminensis*, *Alternanthera denticulata, Senecio campylocarpus, Centella cordifolia, Dichondra repens* and *Ranunculus pumilio ssp. pumilio*. Weeds with a high cover in this EVC include **Lolium rigidum, *Galium aperine* and **Bromus diandrus*.

Using the Index of Wetland Condition methodology this EVC scored 14.9 for biota, indicating that it is in moderate condition. The main factors affecting the condition of this EVC included high weed cover, loss of understorey diversity and reduced cover of structural understorey dominants, which is likely to have been caused by historic cattle grazing and changes in flooding regime due to river regulation.

3.8 Tall Marsh (EVC 821)

Photograph 8 Tall Marsh, Lake Moodemere, July 2011 (D. Cook)

Wetland vegetation dominated by tall emergent graminoids, typically in thick species-poor swards. The structure is variously rushland, sedgeland or reedbed, ranging in structure from closed to open. At optimum development, the vegetation is treeless, but sparse *Eucalyptus camaldulensis* are dispersed through some sites where sufficient dry periods occur to allow their survival.

At Lake Moodemere the structurally dominant species vary, with *Juncus ingens* being most widespread and abundant, and other localised or sub-dominant species including *Phragmites australis*, *Typha orientalis* and *Eleocharis sphacelata*. Associated species are quite variable and include aquatics such as *Azolla filiculoides*, *Landoltia punctata* and *Lemna disperma* and the floating liverwort *Ricciocarpos natans*.

Using the Index of Wetland Condition methodology this EVC scored 17.5 for biota, indicating that it is in good condition.

3.8.1 Ecological Vegetation Classes not assessed using the Index of Wetland Condition methodology

Floodway Pond Herbland (EVC 810)

No Floodway Pond Herbland was observed at Lake Moodemere, however this vegetation type would be likely to develop on the bed of the lake and its associated wetlands if water levels were allowed to draw down. This EVC forms a low herbland on the drying mud of floors of ponds on floodway systems. The floristics (and diversity) can be quite variable (both spatially and temporally), according to the traits of the wetland. In temporal cycles the floristics also inter-change with the 'unvegetated' unit or Aquatic Herbland, and probably between seasons at some locations.

This EVC is comprised of various combinations of *Centipeda* spp., *Stellaria caespitosa*, *Polygonum plebeium*, *Glinus* spp., and/or *Persicaria* spp. *Lachnagrostis filiformis* var. 1 can be also conspicuous, particularly during prolonged dry periods. Other species present at some sites include *Dysphania glomulifera*, *Fimbristylis* spp., *Alternanthera* spp. and *Myuros minimus*.

Plains Woodland (EVC 803)

The riverine variant has a grassy woodland structure, rich in small chenopods, on non-flooded alluvial deposits. Typically on heavy clay soils, but sometimes with a shallow sandy overlay.

The overstorey is dominated by box eucalypts, variously *E. microcarpa*, *E. melliodora* and *Allocasuarina luehmannii*. A range of shrubs are present, including *Pittosporum angustifolium*, but their cover is greatly reduced as a consequence of grazing by domestic stock and rabbits. The ground-layer is primarily grassy-herbaceous, dominated by species of *Austrodanthonia* and *Austrostipa*, with a range of small annual herbs and small chenopod (saltbush) species (notably species of *Maireana*, *Einadia* and *Atriplex*).

Riverine Grassy Woodland (EVC 295)

Woodland of relatively elevated floodplain sites prone to high-level flooding only, principally on natural levees, with a grassy understorey (to lightly shrubby or with chenopod semi-shrubs). The understorey is dominated by species not ecologically reliant on flooding (but tolerant of relatively brief and superficial inundation) and is potentially herb-rich in relatively intact vegetation. Soils are often sandy to silty.

Much of this vegetation type in the area of Lake Moodemere has been highly simplified by grazing and weed invasion, to such as extent that it difficult to determine its pre-European distribution in relation to adjacent EVCs. *Eucalyptus camaldulensis* is the dominant tree species. The ground-layer vegetation of more intact sites is dominated by *Austrodanthonia* spp., notably *A. setacea* and/or *Austrostipa scabra*. Other species include *Einadia nutans*, *Wahlenbergia fluminensis*, *Carex inversa*, *Oxalis perennans*, *Juncus subsecundus*, *Rumex brownii*, *Senecio quadridentatus*, *Geranium* sp., *Sida corrugata*, *Vittadinia* spp. and *Sclerolaena muricata*. This EVC is mostly very weedy in the study area, with the understorey frequently dominated by **Ehrharta longiflora*.

4.0 HYDROLOGICAL REQUIREMENTS OF ECOLOGICAL VEGETATION CLASSES (EVCs) AND FLORA SPECIES

Two hundred and seventy-eight vascular flora species were recorded during the current study (Appendix 1, page 31). Of the recorded flora species 169 (approximately 60 percent) were indigenous, fourteen of which are considered to be rare or threatened (Table 2, below).

Four of these threatened species – Pale Swamp Everlasting, River Red-gum, Winged Water-starwort and Riverina Bitter-cress – occurred as substantial populations in areas of suitable habitat. River Swamp Wallaby-grass, Late-flower Flax-lily, Hypsela and Floodplain Fireweed were rare within the study area and occurred in very low numbers in restricted habitats.

Hydrological requirements for the vegetation values recorded in the current study are presented in Table 3 (page 22).

Table 2 Threatened plant species recorded at Lake Moodemere, July 2011

Scientific Name	Common Name	EPBC	FFG	VROTS	IUCN	EVC No.
Amphibromus fluitans	River Swamp Wallaby-grass	V	L		EN	653, 945
Dianella tarda	Late-flower Flax-lily			v	CR	56
Helichrysum aff. rutidolepis (Lowland Swamps)	Pale Swamp Everlasting			v		56, 815
Hypsela tridens	Hypsela			k	CR	945
Eucalyptus camaldulensis	River Red-gum				EN	All sans 803
Hydrilla verticillata	Hydrilla			r	CR	653
Ceratophyllum demersum	Hornwort			k		653
Senecio campylocarpus	Floodplain Fireweed			r		56, 816
Callitriche umbonata	Winged Water-starwort			r	CR	945
Allocasuarina luehmannii	Buloke		L		CR	803
Amyema linophylla subsp. orientale	Buloke Mistletoe			v	EN	803

Scientific Name	Common Name	EPBC	FFG	VROTS	IUCN	EVC No.
Nymphoides crenata	Wavy Marshwort		L	v	EN	653
Brachyscome muelleroides [1]	Mueller Daisy	V	L	e	CR	816
Cardamine moirensis	Riverina Bitter-cress			k	CR	945

1 = Identified as potentially being in the area by the EPBCA protected matters search tool, but no known records for the site

Conservation Status in Australia
EX Extinct: A taxon is extinct when there is no reasonable doubt that the last individual of the taxon has died.
CR Critically Endangered: A taxon is critically endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.
EN Endangered: A taxon is endangered when it is not critically endangered but is facing a very high risk of extinction in the wild in the near future.
VU Vulnerable: A taxon is vulnerable when it is not critically endangered or endangered but is facing a high risk of extinction in the wild in the medium-term future.

Conservation Status in Victoria
x Presumed Extinct in Victoria: not recorded from Victoria during the past 50 years despite field searches specifically for the plant, or, alternatively, intensive field searches (since 1950) at all previously known sites have failed to record the plant.
e Endangered in Victoria: at risk of disappearing from the wild state if present land use and other causal factors continue to operate.
v Vulnerable in Victoria: not presently endangered but likely to become so soon due to continued depletion; occurring mainly on sites likely to experience changes in land-use which would threaten the survival of the plant in the wild; or, taxa whose total population is so small that the likelihood of recovery from disturbance, including localised natural events such as drought, fire or landslip, is doubtful.
r Rare in Victoria: rare but not considered otherwise threatened - there are relatively few known populations or the taxon is restricted to a relatively small area.
k Poorly Known in Victoria: poorly known and suspected, but not definitely known, to belong to one of the above categories (x, e, v or r) within Victoria. At present, accurate distribution information is inadequate.
f listed under the Flora and Fauna Guarantee Act 1988

Table 3 Wetland vegetation values and their optimum hydrological requirements for Lake Moodemere

Vegetation value	Frequency of event	Maximum depth	Ideal ponding duration	Preferred timing of inflows	Maximum flood duration	Ideal dry period	Maximum dry period
Floodplain Riparian Woodland	occasional	<0.2 m	< 3 days	Any T	< 1 week	11 months	10 years
Grassy Riverine Forest	occasional	<0.2 m	Up to 1 month	any	< 6 weeks	11 months	5 years
Riverine Swampy Woodland	Occasional flood	<0.2 m	1 to 2 months	winter and spring	3 months	10 to 11 months	5 years
Sedgy Riverine Forest	6 in 10 years	<0.5 m	1 to 3 months	winter and spring	3 months	9 to 11 months	5 years
Riverine Swamp Forest	8 in 10 years	<1m	3 to 6 months	winter and spring	12 to 18 months	3 to 6 months	2 years
Rushy Riverine Swamp	8 in 10 years	1 m	6 to 9 months	winter and spring	24 months	3 to 6 months	1 year
Tall Marsh	8 in 10 years	1 m	6 to 9 months	winter and spring	36 months	3 to 6 months	1 year
Aquatic Herbland	8 in 10 years	2 m	6 to 9 months	winter and spring	36 months	3 to 6 months	1 year
River Swamp Wallaby-grass	8 in 10 years	1 m	6 months	winter and spring	9 months	6 months	1 year
Late-flower Flax-lily	terrestrial	NA	NA	NA	NA	NA	NA
Pale Swamp Everlasting	5 in 10 years	0.5 m	3 month	winter and spring	3 months	9 months	5 years

Vegetation value	Frequency of event	Maximum depth	Ideal ponding duration	Preferred timing of inflows	Maximum flood duration	Ideal dry period	Maximum dry period
Hypsela	8 in 10 years	1 m	2 to 3 month	winter and spring	6 months	9 months	3 years
River Red-gum	every 1 to 3 years	Up to 1m	6 to 18 months	Autumn to Spring	18 months#	3 to 7 months	36 months
Hydrilla	8 in 10 years	3 m	9 months	winter and spring	12 months	3 months	1 year
Hornwort	8 in 10 years	3 m	9 months	winter and spring	12 months	3 months	1 year
Buloke	terrestrial	NA	NA	NA	NA	NA	NA
Buloke Mistletoe	terrestrial	NA	NA	NA	NA	NA	NA
Wavy Marshwort	8 in 10 years	1 m	6 months	winter and spring	9 months	6 months	1 year
Mueller Daisy	8 in 10 years	0.5 m	3 month	winter and spring	3 months	9 months	5 years
Riverina Bitter-cress	8 in 10 years	1 m	2 to 3 month	winter and spring	6 months	9 months	3 years
Floodplain Fireweed	5 in 10 years	0.5 m	3 month	winter and spring	3 months	9 months	5 years
Winged Water-starwort	8 in 10 years	1 m	2 to 3 month	winter and spring	6 months	9 months	3 years

5.0 HYDROLOGICAL REQUIREMENTS OF BIRD AND FAUNA SPECIES

5.1 Birds Species

One hundred and thirty-three species of birds were previously recorded within the Lake Moodemere study area (DSE, 2010b). Of these 43 are considered wetland species and three are introduced species. Seventy-three species of birds were recorded during the field study over five days in the last week of July 2011 (Appendix 2, page 40). Threatened species observed during this study included Azure Kingfisher, Eastern Great Egret, Brown Treecreeper, Hardhead, Nankeen Night Heron, Royal Spoonbill and White-bellied Sea Eagle (Table 4, page 26).

