



**FAUNA SURVEY OF
MERRICKS BEACH FORESHORE
RESERVE, MERRICKS**

OCTOBER, 2006 TO FEBRUARY, 2007.

Fieldwork and Report Writing – Malcolm Legg

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FAUNA SURVEY AND MANAGEMENT PRESCRIPTIONS FOR MERRICKS BEACH FORESHORE RESERVE, MERRICKS, OCTOBER 2006 to FEBRUARY 2007.

INTRODUCTION

Malcolm Legg from Mal's Environmental & Ecological Services was commissioned by the Merricks Beach Foreshore Committee of Management to conduct a fauna survey along the entire Merricks Foreshore from the Point Leo Foreshore boundary to the Balnarring Foreshore boundary on the Mornington Peninsula, Victoria. The study was carried out between October, 2006 and February, 2007.

During this survey Decapod Crustaceans, Fresh-water Fish, Amphibians, Reptiles, Birds and Mammals were sampled along the Merricks Foreshore Reserve.

Human activity has altered the habitat provided for fauna in most areas due to invasion by noxious and environmental weeds, along with clearing of indigenous vegetation in the hinterland (large areas on surrounding properties), and the unnecessary pressures of the introduction of vermin towards native fauna.

Local extinction of several animals has occurred in the greater area due to habitat destruction and degradation and from the impacts of vermin, e.g. Growling Grass Frog, Tree Goanna, Emu, Eastern Quoll, Spot-tailed Quoll, Wombat, Eastern Pygmy Possum and the Feathertail Glider and possibly the Tasmanian Pademelon etc, while several species are becoming scarce.

SUMMARY

This report documents the significant taxa, their habitat and management prescriptions, along with a complete list of taxa recorded during the survey throughout Merricks Beach Foreshore Reserve. Merricks Beach Foreshore Reserve will now be mentioned as either 'the foreshore reserve', or 'the study site' throughout this report.

Taxa detected in the study site includes; one species of Decapod Crustacean, three species of native fish, four species of Amphibians, eleven species of Reptiles (of which nine species are lizards and two species are snakes), 86 species of Birds (of which five species are introduced) and 22 species of Mammals (of which five species are introduced). The environs of the study area can be considered to be of regional significance, with the taxa throughout the study site listed at local, regional, State and National levels. This is due to mass depletion of natural vegetation and fauna populations on the Mornington Peninsula and loss of some significant species. Overall the significant taxa includes 12 species of high local significance, 35 species of regional significance, eight species of State significance, one species of National significance and the remaining native species are of local significance based upon large-scale depletion of habitat and fauna populations on the Peninsula.

Weeds, vermin and human disturbance are the greatest causes of local extinction of habitat and fauna populations on the Peninsula and within the environs of the study site. Ongoing weed control and eradication, along with regeneration of the original vegetation communities (EVC's) throughout the site, including possibly carrying out controlled burns in some areas, is recommended as high priority. Introduced fauna can cause unnecessary pressure on remaining native fauna and should be eradicated or controlled.

STUDY AREA

The study area is approximately four kilometers long which encompasses Grassy Woodland, Coast Banksia Woodland, primary dunes, drainage lines and creeks, sandy beaches, basalt intertidal reefs and Westernport Bay. (Melways reference map no 192 H12). Altitude varies from sea level to 30m. Geologically there are different soil types. The Intertidal reefs are made up of Basalt. The beaches and primary dunes consists of coastal deposits (and are made up from siliceous sand and shell beds) which were formed in the Recent period of the Quaternary era. The cliffs consist of bauxite clays resting on hard columnar basalt with secondary iron filling joints below the high water mark. Above the cliffs the soils are derived from Older Volcanics which consists of Flinders Basalt, basalt, tuff and agglomerate. These were formed in the Eocene period of the Tertiary era.

**Cover photo: Looking east along Merricks Foreshore.*



Looking at the foreshore and intertidal reefs at the eastern end.



Short-finned Eel photographed in the creek just before dusk during February 2007.

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1.0 METHODOLOGY

1.1 Field Work

Fauna surveys were carried out using the following methods:

- Decapod Crustaceans were identified by sight.
- Freshwater fish were sampled in bait traps.
- Amphibians were identified by sight and listening to vocal calls.
- Reptiles were identified by sight, hand capture and capture under logs and tin.
- Birds were identified by sight, their calls and during spotlight walks.
- Mammals were identified by sampling in Elliot traps, analysing scats and by vocal calls and sight at night.
- Bats were detected using the Anabat II Bat Detector which records their echolocation calls and identifies the species on computer using specialized software.
- Spotlighting was carried out over two nights.

Taxa were identified using reference literature including Allen (2002), Cogger (2000), Menkhorst (1996), Simpson and Day (1999) and Strahan (1998).

1.2 Data Storage

Listings of all taxa detected throughout this survey have been submitted to the Department of Sustainability and Environment, (Nicholson Street) and recorded on the Atlas of Victoria Wildlife for future reference.

1.3 Research Permit

All fauna trapping within the foreshore reserve was carried out LEGALLY under Research Permit number 10002918.

1.4 Defining Significant Habitats

The evaluation of habitat does not have any rigid guidelines. An area can have high habitat value for any or all of the following reasons:

- it is a representative or remnant community,
- it constitutes a wildlife corridor,
- it contains important breeding sites,
- it has unusual ecology or community structure,
- it has high species richness.

1.5 Habitat Types

The foreshore reserve has varying habitat types with the most diverse being the Grassy Woodland and Coast Banksia Woodland. Within the Grassy Woodland old growth eucalypt trees with hollows are relatively common with reasonably well developed middlestorey and a well intact understorey where weeds are absent. Poas and fallen logs provide homes for several terrestrial taxa. Within the Coast Banksia Woodland there is still a well developed Banksia overstorey which provides food and shelter for several bird species. The middlestorey and understorey still relatively exists where weeds are absent. The Coast Banksia Woodland is generally confined to the cliffs and gives way to the Primary Dunes at the bottom. The primary dunes provide habitat for some reptiles and bird species and are relatively weed free. The sandy beaches provide food for scavenging coastal birds and the Basalt Intertidal Reefs are homes to several intertidal flora and fauna and feeding sites for coastal birds. Westport Bay is home to several fish and coastal birds can be seen hunting over the water.

2.0 RESULTS

2.1 Decapod Crustaceans and Fresh-water Fish

One species of Decapod Crustacean and three species of Fresh-water Fish were sampled during this survey.

Two bait traps were deployed in the creek west of the Yacht Club to sample for fish. The first trap was deployed near the mouth while the second was deployed in the creek approximately 30 meters inland from the mouth. Three species of native fish were sampled and the bait used was white bait.

Table 1: Fish sampled in bait traps

Species	Date	Number recorded	Area Observed
Short finned Eel	22/10/06	one	Bait trap one, creek.
Common Galaxias	22/10/06	five	Bait trap two, creek.
	29/10/06	four	Bait trap one, creek.
Tupong	30/10/06	three juv.	Bait trap one, creek.

2.2 Amphibians

Four species of frogs were sampled at the study site during this survey and were mainly heard calling from water soaked areas.

2.3 Reptiles

Eleven species of reptiles were sampled during this survey within the study site. Of these nine species are lizards and two species are snakes. The majority of reptiles were sampled by sight and hand capture and the diversity represents an excellent number of species which would likely occur in such an area.

2.4 Birds

86 species of birds were sampled during this survey of which 81 species are indigenous species and five species are introduced. The study site represents a large diversity of bird species.

2.5 Mammals

22 species of mammals were sampled during this survey within the study area, which represents a fairly moderate diversity of species from the greater area. Of these 17 are native species, five species are introduced and one species (the Common Wombat) is presumed extinct.

2.6 Trapping Survey

Elliot traps were deployed throughout the study area in order to sample taxa usually sampled in Elliot traps. Pitfall and cage traps were not used as interference from the public was inevitable. Taxa usually sampled in these traps were sampled by other means already discussed in methodology.

