

**Assessment of mammals at Fairyland Nature Reserve,
Coogoorah Park and Anglesea River, Anglesea.**

**Report to
Surf Coast Shire, Victorian Government**

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Assessment of mammals at Fairyland Nature Reserve, Coogoorah Park, and Anglesea River, Anglesea, Victoria.

Prepared for Surf Coast Shire, Victorian Government

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Front piece photo *Antechinus minimus*

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Introduction

Fairyland Nature Reserve and Coogoorah Park are two important Surfcoast Shire Reserves located in Anglesea along the Anglesea River (Figure 1). They are managed by the Surfcoast Shire and border land managed by Parks Victoria (DSE 2007).

Coogoorah Park covers 17.3 ha and has a number of habitats including estuarine wetland, heathy woodland, riparian scrub and lowland forest (DSE 2007). Fairyland Nature Reserve covers 8 ha and is adjacent to the bowling and tennis clubs, the caravan park and the Anglesea River. Habitats within the reserve include herb rich scrub and estuarine wetlands. Both parks have a number of pathways for human recreation and have high levels of visitation.

Surveys undertaken in 2007 recorded a total of 84 vertebrate species at Coogoorah Park, and 38 vertebrates at Fairyland Nature Reserve including 11 mammal species and eight mammal species respectively (DSE 2007). Three terrestrial mammal species were recorded *Antechinus swainsoni*, Dusky antechinus, *Rattus fuscipes* Bush rat, and *Rattus lutreolus* swamp rat (DSE 2007).

In 2015 three specimens of dead male *Antechinus minimus* swamp antechinus were found fortuitously in Anglesea. Two were located in the Fairyland Nature Reserve (E. Danby, *pers. comm*) and one was located north of the reserve on the Anglesea River at Coalmine Road (P. Forster *pers. com.*). These were significant findings as recent trapping surveys (2013 – 2016) at twenty sites resulted in the capture of only six individual *A. minimus* in the eastern Otways Wilson & Garkaklis 2014, 2015; Zhuang-Griffin 2015). The animals were trapped at three sites where the species had been recorded historically but failed to record *A. minimus* at sites that once supported high density populations (15 to 28 individuals per hectare) over a number of years (e.g. Urquharts Bluff, Harvey St, Aireys Inlet, Painkalac Creek) (Wilson et al, 2001; Magnusdottir et al. 2008; Sale et al. 2008). Remaining populations of the species may now only be represented by individuals or small populations scattered across the landscape (Wilson & Garkaklis 2015; Zhuang-Griffin 2015). The capture of swamp antechinus in coastal dunes provides evidence that these coastal systems may provide refuge for the species in the eastern Otways (Wilson & Garkaklis 2015; Zhuang-Griffin 2015).

The swamp antechinus is currently under nomination to be listed as Vulnerable under the federal *Environmental Protection and Biodiversity Conservation Act* 1999 (EPBC Act), and is listed as Threatened (Near Threatened) under the *Victoria Flora and Fauna Guarantee Act* 1988 (FFG Act) (Woinarski *et al.* 2014, Department of Sustainability and Environment 2013, Department of Environment 2015). The proposed listing (EPBC Act) of *A. minimus* is based on its continuing decline nationally due to habitat loss and degradation, and impacts of feral predators and fire (Woinarski *et al.* 2014, Department of Environment 2015).

The specific aims of this study were thus to:

1. Assess the current presence and distribution of the swamp antechinus in Fairyland Nature Reserve and Coogoorah Park, Anglesea River areas
2. Record the presence of other small mammal species in the area and compare them to previous studies and surveys.

3. Assess the factors influencing the swamp antechinus populations (vegetation structure/composition)

Methods

The survey was conducted in Fairyland Nature Reserve, Coogoorah Park and in Parks Vic land located in Anglesea, Victoria. The survey sites, referred to as Fairyland herb rich scrub, Fairyland wetlands, Coogoorah and Anglesea River (Figure 1). Small mammals were live captured using 20 Elliot aluminium traps at each site over three nights. At Fairyland traps were placed in 4 lines of 5 traps approximately 10m apart (Figure 2); whilst at Coogoorah and Anglesea River traps were placed in 2 lines of 10 traps also 10 m apart (Figure 3). Traps were baited with rolled oats and peanut butter wrapped in gauze and Dacron was used to provide warmth for any trapped mammals. A total of 240 trap nights were carried out over 3 consecutive nights from the 15/03/16-18/03/16 (Table 1). Traps were checked at sunrise, captured animals were identified, sexed, weighed, measured, tagged and released.