The greatest abundance and diversity of wetland birds deteced during field work conducted for this study were observed in open water habitats on Sunday Creek and the open, eastern section of Lake Moodemere. Wetland bird communities in these areas were dominated by species characteristic of deeper water habitats including Grebes and Cormorants. During the study water levels in the lake were high, providing limited shallow water habitat for wading species.

The shallower wetland area to the north-east of the main lake supported the greatest numbers of ducks observed during the study and also provided habitat for large wading species such as Herons and Egrets. The dense beds of Giant Rush in this area also provided habitat for secretive species such as the Little Grassbird and Purple Swamphen. A large River Red Gum in this area supported a White-bellied Sea Eagle nest.

Only a few species of wetland birds in low numbers were observed in the Rushy Riverine Swamp habitat of Forest Swamp. Bird transects were conducted through other habitats present on the site, though due to lack of recent inundation these areas did not support wetland birds. They did however support diverse and abundant woodland bird communities.

Of particular note was the presence of White-throated Gerygone. This species is mostly a summer migrant to Victoria (Emison and Emison, 1987), with birds moving further north in winter from most areas. Populations of White-throated Gerygone overwintering in Victoria are restricted to few localities in the centre and north-east of the state (Barrett, 2003), including the forest around Lake Moodemere.

The persistence of water in Lake Moodemere, even in times of drought, makes the area an important drought refuge for the region's wetland birds. Habitat diversity at the lake is increased when water levels are lower, when deep water, shallow water and mudflat habitats are present simultaneously. Therefore restoring a more natural hydrological regime to the lake, allowing draw down in summer, is likely to provide habitat to a greater diversity of birds.

5.2 Frog Species

Very few frog species records for the Lake Moodemere study area were held by the Victorian Wildlife Database (DSE, 2010a). Three frog species were heard calling during field surveys of Lake Moodemere during July 2011; Common Froglet, Plains Froglet and Sloan's Froglet (Photograph 9, page 26). One other species, the Spotted Marsh Frog, was found by active searching under logs and other forest debris.

Large areas of the lake and surrounding wetlands were searched on foot and by canoe on dusk and into the evening. No frogs at all were heard calling from within or around the lake. The only frog choruses detected in the entire study area during this survey were at Forest Swamp and in the area of Riverine Swamp Forest to the north-east of the lake (see Frog Transects 1 and 4; Figure 2, page 6).

It is likely other species of frogs occur in the lake and wetlands, and that these would be detected if the area was searched during seasons when more frog species are active. Many species of frogs begin calling as weather warms up in spring, including the Eastern Banjo Frog, Barking Marsh Frog and Peron's Tree Frog. Other species only call in autumn, including the Bibron's Brood Frog. Therefore in order to comprehensively survey the frogs of the area further surveys would have to be conducted in spring, summer and autumn.

Frogs are often most abundant in wetlands that have regular drying periods and aquatic vegetation made up of a diversity of lifeforms, including emergent, floating-leaved and submerged species. It is therefore likely that frog diversity and abundance at Lake Moodemere could be increased by returning a more natural hydrological regime to the lake and its associated wetlands.

Hydrological values for the fauna values recorded during this study are presented in Table

Photograph 9 Sloan's Froglet *Crinia sloanei*

Table 4 Threatened birds and frogs recorded or potentially occurring at Lake Moodemere, July 2011

Species	Scientific Name	EPBC	FFG	VROTS
Australasian Shoveler	*Anas rhynchotis*			v
Australian Painted Snipe[1]	*Rostratula australis*	V	L	ce
Azure Kingfisher	*Alcedo azurea*			n
Barking Owl	*Ninox connivens*		L	e
Black Falcon	*Falco subniger*			v
Black-chinned Honeyeater	*Melithreptus gularis*			n
Blue-billed Duck	*Oxyura australis*		L	e
Brown Treecreeper (south-eastern ssp.)	*Climacteris picumnus victoriae*			n
Eastern Great Egret	*Ardea modesta*		L	v
Freckled Duck	*Stictonetta naevosa*		L	e
Hardhead	*Aythya australis*			v
Hooded Robin	*Melanodryas cucullata*		L	n

Species	Scientific Name	EPBC	FFG	VROTS
Musk Duck	*Biziura lobata*			v
Nankeen Night Heron	*Nycticorax caledonicus*			n
Pied Cormorant	*Phalacrocorax varius*			n
Royal Spoonbill	*Platalea regia*			v
White-bellied Sea-Eagle	*Haliaeetus leucogaster*		L	v
Growling Grass Frog[1]	*Litoria raniformis*	V	L	e

1= Identified as potentially being in the area by the EPBC protected matters search tool, but no known records for the site

Conservation Status in Australia
EX Extinct: A taxon is extinct when there is no reasonable doubt that the last individual of the taxon has died.
CR Critically Endangered: A taxon is critically endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.
EN Endangered: A taxon is endangered when it is not critically endangered but is facing a very high risk of extinction in the wild in the near future.
VU Vulnerable: A taxon is vulnerable when it is not critically endangered or endangered but is facing a high risk of extinction in the wild in the medium-term future.

Conservation Status in Victoria
x Presumed Extinct in Victoria: not recorded from Victoria during the past 50 years despite field searches specifically for the plant, or, alternatively, intensive field searches (since 1950) at all previously known sites have failed to record the plant.
e Endangered in Victoria: at risk of disappearing from the wild state if present land use and other causal factors continue to operate.
v Vulnerable in Victoria: not presently endangered but likely to become so soon due to continued depletion; occurring mainly on sites likely to experience changes in land-use which would threaten the survival of the plant in the wild; or, taxa whose total population is so small that the likelihood of recovery from disturbance, including localised natural events such as drought, fire or landslip, is doubtful.
r Rare in Victoria: rare but not considered otherwise threatened - there are relatively few known populations or the taxon is restricted to a relatively small area.
k Poorly Known in Victoria: poorly known and suspected, but not definitely known, to belong to one of the above categories (x, e, v or r) within Victoria. At present, accurate distribution information is inadequate.
f listed under the Flora and Fauna Guarantee Act 1988

Table 5 Fauna values and their optimum hydrological requirements for Lake Moodemere

Fauna value	Frequency of event	Minimum Depth	Maximum Depth	Ideal ponding duration	Preferred timing of inflows	Maximum flood duration	Maximum dry period
Australasian Shoveler	8 in 10 years	0.5 m	2 m	6 to 9 months	any	12 months	1 year
Australian Painted Snipe[1]	6 in 10 years	0.1 m	0.5 m	3 months	any	6 months	5 years
Azure Kingfisher	8 in 10 years	0.5 m	NA	6 to 9 months	any	12 months	1 year
Barking Owl	terrestrial	NA	NA	NA	NA	NA	NA
Black Falcon	terrestrial	NA	NA	NA	NA	NA	NA
Black-chinned Honeyeater	terrestrial	NA	NA	NA	NA	NA	NA
Blue-billed Duck	8 in 10 years	1 m	4 m	12 months	any	12 months	1 year
Brown Treecreeper	terrestrial	NA	NA	NA	NA	NA	NA
Eastern Great Egret	6 in 10 years	0.1 m	0.5 m	3 months	any	6 months	5 years
Freckled Duck	8 in 10 years	0.5 m	2 m	6 to 9 months	any	12 months	1 year
Hardhead	8 in 10 years	0.5 m	2 m	6 to 9 months	any	12 months	1 year
Hooded Robin	terrestrial	NA	NA	NA	NA	NA	NA
Musk Duck	8 in 10 years	1 m	4 m	12 months	any	12 months	1 year
Nankeen Night Heron	6 in 10 years	0.1 m	0.5 m	3 months	any	6 months	5 years
Pied Cormorant	8 in 10 years	1 m	4 m	12 months	any	12 months	1 year
Royal Spoonbill	6 in 10 years	0.1 m	0.5 m	3 months	any	6 months	5 years
White-bellied Sea-Eagle	8 in 10 years	1 m	4 m	12 months	any	12 months	1 year
Growling Grass Frog[1]	8 in 10 years	0.5 m	2 m	6 to 9 months	spring	12 months	1 year

1= Identified as potentially being in the area by the EPBC protected matters search tool, but no known records for the site

6.0 CONCLUSION

Changes to the hydrological regime of Lake Moodemere and its associated wetlands due to the lake being used as water storage for irrigation have had negative impacts on the condition of wetland vegetation. These impacts have caused changes in the composition and structure of vegetation which has had flow-on effects on native fauna such as frogs and birds, which rely on wetland vegetation for shelter and as the basis of the food webs that sustain them.

While some of the ecological impacts of the changed water regime have been severe, Lake Moodemere has retained highly significant ecological values. It supports a diverse range of floodplain plant communities, many of which are in moderate to excellent condition, and is known to provide habitat for twelve species of rare and threatened plants, sixteen species of rare and threatened birds and a diverse range of other flora and fauna. Another ecological value of the lake is that it provides drought refuge for wetland dependant birds of the region. The area surrounding the lake supports Red Gum forests and woodlands composed of many large, old trees which support diverse and abundant bird communities.

Re-instating a more natural hydrological regime to Lake Moodemere and its associated wetlands has the potential to maintain and assist in restoring the ecological values of the area. However, any environment change is be accompanied by potential risks, and these risks must be managed. If any change is implemented it is strongly recommended that a comprehensive program be devised to monitor the condition of vegetation composition, structure and health and the associated diversity and abundance of fauna populations.

In order to comprehensively survey the frogs of the area further surveys would have to be conducted in spring, summer and autumn.