2.6.1 Elliot trap survey

20 Elliot traps were deployed along five transects throughout the study site where appropriate habitat occurred. Transect one and two were deployed within the Grassy Woodland towards the western boundary of the foreshore (Point Leo end). Transect three and four were deployed in Banksia Woodland within the Fern Gully and along the Coastal Cliffs towards the Balnarring end. Transect five was deployed in Primary Sand Dune. After carrying out 300 trapping nights it appears that the Agile Antechinus, Dusky Antechinus, Swamp Rat and the introduced House Mouse are all that remains of the small mammal populations that once occupied these Coastal Foothills.

The bait used to lure the animals into the traps was peanut-butter, honey and oats.

Table 2: Fauna sampled in Elliot traps throughout the study site during Nov. 2006 to Feb. 2007.

Species	Date	Number	Area detected
Agile Antechinus	08/11/06	1f	Transect 2, trap 6.
Dusky Antechinus	08/11/06	1f	Transect 3, trap 11.
	08/11/06	1f	Transect 4, trap 16.
Swamp Rat	02/11/06	3	Transect 1, traps 1, 5 & 9.
	02/11/06	2	Transect 2, traps 4 & 14.
	03/11/06	3	Transect 1, traps 1, 5 & 14.
	03/11/06	5	Transect 2, traps 1, 5, 9, 14 & 15.
	08/11/06	2	Transect 3, traps 1 & 14.
	08/11/06	4	Transect 4, traps 3, 6, 7 & 18.
*House Mouse	09/11/06	2	Transect 5, traps 8 & 13.

2.6.2 Hair tube survey

Ten Hair tubes were deployed along five transects which were the same transects as the Elliot traps. The hair tubes were deployed for seven nights and the bait used to lure the animals into the traps was peanut-butter, honey and oats.

Table 3: Fauna sampled in Hair Tubes throughout the study site

Species	Date	Area Observed
Long-nosed Bandicoot	10/11/06	Transect 1, HT 8.
Swamp Rat	10/11/06	Transect 1, HT 4.
	10/11/06	Transect 3, HT 6.
	10/11/06	Transect 4, HTs 4, 5, 6, 7, 8 & 9.
	10/11/06	Transect 5, HT 8.
*Black Rat	10/11/06	Transect 2, HTs 2, 3, 4, 5, 8 & 9.
	10/11/06	Transect 5, HT 6 & 7.

2.7 Spotlighting

Spotlighting was carried out over two warm nights in January and February, 2007 in excellent conditions to sample maximum taxa. Below in the table is the taxa recorded during spotlighting.

Table 4: Fauna observed during spotlighting throughout the study site in February 2005.

Species	Date	Number observed	Area Observed
Amphibians			
Common Froglet	22/01/07	10+	Wet areas.
	19/02/06	5+	Along creek.
Southern Bullfrog	22/01/07	3	Along creek
	19/02/06	10+	On ground in woodland.
Southern Brown Tree Frog	22/01/07	10+	Wet areas.
	19/02/06	10+	Along creek.
Verreaux's Tree Frog	22/01/07	10+	Wet areas.
	19/02/06	5+	Along creek. and paperbark areas
Birds			
Tawny Frogmouth	22/01/07	4	Woodlands.
	19/02/06	2	Woodlands.
Southern Boobook	22/01/07	12	Grassy Woodland.
Mammals			
Koala	22/01/07	3	Woodlands
	19/02/06	2	Woodlands.
Common Brushtail Possum	22/01/07	10+	Woodlands
	19/02/06	5+	Woodlands.
Sugar Glider	22/01/07	10+	Grassy Woodland.

Species	Date	Number observed	Area Observed
	19/02/06	4	Grassy Woodlands.
Common Ringtail Possum	22/01/07	20+	Woodlands.
	19/02/06	15+	Woodlands.
Black Wallaby	22/01/07	2	Banksia Woodland.
Bat sps	22/01/07	10+	Wet areas.
	19/02/06	2	Woodlands.
*Fox	22/01/07	4	Through out
	19/02/06	7	Through out
*Feral Cat	22/01/07	3	Through out
	19/02/06	2	Eastern track.

2.8 Anabat II Bat Detector

Microbat echolocation calls were recorded over two nights and analyzed by the author.

Table 5: Microbats recorded on the Anabat II Bat Detector

Species	Date	Number recorded	Area Observed
Gould's Wattled Bat	19/02/07	9	Along main track.
Lesser Long-eared Bat	19/02/07	3	Along main track.
Large Forest Bat	19/02/07	13	Along main track.
	22/02/07	22	Along main track.
Southern Forest Bat	19/02/07	2	Along main track.
Little Forest Bat	19/02/07	11	Along main track.

3.0 DISCUSSION

The health of the creek appears to be relatively healthy with plenty of fresh water macro-invertebrates and some fish species present.

Most frog species which utilize this side of the peninsula are present with the exception of a few species. Southern Bull Frogs were found jumping along the ground at night during spotlight walks especially after thunder storms.

All reptile species occurring along the coast were present except for the Tiger Snake and populations of the Southern Water Skink appear to be healthy in the woodland sections.

Most bird species occurring along the Westernport Coast were sampled within the foreshore reserve and those species absent are listed in section four of this report.

Antechinus numbers of both species appear to be very low which is due to high fox and cat predation. Koala numbers appear to be stable with young dispersing adults found during the day in February

Diggings resembling Long-nosed Bandicoot diggings were found in Coast Banksia Woodland near the Point Leo end of the foreshore. One hair sample was also found in a Hair Tube at the same location.

Eastern Grey Kangaroo scats were found in the Grassy Woodland near the Point Leo boundary. These are probably young males which have been pushed out from the nearby mob on Point Leo Road.

Black Wallaby scats were found through out especially along the cliffs. Sugar Gliders were found in the Grassy Woodland areas but appear to be absent within the Coast Banksia Woodland.

In late summer microbats were everywhere especially along the tracks and Swamp Rats were found through out where appropriate under storey exists.

4.0 PAST FAUNA RECORDS AND THOSE POSSIBLY OCCURRING IN THE REGION BUT NOT DETECTED AT THE STUDY SITE DURING THIS SURVEY

The following species were not recorded within the study site during this survey, but possibly do occur, or once did, within or near the study site as appropriate habitat exists.

Fish

The Lampreys, Spotted Galaxias, Tupong and Gudgeons possibly utilise the creek at peak flows but weren't detected within the creek during this survey.

Frogs

The rarer species, which seem to be disappearing from Victoria's wetlands, include the Growling Grass Frog, Spotted Marsh Frog, Haswell's Froglet, Victorian Smooth Froglet and the Southern Toadlet. Their disappearance is related to surfactants and pollutants leaching into the waterways, salting, and reclamation of wetlands by humans, possible increase of UV rays from the "greenhouse effect" and a possible virus. If detected in the future it is really important to record these species on the Atlas of Victorian Wildlife. The following is a description of their calls to help with identification:

- | | |
|--------------------------|---|
| Growling Grass Frog- | call is a growl of about one second duration-'crawark-crawark-crok-crok'- repeated every few seconds (Hero Littlejohn and Marantelli 1991). |
| Spotted Marsh Frog | call is a single, short sharp call-'click' or 'plock' (Hero Littlejohn and Marantelli 1991). |
| Haswell's Froglet | - explosive note repeated at intervals of about ten seconds, -'aak' or 'ank' (Hero Littlejohn and Marantelli 1991). |
| Victorian Smooth Froglet | call is divided into two parts the first is a harsh introductory note, followed by a long series of short, rapidly repeated, explosive musical notes-'wa-a-a-a-ark pip-pip-pip-pip-pip-pip...' (Hero Littlejohn and Marantelli 1991). |
| Southern Toadlet | call is a short, harsh, grating note-'cre-ek'- repeated every few seconds. (Hero Littlejohn and Marantelli 1991). |

Reptiles

The Common Scaly-foot Legless Lizard, Tree Goanna, White's Skink, Mainland Tiger Snake and the Eastern Small-eyed Snake could have occurred in the study area or nearby. These species were known to occur on similar terrain throughout the Peninsula.