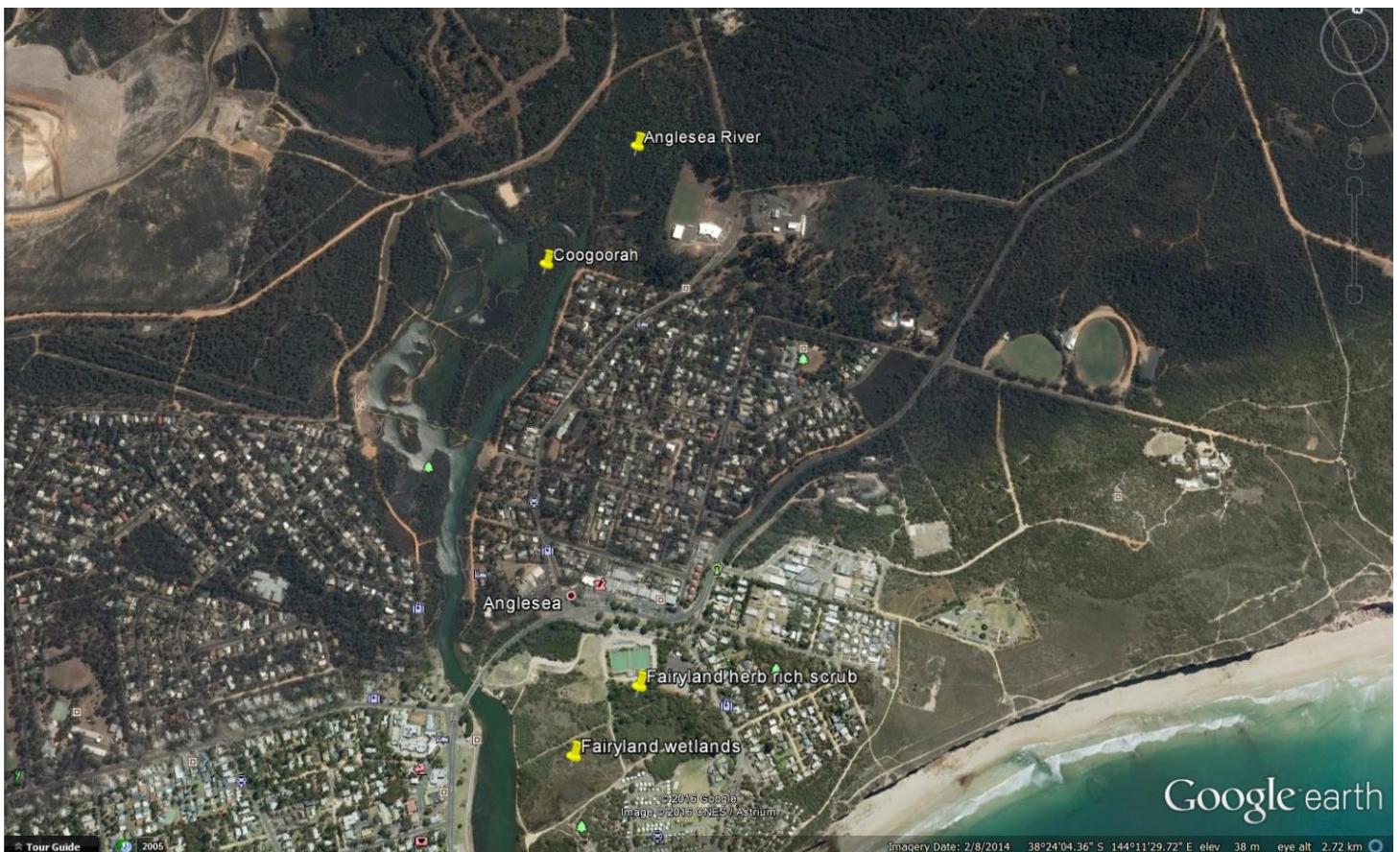


Figure 1. Location of study site in Anglesea VIC



Figure 2. Location of study site in Fairyland Nature reserve. Red lines = 4 lines of 5 traps in herb rich scrub habitat, yellow lines = 4 lines of 5 traps in estuarine wetland habitat.



Figure 3. Location of study site at Coogoorah Park and at Anglesea river site. Red lines= 2 lines of 10 traps at Anglesea River site, Yellow lines=2 lines of 10 traps at Coogoorah site.

