



Armstrong Reserve Targeted Western Ringtail Possum Survey

**Prepared for Capecare
28 November 2019**



Document Status						
Rev No.	Authors	Reviewer/s	Date	Approved for Issue		
				Name	Distributed To	Date
1	D.Brearley	S.Elscot	25/11/19	D.Brearley	M.Sproule	28/11/19



ACN 095 837 120
PO Box 227
YALLINGUP WA 6282
M 0427 339842
E-mail: info@onshoreenvironmental.com.au

COPYRIGHT: The concepts and information contained in this document are the property of Onshore Environmental Consultants Pty Ltd. Use or copying of this document in whole or in part without the written permission of Onshore Environmental Consultants Pty Ltd constitutes an infringement of copyright.

DISCLAIMER: This report has been undertaken solely for CapeCare. No responsibility is accepted to any third party who may come into possession of this report in whatever manner and who may use or rely on the whole or any part of this report. If any such third party attempts to rely on any information contained in this report such party should obtain independent advice in relation to such information.

TABLE OF CONTENTS

TABLE OF CONTENTS	ii
1.0 INTRODUCTION	1
1.1 Preamble.....	1
1.2 Scope of Works	1
2.0 METHODOLOGY	2
2.1 Field Survey.....	2
2.2 Survey constraints	2
3.0 RESULTS	3
3.1 WRP Habitat within Armstrong Reserve	3
3.2 WRP Observations.....	3
3.3 Comparison to Previous Surveys.....	4
4.0 CONCLUSION	4
5.0 BIBLIOGRAPHY	5
Figure 1 Location of Armstrong Reserve.....	7
Figure 2 Location of WRP individuals, dreys and hollows at October 2019.	8
APPENDIX 1	
Location of WRP individuals, dreys and hollows within Armstrong Reserve	9

1.0 INTRODUCTION

1.1 Preamble

Armstrong Reserve is situated within the City of Busselton. It is located approximately 500 m north of the Dunsborough business centre and bounded by Armstrong Place to the south, Gifford Road to the east, and Naturaliste Terrace to the west (Figure 1). Armstrong Reserve has been gazetted into three lots with the City of Busselton retaining vesting of Reserve 25339 (Lots 3000 and 601) for the purpose of 'Landscape Protection', and Water Corporation retaining vesting of Reserve 40445 (Lot 258) for the purpose of 'Drainage'. A 1.28 ha portion of Armstrong Reserve has been excised to form Lot 600 to be managed by Capecare under the zoning 'Special Purpose - Aged Person Housing'. Development of an aged care facility at Lot 600 has recently commenced.

A number of commitments were made by Capecare as part of the project approval; these are outlined in the Environmental Management Plan for Armstrong Reserve, Dunsborough - Urban and Commercial Development (Ministerial Statement 1094, May 2019). One condition required a pre-clearance surveys to be undertaken within Armstrong Reserve, specifically targeting the Western Ringtail Possum *Pseudocheirus occidentalis* (Critically Endangered), due to potential impact on fauna from clearing of vegetation for development within Lot 600.

This report details the results of a targeted WRP survey of Armstrong Reserve over four nights in October 2019. The aim of the survey work was to record baseline data on the status and distribution of WRPs within the reserve. This will allow for comparison with future surveys to inform on potential impacts that the aged care development may have on WRPs in the area.

1.2 Scope of Works

The scope of works was to conduct a WRP survey, following closely the recommended procedures and requirements of the 'Development Planning Guidelines for a preliminary survey of WRPs' (DEC 2009). The aim of the survey work was to determine as accurately as possible the number and distribution of WRPs utilising Armstrong Reserve. The assessment included:

1. Daytime targeted search for evidence of WRPs (e.g. dreys, tree hollows, scats, individuals); and
2. Nocturnal count to determine the distribution and abundance of WRPs within Armstrong Reserve.

2.0 METHODOLOGY

2.1 Field Survey

A diurnal inspection of the site was carried out between the 21st and 22nd October 2019, with the principal aim of recording the location of dreys or other potential daytime refuge sites (e.g. tree hollows) and actual WRP individuals. The diurnal search involved a series of close spaced grid traverses (20m spacing or closer) carried out on foot using a GPS for guidance and as a data recorder.