Birds

The over-all list is a good coverage of the birds found in the study area, however there could be a few other species at different times of the year. Species not found during this survey but detected by the author at nearby Shoreham Foreshore Reserve include Fluttering Shearwater, Shy Albatross, Cape Barron Goose, Pied Oystercatcher, Double-banded Plover, Ruddy Turnstone, Little Eagle, Australian King Parrot, Pallid Cuckoo, Barn Owl, Scarlet Robin, Rufous Fantail, Bell Minor and the Little Raven. Species such as the Emu and the Australian Bustard are now extinct from the Peninsula. The author's records and the Atlas of Victorian Wildlife cover a wider range of bird species occurring in the greater area.

Mammals

The following mammals were not detected during the survey but probably did occur within the study area some decades ago.

Dasyurids

The Eastern Quoll, Spot-tailed Quoll and the White-footed Dunnart would have once occurred within the study area but no longer do. The Eastern Quoll and Spot-tailed Quoll are extinct on the Mornington Peninsula while the Dunnart is now rare.

Bandicoots

The Southern Brown Bandicoot possibly would once have occurred throughout some parts of the study site but appears to no longer. Extensive searching throughout the area failed to reveal signs (such as conical diggings or scats) of their presence and despite extensive sampling none were captured. However diggings associated with the Long-nosed Bandicoot were found in Coast Banksia Woodland west of the Yacht Club heading towards Point Leo.

Wombats

Wombats became extinct on the peninsula (especially along Westernport side) during the 1980's and unsuccessful attempts to reintroduce them have failed.

Microbats

The following microbat species weren't sampled during the survey but are known to occur on the Southern Peninsula: White-striped Free-tail Bat, Chocolate Wattled Bat, Common Bent-wing Bat and Tasmanian Pipistrelle.

The following are extracts from historical records of the fauna that used to occur in the area (between Melbourne and Arthurs Seat) during the 1800's and early to mid 1900's:

Cavill (1986, p. 39) recounts the wildlife around her property (immediately to the east of Moorooduc Quarry) in the 1930's:

“Koalas grunted all night, wombats, kangaroos, wallabies, possums, echidnas, bush and water rats, flying foxes and bandicoots were abundant and tame.”

The numbers of kangaroos must have been enormous.

“Kangaroos were formerly so plentiful that they resembled flocks of sheep. At Sandy Point they erected yards for a big kangaroo drive. Messrs. Clark, White, Benton and others got 1500 in the first drive. Stakes seven foot high were driven into the ground and interwoven with ti-tree. In the last drive they got 800 kangaroos. On the plain they were in thousands, as also were possums. Bandicoots and goannas were also very numerous.” (Tuck, 1971, p. 10).

Also,

“The place was full of wild animals – wild cats, kangaroos, possums, snakes, emus and everything...” (Tuck, 1971, p.10)

Cavill (pers. comm.) has noted the decline in occurrence of vertebrates living around the quarry. Of the mammals, Quolls, Southern Brown Bandicoots and Eastern Grey Kangaroos lasted until around the 1940's while the Common Wombat remained until twenty years latter. As recently as twenty years ago, Mrs Cavill recalls Koalas, Sugar Gliders and Agile Antechinus as abundant, although their numbers have since declined dramatically. She believes the Black Wallaby was still present until 1984. Two species of pygmy possum (Feathertail Glider and possibly the Eastern Pygmy Possum) were also thought to have lived there.

Wheelwright (1979) whose 'wanderings' all occurred within sixty-five kilometres of Melbourne was one of the first naturalists to write about (and shoot so many of) the region's fauna. He records Dingos “lying up generally in thick patches of tea-tree...” (p. 35) and being common in thick forests, deeply scrubbed gullies, in belts of timber bordering the large plains and in patches of tea-tree on the plains themselves.” (p35). Wheelwright also described many of the species noted by Cavill – Common Wombats, Koalas, the

two possums, Sugar Gliders, Feathertail Glider, Bandicoots (two species), Short-beaked Echidnas, Eastern Water Rats and various smaller bush animals, such as field-mice and rats.

In the 1850's Wheelwright also observed a "Kangaroo Rat" which was "common throughout the bush" and was "excellent eating". This species described by Wheelwright is almost certainly the Long-nosed Potoroo.

Interestingly Wheelwright never observed Platypus in the "Westernport district", although he found it common in the "Yarra, the Exe and many of the streams to the north and east of Melbourne" (p.52). Wheelwright also shot both species of quolls. He found the Spotted-tail Quolls rare, but the Eastern Quolls to be "one of the commonest of all bush animals" (p.48). He found Eastern Quolls especially common in the belts of timber around swamps.

Kenyon (1930) reporting on the work and travels of Dr Edmond Charles Hobson, an early Victorian naturalist, quotes from Hobson's 1837 notes:

"The forests between Melbourne and Arthurs Seat teem with life. The large Kangaroos may be seen in flocks of three hundred or four hundred, and some measure nearly eight feet in height."

He goes on and describes that the Southern Brown Bandicoot, Common Wombat, Eastern Quoll, Common Brushtail Possum and Common Ringtail Possum were very numerous.

Hobson's 1837 records, comments on a number of birds including the Brolga and the Australian Bustard which were common but have now disappeared from the Greater Melbourne region. They are now listed as vulnerable and endangered in Victoria.

Historical records indicate that by the 1860's Ducks were almost shot out on the Port Phillip Bay side of the Peninsula, and that excessive hunting and drainage of their habitat had reduced numbers dramatically.

5.0 FAUNAL SIGNIFICANCE WITHIN THE STUDY SITE

On the basis of the significant EVC's, and flora and fauna species occurring within the study site, the study area can be considered to be of Regional Significance.

5.1 Habitat Significance

What remains of the vegetation communities within the study site contain important habitat for fauna species. The indigenous treed communities support arboreal mammals and avifauna, whereas the ground vegetation supports terrestrial fauna and scrub-dwelling avifauna. Some weed species are threatening the diversity within the area and some are currently being controlled.

5.2 Defining Significant Species

Taxa within the study site were classed according to their local, regional, State and National significant levels. As lists of high local and local significant fauna aren't available from relevant government authorities, those significant taxa were assessed by the author and from using previous records.

KEY

Signif Significant/status of species is designated by:

N National
S State
R Regional
HL High Local

NRE Threatened Vertebrate in Victoria-2000 (NRE 2000)

FFG Flora and Fauna Guaranteed Act 1988

ActPI Action Plan approved by environmental Australia

EPBC Environment Protection and Biodiversity Conservation Act 1999

TR International Treaties, C=China and J=Japan

Cen critically endangered
 End endangered
 Vul vulnerable
 LR lower risk-near threatened
 DD data deficient
 Ls Listed
 Mi Migratory
 Un Uncommon
 MC Moderately Common
 LC Locally Common
 C Common
 Lim Limited
 R Rare

Table 6: Significant fauna species along with their ratings recorded along the foreshore reserve.

Common Name	Scientific Name	Signif.	NRE.	FFG.	ActPI	EPBC	TR
Amphibians							
Verreaux's Tree Frog	<i>Litoria verreauxi</i>	R	MC				
Reptiles							
Eastern Three-lined Skink	<i>Bassiana duperreyi</i>	R	MC				
Southern Water Skink	<i>Eulamprus tympanum</i>	R	MC				
Delicate Skink	<i>Lampropholis delicata</i>	R	LC				
McCoy's Skink	<i>Nanoscincus maccoyi</i>	R	MC				
Metallic Skink	<i>Niveoscincus metallicus</i>	R	MC				
Southern Grass Skink	<i>Pseudemoia entrecasteauxii</i>	R	MC				
Weasel Skink	<i>Saproscincus mustelinus</i>	R	MC				
Blotched Blue-tongue	<i>Tiliqua nigrolutea</i>	R	MC				
Lowland Copperhead	<i>Austrelaps superbis</i>	HL	MC				
White-lipped Snake	<i>Drysdalia coronoides</i>	R	Un				
Birds							
Little Penguin	<i>Eudyptula minor novaehollandiae</i>	R	C				
Black-browed Albatross	<i>Thalassarche melanophris</i>	S	End				
Short-tailed Shearwater	<i>Puffinus tenuirostris</i>	R	A				J
Australasian Gannet	<i>Morus serrator</i>	R	LC				
Black-faced Cormorant	<i>Phalacrocorax fuscescens</i>	S	LR				
Pied Cormorant	<i>Phalacrocorax varius</i>	S	LR				
Buff-banded Rail	<i>Gallirallus philippensis</i>	R	MC				
Red-necked Stint	<i>Calidris ruficollis</i>	R	C				CJ
Sooty Oystercatcher	<i>Haematopus fuliginosus</i>	S	LR				
Red-capped Plover	<i>Charadrius ruficapillus</i>	R	MC				
Pacific Gull	<i>Larus pacificus</i>	S	LR				
Crested Tern	<i>Sterna bergii</i>	R	Un				
Osprey	<i>Pandion haliaetus</i>	S	R				
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	S	Vul	Ls		Mi	C
Wedge-tailed Eagle	<i>Aquila audax</i>	HL	MC				
Swamp Harrier	<i>Circus approximans</i>	R	MC				
Australian Hobby	<i>Falco longipennis</i>	R	MC				