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Appendix 1 Lake Moodemere Bird Survey Results, July 2011

Bird Transect MB1

Site: MB1	Date: 12/07/2011
HABITAT: Rushy Riverine Swamp	Time: 15:20 to 15:50
Start: 0443449 69971	Finish: 0443491 6010011
Weather: Still, overcast	Temperature: 16 degrees

Common Name	Species	Count
WETLAND		
Grey Teal	*Anas gracilis*	3
Little Grassbird	*Megalurus gramineus*	2
White-faced Heron	*Egretta novaehollandiae*	2
NON WETLAND		
Australian Magpie	*Cracticus tibicen*	3
Crested Shrike-tit	*Falcunculus frontatus*	1
Grey Shrike-thrush	*Colluricincla harmonica*	1
Laughing Kookaburra	*Dacelo novaeguineae*	4
Magpie-lark	*Grallina cyanoleuca*	4
Peaceful Dove	*Geopelia striata*	1
Scarlet Robin	*Petroica boodang*	1
Sulphur-crested Cockatoo	*Cacatua galerita*	1 F
Superb Fairy-wren	*Malurus cyaneus*	20
White-plumed Honeyeater	*Lichenostomus penicillatus*	3
Willie Wagtail	*Rhipidura leucophrys*	1
Yellow Rosella	*Platycercus elegans flaveolus*	5

F = Flying overhead during transect

Bird Transect MB2

Site: MB2	Date: 13/07/2011
HABITAT: Open water, Sunday Creek	Time: 9:20 to 9:50
Start: 0445781 6009386	Finish: 0445891 6010204
Weather: Still, overcast	Temperature: 13

Common Name	Species	Count
WETLAND		
Australasian Grebe	*Tachybaptus novaehollandiae*	8
Australian Wood Duck	*Chenonetta jubata*	7
Azure Kingfisher	*Ceyx azureus*	1
Dusky Moorhen	*Gallinula tenebrosa*	1
Great Cormorant	*Phalacrocorax carbo*	10
Little Black Cormorant	*Phalacrocorax sulcirostris*	2
Little Pied Cormorant	*Microcarbo melanoleucos*	29
Pacific Black Duck	*Anas superciliosa*	13
Swamp Harrier	*Circus approximans*	1
White-faced Heron	*Egretta novaehollandiae*	1
NON WETLAND		
Australian Magpie	*Cracticus tibicen*	1
Australian Raven	*Corvus coronoides*	1
Brown Thornbill	*Acanthiza pusilla*	2
Common Blackbird	*Turdus merula*	1
Grey Shrike-thrush	*Colluricincla harmonica*	1
Laughing Kookaburra	*Dacelo novaeguineae*	4
Magpie-lark	*Grallina cyanoleuca*	1
Silvereye	*Zosterops lateralis*	10
Sulphur-crested Cockatoo	*Cacatua galerita*	10 F
Superb Fairy-wren	*Malurus cyaneus*	4
White-plumed Honeyeater	*Lichenostomus penicillatus*	1
White-throated Treecreeper	*Cormobates leucophaeus*	1
White-winged Chough	*Corcorax melanorhamphos*	6

F = Flying overhead during transect

Bird Transect MB3

Site: MB3	Date: 13/07/2011
HABITAT: North-east marshes, Aquatic Herbland invaded by *Juncus injens*	Time: 15:20 to 15:50
Start: 0444927 6010147	Finish: 0444935 6010268
Weather: Sunny, 10% cloud cover, still	Temperature: 16

Common Name	Species	Count
WETLAND		
Grey Teal	*Anas gracilis*	40
Little Black Cormorant	*Phalacrocorax sulcirostris*	16
Little Grassbird	*Megalurus gramineus*	1
Little Pied Cormorant	*Microcarbo melanoleucos*	1
Pacific Black Duck	*Anas superciliosa*	20
Purple Swamphen	*Porphyrio porphyrio*	4
Swamp Harrier	*Circus approximans*	1
White-faced Heron	*Egretta novaehollandiae*	2
NON WETLAND		
Australian Magpie	*Cracticus tibicen*	1
Crested Shrike-tit	*Falcunculus frontatus*	1
Grey Shrike-thrush	*Colluricincla harmonica*	1
Magpie-lark	*Grallina cyanoleuca*	3
Spotted Pardalote	*Pardalotus punctatus*	1
Sulphur-crested Cockatoo	*Cacatua galerita*	15
Superb Fairy-wren	*Malurus cyaneus*	10
Welcome Swallow	*Hirundo neoxena*	26
White-plumed Honeyeater	*Lichenostomus penicillatus*	6
White-throated Treecreeper	*Cormobates leucophaeus*	2
Willie Wagtail	*Rhipidura leucophrys*	2
Yellow Rosella	*Platycercus elegans flaveolus*	1

Bird Transect MB4

Site: MB4	Date: 14/07/2011
HABITAT: Floodway Pond Herbland/Riverine Swamp Forest Complex	Time: 14:10 to 14:40
Start: 0444159 6010230	Finish: 0443986 6010323
Weather: Sunny, still	Temperature: 16

Common Name	Species	Count
NON WETLAND		
Australian Magpie	*Cracticus tibicen*	3
Brown Treecreeper (south-eastern ssp.)	*Climacteris picumnus victoriae*	4
Crested Shrike-tit	*Falcunculus frontatus*	1
Grey Fantail	*Rhipidura albiscarpa*	4
Laughing Kookaburra	*Dacelo novaeguineae*	1
Magpie-lark	*Grallina cyanoleuca*	2
Spotted Pardalote	*Pardalotus punctatus*	6
Striated Thornbill	*Acanthiza lineata*	5
Sulphur-crested Cockatoo	*Cacatua galerita*	10
Superb Fairy-wren	*Malurus cyaneus*	20
Welcome Swallow	*Hirundo neoxena*	5
White-plumed Honeyeater	*Lichenostomus penicillatus*	3
White-throated Gerygone	*Gerygone albogularis*	2
Willie Wagtail	*Rhipidura leucophrys*	1
Yellow Rosella	*Platycercus elegans flaveolus*	2

Bird Transect MB5

Site: MB5	Date: 14/07/2011
HABITAT: Sedgy Riverine Forest	Time: 14:50 to 15:20
Start: 0443853 6010385	Finish: 0443677 6010438
Weather: Sunny, still	Temperature: 14

Common Name	Species	Count
WETLAND		
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	1F
NON WETLAND		
Brown Thornbill	*Acanthiza pusilla*	3
Brown Treecreeper (south-eastern ssp.)	*Climacteris picumnus victoriae*	3
Grey Fantail	*Rhipidura albiscarpa*	10
Grey Shrike-thrush	*Colluricincla harmonica*	1
Laughing Kookaburra	*Dacelo novaeguineae*	2
Magpie-lark	*Grallina cyanoleuca*	2
Spotted Pardalote	*Pardalotus punctatus*	1
Striated Thornbill	*Acanthiza lineata*	20
Sulphur-crested Cockatoo	*Cacatua galerita*	20
Superb Fairy-wren	*Malurus cyaneus*	10
Wedge-tailed Eagle	*Aquila audax*	1F
White-plumed Honeyeater	*Lichenostomus penicillatus*	5
White-throated Gerygone	*Gerygone albogularis*	2
White-throated Treecreeper	*Cormobates leucophaeus*	3
Yellow Rosella	*Platycercus elegans flaveolus*	5

F = Flying overhead during transect

Bird Transect MB6

Site: MB6	Date: 14/07/2011
HABITAT: Floodplain Riparian Woodland	Time: 15:30 to 16:00
Start: 0443832 601753	Finish: 0444042 6010777
Weather: Sunny, still	Temperature: 13

Common Name	Species	Count
NON WETLAND		
Australian Raven	*Corvus coronoides*	1F
Crested Shrike-tit	*Falcunculus frontatus*	1
Grey Fantail	*Rhipidura albiscarpa*	2
Laughing Kookaburra	*Dacelo novaeguineae*	2F
Magpie-lark	*Grallina cyanoleuca*	1
Noisy Miner	*Manorina melanocephala*	1
Red-browed Finch	*Neochmia temporalis*	30
Spotted Pardalote	*Pardalotus punctatus*	1
Sulphur-crested Cockatoo	*Cacatua galerita*	1F
Superb Fairy-wren	*Malurus cyaneus*	12
White-browed Scrubwren	*Sericornis frontalis*	2
White-plumed Honeyeater	*Lichenostomus penicillatus*	2
White-throated Treecreeper	*Cormobates leucophaeus*	2

F = Flying overhead during transect

Bird Transect MB7

Site: MB7	Date: 14/07/2011
HABITAT: North-east marshes, Aquatic Herbland invaded by *Juncus injens*	Time: 16:20 to 16:50
Start: 0444413 6010839	Finish: 0444589 6010915
Weather: Sunny, still	Temperature: 10

Common Name	Species	Count
WETLAND		
Eastern Great Egret	*Ardea modesta*	3
Little Pied Cormorant	*Microcarbo melanoleucos*	3
Masked Lapwing	*Vanellus miles*	1
Pacific Black Duck	*Anas superciliosa*	8
Purple Swamphen	*Porphyrio porphyrio*	1
Sacred Kingfisher	*Todiramphus sanctus*	1
Swamp Harrier	*Circus approximans*	1
White-faced Heron	*Egretta novaehollandiae*	4
NON WETLAND		
Brown Treecreeper (south-eastern ssp.)	*Climacteris picumnus victoriae*	1
Spotted Pardalote	*Pardalotus punctatus*	1
Sulphur-crested Cockatoo	*Cacatua galerita*	10F
Superb Fairy-wren	*Malurus cyaneus*	3
White-plumed Honeyeater	*Lichenostomus penicillatus*	1
White-throated Treecreeper	*Cormobates leucophaeus*	3
Willie Wagtail	*Rhipidura leucophrys*	1
Yellow Rosella	*Platycercus elegans flaveolus*	2

F = Flying overhead during transect

Bird Transect MB8

Site: MB8	Date: 15/07/2011
HABITAT: Open water, Lake east	Time: 11:20 to 11:50
Start: 0444768 6009389	Finish: 0444628 6009515
Weather: Sunny, still	Temperature: 14

Common Name	Species	Count
WETLAND		
Australasian Grebe	*Tachybaptus novaehollandiae*	20
Australian Shelduck	*Tadorna tadornoides*	4
Australian Wood Duck	*Chenonetta jubata*	3
Dusky Moorhen	*Gallinula tenebrosa*	1
Eastern Great Egret	*Ardea modesta*	3
Eurasian Coot	*Fulica atra*	2
Great Cormorant	*Phalacrocorax carbo*	20
Grey Teal	*Anas gracilis*	3
Little Grassbird	*Megalurus gramineus*	1
Little Pied Cormorant	*Microcarbo melanoleucos*	3
Masked Lapwing	*Vanellus miles*	2
Pacific Black Duck	*Anas superciliosa*	2
Swamp Harrier	*Circus approximans*	2
NON WETLAND		
Australian Magpie	*Cracticus tibicen*	2
Australian Raven	*Corvus coronoides*	1
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	2
Galah	*Eolophus roseicapilla*	2
Grey Shrike-thrush	*Colluricincla harmonica*	1
Laughing Kookaburra	*Dacelo novaeguineae*	2
Little Corella	*Cacatua sanguinea*	6
Magpie-lark	*Grallina cyanoleuca*	2
Mistletoebird	*Dicaeum hirundinaceum*	1
Noisy Miner	*Manorina melanocephala*	1
Red-browed Finch	*Neochmia temporalis*	6
Sulphur-crested Cockatoo	*Cacatua galerita*	17F
Superb Fairy-wren	*Malurus cyaneus*	25
Whistling Kite	*Haliastur sphenurus*	2
White-plumed Honeyeater	*Lichenostomus penicillatus*	3