The nocturnal count was undertaken on the 23rd and 24th October 2019. The sampling procedure involved systematic searching of the entire reserve by way of close spaced traverses (~20m spacing or closer) on foot, using a head torch to detect individual WRPs or their eye shine. The nocturnal counts were carried out using a handheld GPS for guidance and as a data recorder.

2.2 Survey constraints

The survey records and associated conclusions are based on field work undertaken over a short sampling period and must therefore be considered indicative of the environmental conditions of the site at that specific time. The effectiveness of targeted field surveys varies between sites in response to factors such as the size of area being surveyed, topography, access, vegetation structure and composition, weather, seasonality, and the experience of the ecologist. WRP surveys can be further complicated where the home range of animals crosses lot boundaries and influences continuity of records across multiple sampling nights.

The assessment reported on here has included one diurnal inspection to confirm vegetation types present and search for evidence of WRPs, and two nocturnal counts aimed at locating WRPs within Armstrong Reserve. The study area is relatively small approximating 3.51 ha, however dense understorey vegetation and seasonal inundation increased the difficulty of field survey. The number of WRPs observed at October 2019 represents the minimum number of WRPs that were using the site at the time of survey.

3.0 RESULTS

3.1 WRP Habitat within Armstrong Reserve

The description of flora and vegetation within Armstrong Reserve is informed by detailed flora and vegetation surveys undertaken in Spring 2005, 2006 and 2007 (Coffey Environment 2008) and 2009 (Ecoscape 2010). The reserve contains three distinct vegetation types as follows:

1. CcAfMxOF - *Corymbia calophylla*, *Agonis flexuosa* and mixed species Open Forest to Low Woodland occasionally over *Jacksonia furcellata* Tall Open Shrubland occasionally over *Acacia divergens*, *Acacia pulchella* and *Daviesia divaricata* Open Heath over *Xanthorrhoea preissii*, *Hibbertia hypericoides* and mixed species Open Low Heath to Low Shrubland over mixed Open Herbland and mixed Open to Very Open Sedgeland on dryland soils in a thin strip along the northern boundary as well as in the south-west corner of the site.
2. AfCcErBILOF - *Agonis flexuosa* (Peppermint), *Corymbia calophylla* (Marri), *Eucalyptus rudis* (Flooded Gum) and *Banksia littoralis* (Swamp Banksia) Low Open Forest to Open Woodland over *Hakea varia*, *Jacksonia furcellata* and *Viminaria juncea* Tall Open Shrubland over Mixed Open Shrubland over *Hibbertia hypericoides* and *Xanthorrhoea* spp. Low Open Shrubland over *Mesomalaena tetragona* and mixed species Sedgeland over *Caesia micrantha* and *Conostylis aculeata* Very Open Herbland occurring at the transition from dryland to wetland soils in a thin strip near the northern boundary as well as in the south-east corner of the site.
3. MrErAfLOF - *Melaleuca raphiophylla*, *Eucalyptus rudis*, *Agonis flexuosa* Low Open Forest or Woodland over *Viminaria juncea*, *Hakea varia* Tall Open Shrubland over *Xanthorrhoea preissii* Low Open Shrubland to Low Open Heath over *Lepidosperma squamatum*, *Cyathochaeta avenacea*, *Tetraria capillaris* and mixed species Sedgeland on waterlogged (dampland) soils in the centre of the site extending from Naturaliste Terrace to Gifford Road.

The detection of WRP within the reserve is likely to vary between the different vegetation communities, with detection most difficult in areas supporting the densest tree canopy; *Melaleuca raphiophylla* low open forest (vegetation association 3) present in the lowest lying areas of the site. This was reflected in the distribution of WRP sightings, with more WRP found in the open woodland areas at the northern, north-eastern and north-western corners of the reserve.