Common Name	Scientific Name	Signif.	NRE.	FFG.	ActPI	EPBC	TR
Brown Falcon	<i>Falco berigora</i>	HL	C				
Common Bronzewing	<i>Phaps chalcoptera</i>	HL	MC				
Yellow-tailed Black-Cockatoo	<i>Calyptorhynchus funereus</i>	HL	MC				
Musk Lorikeet	<i>Glossopsitta concinna</i>	HL	C				
Southern Boobook	<i>Ninox novaeseelandiae</i>	R	MC				
White-throated Needletail	<i>Hirundapus caudacutus</i>	HL	C				CJ
White-eared Honeyeater	<i>Lichenostomus leucotis</i>	HL	LC				
Brown-headed Honeyeater	<i>Melithreptus brevirostris</i>	R	MC				
Eastern Yellow Robin	<i>Eopsaltria australis</i>	R	Un				
Crested Shrike-tit	<i>Falcunculus frontatus</i>	R	Un				
Rufous Whistler	<i>Pachycephala rufiventris</i>	HL	MC				
Satin Flycatcher	<i>Myiagra cyanoleuca</i>	HL	MC				
Mistletoebird	<i>Dicaeum hirundinaceum</i>	R	MC				
Mammals							
Grey Currawong	<i>Strepera versicolor</i>	R	MC				
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	R	C				
Agile Antechinus	<i>Antechinus agilis</i>	R	C				
Dusky Antechinus	<i>Antechinus swainsonii</i>	R	Un				
Long-nosed Bandicoot	<i>Perameles nasuta</i>	R	MC				
Sugar Glider	<i>Petaurus breviceps</i>	R	MC				
Koala	<i>Phascolarctos cinereus</i>	R	MC		Yes		
Eastern Grey Kangaroo	<i>Macropus giganteus</i>	HL	C				
Black Wallaby	<i>Wallabia bicolor</i>	R	C				
Microbat species in study area.	As per results	R	C				
Swamp Rat	<i>Rattus lutreolus</i>	R	LC				
Leopard Seal	<i>Hydrurga leptonyx</i>	R	MC				
Australian Fur Seal	<i>Arctocephalus pusillus</i>	R	MC				
Southern Right Whale	<i>Eubalaena australis</i>	N	Cen	Ls	End	End	
Bottlenose Dolphin (Westernport)	<i>Tursiops sp.</i>	S	End				

Table 7: Significant taxa of the study area along with their habitat requirements and management actions.

Species	Habitat Requirements	Management Actions
Verreaux's Tree Frog	Usually found in association with Swamp Paperbark and wet areas where they hide in the small old growth hollows during the day and venture out when the area below becomes flooded.	Maintain Swamp Paperbark and wet areas free of weeds and die-back and control vermin
Eastern Three-lined Skink	Terrestrial species confined to the sandy Primary Dune system and is a burrowing species.	Maintain dune system free of weeds and vermin and look into ways to prevent erosion.
Southern Water Skink	A medium-sized terrestrial species confined to the Grassy Woodland and Banksia Woodland along the cliff areas.	Maintain habitat free of habitat changing weeds and control vermin. Leave logs on ground and no fire wood collection.
Delicate Skink	Ground dwelling species found under logs or in grasslands where intact understorey occurs.	Maintain dense ground cover and leave fallen logs on ground (no collection of firewood). Control introduced predators and weeds especially cats.

Species	Habitat Requirements	Management Actions
McCoy's Skink	Terrestrial burrowing species with a striking yellow-belly found under logs and derby, in leaf-litter and is active during colder temperatures when other species are dormant.	Maintain fallen timber and eradicate habitat changing weeds and control vermin.
Metallic Skink	Terrestrial species found along the coastal cliffs where intact grassy understorey still exists.	Maintain habitat free of habitat changing weeds and control vermin. Leave logs on ground and no fire wood collection.
Southern Grass Skink	Ground dwelling species found under logs or in grasslands where intact understorey occurs.	Retain indigenous understorey and fallen limbs and trees throughout, free of habitat changing weeds. Control vermin.
Weasel Skink	Shade hugging species found under logs or amongst leaf-litter.	Maintain habitat free of habitat changing weeds and control vermin. Leave logs on ground and no fire wood collection.
Blotched Blue-tongue	A large Skink found in intact understoreys preferring poas and logs where they hide and feed on flowers, vegetation, insects and some carrion.	Maintain habitat free of habitat changing weeds and control vermin. Leave logs on ground and no fire wood collection.
Lowland Copperhead	A terrestrial species occupying intact understoreys mainly grasslands, where they feed on frogs, lizards and small mammals.	Retain indigenous understorey and fallen limbs and trees throughout, free of habitat changing weeds. Control vermin.
White-lipped Snake	A terrestrial species occupying intact understoreys mainly grasslands, where they feed on small skinks.	Retain understorey and logs on the ground and control habitat changing weeds and introduced vermin.
Little Penguin	Rookeries are on Philip Island and they hunt for fish in the bay and coastal ocean. Injured or fatigued specimens sometimes beach themselves along the coast. Beach washed specimens are usually quickly taken by foxes.	Control foxes along the foreshore and report injured penguins to Philip Island Penguin Information Centre.
Black-browed Albatross	Occasionally seen in the southern part of the bay during winter where it is readily seen hunting. Larger numbers are found in Bass Strait.	No management required. However keep records if sightings occur
Short-tailed Shearwater	Migrates from Japan to Southern Australia in late Spring and nests in burrows.	Control foxes and cats and prevent dog interference if any are nesting.
Australasian Gannet	Seen hunting out over the bay where it dives for fish and nests on Pope's Eye in Port Phillip Bay.	No management required.
Black-faced Cormorant	Seen roosting on channel markers and buoys in Westernport Bay adjacent to the foreshore.	No management required.
Pied Cormorant	Seen flying overhead where it feeds in the bay or ocean and mainly feeds on fish.	No management required.
Buff-banded Rail	Seen nesting in dense poas near the Point Leo end.	Maintain grasslands free of weed and control vermin.
Sooty Oyster-catcher	Feeds on the intertidal reefs where it moves up and down the coast. Feeds on a variety of shellfish.	Prevent access for dogs on the intertidal reefs.