Common Name	Species	Count
Yellow Rosella	*Platycercus elegans flaveolus*	1

F = Flying overhead during transect

Bird Transect MB9

Site: MB9	Date: 15/07/2011
HABITAT: Open water, Lake west	Time: 12:00 to 12:30
Start: 0444458 6010159	Finish: 0444345 6010279
Weather: Sunny, still	Temperature: 14

Common Name	Species	Count
WETLAND		
Australasian Grebe	*Tachybaptus novaehollandiae*	4
Eastern Great Egret	*Ardea modesta*	1
Eurasian Coot	*Fulica atra*	1
Grey Teal	*Anas gracilis*	3
Little Black Cormorant	*Phalacrocorax sulcirostris*	2
Little Pied Cormorant	*Microcarbo melanoleucos*	2
Masked Lapwing	*Vanellus miles*	2
Purple Swamphen	*Porphyrio porphyrio*	1
NON WETLAND		
Laughing Kookaburra	*Dacelo novaeguineae*	6
Magpie-lark	*Grallina cyanoleuca*	2
Sulphur-crested Cockatoo	*Cacatua galerita*	6F
Superb Fairy-wren	*Malurus cyaneus*	7
White-plumed Honeyeater	*Lichenostomus penicillatus*	3

F = Flying overhead during transect

Appendix 2 Lake Moodemere Frog Survey Results, July 2011

Frog Transect MF1

Site: MF1	Date: 13/07/2011
HABITAT: Riverine Swamp Forest	Time: 18:00 to 18:30
Start: 0445806 6010254	Finish: 0445708 6010278
Weather: Still, overcast	Temperature: 10

Species	Common Name	Abundance
Crinia parinsignifera	Plains Froglet	(<10)
Crinia signifera	Common Froglet	<10
Crinia sloanei	Sloane's Froglet	10 to 100
Limnodynastes tasmaniensis (NCR)	Spotted Grass Frog (Northern Call Race)	(6)

Numbers in parenthesis ( ) indicate incidental observations outside of timed transect

Frog Transect MF2

Site: MF2	Date: 13/07/2011
HABITAT: Sedgy Riverine Forest	Time: 18:30 to 19:00
Start: 0445810 6009849	Finish: 0445708 6010278
Weather: Still, overcast, drizzle	Temperature: 10

Species	Common Name	Abundance
Nothing observed		

Frog Transect MF3

Site: MF3	Date: 14/07/2011
HABITAT: Tall Marsh	Time: 18:00 to 18:30
Start: 0444539 6009656	Finish: 0444442 6009742
Weather: Still, no cloud (full moon)	Temperature: 6

Species	Common Name	Abundance
Nothing observed		

Frog Transect MF4

Site: MF4	Date: 14/07/2011
HABITAT: Rushy Riverine Swamp	Time: 18:30 to 19:00
Start: 0443459 6009904	Finish: 0443339 6010021
Weather: Still, no cloud (full moon)	Temperature: 6

Species	Common Name	Abundance
Crinia parinsignifera	Plains Froglet	<10
Crinia sloanei	Sloane's Froglet	10 to 100
Limnodynastes tasmaniensis (NCR)	Spotted Grass Frog (Northern Call Race)	(2)

Numbers in parenthesis ( ) indicate incidental observations outside of timed transect

Frog Transect MF5

Site: MF5	Date: 14/07/2011
HABITAT: Floodway Pond Herbland/Riverine Swamp Forest Complex	Time: 14:10 to 14:40
Start: 0444159 6010230	Finish: 0443986 6010323
Weather: Sunny, still	Temperature: 16

Species	Common Name	Abundance
Nothing observed		

Frog Transect MF6

Site: MF6	Date: 14/07/2011
HABITAT: Sedgy Riverine Forest	Time: 14:50 to 15:20
Start: 0443853 6010385	Finish: 0443677 6010438
Weather: Sunny, still	Temperature: 14

Species	Common Name	Abundance
Crinia parinsignifera	Plains Froglet	<10

Frog Transect MF7

Site: MF7	**Date: 14/07/2011**
HABITAT: North-east marshes, Aquatic Herbland invaded by *Juncus injens*	Time: 16:20 to 16:50
Start: 0444413 6010839	Finish: 0444589 6010915
Weather: Sunny, still	Temperature: 10

Species	**Common Name**	**Abundance**
Crinia parinsignifera	Plains Froglet	<10
Crinia signifera	Common Froglet	<10

Appendix 3 Lake Moodemere vegetation quadrat results, July 2011

Vegetation Quadrat 1

Description	Eastings	Northings	Datum and Projection	Elevation (GPS)	Survey Team
Quadrat 1	444021	6010793	GDA94 UTM Zone 55H	143 m	Damien Cook, Elaine Bayes

Survey Date and Time	Quadrat Dimensions (metres)	Ecological Vegetation Class	EVC Number
12/7/2011 15:58	30 x 30	Floodplain Riparian Woodland	56

Origin	Scientific Name	Common Name	Cover (%)
*	*Bromus catharticus*	Prairie Grass	2
	Carex bichenoviana	Plains Sedge	5
	Carex inversa	Knob Sedge	25
	Carex tereticaulis	Poong'ort	5
*	*Cirsium vulgare*	Spear Thistle	2

Origin	Scientific Name	Common Name	Cover (%)
*	*Cynodon dactylon var. dactylon*	Couch	1
	Eucalyptus camaldulensis subsp. camaldulensis	River Red-gum	20
*	*Galium aparine*	Cleavers	1
	Geranium sp. 2	Variable Crane's-bill	1
	Hemarthria uncinata var. uncinata	Mat Grass	10
*	*Hypochaeris radicata*	Flatweed	1
	Juncus usitatus	Billabong Rush	2
	Microlaena stipoides var. stipoides	Weeping Grass	5
*	*Olea europaea*	Olive	+
	Oxalis perennans	Grassland Wood-sorrel	1
#	*Paspalidium jubiflorum*	Warrego Summer-grass	+
*	*Paspalum dilatatum*	Paspalum	1
*	*Phalaris aquatica*	Toowoomba Canary-grass	+
*	*Plantago lanceolata*	Ribwort	1
	Poa labillardierei	Common Tussock-grass	25
	Ranunculus lappaceus	Australian Buttercup	1
	Ranunculus pumilio var. pumilio	Ferny Small-flower Buttercup	1
	Rumex brownii	Slender Dock	+
*	*Sonchus oleraceus*	Common Sow-thistle	+
*	*Trifolium dubium*	Suckling Clover	1
*	*Trifolium subterraneum*	Subterranean Clover	1
*	*Vicia sativa*	Common Vetch	1
	Bare Ground	NA	1
	Cryptograms	NA	1
	Leaf Litter	NA	20
	Logs and Branches	NA	1

Vegetation Quadrat 2

Description	Eastings	Northings	Datum and Projection	Elevation (GPS)	Survey Team
Quadrat 2	443460	6009965	GDA94 UTM Zone 55H	118 m	Damien Cook, Elaine Bayes

Survey Date and Time	Quadrat Dimensions (metres)	Ecological Vegetation Class	EVC Number
12/7/2011 15:23	30 x 30	Rushy Riverine Swamp	804

Origin	Scientific Name	Common Name	Cover (%)
	Azolla filiculoides	Pacific Azolla	2
	Eucalyptus camaldulensis	River Red-gum	1
	Juncus ingens	Giant Rush	40
	Lachnagrostis filiformis s.s.	Common Blown-grass	1
	Landoltia punctata	Thin Duckweed	1
	Ricciocarpos natans	Fringed Heartwort	1
	Bare Ground	NA	0

Origin	Scientific Name	Common Name	Cover (%)
	Cryptograms	NA	0
	Leaf Litter	NA	0
	Logs and Branches	NA	0
	Open Water	NA	60

Vegetation Quadrat 3

Description	Eastings	Northings	Datum and Projection	Elevation (GPS)	Survey Team
Quadrat 3	443993	6010316	GDA94 UTM Zone 55H	139 m	Damien Cook, Elaine Bayes

Survey Date and Time	Quadrat Dimensions (metres)	Ecological Vegetation Class	EVC Number
12/7/2011 16:28	15 x 45	Riverine Swamp Forest	814

Origin	Scientific Name	Common Name	Cover (%)
	Alternanthra denticulata	Lesser Joyweed	1
	Amyema miquelii	Box Mistletoe	+
	Azolla filiculoides	Pacific Azolla	1
	Callitriche umbonata	Winged Water-starwort	2
	Cardamine moirensis	Riverina Bitter-cress	2
	Carex inversa	Knob Sedge	1
	Carex tereticaulis	Poong'ort	2

Origin	Scientific Name	Common Name	Cover (%)
	Centipeda cunninghamii	Common Sneezeweed	1
	Centipeda minima s.l.	Spreading Sneezeweed	1
*	*Cirsium vulgare*	Spear Thistle	+
*	*Conyza bonariensis*	Flaxleaf Fleabane	1
	Cotula australis	Common Cotula	1
#	*Cyperus difformis*	Variable Flat-sedge	+
*	*Cyperus eragrostis*	Drain Flat-sedge	+
	Dichondra repens	Kidney-weed	1
#	*Eclipta platyglossa*	Yellow Twin-heads	+
	Elatine gratioloides	Waterwort	1
	Eleocharis acuta	Common Spike-sedge	2
	Eleocharis pusilla	Small Spike-sedge	+
	Epilobium billardierianum subsp. cinereum	Grey Willow-herb	1
	Eucalyptus camaldulensis	River Red-gum	10
*	*Galium aparine*	Cleavers	+
	Gnaphalium polycaulon	Indian Cudweed	2
*	*Hypochaeris radicata*	Flatweed	+
	Hypsela tridens	Hypsela	+
	Juncus amabilis	Hollow Rush	1
	Juncus bufonius	Toad Rush	+
	Lachnagrostis filiformis s.s.	Common Blown-grass	1
*	*Lolium rigidum*	Wimmera Rye-grass	5
	Ludwigia peploides subsp. montevidensis	Clove-strip	2
	Lythrum hyssopifolia	Small Loosestrife	2
	Myriophyllum crispatum	Upright Water-milfoil	2
#	*Paspalidium jubiflorum*	Warrego Summer-grass	+
	Persicaria prostrata	Creeping Knotweed	1
	Pseudognaphalium luteoalbum	Jersey Cudweed	1
	Ranunculus inundatus	River Buttercup	+
	Ranunculus pumilio var. pumilio	Ferny Small-flower Buttercup	10
*	*Rorippa palustris*	Marsh Yellow-cress	1
	Rumex brownii	Slender Dock	+
	Senecio runcinifolius	Tall Fireweed	+
*	*Soliva anthemifolia*	Dwarf Jo-jo	1

Origin	Scientific Name	Common Name	Cover (%)
*	*Sonchus asper s.l.*	Rough Sow-thistle	+
*	*Sonchus oleraceus*	Common Sow-thistle	1
*	*Stellaria media*	Chickweed	+
	Triglochin multifructa	Northern Water-ribbons	2
	Wahlenbergia fluminalis	River Bluebell	1
	Leaf Litter	NA	10
	Bare Ground/ Mud	NA	20
	Cryptograms	NA	NA
	Open Water	NA	20
	Logs and Branches	NA	2