3.2 WRP Observations

Evidence of WRP using vegetation within the reserve was confirmed by recording dreys ('nests' of small sticks and foliage used for daytime refuge) and tree hollows during daytime searches. Individual WRPs were then recorded during nocturnal surveys. Combined results are provided in Figure 2 and Appendix 1.

A total of 11 dreys and two suitable hollows were recorded within the reserve during daytime searches (Figure 2). Totals of 17 and 21 WRPs (Appendix 1) were recorded within the reserve during the two nights of nocturnal searches.

3.3 Comparison to Previous Surveys

The first targeted WRP survey undertaken at Armstrong Reserve¹ between the 5th and 8th of September and the 5th and 7th October 2005 recorded 19 and 21 WRPs respectively, along with 14 dreys (ATA Environmental 2006).

A later Level 2 fauna survey (Ecoscape 2012) estimated the population size (abundance) and density of WRPs at Armstrong Reserve using the 'Distance Sampling' methodology, as described by Buckland *et al.* (2004). A total of nine WRP were observed while spotlighting along the semi-permanent transects, with density estimated at six individuals per hectare (Ecoscape 2012).

The October 2019 survey by Onshore Environmental (17 and 21 individuals) is similar to the number of WRP recorded within Armstrong Reserve by ATA Environmental (2006) in September / October 2005 survey (19 and 21 individuals).

4.0 CONCLUSION

The October 2019 assessment confirms that remnant vegetation at Armstrong Reserve remains in very good condition and supports a stable and healthy population of WRP. The data provides an accurate baseline against which to compare results from any future surveys.

¹ It is noted that the entire reserve was surveyed, including the 1.28 ha which now forms Lot 600 and is currently being developed for aged care.

5.0 BIBLIOGRAPHY

- ATA Environmental (2006). *Fauna Assessment, Armstrong Reserve, Dunsborough*. Unpublished Report No. 2005/176. Prepared for Ray Village Aged Services (Inc.), April 2006.
- ATA Environmental (2008). *Flora and Vegetation Survey, Armstrong Reserve, Dunsborough*. Unpublished Report No. 2005/208 (Version 3). Prepared for Ray Village Aged Services (Inc.).
- ATA Environmental (2007). *Regional Western Ringtail Possum Assessment, Armstrong Reserve, Dunsborough*. Unpublished Report No. 2007/088. Prepared for Ray Village Aged Services (Inc.), October 2007.
- Buckland, S. T., Anderson, D. R., Burnham, K. P., Laake, J. L., Borchers, D. L. and Thomas, L. (2004). *Advanced Distance Sampling. Estimating abundance of biological populations*. Oxford University Press. Oxford, UK.
- Burbidge A.A, and de Tores P. (1997). Western Ringtail Possum Interim Recovery Plan 1997-1999. Department of Conservation and Land Management, Perth Western Australia.
- Burbidge, A. (1997-98). Endangered: Western Ringtail Possum. *LANDSCOPE* 13(2): 49.
- de Tores, P. (2008). Western Ringtail Possum *Pseudocheirus occidentalis* pp 253-255 in Van Dyck, S. and Strahan R. (eds). (2008). *The Mammals of Australia*. Queensland Museum / Reed Books.
- de Tores, P. J. and Elscot, S. (2010). Estimating the population size of a threatened arboreal marsupial: Use of Distance Sampling to dispense with *ad hoc* survey techniques. *Wildlife Research* 37 (6): 512-523.
- de Tores, P., Rosier, S. and Paine, G. (1998). Conserving the Western Ringtail Possum. *LANDSCOPE* 13(4): 28.
- de Tores, P., Hayward, M. W. and Rosier, S.M. (2004). The western ringtail possum *Pseudocheirus occidentalis* and the quokka, *Setonix brachyurus*, case studies: Western Shield review- February 2003. *Conservation Science W. Aust* 5 (2): 235-257.
- de Tores, P., Rosier, S. Jackson, J., Clarke, J and Aravidis, L. (2008). Working to Conserve the Western Ringtail Possum. *LANDSCOPE* 25(4): 55-60.
- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008). Background Paper to the EPBC Act Policy Statement 3.10 – Nationally Threatened Species and Ecological Communities. “Significant Impact Guidelines for the vulnerable western ringtail possum (*Pseudocheirus occidentalis*) in the southern Swan Coastal Plain, Western Australia”.
- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2009a). Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Policy Statement 3.10 “Significant Impact Guidelines for the vulnerable western ringtail possum (*Pseudocheirus occidentalis*) in the southern Swan Coastal Plain, Western Australia”.
- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2009b). Matters of National Environmental Significance. Significant Impact Guidelines 1.1, *EPBC Act 1999*.
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2011). *EPBC Act Environmental Offsets Policy Consultation Draft*.