Species	Habitat Requirements	Management Actions
Red-capped Plover	Seen feeding around the mouth of the creek. Not known to nest but nests at Honeysuckle, Shoreham above the high tide mark	Protect nesting sites from human disturbance and predation from dogs and foxes.
Pacific Gull	Found along the coast where it builds a nest on the ground or ledge.	Prevent access for dogs on the intertidal reefs and along the beach.
Crested Tern	Seen hunting out over the bay where it dives for fish and nests on Seal Rocks in Westernport Bay. Juveniles roost on intertidal reefs after fledging.	Prevent access for dogs on the intertidal reefs.
Osprey	Occasionally seen hunting along the coast for fish. Known to roost in pines at The Shoreham Foreshore Reserve.	No management required within the foreshore. However keep records if sightings occur.
White-bellied Sea-Eagle	Occasionally seen migrating along the coast during autumn. Known to nest at Devilbend Reservoir and French Island.	No management required within foreshore. However keep records if sightings occur.
Wedge-tailed Eagle	Seen soaring over the foreshore, where they are known to nest along Stony Creek, Bold Hill/Red Hill, Arthurs Seat, Main Ridge and French Island areas. A carrion eater often seen soaring on long, fingered upswept wings.	Maintain bushland as some larger fauna species within or nearby are ideal food sources. Lobby to maintain rural areas around their habitat.
Swamp Harrier	Seen hunting over the foreshore in search of food. Migrates from northern Australia in early spring. Nests at nearby Coolart wetlands.	No management required.
Australian Hobby	Fierce and dashing arboreal hunter which knocks its prey out of the air by stunning them with its talons. Likes to hawk its prey from the top of dead trees.	Maintain some dead trees along the coastal cliffs as raptors like to hawk their prey from.
Brown Falcon	Breeds along the coastal cliffs in pine trees and usually hunts in a stationary position.	Maintain pines which are breeding sites and replace others with gums.
Common Bronzewing	Feeds on the ground in the open mainly on seeds. Nests in trees where it is made from sticks and twigs.	Protect remnant stands of gum trees and continue to plant more. Control weeds and foxes.
Yellow-tailed Black-Cockatoo	Migrates along the coast feeding on Banksia, Sheoke and pine tree seed. Breeds in large old growth Eucalypt hollows and not known to nest on the peninsula.	Erect suitable nesting boxes on the foreshore to encourage breeding.
Musk Lorikeet	Migrates in late summer/autumn to the Peninsula where it feeds on flowering Eucalyptus species. Prefers flowering eucalypts in surrounding properties. If nesting occurs, tree hollows are sought after.	Protect the surrounding eucalypts and remove exotic weeds within the area. Encourage regrowth of die-back areas and protect some introduced Eucalyptus species. Control introduced predators
Southern Boobook	Nests in old-growth tree hollows within the foreshore and elsewhere. Nocturnal feeding on large insects and small mammals.	Retain and protect old-growth eucalypts from die-back and weed invasion. Control vermin.

Species	Habitat Requirements	Management Actions
White-throated Needletail	Occurs in the summer period where it migrates from Northern Asia. Aerial, usually over coastal and mountainous areas on the peninsula and flies with flickering strokes, then long-winged raking glides and slow turns.	No management required
White-eared Honeyeater	Largish honeyeater preferring the woodlands where it feeds amongst the canopy.	Protect woodlands from weed invasion and die-back. Control vermin
Brown-headed Honeyeater	Small flocks congregate in the woodlands where they feed in the canopy.	Protect woodlands from weed invasion and die-back. Control vermin.
Eastern Yellow Robin	Prefers the wooded areas and thickets throughout. Feeds on the ground and perches sideways on tree trunks. Known to nest in pittosporums.	Only remove pittosporum in the non-breeding season. Make sure no nests are in pittosporums prior to removal, as birds frequent the same nest site each year.
Crested Shrike-tit	Likes to forage on gum trees where it swings on loose bark and makes a bark tearing sound.	Maintain and increase gum tree numbers free of die-back and habitat changing weeds.
Rufous Whistler	Migrates from Northern Australia during spring where it prefers to nest along riparian situations on the Mornington Peninsula.	Protect woodlands from weed invasion and die-back. Control vermin.
Satin Flycatcher	Migrates from Southern new Guinea in November to the Mornington peninsula and nests in the woodland canopy.	Protect woodlands from weed invasion and die-back. Control vermin.
Grey Currawong	Prefers the Eucalypt woodlands where they forage on tree trunks and ground.	Protect woodlands from weed invasion and die-back. Control vermin.
Mistletoebird	Prefers the woodlands where mistletoe grows.	Protect woodlands from weed invasion and die-back. Control vermin.
Short-beaked Echidna	Is solitary and occupies a range of habitats that have year-round supply of ants and termites. Needs hollow logs on ground to nest within and for food.	Do not remove fallen limbs or dead trees including exotic dead trees. Retain ground cover and remove threatening weeds. Control access by dogs and foxes.
Agile Antechinus	Builds a nest in tree hollows and usually feeds in the middlestorey or on the ground. Carnivorous Marsupial feeding on insects and small vertebrates.	Maintain eucalypts free of habitat changing weeds and die-back. Control or eradicate foxes and cats and prevent Black Rats from taking over essential hollows.
Dusky Antechinus	Found along the coastal cliffs and in the gullies where appropriate intact understorey exists such as poas. Digs for food in the soil and leaf-litter and builds a nest of gum leaves in burrows under logs and dense grasses or in cavities in logs and stumps.	Maintain and protect habitat. Retain fallen logs on the ground and plant out poas which are lacking in areas. Continue to control weeds and vermin.
Long-nosed Bandicoot	Prefers the moister sites along the cliffs especially amongst the Coast Banksia Woodland. Makes conical diggings in the soil when foraging for food.	Protect the woodlands from weed invasion and eradicate vermin especially FOXES .
Sugar Glider	Arboreal species requiring hollows to support up to 12 individuals. Feeds on insects, flowers, leaves and gum produced from eucalypts and wattles	Maintain and protect habitat from die-back and habitat changing weeds. Control vermin.

Species	Habitat Requirements	Management Actions
Koala	A solitary species preferring Manna Gum and Swamp Gum leaves. Only come together for mating.	Maintain eucalypt woodland free of habitat changing weeds and control dogs and foxes.
Eastern Grey Kangaroo	Sought after habitats include a high level of grass cover, combined with lateral cover from trees to provide shelter.	Maintain mowed open grazing areas and control foxes and dogs, which prey on juveniles.
Black Wallaby	Is solitary in nature sheltering in dense thickets during the day and venturing out after dark to feed.	Maintain dense thickets free of blackberry and pine. Control foxes.
Microbat species occurring in the study area.	Utilise tree hollows and loose bark as roost sites. Feed on insects at night.	Retain and restore mature woodland habitat and remove weed trees. Implement a bat-box program using a variety of designs. Investigate methods shown to promote tree hollows.
Swamp Rat	Prefers areas of dense cover eg low-lying heaths and other vegetation. Feeds on rhizomes and excavates runways and burrows. After fire, habitat is not usually suitable for several years.	Protect areas that have intact habitat. Ensure any revegetation areas include essential understorey plants. Control vermin and weeds.
Leopard Seal	Solitary and usually confined to the unconsolidated pack-ice surrounding the Antarctic Continent. It is an uncommon seasonal visitor to mainland Australia where it beaches itself to rest.	No management required within the foreshore. However keep records if sightings occur and if beaching occurs prevent humans and dogs from harassing.
Australian Fur Seal	A colony of between 10 000 to 12 000 seals live on nearby Seal Rocks where they enter the sea to feed on fish. Some beach themselves along the coast to rest, while others are washed up dead.	No management required within the foreshore. However keep records if sightings occur and if beaching occurs prevent humans and dogs from harassing.
Southern Right Whale	The occasional sighting is becoming more common each year. A mother sometimes enters the bay to give birth or for safety with a calf.	No management required within the foreshore. However keep records if sightings occur.
Bottle-nosed Dolphin (Westernport species)	Occasionally seen swimming close to the shore in small pods of up to five. Endemic to the bay.	No management required within foreshore. However keep records if sightings occur and prevent humans and dogs from harassing.

5.3 Legislation and Government Policy

Flora and fauna listed as threatened under the Victorian FFG Act and Federal EPBC Act were recorded during this survey.

6.0 MANAGEMENT PRESCRIPTIONS FOR THE FORESHORE RESERVE.

6.1 Management requirements for significant taxa in Table Seven.

In order to maintain the significant taxa within the foreshore reserve the managers need to adopt the management requirements set out in Table seven of this report.

- * Implement actions as outlined in Table Seven.

6.2 Future survey work

Future survey work needs to be carried out every five years to determine if fauna populations are increasing and if new species have entered the foreshore reserve.

- * Use the author to carry out a fauna survey of the foreshore reserve in five years time.