Vegetation Quadrat 4

Description	Eastings	Northings	Datum and Projection	Elevation (GPS)	Survey Team
Quadrat 4	445917	6010322	GDA94 UTM Zone 55H	140 m	Damien Cook, Elaine Bayes

Survey Date and Time	Quadrat Dimensions (metres)	Ecological Vegetation Class	EVC Number
7/13/2011 10:00 AM	20 x 40	Tall Marsh	821

Origin	Scientific Name	Common Name	Cover (%)
	Azolla filiculoides	Pacific Azolla	5
	Eucalyptus camaldulensis	River Red-gum	2
	Juncus ingens	Giant Rush	30
	Lemna disperma	Common Duckweed	+
	Ricciocarpos natans	Fringed Heartwort	1
	Bare Ground/Mud	NA	0
	Cryptograms	NA	NA

Origin	Scientific Name	Common Name	Cover (%)
	Leaf Litter	NA	NA
	Logs and Branches	NA	1
	Open Water	NA	65

Vegetation Quadrat 5

Description	Eastings	Northings	Datum and Projection	Elevation (GPS)	Survey Team
Quadrat 5	445626	6010294	GDA94 UTM Zone 55H	147 m	Damien Cook, Elaine Bayes

Survey Date and Time	Quadrat Dimensions (metres)	Ecological Vegetation Class	EVC Number
7/13/2011 11:20 AM	30 x 30	Riverine Swampy Woodland	815

Origin	Scientific Name	Common Name	Cover (%)
	Alternanthra denticulata	Lesser Joyweed	1
	Amphibromus nervosus	Common Swamp Wallaby-grass	+

Origin	Scientific Name	Common Name	Cover (%)
*	*Arctotheca calendula*	Cape Weed	+
	Arthropodium minus	Small Vanilla-lily	1
*	*Bromus diandrus*	Great Brome	5
	Carex inversa	Knob Sedge	5
	Carex tereticaulis	Poong'ort	2
	Centipeda cunninghamii	Common Sneezeweed	1
*	*Cirsium vulgare*	Spear Thistle	1
	Cotula australis	Common Cotula	1
	Craspedia paludicola	Swamp Billy-buttons	1
*	*Cucumis myriocarpus subsp. leptodermis*	Paddy Melon	+
	Dichondra repens	Kidney-weed	2
*	*Echium plantagineum*	Paterson's Curse	1
	Eleocharis pusilla	Small Spike-sedge	2
	Eucalyptus camaldulensis	River Red-gum	10
	Helichrysum aff. rutidolepis (Lowland Swamps)	Pale Swamp Everlasting	5
	Hydrocotyle sibthorpioides	Shining Pennywort	+
*	*Hypochaeris radicata*	Flatweed	5
	Juncus amabilis	Hollow Rush	1
	Juncus usitatus	Billabong Rush	5
	Lachnagrostis filiformis s.s.	Common Blown-grass	1
*	*Lactuca serriola*	Prickly Lettuce	1
	Lobelia concolor	Poison Pratia	1
*	*Lolium rigidum*	Wimmera Rye-grass	40
	Lythrum hyssopifolia	Small Loosestrife	1
	Mentha diemenica	Slender Mint	1
	Oxalis perennans	Grassland Wood-sorrel	1
	Persicaria prostrata	Creeping Knotweed	1
	Pseudognaphalium luteoalbum	Jersey Cudweed	+
	Ranunculus lappaceus	Australian Buttercup	1
	Ranunculus pumilio var. pumilio	Ferny Small-flower Buttercup	1
*	*Romulea rosea*	Onion Grass	1
	Rumex brownii	Slender Dock	1
	Rytidosperma duttonianum	Brown-back Wallaby-grass	1

Origin	Scientific Name	Common Name	Cover (%)
*	*Solanum nigrum s.s.*	Black Nightshade	1
*	*Sonchus oleraceus*	Common Sow-thistle	1
*	*Trifolium subterraneum*	Subterranean Clover	1
*	*Vulpia bromoides*	Squirrel-tail Fescue	5
	Wahlenbergia fluminalis	River Bluebell	1
*	*Xanthium spinosum*	Bathurst Burr	+
	Leaf Litter	NA	20
	Bare Ground/ Mud	NA	2
	Cryptograms	NA	1
	Open Water	NA	NA
	Logs and Branches	NA	2

Vegetation Quadrat 6

Description	Eastings	Northings	Datum and Projection	Elevation (GPS)	Survey Team
Quadrat 6	444886	6010334	GDA94 UTM Zone 55H	141 m	Damien Cook, Elaine Bayes

Survey Date and Time	Quadrat Dimensions (metres)	Ecological Vegetation Class	EVC Number
7/13/2011 4:01 PM	30 x 30	Aquatic Herband invaded by *Juncus injens*	653

Origin	Scientific Name	Common Name	Cover (%)
	Eucalyptus camaldulensis	River Red-gum	5
	Juncus ingens	Giant Rush	30
	Triglochin multifructa	Northern Water-ribbons	+
	Bare Ground/Mud	NA	NA
	Cryptograms	NA	NA
	Leaf Litter	NA	NA
	Logs and Branches	NA	1
	Open Water	NA	70

Vegetation Quadrat 7

Description	Eastings	Northings	Datum and Projection	Elevation (GPS)	Survey Team
Quadrat 7	444787	6010534	GDA94 UTM Zone 55H	146 m	Damien Cook, Elaine Bayes

Survey Date and Time	Quadrat Dimensions (metres)	Ecological Vegetation Class	EVC Number
7/13/2011 4:30 PM	30 x 30	Grassy Riverine Forest	106

Origin	Scientific Name	Common Name	Cover (%)
*	*Arctotheca calendula*	Cape Weed	+
*	*Bromus diandrus*	Great Brome	40
	Carex inversa	Knob Sedge	2
	Carex tereticaulis	Poong'ort	5
*	*Cirsium vulgare*	Spear Thistle	1
	Cotula australis	Common Cotula	1
	Crassula decumbens var.	Spreading Crassula	1

Origin	Scientific Name	Common Name	Cover (%)
	decumbens		
*	*Cucumis myriocarpus subsp. leptodermis*	Paddy Melon	+
*	*Cynodon dactylon var. dactylon*	Couch	1
	Dichondra repens	Kidney-weed	+
*	*Echium plantagineum*	Paterson's Curse	1
	Epilobium billardierianum subsp. cinereum	Grey Willow-herb	+
	Eucalyptus camaldulensis	River Red-gum	10
*	*Galium aparine*	Cleavers	+
*	*Hypochaeris glabra*	Smooth Cat's-ear	1
*	*Hypochaeris radicata*	Flatweed	1
	Juncus usitatus	Billabong Rush	1
*	*Lactuca serriola*	Prickly Lettuce	1
*	*Lolium rigidum*	Wimmera Rye-grass	10
	Lythrum hyssopifolia	Small Loosestrife	1
*	*Modiola caroliniana*	Red-flower Mallow	+
*	*Olea europaea*	Olive	+
	Oxalis perennans	Grassland Wood-sorrel	1
*	*Oxalis pes-caprae*	Soursob	1
#	*Paspalidium jubiflorum*	Warrego Summer-grass	15
	Persicaria prostrata	Creeping Knotweed	1
	Ranunculus pumilio var. pumilio	Ferny Small-flower Buttercup	1
	Rumex brownii	Slender Dock	1
*	*Solanum nigrum s.s.*	Black Nightshade	+
*	*Sonchus oleraceus*	Common Sow-thistle	1
*	*Vulpia bromoides*	Squirrel-tail Fescue	5
	Leaf Litter	NA	5
	Bare Ground/ Mud	NA	1
	Cryptograms	NA	2
	Open Water	NA	NA
	Logs and Branches	NA	1

Vegetation Quadrat 8

Description	Eastings	Northings	Datum and Projection	Elevation (GPS)	Survey Team
Quadrat 8	444952	6009942	GDA94 UTM Zone 55H	136 m	Damien Cook, Elaine Bayes

Survey Date and Time	Quadrat Dimensions (metres)	Ecological Vegetation Class	EVC Number
7/13/2011 5:17 PM	30 x 30	Tall Marsh	821

Origin	Scientific Name	Common Name	Cover (%)
	Azolla filiculoides	Pacific Azolla	5
	Eucalyptus camaldulensis	River Red-gum	1
	Eleocharis sphacelata	Tall Spike-sedge	1
	Juncus ingens	Giant Rush	50
	Ricciocarpos natans	Fringed Heartwort	1
	Bare Ground/Mud	NA	NA
	Cryptograms	NA	NA
	Leaf Litter	NA	NA

Origin	Scientific Name	Common Name	Cover (%)
	Logs and Branches	NA	NA
	Open Water	NA	45

Vegetation Quadrat 9

Description	Eastings	Northings	Datum and Projection	Elevation (GPS)	Survey Team
Quadrat 9	444443	6009881	GDA94 UTM Zone 55H	143 m	Damien Cook, Elaine Bayes

Survey Date and Time	Quadrat Dimensions (metres)	Ecological Vegetation Class	EVC Number
7/14/2011 12:26 PM	30 x 30	Sedgy Riverine Forest	816

Origin	Scientific Name	Common Name	Cover (%)
	Alternanthra denticulata	Lesser Joyweed	1
*	*Bromus diandrus*	Great Brome	1
	Carex inversa	Knob Sedge	1
	Carex tereticaulis	Poong'ort	20
*	*Cirsium vulgare*	Spear Thistle	+
	Centella cordifolia	Centella	+
	Dichondra repens	Kidney-weed	1
	Eleocharis acuta	Common Spike-sedge	20
	Eleocharis pusilla	Small Spike-sedge	10

Origin	Scientific Name	Common Name	Cover (%)
	Eucalyptus camaldulensis	River Red-gum	20
	Eulalia aurea	Silky Browntop	1
*	*Fumaria bastardii*	Bastard's Fumitory	+
*	*Galium aparine*	Cleavers	1
*	*Hypochaeris radicata*	Flatweed	+
	Juncus amabilis	Hollow Rush	2
	Lobelia concolor	Poison Pratia	2
*	*Lolium rigidum*	Wimmera Rye-grass	10
	Ludwigia peploides subsp. montevidensis	Clove-strip	2
	Lythrum hyssopifolia	Small Loosestrife	+
	Marsilea costulifera	Narrow-leaf Nardoo	1
*	*Medicago polymorpha*	Burr Medic	1
	Rumex brownii	Slender Dock	1
	Senecio campylocarpus	Floodplain Fireweed	+
*	*Solanum nigrum s.s.*	Black Nightshade	+
*	*Sonchus asper s.l.*	Rough Sow-thistle	+
*	*Sonchus oleraceus*	Common Sow-thistle	+
*	*Silybum marianum*	Variegated Thistle	+
*	*Stellaria media*	Chickweed	+
*	*Vicia sativa subsp. sativa*	Common Vetch	1
	Wahlenbergia fluminalis	River Bluebell	1
	Leaf Litter	NA	40
	Bare Ground/ Mud	NA	2
	Cryptograms	NA	1
	Open Water	NA	NA
	Logs and Branches	NA	2