- Ecoscape (Australia) Pty Ltd (2012). *Armstrong Reserve Level 2 Fauna Survey*. Unpublished Report No. 7925-2582-11R prepared for Ray Village Aged Services (Inc.) trading as CapeCare. May 2012.
- EndPlan Environmental Planning (2011). Armstrong Reserve, Dunsborough, Urban and Commercial Development – Environmental Scoping Document (EPA Assessment No. 1080), Endplan Environmental Planning, Perth.
- Environmental Protection Authority (EPA) (2002). Terrestrial Biological Surveys As An Element of Biodiversity Protection. Position Statement No. 3. EPA, Perth.
- Environmental Protection Authority (EPA), (2003a). Level of Assessment for Proposals Affecting Natural Areas Within the System 6 Region and Swan Coastal Plain Portion of the *System 1* Region. Guidance Statement 10.
- Environmental Protection Authority (EPA) (2004). Guidance for the Assessment of Environmental Factors - Terrestrial fauna surveys for environmental impact assessment in Western Australia. Guidance Statement No 56 EPA, Perth.
- Environmental Protection Authority (EPA) and Department of Environment and Conservation (DEC) (2010). Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessments (eds B.M. Hyder, J. Dell and M.A. Cowan), Perth Western Australia.
- Jones, B. (1995). Western Ringtail Possum. In R. Strahan (Ed.) *The Mammals of Australia*. Australian Museum and Reed Books. Chatswood, NSW.
- Jones, B., Henry, J., and Francesconi, M. (2007). An important local population of the Western Ringtail Possum *Pseudocheirus occidentalis*: a 2006 survey study of the population and habitat in the Busselton localities of Siesta Park and Kealy. Unpublished report for GeoCatch, Busselton, W.A.
- Jones, B.A., R.A. How and D.J. Kitchener (1994a) A field study of *Pseudocheirus occidentalis* (Marsupialia: Petauridae). II. Distribution and habitat. Population studies in *Wildlife Research* 21: Page(s) 175-187.
- Jones, B.A., R.A. How and D.J. Kitchener (1994b) A field study of *Pseudocheirus occidentalis* (Marsupialia: Petauridae). II. Population studies in *Wildlife Research* 21: Page(s) 189-201.
- Maxwell S., Burbidge A.A and Morris K. (1996). The 1996 Action Plan for Australian Marsupials and Monotremes. Wildlife Australia, Canberra.
- Menkhorst, P. and Knight, F. (2011). *A Field Guide to the Mammals of Australia*. Oxford University Press, Melbourne.
- Van Dyck, S. and Strahan, R. Eds (2008) *The Mammals of Australia*. Third edition Queensland Museum.



PINPOINT CARTOGRAPHICS (08) 9562 7136 RVA292_78-02.dgn

<p>EndPlan Environmental</p>	<p>Ray Village Aged Care Services Inc t/a CapeCare ENVIRONMENTAL MANAGEMENT PLAN ARMSTRONG RESERVE, DUNSBOROUGH - URBAN AND COMMERCIAL DEVELOPMENT</p> <p>EXISTING ENVIRONMENT WITH CADASTRE (2015)</p>	<p>Date: 17 May 2019 Drawn: B. Van der Wiele</p> <p>Figure 1 Report No. RVA292_78</p>
---	--	--