6.3 Management of Weeds.

On going eradication of weeds is of high priority. The highest priority is to continue to removal any habitat changing weeds from the study site (such as Pittosporum, Blackberries, Pine Trees, thistles etc). The removal of weedy shrubs and trees should only be removed during the non bird breeding season. If any Ringtail Possum dreys are present or significant breeding and roosting birds, then leave or ring-bark without poisoning.

- * Continue to remove weeds from the foreshore reserve and during the non-bird breeding season.
- * Allow natural regeneration to occur.
- * If Ringtail Possum dreys occur in weeds then ring-bark with out poisoning. Follow-up after a year.
- * Leave if Robins or other significant birds are nesting or roosting.

6.4 Introduced Birds

Introduced starlings and mynas are aggressive towards hollow-dependant fauna and take over their homes. The Spotted Turtle Dove competes for essential seed with native pigeons and rosellas. Blackbirds have replaced the native ground thrush and are spreading introduced weed seed.

- * Eradicate or control introduced birds on the foreshore reserve when they occur.

6.5 Rabbit Control

Rabbits are a problem at the study site and continued control measures along with a major Rabbit Bust Program is required with the foreshore reserve and surrounding properties.

- * Continue to control rabbits on the foreshore reserve and start up a control program with surrounding property owners.

6.6 Fox Control Methods

Fox populations appear to be relatively high throughout the study site but increased activity was noted during late summer especially along tracks. Live specimens were seen at times especially running along the beach on dusk. The most suitable methods of fox control are poisoning, fumigating dens or shooting. And trapping using soft-jawed foot-hold traps. Poisoning is not permitted on properties less than 200 acres, but is allowed when surrounding properties totalling 200 or more acres in size work together in an eradication program.

- * Eradicate or control fox populations by using methods discussed.
- * Set up a fox eradication program with surrounding neighbours.

6.7 Cat Control

Cats that visit the reserve should be eliminated or if they are a pet, taken back to their owners and told of the destruction they cause on our native fauna.

- * Eradicate or control domestic and feral cats entering the study site.
- * Domestic cats should be trapped in cage traps and taken to their owners who should be made aware of the impact their pets are having on native fauna populations.
- * Educate the surrounding public about retaining cats on their property and the 24 hour cat curfew, which is State and MPS Legislation.

6.8 Black Rat Control

The introduced Black Rats aggressively takes over important Antechinus hollows and displaces them out of their niche.

- * Eradicate or control Black Rats during autumn and early winter by using cage traps.

6.9 Nesting boxes and ground logs

Nesting boxes need to be erected throughout the foreshore reserve, especially in the areas lacking natural hollows. This will help to attract hollow-dependent fauna, particularly the Agile Antechinus, Sugar Gliders, various microbat species and certain bird species. Tree trunks and fallen logs need to be retained on the ground in order to enhance the habitat for terrestrial taxa. Both the nesting boxes and logs should be monitored monthly to determine what taxa are using them.

- * Increase the diversity of hollow-dependent taxa through out the study site by erecting different sized, species-specific nesting boxes.
- * Always retain trunks and logs on the ground to enhance terrestrial habitat (no firewood collection).
- * Monitor the nesting boxes and logs monthly to determine what taxa are utilising them.

6.10 Controlled Burns

Mosaic style controlled burns can be conducted through out the study site at different times. This could help to attract Bandicoots and other species back to the area.

- * Look into the fire regime of the area before white settlement and continue to implement mosaic style controlled burns which will maintain a range of vegetation age classes as appropriate for the flora and fauna requirements, to enhance faunal diversity and to maintain floral diversity.

6.11 Wildlife Corridors

Always allow remnant parcels of bushland to be connected to each other by wide corridors (no less than 100 meters wide) in order to allow the healthy movement of taxa to and from. This could be an education tool for surrounding property owners to link up parcels of bushland, creeks and drainage-lines via corridors. Local, State and Federal government agencies currently provide grants for such works.

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Key

BROAD HABITAT TYPES

GW=Grassy Woodland

CBW=Coast Banksia Woodland

SBD=Sandy Beaches and Dunes

IN=Intertidal Reefs

RV=Riparian Vegetation

C=Creeks and Drainage lines

WPB=Westernport Bay

X= Present within habitat type

APPENDIX 1: FAUNA SPECIES OCCURING AT MERRICKS BEACH FORESHORE AND THE HABITAT THEY ARE FOUND IN.

Common Name	GW	CBW	SBD	IN	RV	CD	WPB
Decapod Crustacean					X	X	
Burrowing Cray							
Freshwater Fish							
Short-finned Eel						X	X
Common Galaxias						X	X
Tupong						X	X
Amphibians						X	X
Common Froglet						X	
Southern Bullfrog						X	
Southern Brown Tree Frog						X	
Verreaux's Tree Frog						X	
Reptiles							
Eastern Three-lined Skink			X				
Southern Water Skink	X	X			X		
Delicate Skink	X	X					
Garden Skink	X	X					
McCoy's Skink	X	X					
Metallic Skink	X	X					
Southern Grass Skink	X						
Weasel Skink	X	X			X		
Blotched Blue-tongue Lizard	X	X	X				
Lowland Copperhead	X	X			X	X	
White-lipped Snake	X	X					
Birds							
Little Penguin			X	X			X
Black-browed Albatross							X
Short-tailed Shearwater			X				X
Australasian Gannet							X
Black-faced Cormorant							X
Pied Cormorant				X			X
Little Pied Cormorant				X		X	X
Great Cormorant							X
Little Black Cormorant							X
Black Swan							X
Australian Wood Duck	X					X	
Buff-banded Rail	X						
White-faced Heron			X	X		X	X
Australian White Ibis			X	X			
Straw-necked Ibis			X	X			

Common Name	GW	CBW	SBD	IN	RV	CD	WPB
Red-necked Stint			X				
Sooty Oystercatcher				X			X
Masked Lapwing			X	X			
Red-capped Plover			X				
Silver Gull			X	X			X
Pacific Gull			X	X			X
Crested Tern				X			X
Osprey							X
White-bellied Sea-Eagle							X
Black-shouldered Kite							
Wedge-tailed Eagle	X	X					
Brown Goshawk	X	X			X		
Swamp Harrier	X	X					
Australian Hobby	X	X					
Brown Falcon	X	X					
Spotted Turtle-Dove	X	X			X		
Common Bronzewing	X	X					
Crested Pigeon	X						
Yellow-tailed Black-Cockatoo	X	X					
Galah.	X	X					
Sulphur-crested Cockatoo	X	X					
Rainbow Lorikeet	X						
Musk Lorikeet	X						
Crimson Rosella	X	X					
Eastern Rosella	X	X					
Fantail Cuckoo	X	X					
Horsfield's Bronze Cuckoo	X	X					
Southern Boobook	X	X					
Tawny Frogmouth	X	X					
White-throated Needletail	X	X					X
Laughing Kookaburra	X	X			X		
Superb Fairy-wren	X	X	X		X		
Spotted Pardalote	X	X			X		
Striated Pardalote	X	X			X		
White-browed Scrubwren	X	X			X		
Brown Thornbill	X	X			X		
Striated Thornbill	X						
Red Wattlebird	X	X			X		
Little Wattlebird	X	X					
Noisy Miner	X	X					
Yellow-faced Honeyeater	X	X					
White-eared Honeyeater	X	X			X		
White-plumed Honeyeater	X	X			X		
Brown-headed Honeyeater	X	X					
White-napped Honeyeater	X	X			X		
New Holland Honeyeater	X	X			X		
Eastern Spinebill	X	X					
Eastern Yellow Robin	X	X			X		
Crested Shrike-tit	X						
Grey Shrike Thrush	X	X			X		
Golden Whistler	X	X					
Rufous Whistler	X	X			X		