Appendix 4 Vascular plant species of Lake Moodemere

Scientific Name	Common Name	Family
Acacia acinacea s.l.	Gold-dust Wattle	Mimosaceae
Acacia dealbata	Silver Wattle	Mimosaceae
Acacia implexa	Lightwood	Mimosaceae
Acacia paradoxa	Hedge Wattle	Mimosaceae
Acacia pycnantha	Golden Wattle	Mimosaceae
Acetosella vulgaris	Sheep Sorrel	Polygonaceae
Aira cupaniana	Quicksilver Grass	Poaceae
Allocasuarina luehmannii	Buloke	Casuarinaceae
Alopecurus aequalis	Orange Fox-tail	Poaceae
Alopecurus geniculatus	Marsh Fox-tail	Poaceae
Alternanthera denticulata s.s.	Lesser Joyweed	Amaranthaceae
Amphibromus fluitans	River Swamp Wallaby-grass	Poaceae
Amphibromus nervosus	Common Swamp Wallaby-grass	Poaceae
Amyema linophylla subsp. orientale	Buloke Mistletoe	Loranthaceae
Amyema miquelii	Box Mistletoe	Loranthaceae
Anagallis arvensis	Pimpernel	Primulaceae
Anthosachne scabra s.s.	Common Wheat-grass	Poaceae
Arctotheca calendula	Cape Weed	Asteraceae
Arthropodium minus	Small Vanilla Lily	Anthericaceae
Arthropodium strictum s.l.	Chocolate Lily	Anthericaceae
Austrostipa nodosa	Knotty Spear-grass	Poaceae
Austrostipa scabra subsp. falcata	Rough Spear-grass	Poaceae
Austrostipa spp.	Spear Grass	Poaceae
Avena fatua	Wild Oat	Poaceae
Avena sativa	Oat	Poaceae
Azolla filiculoides	Pacific Azolla	Azollaceae
Azolla pinnata	Ferny Azolla	Azollaceae
Bothriochloa macra	Red-leg Grass	Poaceae
Briza maxima	Large Quaking-grass	Poaceae
Briza minor	Lesser Quaking-grass	Poaceae
Bromus catharticus	Prairie Grass	Poaceae
Bromus diandrus	Great Brome	Poaceae
Bromus hordeaceus subsp. hordeaceus	Soft Brome	Poaceae
Bromus madritensis	Madrid Brome	Poaceae
Bromus spp.	Brome	Poaceae
Bromus sterilis	Sterile Brome	Poaceae
Callistemon sieberi	River Bottlebrush	Myrtaceae
Callitriche brutia var. brutia	Thread Water-starwort	Veronicaceae
Callitriche sonderi	Matted Water-starwort	Veronicaceae
Calocephalus citreus	Lemon Beauty-heads	Asteraceae
Calotis scapigera	Tufted Burr-daisy	Asteraceae
Capsella bursa-pastoris	Shepherd's Purse	Brassicaceae
Cardamine moirensis	Riverina Bitter-cress	Brassicaceae
Cardamine paucijuga s.l.	Annual Bitter-cress	Brassicaceae
Carduus pycnocephalus	Slender Thistle	Asteraceae

Scientific Name	Common Name	Family
Carex appressa	Tall Sedge	Cyperaceae
Carex bichenoviana	Plains Sedge	Cyperaceae
Carex inversa	Knob Sedge	Cyperaceae
Carex tereticaulis	Poong'ort	Cyperaceae
Carthamus dentatus	Toothed Thistle	Asteraceae
Centaurea melitensis	Malta Thistle	Asteraceae
Centaurium erythraea	Common Centaury	Gentianaceae
Centaurium tenuiflorum	Slender Centaury	Gentianaceae
Centella cordifolia	Centella	Apiaceae
Centipeda cunninghamii	Common Sneezeweed	Asteraceae
Centipeda minima s.l.	Spreading Sneezeweed	Asteraceae
Centipeda minima subsp. minima s.s.	Spreading Sneezeweed	Asteraceae
Cerastium glomeratum s.l.	Common Mouse-ear Chickweed	Caryophyllaceae
Ceratophyllum demersum	Hornwort	Ceratophyllaceae
Cheilanthes austrotenuifolia	Green Rock-fern	Adiantaceae
Chenopdium ambrosioides	Mexican Tea	Chenopodiaceae
Chenopodium desertorum	Frosted Goosefoot	Chenopodiaceae
Chenopodium desertorum subsp. microphyllum	Small-leaf Goosefoot	Chenopodiaceae
Chloris truncata	Windmill Grass	Poaceae
Cirsium vulgare	Spear Thistle	Asteraceae
Citrullus lanatus	Camel Melon	Cucurbitaceae
Convolvulus erubescens spp. agg.	Pink Bindweed	Convolvulaceae
Convolvulus wimmerensis	Wimmera Bindweed	Convolvulaceae
Conyza bonariensis	Flaxleaf Fleabane	Asteraceae
Conyza sumatrensis	Tall Fleabane	Asteraceae
Cotula australis	Common Cotula	Asteraceae
Craspedia paludicola	Swamp Billy-buttons	Asteraceae
Crassula colorata	Dense Crassula	Crassulaceae
Crassula decumbens var. decumbens	Spreading Crassula	Crassulaceae
Crassula sieberiana s.l.	Sieber Crassula	Crassulaceae
Cucumis myriocarpus subsp. leptodermis	Paddy Melon	Cucurbitaceae
Cynodon dactylon	Couch	Poaceae
Cyperus difformis	Variable Flat-sedge	Cyperaceae
Cyperus eragrostis	Drain Flat-sedge	Cyperaceae
Cyperus exaltatus	Tall Flat-sedge	Cyperaceae
Damasonium minus	Star Fruit	Alismataceae
Daucus glochidiatus	Australian Carrot	Apiaceae
Deyeuxia quadriseta	Reed Bent-grass	Poaceae
Dianella longifolia var. longifolia s.l.	Pale Flax-lily	Hemerocallidaceae
Dianella revoluta s.l.	Black-anther Flax-lily	Hemerocallidaceae
Dichondra repens	Kidney-weed	Convolvulaceae
Digitaria sanguinalis	Summer Grass	Poaceae
Dittrichia graveolens	Stinkwort	Asteraceae
Dodonaea viscosa	Sticky Hop-bush	Sapindaceae
Echium plantagineum	Paterson's Curse	Boraginaceae
Eclipta platyglossa	Yellow Twin-heads	Asteraceae

Scientific Name	Common Name	Family
Ehrharta erecta	Panic Veldt-grass	Poaceae
Ehrharta longiflora	Annual Veldt-grass	Poaceae
Einadia hastata	Saloop	Chenopodiaceae
Einadia nutans subsp. nutans	Nodding Saltbush	Chenopodiaceae
Elatine gratioloides	Waterwort	Elatinaceae
Eleocharis acuta	Common Spike-sedge	Cyperaceae
Eleocharis gracilis	Slender Spike-sedge	Cyperaceae
Eleocharis sphacelata	Tall Spike-sedge	Cyperaceae
Elodea canadensis	Canadian Pondweed	Hydrocharitaceae
Enneapogon nigricans	Nigger-heads	Poaceae
Enteropogon acicularis	Spider Grass	Poaceae
Epilobium billardierianum subsp. cinereum	Grey Willow-herb	Onagraceae
Epilobium hirtigerum	Hairy Willow-herb	Onagraceae
Eragrostis brownii	Common Love-grass	Poaceae
Eragrostis diandra	Close-headed Love-grass	Poaceae
Erodium botrys	Big Heron's-bill	Geraniaceae
Erodium cicutarium	Common Heron's-bill	Geraniaceae
Erodium moschatum	Musky Heron's-bill	Geraniaceae
Eucalyptus camaldulensis	River Red-gum	Myrtaceae
Eucalyptus melliodora	Yellow Box	Myrtaceae
Eucalyptus microcarpa	Grey Box	Myrtaceae
Euchiton collinus s.s.	Creeping Cudweed	Asteraceae
Euchiton involucratus s.s.	Star Cudweed	Asteraceae
Eulalia aurea	Silky Browntop	Poaceae
Festuca spp.	Fescue	Poaceae
Fumaria bastardii	Bastards Fumitory	Fumariaceae
Galium aperine	Cleavers	Rubiaceae
Gamochaeta purpurea	Purple Cudweed	Asteraceae
Geranium retrorsum s.l.	Grassland Crane's-bill	Geraniaceae
Geranium solanderi s.l.	Austral Crane's-bill	Geraniaceae
Geranium sp. 2	Variable Crane's-bill	Geraniaceae
Glossostigma elatinoides	Small Mud-mat	Phrymaceae
Glycine tabacina s.l.	Variable Glycine	Fabaceae
Gnaphalium polycaulon	Indian Cudweed	Asteraceae
Gomphocarpus fruticosus subsp. fruticosus	Swan Plant	Asclepiadaceae
Goodenia humilis	Swamp Goodenia	Goodeniaceae
Gratiola peruviana	Austral Brooklime	Veronicaceae
Haloragis heterophylla	Varied Raspwort	Haloragaceae
Helichrysum rutidolepis s.l.	Pale Everlasting	Asteraceae
Hemarthria uncinata var. uncinata	Mat Grass	Poaceae
Holcus lanatus	Yorkshire Fog	Poaceae
Hordeum hystrix	Mediterranean Barley-grass	Poaceae
Hordeum leporinum	Barley-grass	Poaceae
Hordeum murinum s.l.	Barley-grass	Poaceae
Hydrilla verticillata	Hydrilla	Hydrocharitaceae
Hydrocotyle sibthorpioides	Shining Pennywort	Araliaceae