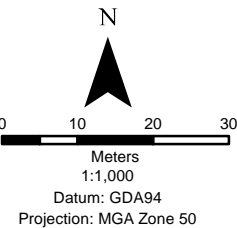


CAPECARE

FIGURE 2
Armstrong Reserve
Targeted WRP
Survey

Legend

- Armstrong Reserve
- Development Envelope
- Drey Locations
- Hollow Locations
- Western Ringtail Possum Locations



Date:	26/11/2019
Status:	Final
Figure:	2
Sheet Size:	A3
Internal Reference:	Armstg_Res
Drawn by:	GSM
Requested by:	DB



APPENDIX 1

Location of WRP individuals, dreys and hollows
within Armstrong Reserve

Western Ringtail Possum - Location of Individuals

UTM	Easting	Northing	Comment
23 October 2019 - overcast, windy NW 15-21 knots, light drizzle, 6mm rain to 9am the following morning			
50 H	324046	6279448	One WRP in a Peppermint tree, 7m up
50 H	324229	6279390	One WRP, 5m up in Marri
50 H	324101	6279484	One male WRP in a Peppermint tree, 7m up
50 H	324068	6279437	Two WRP in a Peppermint tree, one female and yearling, 5m up
50 H	324115	6279429	Two WRP in a Peppermint tree, 7m up
50 H	324121	6279451	One WRP in a Marri tree, 8m up
50 H	324203	6279463	One WRP in a Marri tree, 7m up
50 H	324171	6279422	One WRP in a Eucalyptus rudis tree, 10m up
50 H	324201	6279408	One WRP in a Melaleuca tree, 3m up
50 H	324244	6279400	Three WRP, one female and two yearlings, in a Peppermint tree 8m up
24 October 2019 - clear, light SSE winds, 0mm rain to 9am the following morning			
50 H	324232	6279399	One female WRP in Peppermint tree , 4m up
50 H	324242	6279417	One WRP in Viminaria juncea, 4m up
50 H	324240	6279404	One WRP in Melaleuca raphiophylla 5m up
50 H	324202	6279437	Two WRP in Hakea varia, 6m up
50 H	324121	6279443	Two WRP in a Peppermint tree, 8m up
50 H	324091	6279469	Two WRP in Marri, 10m up
50 H	324082	6279431	One WRP in a Peppermint tree, 7m up
50 H	324039	6279448	One WRP in a Marri, 8m up
50 H	324039	6279447	One WRP in a Peppermint tree, 8m up
50 H	324201	6279499	One female WRP in Peppermint tree , 5m up
50 H	324250	6279406	One yearling WRP in a Marri 5m up
50 H	324285	6279330	Three WRP, one female and two yearlings, in a Peppermint tree 5m up
50 H	324083	6279384	One WRP in a Eucalyptus rudis tree, 10m up
50 H	324069	6279366	Two WRP in in a Peppermint tree, 12m up

Western Ringtail Possum - Location of Dreys

UTM	Easting	Northing	Comment
50 H	324187	6279425	Platform drey in Melaleuca raphiophylla, 3m up
50 H	324207	6279397	Large basket drey in a Peppermint tree, 7m up
50 H	324261	6279330	Large basket drey in Peppermint tree, 6m up, WRP visible
50 H	324212	6279405	Large basket drey in Peppermint tree, 6m up
50 H	324218	6279426	Large basket drey in Melaleuca raphiophylla, 4m up
50 H	324293	6279358	Large basket drey in Melaleuca raphiophylla, 5m up
50 H	324291	6279356	Large basket drey in Marri, 6m up
50 H	324274	6279378	Large basket drey in Melaleuca raphiophylla, 4m up
50 H	324260	6279402	Large basket drey in Peppermint tree, 6m up
50 H	324189	6279498	Basket drey in Melaleuca raphiophylla, 4m up
50 H	324114	6279494	Large basket drey in upper canopy of Peppermint tree, 10m up

Western Ringtail Possum - Location of Suitable Hollows

UTM	Easting	Northing	Comment
50 H	324243	6279337	Hollow in large Nyctia floribunda tree, dense WRP scat at base of tree
50 H	324266	6279359	Hollow in large Marri tree