Common Name	GW	CBW	SBD	IN	RV	CD	WPB
Grey Fantail	X	X			X		
Willy Wagtail	X						
Satin Flycatcher	X				X		
Black-faced Cuckoo-shrike	X	X			X		
Dusky Woodswallow	X	X			X		
Magpie-lark	X	X					
Grey Butcherbird	X	X					
Australian Magpie	X	X	X				
Grey Currawong	X						
Australian Raven	X	X	X	X	X		
Little Raven	X	X					
Welcome Swallow	X	X	X		X		
European Goldfinch	X	X	X		X		
Red-browed Finch	X	X					
Mistletoebird	X	X			X		
Silvereye	X	X	X		X		
Common Blackbird	X	X	X		X		
Common Starling	X	X	X	X	X		
Common Myna	X	X			X		
Mammals							
Short-beaked Echidna	X	X	X		X		
Agile Antechinus	X	X					
Dusky Antechinus	X	X					
Long-nosed Bandicoot	X	X					
Koala	X	X			X		
Common Brushtail Possum	X	X			X		
Sugar Glider	X						
Common Ringtail Possum	X	X			X		
Eastern Grey Kangaroo	X						
Black Wallaby	X	X	X		X		
Gould's Wattle Bat	X	X					
Lesser Long-eared Bat	X	X					
Large Forest Bat	X	X					
Southern Forest Bat	X	X					
Little Forest Bat	X	X					
Swamp Rat	X	X	X		X		
House Mouse	X	X	X		X		
Black Rat	X	X	X		X		
European Rabbit	X	X	X		X		
Red Fox	X	X	X	X	X		
Feral Cat	X	X			X		

KEY-Significance/status of species:

N National
S State
R Regional
HL High Local
L Local
***** Introduced

Type of record:

h Heard
s Seen
I Incidental (scats, feathers etc.)
t Trapped/handheld
B Breeding residential bird
Ex Presumed Extinct

APPENDIX 2: DECAPOD CRUSTACEANS RECORDED THROUGH OUT THE STUDY SITE, FEBRUARY, 2007.

Scientific Name	Common Name	Conservation status within the site.	Type of record
<i>Engaeus sp.</i>	Burrowing Cray	Common in some areas.	Lt

APPENDIX 3: FISH RECORDED WITHIN THE STUDY SITE, FEBRUARY, 2007.

Scientific Name	Common Name	Conservation status within the site.	Type of record
<i>Anguilla australis</i>	Short-finned Eel	Uncommon	Lt
<i>Galaxias maculatus</i>	Common Galaxias	Common	Lt
<i>Aldrichetta forsteri</i>	Yellow-eyed Mullet	Uncommon	Lt

APPENDIX 4: AMPHIBIANS RECORDED WITHIN THE STUDY SITE, FEBRUARY, 2007.

Scientific Name	Common Name	Conservation status within the site.	Type of record
<i>Crinia signifera</i>	Common Froglet	Common	Lhs
<i>Limnodynastes dumerilii insularis</i>	Southern Bullfrog	Common	Lhs
<i>Litoria ewingii</i>	Southern Brown Tree Frog	Common	Lhs
<i>Litoria verreauxii</i>	Verreaux's Tree Frog	Uncommon	Rhs

APPENDIX 5: REPTILES RECORDED WITHIN THE STUDY SITE, FEBRUARY, 2007.

Scientific Name	Common Name	Conservation status within the site.	Type of record
LIZARDS			
<i>Bassiana duperreyi</i>	Eastern Three-lined Skink	Common	Rst
<i>Eulamprus tympanum tympanum</i>	Southern Water Skink	Common	Rst
<i>Lampropholis delicata</i>	Delicate Skink	Common	Rst
<i>Lampropholis guichenoti</i>	Garden Skink	Common	Lst
<i>McCoy's Skink</i>	McCoy's Skink	Uncommon	Rst
<i>Niveoscincus metallicus</i>	Metallic Skink	Uncommon	Rt
<i>Pseudemoia entrecasteauxii</i>	Southern Grass Skink	Uncommon	Rs
<i>Saproscincus mustelinus</i>	Weasel Skink	Common	Rst
<i>Tiliqua nigrolutea</i>	Blotched Blue-tongue Lizard	Uncommon	Rst
SNAKES			
<i>Austrelaps superbus</i>	Lowland Copperhead	Uncommon	HLs
<i>Drysdalia coronoides</i>	White-lipped Snake	Uncommon	Rst

**APPENDIX 6: COASTAL & WETLAND BIRDS RECORDED WITHIN THE STUDY SITE,
FEBRUARY, 2007.**

Scientific Name	Common Name	Conservation status within the site.	Type of record
<i>Eudyptula minor</i>	Little Penguin	Uncommon	RhsI
<i>Thalassarche melanophris</i>	Black-browed Albatross	Rare	Ss
<i>Puffinus tenuirostris</i>	Short-tailed Shearwater	Uncommon	Rsl
<i>Morus serrator</i>	Australasian Gannet	Uncommon	Rs
<i>Phalacrocorax fuscescens</i>	Black-faced Cormorant	Rare	Ss
<i>Phalacrocorax varius</i>	Pied Cormorant	Uncommon	Ss
<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant	Uncommon	Ls
<i>Phalacrocorax carbo</i>	Great Cormorant	Uncommon	Ls
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	Uncommon	Ls
<i>Cygnus atratus</i>	Black Swan	Rare	Ls
<i>Chenonetta jubata</i>	Australian Wood Duck	Uncommon	Lhs
<i>Gallirallus philippensis</i>	Buff-banded Rail	Uncommon	Rhs
<i>Egretta novaehollandiae</i>	White-faced Heron	Uncommon	Ls
<i>Threskiornis molucca</i>	Australian White Ibis	Common	Lhs
<i>Threskiornis spinicollis</i>	Straw-necked Ibis	Uncommon	Lhs
<i>Calidris ruficollis</i>	Red-necked Stint	Rare	Rs
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	Rare	Ss
<i>Vanellus miles</i>	Masked Lapwing	Common	Lhs
<i>Charadrius ruficapillus</i>	Red-capped Plover	Rare	Rs
<i>Larus novaehollandiae</i>	Silver Gull	Common	Lhs
<i>Larus pacificus</i>	Pacific Gull	Uncommon	Ss
<i>Sterna bergii</i>	Crested Tern	Uncommon	Rs
<i>Pandion haliaetus</i>	Osprey	Rare	Ss
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	Rare	Ss

APPENDIX 7: WOODLAND BIRDS RECORDED WITHIN THE STUDY SITE, FEB, 2007.

Scientific Name	Common name	Conservation status within the site.	Type of record
<i>Elanus axillaris</i>	Black-shouldered Kite	Uncommon	Lhs
<i>Aquila audax</i>	Wedge-tailed Eagle	Uncommon	HLs
<i>Accipiter fasciatus</i>	Brown Goshawk	Uncommon	Lhs
<i>Circus approximans</i>	Swamp Harrier	Uncommon	Rhs
<i>Falco longipennis</i>	Australian Hobby	Rare	Rs
<i>Falco berigora</i>	Brown Falcon	Uncommon	Hls
<i>*Streptopelia chinensis</i>	Spotted Turtle-Dove	Common	hs
<i>Phaps chalcoptera</i>	Common Bronzewing	Common	HLhs
<i>Ocyphaps lophotes</i>	Crested Pigeon	Rare/vagrant	Ls
<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo	Uncommon	Rhs
<i>Eolophus roseicapillus</i>	Galah.	Uncommon	Lhs
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Uncommon	Lhs
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Common at times	Lhs
<i>Glossopsitta concinna</i>	Musk Lorikeet	Common at times	HLhs
<i>Platycercus elegans</i>	Crimson Rosella	Common	Lhs
<i>Platycercus eximius</i>	Eastern Rosella	Common	Lhs
<i>Cacomantis flabelliformis</i>	Fantail Cuckoo	Common	Lhs
<i>Chalcites basalus</i>	Horsfield's Bronze Cuckoo	Uncommon	Lhs
<i>Ninox novaehollandiae</i>	Southern Boobook	Uncommon	Rh
<i>Podargus strigoides</i>	Tawny Frogmouth	Uncommon	Lhs
<i>Hirundapus caudactis</i> race <i>caudactis</i>	White-throated Needletail	Common at times	HLs
<i>Dacelo novaehollandiae</i>	Laughing Kookaburra	Common	Lhs