Scientific Name	Common Name	Family
Hypericum gramineum	Small St John's Wort	Hypericaceae
Hypericum perforatum subsp. veronense	St John's Wort	Hypericaceae
Hypochaeris glabra	Smooth Cat's-ear	Asteraceae
Hypochaeris radicata	Flatweed	Asteraceae
Hypsela tridens	Hypsela	Campanulaceae
Isolepis cernua var. platycarpa	Broad-fruit Club-sedge	Cyperaceae
Isotoma fluviatilis subsp. australis	Swamp Isotome	Campanulaceae
Juncus amabilis	Hollow Rush	Juncaceae
Juncus aridicola	Tussock Rush	Juncaceae
Juncus bufonius	Toad Rush	Juncaceae
Juncus flavidus	Gold Rush	Juncaceae
Juncus gregiflorus	Green Rush	Juncaceae
Juncus ingens	Giant Rush	Juncaceae
Juncus sarophorus	Broom Rush	Juncaceae
Juncus semisolidus	Plains Rush	Juncaceae
Juncus subsecundus	Finger Rush	Juncaceae
Juncus usitatus	Billabong Rush	Juncaceae
Juncus vaginatus	Clustered Rush	Juncaceae
Kickxia elatine subsp. crinita	Twining Toadflax	Scrophulariaceae
Lachnagrostis filiformis s.l.	Common Blown-grass	Poaceae
Lactuca serriola	Prickly Lettuce	Asteraceae
Landoltia punctata	Thin Duckweed	Araceae
Lemna disperma	Common Duckweed	Araceae
Lepidium africanum	Common Peppercress	Brassicaceae
Limosella australis	Austral Mudwort	Scrophulariaceae
Lobelia concolor	Poison Pratia	Campanulaceae
Lolium perenne	Perennial Rye-grass	Poaceae
Lolium rigidum	Wimmera Rye-grass	Poaceae
Lomandra filiformis subsp. coriacea	Wattle Mat-rush	Xanthorrhoeaceae
Ludwigia peploides subsp. montevidensis	Clove-strip	Onagraceae
Lycium ferocissimum	African Box-thorn	Solanaceae
Lythrum hyssopifolia	Small Loosestrife	Lythraceae
Maireana enchylaenoides	Wingless Bluebush	Chenopodiaceae
Marrubium vulgare	Horehound	Lamiaceae
Marsilea costulifera	Narrow-leaf Nardoo	Marsileaceae
Medicago arabica	Spotted Medic	Fabaceae
Medicago minima	Little Medic	Fabaceae
Medicago polymorpha	Burr Medic	Fabaceae
Mentha diemenica	Slender Mint	Lamiaceae
Microlaena stipoides var. stipoides	Weeping Grass	Poaceae
Modiola caroliniana	Red-flower Mallow	Malvaceae
Moenchia erecta	Erect Chickweed	Caryophyllaceae
Myosurus australis	Mousetail	Ranunculaceae
Myriophyllum crispatum	Upright Water-milfoil	Haloragaceae
Myriophyllum papillosum	Robust Water-milfoil	Haloragaceae
Myriophyllum variifolium	Varied Water-milfoil	Haloragaceae

Scientific Name	Common Name	Family
Myriophyllum verrucosum	Red Water-milfoil	Haloragaceae
Nassella trichotoma	Serrated Tussock	Poaceae
Neopaxia australasica	White Purslane	Portulacaceae
Nymphoides crenata	Wavy Marshwort	Menyanthaceae
Olea europaea	Olive	Oleaceae
Opuntia stricta	Common Prickly-pear	Cactaceae
Oxalis exilis	Shady Wood-sorrel	Oxalidaceae
Oxalis perennans	Grassland Wood-sorrel	Oxalidaceae
Oxalis pes-caprae	Soursob	Oxalidaceae
Paspalidium jubiflorum	Warrego Summer-grass	Poaceae
Paspalum dilatatum	Paspalum	Poaceae
Paspalum distichum	Water Couch	Poaceae
Persicaria hydropiper	Water Pepper	Polygonaceae
Persicaria prostrata	Creeping Knotweed	Polygonaceae
Petrorhagia dubia	Velvety Pink	Caryophyllaceae
Phalaris aquatica	Toowoomba Canary-grass	Poaceae
Pimelea curviflora s.l.	Curved Rice-flower	Thymelaeaceae
Pimelea curviflora var. 1	Curved Rice-flower	Thymelaeaceae
Pittosporum angustifolium	Weeping Pittosporum	Pittosporaceae
Plagiobothrys elachanthus	Hairy Forget-me-not	Boraginaceae
Plantago lanceolata	Ribwort	Veronicaceae
Poa annua	Annual Meadow-grass	Poaceae
Poa bulbosa	Bulbous Meadow-grass	Poaceae
Poa bulbosa var. vivipara	Bulbous Meadow-grass	Poaceae
Poa labillardierei	Common Tussock-grass	Poaceae
Poa sieberiana	Grey Tussock-grass	Poaceae
Polygonum aviculare s.l.	Prostrate Knotweed	Polygonaceae
Polygonum plebeium	Small Knotweed	Polygonaceae
Pseudognaphalium luteoalbum	Jersey Cudweed	Asteraceae
Pseudoraphis spinescens	Spiny Mud-grass	Poaceae
Ranunculus inundatus	River Buttercup	Ranunculaceae
Ranunculus lappaceus	Australian Buttercup	Ranunculaceae
Ranunculus muricatus	Sharp Buttercup	Ranunculaceae
Ranunculus parviflorus	Small-flower Buttercup	Ranunculaceae
Ranunculus pumilio var. pumilio	Ferny Small-flower Buttercup	Ranunculaceae
Ranunculus sceleratus subsp. sceleratus	Celery Buttercup	Ranunculaceae
Ranunculus sessiliflorus	Annual Buttercup	Ranunculaceae
Romulea minutiflora	Small-flower Onion-grass	Iridaceae
Romulea rosea	Onion Grass	Iridaceae
Rorippa laciniata	Jagged Bitter-cress	Brassicaceae
Rorippa palustris	Marsh Yellow-cress	Brassicaceae
Rosa rubiginosa	Sweet Briar	Rosaceae
Rumex brownii	Slender Dock	Polygonaceae
Rumex conglomeratus	Clustered Dock	Polygonaceae
Rumex crispus	Curled Dock	Polygonaceae
Rytidosperma caespitosum	Common Wallaby-grass	Poaceae

Scientific Name	Common Name	Family
Rytidosperma duttonianum	Brown-back Wallaby-grass	Poaceae
Rytidosperma racemosum var. racemosum	Slender Wallaby Grass	Poaceae
Rytidosperma setaceum var. setaceum	Bristly Wallaby-grass	Poaceae
Rytidosperma tenuius	Purplish Wallaby-grass	Poaceae
Sagina apetala	Common Pearlwort	Caryophyllaceae
Salvia verbenaca	Wild Sage	Lamiaceae
Schinus molle	Pepper Tree	Anacardiaceae
Senecio campylocarpus	Floodplain Fireweed	Asteraceae
Senecio quadridentatus	Cotton Fireweed	Asteraceae
Senecio runcinifolius	Tall Fireweed	Asteraceae
Setaria parviflora	Slender Pidgeon-grass	Poaceae
Sida corrugata	Variable Sida	Malvaceae
Silybum marianum	Variegated Thistle	Asteraceae
Solanum nigrum	Black Nightshade	Solanaceae
Solanum psuedocapsicum	Madeira Winter-cherry	Solanaceae
Soliva anthemifolia	Dwarf Jo-jo	Asteraceae
Soliva sessilis	Jo Jo	Asteraceae
Sonchus asper s.l.	Rough Sow-thistle	Asteraceae
Sonchus oleraceus	Common Sow-thistle	Asteraceae
Spergularia sp.3	Salt Sea-spurrey	Caryophyllaceae
Stachys arvensis	Stagger Weed	Lamiaceae
Stellaria caespitosa	Matted Starwort	Caryophyllaceae
Stellaria media	Chickweed	Caryophyllaceae
Stellaria pallida	Lesser Chickweed	Caryophyllaceae
Stenotaphrum secundatum	Buffalo Grass	Poaceae
Stuartina muelleri	Spoon Cudweed	Asteraceae
Trifolium angustifolium var. angustifolium	Narrow-leaf Clover	Fabaceae
Trifolium arvense var. arvense	Hare's-foot Clover	Fabaceae
Trifolium campestre var. campestre	Hop Clover	Fabaceae
Trifolium cernuum	Drooping-flower Clover	Fabaceae
Trifolium fragiferum var. fragiferum	Strawberry Clover	Fabaceae
Trifolium glomeratum	Cluster Clover	Fabaceae
Trifolium ornithopodioides	Birdsfoot Clover	Fabaceae
Trifolium repens var. repens	White Clover	Fabaceae
Trifolium subterraneum	Subterranean Clover	Fabaceae
Triglochin multifructa	Northern Water Ribbons	Juncaginaceae
Triglochin procera s.l.	Water Ribbons	Juncaginaceae
Typha domingensis	Narrow-leaf Cumbungi	Typhaceae
Typha orientalis	Broad-leaf Cumbungi	Typhaceae
Ulmus sp.	Elm	Ulmacaceae
Urtica urens	Small Nettle	Urticaceae
Verbena bonariensis var. bonariensis s.s.	Purple-top Verbena	Verbenaceae
Veronica peregrina	Wandering Speedwell	Veronicaceae
Vicia sativa subsp. sativa	Common Vetch	Fabaceae

Scientific Name	Common Name	Family
Vittadinia cervicularis	Annual New Holland Daisy	Asteraceae
Vittadinia cervicularis var. subcervicularis	Annual New Holland Daisy	Asteraceae
Vulpia bromoides	Squirrel-tail Fescue	Poaceae
Vulpia muralis	Wall Fescue	Poaceae
Vulpia myuros f. myuros	Rat's-tail Fescue	Poaceae
Wahlenbergia communis s.l.	Tufted Bluebell	Campanulaceae
Wahlenbergia communis s.s.	Tufted Bluebell	Campanulaceae
Wahlenbergia fluminalis	River Bluebell	Campanulaceae
Wahlenbergia gracilis	Sprawling Bluebell	Campanulaceae
Walwhalleya proluta	Rigid Panic	Poaceae
Wurmbea dioica	Common Early Nancy	Colchicaceae
Xanthium spinosum	Bathurst Burr	Asteraceae

Appendix 5 Fauna species recorded at Lake Moodemere

The following fauna list was sourced from the Victorian Fauna Database (DSE, 2011) and updated with field observations from July 2011. The combined fauna list was then updated with the recent name changes using *Systematics and Taxonomy of Australian Birds* (Christidis, L. and W.E. Boles, 2008: CSIRO Publishing, Melbourne). The conservation status of each species was then determined using EPBC Act (1999), IUCN Red List of Threatened Species, FFG list (2010) and DSE (2007).