Table 1. Trapping sessions

Start Date	End Date	Long	Lat	Site Description	Number traps	Number Nights	Total Trap Nights	Total captures including retraps	Total Indiv.
15/03/2016	18/03/2016	144.1906	-38.4067	Fairyland Herb rich scrub	20	3	60	3	2
15/03/2016	18/03/2016	144.1893	-38.4081	Fairyland estuarine wetlands	20	3	60	0	0
15/03/2016	18/03/2016	144.187	-38.3976	Coogoorah	20	3	60	3	1
15/03/2016	18/03/2016	144.1887	-38.3959	Anglesea River	20	3	60	3	2

Results

Trapping in the Fairyland estuarine wetlands resulted in zero mammal captures (Table 2). There was a total of 3 captures of *Rattus lutreolus* (n=2 individuals) in the Fairyland herb rich scrub habitat (total capture success 5%). A blue tongued lizard was also captured on the first night of trapping.

In Coogoorah Park 1 individual *Rattus fuscipes* was captured (3 captures) identified, giving a total capture success of 5% (Table 2).

At the Anglesea River site there was a total of 3 captures, with 2 individual *Rattus fuscipes* identified, giving a total capture success of 5% (Table 2).

The weather on the first night of trapping was very windy and on the last night there were thunder storms.

Table 2. Trapping results

Site	Date	Trap Location	SpeciesID	Individual No	Retrap ®	Sex	Weight (g)	Head Body (mm)	head (mm)
Fairyland Herb rich scrub	16/03/2016	C4	Blue tongued lizard			NA			
Fairyland Herb rich scrub	17/03/2016	A2	<i>Rattus lutreolus</i>	Right top notch		F	60	96	38
Fairyland Herb rich scrub	17/03/2016	A5	<i>Rattus lutreolus</i>	Left top notch		M	100	112	43
Fairyland Herb rich scrub	18/03/2016	D1	<i>Rattus lutreolus</i>	Right top notch	R	F			
Coogoorah	16/03/2016	1 east	<i>Rattus fuscipes</i>	Right top hole		F	90	104	44
Coogoorah	17/03/2016	1 east	<i>Rattus fuscipes</i>		R	F			
Coogoorah	18/03/2016	2 west	<i>Rattus fuscipes</i>		R	F			
Anglesea River	16/03/2016	B5	<i>Rattus fuscipes</i>	Right middle notch		M	130	119	53
Anglesea River	17/03/2016	B4	<i>Rattus fuscipes</i>	Right middle notch	R	M			
Anglesea River	18/03/2016	A6	<i>Rattus fuscipes</i>	Left top hole		M	120	101	49

Discussion

Trap success was low compared to recent trapping (2015) in the eastern Otways where overall trapping success was 12.36 % (Zhuang-Griffin 2015). However the capture success in 2015 at each site did range from 0 to 46.67%, with 5 of the 15 sites resulting in 0 captures.

Two terrestrial mammal species (*Rattus fuscipes* Bush rat, *Rattus lutreolus* swamp rat) recorded in the previous surveys (DSE 2007) were recorded however *Antechinus swainsonni*, Dusky antechinus was not recorded in the current survey. There is the possibility that this species was misidentified as *A. swainsonni* as the species has been recorded infrequently in the eastern Otways. There are only four records of the species in the Wilson database (1975-2016). Given the recent confirmed recordings of *A. minimus* in 2015 in the Surf Coast Shire Anglesea Parks, it is possible that the specimen captured in 2007 was actually *A. minimus*.

The previous survey only recorded the presence of mammal species and did not record capture rates or any details of the number of individuals, size of animals etc. It is thus not possible to assess if there have been any declines or increases in mammal populations.

The proposed listing (EPBC Act) of *A. minimus* based on its continuing decline nationally (Woinarski *et al.* 2014, Department of Environment 2015) and the decline of the species in the eastern Otways means that the recent recordings (2015) of *A. minimus* in the Surf Coast Shire parks is highly significant. Remaining populations of the species may now only be represented by individuals or small populations scattered across the landscape (Wilson & Garkaklis 2015; Zhuang-Griffin 2015). The wet habitat along the Anglesea River may provide key refugia for the species in the eastern Otways (Wilson & Garkaklis 2015; Zhuang-Griffin 2015).

It is recommended that trapping surveys in the Surf Coast Shire Parks be repeated in 2017.

The continuing decline nationally of *A. minimus* has been related to habitat loss and degradation, and the impacts of feral predators and fire (Woinarski *et al.* 2012, Department of Environment 2015).

Key management recommendations for Fairyland Nature Reserve and Coogoorah Park in 2007 were weed control, development of a park management plan and predator control (DSE 2007). It is recommended that weed control activities be reviewed in relationship to maintaining habitat structure for small mammals, particularly for *A. minimus*.

It is recommended that a review of predator control and fire management in these Surf Coast Shire Parks and surrounding land be undertaken in collaboration with relevant management agencies (DELWP, Parks Victoria, GORCC).

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