Scientific Name	Common name	Conservation status within the site.	Type of record
<i>Malurus cyaneus</i>	Superb Fairy-wren	Common	Lhs
<i>Pardalotus punctatus</i>	Spotted Pardalote	Common	Lhs
<i>Pardalotus striatus</i>	Striated Pardalote	Common at times	Lhs
<i>Sericornis frontalis</i>	White-browed Scrubwren	Common	Lhs
<i>Acanthiza pusilla</i>	Brown Thornbill	Common	Lhs
<i>Acanthiza lineata</i>	Striated Thornbill	Uncommon	Lhs
<i>Anthochaera carunculata</i>	Red Wattlebird	Common	Lhs
<i>Anthochaera chrysoptera</i>	Little Wattlebird	Common	Lhs
<i>Manorina melanocephala</i>	Noisy Miner	Common	Lhs
<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater	Common	Lhs
<i>Lichenostomus leucotis</i>	White-eared Honeyeater	Uncommon	HLhs
<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater	Uncommon	Lhs
<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater	Rare	Rhs
<i>Melithreptus lunatus</i>	White-napped Honeyeater	Uncommon	Lhs
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	Common	Lhs
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill	Uncommon	Lhs
<i>Eopsaltria australis</i>	Eastern Yellow Robin	Common	Rhs
<i>Falcunculus frontatus</i>	Crested Shrike-tit	Rare	Rhs
<i>Colluricincla harmonica</i>	Grey Shrike Thrush	Common	Lhs
<i>Pachycephala pectoralis</i>	Golden Whistler	Common	Lhs
<i>Pachycephala rufiventris</i>	Rufous Whistler	Uncommon	HLhs
<i>Rhipidura fuliginosa</i>	Grey Fantail	Common at times	Lhs
<i>Rhipidura leucophrys</i>	Willy Wagtail	Uncommon	Lhs
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Uncommon	HLhs
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Uncommon	Lhs
<i>Artamus cyanopterus</i>	Dusky Woodswallow	Common at times	Lhs
<i>Grallina cyanoleura</i>	Magpie-lark	Common	Lhs
<i>Cracticus torquatus</i>	Grey Butcherbird	Common	Lhs
<i>Gymnorhina tibicen</i>	Australian Magpie	Common	Lhs
<i>Strepera versicolor</i>	Grey Currawong	Rare	Rhs
<i>Corvus coronoides</i>	Australian Raven	Common	Lhs
<i>Corvus mellori</i>	Little Raven	Uncommon	Lhs
<i>Hirundo neoxena</i>	Welcome Swallow	Common	Lhs
* <i>Carduelis carduelis</i>	European Goldfinch	Common	hs
<i>Neochmia temporalis</i>	Red-browed Finch	Common at times	Lhs
<i>Dicaeum hirundinaceum</i>	Mistletoebird	Uncommon	Rs
<i>Zosterops lateralis</i>	Silvereye	Common	Lhs
* <i>Turdus merula</i>	Common Blackbird	Common	hs
* <i>Sturnus vulgaris</i>	Common Starling	Common	hs
* <i>Acridotheres tristis</i>	Common Myna	Common	hs
*Denotes introduced species			

APPENDIX 8: MAMMALS RECORDED WITHIN THE STUDY SITE, FEBRUARY, 2007.

Scientific Name	Common Name	Conservation status within the site.	Type of record
MONOTREMES			
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna	Common	RsI
MARSUPIALS			
<i>Antechinus agilis</i>	Agile Antechinus	Uncommon	Rt
<i>Antechinus swainsonii</i>	Dusky Antechinus	Rare	Rt
<i>Perameles nasuta</i>	Long-nosed Bandicoot	Rare	RI
<i>Vombatus ursinus</i>	Common Wombat	Presumed extinct	
<i>Phascolarctos cinereus</i>	Koala	Uncommon	Shs
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	Common	Lhs
<i>Petaurus breviceps</i>	Sugar Glider	Common	Rhs
<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum	Common	LhsI
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	Rare	HLhs
<i>Wallabia bicolor</i>	Black Wallaby	Uncommon	Rhs
PLACENTAL MAMMALS			
MICROBATS			
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	Common	Rh
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	Uncommon	Rh
<i>Vespadelus darlingtoni</i>	Large Forest Bat	Common	Rh
<i>Vespadelus regulus</i>	Southern Forest Bat	Rare	Rh
<i>Vespadelus darlingtoni</i>	Little Forest Bat	Common	Rh
RODENTS			
<i>Rattus lutreolus ssp. Lutreolus</i>	Swamp Rat	Common	RtI
INTRODUCED MAMMALS			
* <i>Mus musculus</i>	House Mouse	Common	t
* <i>Rattus rattus</i>	Black Rat	Common	t
* <i>Oryctolagus cuniculus</i>	European Rabbit	Common	si
* <i>Vulpes vulpes</i>	Red Fox	Common	sI
* <i>Felis catus</i>	Feral Cat	Common	t
*Denotes introduced species			



Permit No: 10002918
File No: FF380225

Department of Sustainability and Environment

WILDLIFE ACT 1975 RESEARCH PERMIT

Pursuant to the provisions of the **Wildlife Act 1975**, permission is hereby granted to:

Mr Malcolm Legg
Mal's Environmental and Ecological Services
PO Box 247
Shoreham 3916

and Mr B. Hall in order to live-capture and release small mammals (excluding bats), reptiles and amphibians and collect and retain scats for analysis.

Permission is given subject to the following particular conditions:

1. The activities covered by this permit may only be carried out in relation to contractual agreements between Mal's Environmental and Ecological Services and its clients.
2. All trapping activities provided for under this permit must be restricted to sites within the Port Phillip Region of the Department of Sustainability and Environment.
3. **The relevant regional Flora and Fauna Officer, Port Phillip Region of the Department of Sustainability and Environment is to be notified AT LEAST FIVE WORKING DAYS PRIOR to any visit to a collecting or trapping site. The Officer is to be advised as accurately as possible of the location and times of proposed work and the registration number of any vehicle involved.**
4. A clear label is to be fixed to every trap used in connection with this permit, showing "Flora and Fauna permit number 10002918".
5. This permit gives no approval for marking of live wildlife.
6. Where any notable, rare or threatened species are identified, the exact location should be noted and the relevant Flora and Fauna Co-ordinator of the Department of Sustainability and Environment must be informed, in writing, within seven working days.

In addition, the following general conditions apply:


7. The provisions of the **Wildlife Act 1975** and the Wildlife Regulations 2002 are to be observed, except where exemption is specifically provided for in this permit.
8. Before any attempt is made to capture or collect wildlife, the approval of the managing authority of the land involved must be obtained.
9. The direction of any authorised officer of the Department of Sustainability and Environment, in relation to this permit, must be followed.

Mark Winfield
Manager Flora and Fauna
(Delegate of the Secretary)



10. Any traps set must be checked at intervals not exceeding 18 hours.
11. All pit traps used must be securely covered if they are to be left unattended for longer than 18 hours.
12. All traps must be removed and any pits must be filled with soil on completion of the project.
13. All animals captured are to be released at the precise point of capture, within one hour of checking the traps. Any dead animal or any animal with injuries serious enough to warrant its humane dispatch is to be properly preserved, labelled, and lodged with the Museum of Victoria within 30 days of its capture.
14. All specimens, whether entire animals or prepared tissues, remain the property of the Government of Victoria.
15. Within 30 days of the expiration of this permit, a return is to be provided to the Environmental Research Co-ordinator giving details of specimens trapped and/or collected, including: species; numbers; dates; and localities, to the nearest one hundred metres (AMG). The data will be incorporated into the Atlas of Victorian Wildlife.
16. The publication of any results in connection with these specimens must refer to the fact that they were collected or obtained under the terms of this permit.
17. A copy of any research paper, report, thesis or published article resulting from work conducted under this permit is to be lodged with the Environmental Research Co-ordinator within four calendar months of publication. In the case of theses, a thesis summary or a copy of the abstract and notification of the location of the complete work is sufficient.
18. Failure to comply with any condition of this permit may result in its cancellation, at the discretion of the Deputy Director Flora and Fauna.

This permit shall, unless revoked, remain in force until **31 December 2006**.


.....
MARK WINFIELD
Manager Flora and Fauna
(Delegate of the Secretary)

Date of issue:

02 JUL 2004