Fauna Type	EPBC	IUCN	FFG	VROTS	Common Name	Scientific Name
Birds					* Common Blackbird	*Turdus merula*
					* Common Starling	*Sturnus vulgaris*
					* House Sparrow	*Passer domesticus*
					Australasian Darter	*Anhinga novaehollandiae*
					Australasian Grebe	*Tachybaptus novaehollandiae*
				v	Australasian Shoveler	*Anas rhynchotis*
					Australian Hobby	*Falco longipennis*
					Australian Magpie	*Cracticus tibicen*
					Australian Pelican	*Pelecanus conspicillatus*
					Australian Raven	*Corvus coronoides*
					Australian Reed-Warbler	*Acrocephalus australis*
					Australian Shelduck	*Tadorna tadornoides*
					Australian White Ibis	*Threskiornis molucca*
					Australian Wood Duck	*Chenonetta jubata*
				nt	Azure Kingfisher	*Ceyx azureus*
			L	EN	Barking Owl	*Ninox connivens*
				v	Black Falcon	*Falco subniger*
					Black Swan	*Cygnus atratus*
				nt	Black-chinned Honeyeater	*Melithreptus gularis*
					Black-faced Cuckoo-shrike	*Coracina novaehollandiae*
					Black-fronted Dotterel	*Elseyornis melanops*

Fauna Type	EPBC	IUCN	FFG	VROTS	Common Name	Scientific Name
Birds					Black-shouldered Kite	*Elanus axillaris*
		nt	L	EN	Blue-billed Duck	*Oxyura australis*
					Brown Falcon	*Falco berigora*
					Brown Goshawk	*Accipiter fasciatus*
					Brown Songlark	*Cincloramphus cruralis*
					Brown Thornbill	*Acanthiza pusilla*
				nt	Brown Treecreeper (south-eastern ssp.)	*Climacteris picumnus victoriae*
					Brown-headed Honeyeater	*Melithreptus brevirostris*
					Cattle Egret	*Ardea ibis*
					Chestnut Teal	*Anas castanea*
					Cockatiel	*Nymphicus hollandicus*
					Collared Sparrowhawk	*Accipiter cirrhocephalus*
					Crested Pigeon	*Ocyphaps lophotes*
					Crested Shrike-tit	*Falcunculus frontatus*
					Crimson Rosella	*Platycercus elegans elegans*
					Dollarbird	*Eurystomus orientalis*
					Dusky Moorhen	*Gallinula tenebrosa*
					Dusky Woodswallow	*Artamus cyanopterus*
					Eastern Barn Owl	*Tyto javanica*
			L	v	Eastern Great Egret	*Ardea modesta*
					Eastern Rosella	*Platycercus eximius*
					Eurasian Coot	*Fulica atra*
					Fairy Martin	*Petrochelidon ariel*
					Fan-tailed Cuckoo	*Cacomantis flabelliformis*
		nt			Flame Robin	*Petroica phoenicea*
			L	EN	Freckled Duck	*Stictonetta naevosa*
					Fuscous Honeyeater	*Lichenostomus fuscus*
					Galah	*Eolophus roseicapilla*
					Golden Whistler	*Pachycephala pectoralis*
					Great Cormorant	*Phalacrocorax carbo*

Fauna Type	EPBC	IUCN	FFG	VROTS	Common Name	Scientific Name
Birds					Great Crested Grebe	*Podiceps cristatus*
					Grey Fantail	*Rhipidura albiscarpa*
					Grey Shrike-thrush	*Colluricincla harmonica*
					Grey Teal	*Anas gracilis*
				v	Hardhead	*Aythya australis*
					Hoary-headed Grebe	*Poliocephalus poliocephalus*
			L	nt	Hooded Robin	*Melanodryas cucullata*
					Horsfield's Bronze-Cuckoo	*Chalcites basalis*
					Jacky Winter	*Microeca fascinans*
					Laughing Kookaburra	*Dacelo novaeguineae*
					Little Black Cormorant	*Phalacrocorax sulcirostris*
					Little Corella	*Cacatua sanguinea*
					Little Eagle	*Hieraaetus morphnoides*
					Little Friarbird	*Philemon citreogularis*
					Little Grassbird	*Megalurus gramineus*
					Little Lorikeet	*Glossopsitta pusilla*
					Little Pied Cormorant	*Microcarbo melanoleucos*
					Little Raven	*Corvus mellori*
					Magpie-lark	*Grallina cyanoleuca*
					Masked Lapwing	*Vanellus miles*
					Mistletoebird	*Dicaeum hirundinaceum*
				v	Musk Duck	*Biziura lobata*
				nt	Nankeen Night Heron	*Nycticorax caledonicus*
					Noisy Friarbird	*Philemon corniculatus*
					Noisy Miner	*Manorina melanocephala*
					Olive-backed Oriole	*Oriolus sagittatus*
					Pacific Black Duck	*Anas superciliosa*
					Peaceful Dove	*Geopelia striata*
					Pied Butcherbird	*Cracticus nigrogularis*
				nt	Pied Cormorant	*Phalacrocorax varius*

Fauna Type	EPBC	IUCN	FFG	VROTS	Common Name	Scientific Name
Birds					Pied Currawong	*Strepera graculina*
					Pink-eared Duck	*Malacorhynchus membranaceus*
					Purple Swamphen	*Porphyrio porphyrio*
					Rainbow Bee-eater	*Merops ornatus*
					Red-browed Finch	*Neochmia temporalis*
					Red-capped Robin	*Petroica goodenovii*
					Red-kneed Dotterel	*Erythrogonys cinctus*
					Red-rumped Parrot	*Psephotus haematonotus*
					Restless Flycatcher	*Myiagra inquieta*
				V	Royal Spoonbill	*Platalea regia*
					Rufous Songlark	*Cincloramphus mathewsi*
					Rufous Whistler	*Pachycephala rufiventris*
					Sacred Kingfisher	*Todiramphus sanctus*
					Scarlet Robin	*Petroica boodang*
					Silver Gull	*Chroicocephalus novaehollandiae*
					Silvereye	*Zosterops lateralis*
					Southern Boobook	*Ninox novaeseelandiae*
					Spotted Pardalote	*Pardalotus punctatus*
					Straw-necked Ibis	*Threskiornis spinicollis*
					Striated Pardalote	*Pardalotus striatus*
					Striated Thornbill	*Acanthiza lineata*
					Stubble Quail	*Coturnix pectoralis*
					Sulphur-crested Cockatoo	*Cacatua galerita*
					Superb Fairy-wren	*Malurus cyaneus*
					Swamp Harrier	*Circus approximans*
					Tawny Frogmouth	*Podargus strigoides*
					Tree Martin	*Petrochelidon nigricans*
					Unidentified spoonbill .	*Platelea sp*
					Varied Sittella	*Daphoenositta chrysoptera*
					Wedge-tailed Eagle	*Aquila audax*

Fauna Type	EPBC	IUCN	FFG	VROTS	Common Name	Scientific Name
Birds					Weebill	*Smicrornis brevirostris*
					Welcome Swallow	*Hirundo neoxena*
					Whistling Kite	*Haliastur sphenurus*
					White-backed Swallow	*Cheramoeca leucosternus*
					White-bellied Cuckoo-shrike	*Coracina papuensis*
			L	v	White-bellied Sea-Eagle	*Haliaeetus leucogaster*
					White-browed Scrubwren	*Sericornis frontalis*
					White-faced Heron	*Egretta novaehollandiae*
					White-naped Honeyeater	*Melithreptus lunatus*
					White-necked Heron	*Ardea pacifica*
					White-plumed Honeyeater	*Lichenostomus penicillatus*
					White-throated Gerygone	*Gerygone albogularis*
					White-throated Needletail	*Hirundapus caudacutus*
					White-throated Treecreeper	*Cormobates leucophaeus*
					White-winged Chough	*Corcorax melanorhamphos*
					Willie Wagtail	*Rhipidura leucophrys*
					Yellow Rosella	*Platycercus elegans flaveolus*
					Yellow Thornbill	*Acanthiza nana*
					Yellow-billed Spoonbill	*Platalea flavipes*
					Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*
					Zebra Finch	*Taeniopygia guttata*
Frogs					Common Eastern Froglet	*Crinia signifera*
					Plains Froglet	*Crinia parinsignifera*
		DD			Sloane's Froglet	*Crinia sloanei*
					Spotted Marsh Frog	*Lymnodynastes tasmaniensis*
					Spotted Marsh Frog	*Limnodynastes tasmaniensis*
Mammal					Eastern Grey Kangaroo	*Macropus giganteus*
					* European Hare	*Lepus europeaus*
					* European Rabbit	*Oryctolagus cuniculus*
					* Red Fox	*Vulpes vulpes*

Fauna Type	EPBC	IUCN	FFG	VROTS	Common Name	Scientific Name
Mammal					Common Brushtail Possum	*Trichosurus vulpecula*
					Common Ringtail Possum	*Pseudocheirus peregrinus*
					Swamp Wallaby	*Wallabia bicolor*
					White-striped Freetail Bat	*Tadarida australis*
Reptile					Boulenger's Skink	*Morethia boulengeri*
					Common Long-necked Turtle	*Chelodina longicollis*
				DD	Murray River Turtle	*Emydura macquarii*

EPBC 1999 Criteria (as viewed Aug 2011, www.environment.gov.au)

Extinct (EX) A taxon is extinct when there is no reasonable doubt that the last individual of the taxon has died.

Critically Endangered (CR) A taxon is critically endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.

Endangered (EN) A taxon is endangered when it is not critically endangered but is facing a very high risk of extinction in the wild in the near future.

Vulnerable (VU) A taxon is vulnerable when it is not critically endangered or endangered but is facing a high risk of extinction in the wild in the medium-term future.

Conservation Dependent (CD) A taxon is conservation dependent when it is the focus of a specific conservation program, the cessation of which would result in the taxon becoming vulnerable, endangered or critically endangered within a period of five years.

IUCN Red Species List (as viewed Aug 2011, www.iucnredlist.org)

Extinct (EX)

Extinct in the wild (EW)

Critically Endangered (CR)

Endangered (EN)

Vulnerable (VU)

Near Threatened (NT)

Least Concern (LC)

Data Deficient (DD)

Not Evaluated (NE)

Status under the Flora and Fauna Guarantee Act 1988 (FFG)

The aforementioned fauna have been listed as threatened in accordance with Section 10 of the Flora and Fauna Guarantee Act 1988 and in recent amendments contained in the Victorian Government Gazette G 21, p. 1072, published on 27 May 2010.

Listed (L) Listed as threatened

Nominated (N) Nominated for listing as threatened but has not yet completed the listing process. In some cases, the taxon may have received a preliminary or final recommendation indicating that it is eligible or ineligible for listing. In other cases, the nomination might not yet have been considered.

Invalid or ineligible (I) Nominated but rejected for listing as threatened on the basis that the taxon was considered to be invalid (either undescribed or not widely accepted) or ineligible (taxon does not satisfy any of the primary listing criteria).

Delisted (D) Previously listed as threatened but subsequently removed from the Threatened List following nomination for delisting.

Conservation Status in Victoria

The following fauna codes are located in the Advisory List of Threatened Vertebrate Fauna in Victoria –

2003, Department of Natural Resources and Environment, Melbourne. (www.dse.vic.gov.au):

- Extinct (EX)
- Regionally Extinct (RX)
- Extinct in the Wild (WX)
- Critically Endangered (CR)
- Endangered (EN)
- Vulnerable (VU)
- Near Threatened (NT)
- Data Deficient (DD)
- Delisted (D)

Appendix 6 Photographs of threatened flora and fauna recorded at Lake Moodemere, July 2011

Threatened Flora Species

Hypsella tridens Hypsela

Amphibromus fluitans River Swamp Wallaby-grass

Dianella tarda Late-flower Flax-lily

Helichrysum rutidolepis Pale Swamp Everlasting

Nymphoides crenata Wavy Marshwort

Brachyscome muelleroides Mueller Daisy

Threatened Fauna Species

Azure Kingfisher *Ceyx azureus*

Nankeen Night Heron *Nycticorax caledonicus*

Hardhead *Aythya australis*

Eastern Great Egret *Ardea modesta*

White-bellied Sea Eagle *Haliaeetus leucogaster*

Royal Spoonbill *Platalea regia*