



Malleefowl Monitoring in Victoria: 2013/14

Report to the Victorian Malleefowl Recovery Group

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1. Monitoring effectiveness: how did we do?

Table 1 shows a breakdown of the effectiveness of the monitoring effort and the overall result is impressive; more detail is shown in Appendix A.1. The VMRG visited 1192 Malleefowl mounds during the 2013/14 breeding season (all 'sought and found', plus all 'new' mounds), including 6 newly listed mounds.

A total of 47 regular mounds appear to have been neither sought nor found during the 2013 season. Most (32) of these were at v17 (One-tree plain) and v40 (Iluka) for which no data had been received at the time of writing this report, but may still be forthcoming. The remaining 15 regular mounds that were neither sought nor found were scattered through 5 sites (Appendix A.2): most appear to have been forgotten. One of these mounds had been found last year in Paradise (v34) and was active at that time. There were also 10 regular mounds that were sought but could not be found. Most of these appear to be dodgy records added after searches: 4 of these will be deleted from the monitoring lists next season, while for another 3 we will try to locate them one more time and delete them if we still can't find them.

Overall, we managed to find 95.3% of the mounds that we set out to monitor (excluding newly added mounds). This will increase to 97.9% if data from v17 and v40 are forthcoming.

Table 1. Effectiveness of the monitoring effort

	<i>Total</i>	<i>Regular</i>	<i>5yrol</i>	<i>5yrnew</i>	<i>Omitted</i>
Sought and found	1186	1143	35	7	1
New incidental	6	6	0	0	0
Sought, NOT found	11	10	0	0	1
NOT sought or found	168	47	70	51	0
Total	1371	1206	105	58	2

Last season 58 mounds were monitored as regular mounds and marked as optional (5 year mounds) for this season; these mounds show up in the tables as new optional mounds this season. This brings the total number of mounds on the optional list to 163, or about 12% of our monitoring target.

Optional mounds on the 5 year list were also well represented in the mound visits considering there was no obligation to inspect them this year; we visited these mounds in 2010 and don't have to revisit again until 2015. Nonetheless, monitors inspected 42 of the 163 mounds on the list this season, often by just taking a labelled photograph and not measuring the mound. This is a legitimate practice for these optional mounds as its better to have some information than none: if you can visit these optional mounds, please do, even if it's only to take a photo and move on.

2. Malleefowl Breeding numbers

Of the 1192 mounds that were monitored in 2013/14, only 129 were active compared with 218 the previous season (including mounds out-of-site boundaries; see Appendix A 3a-c).

Figures 2-4 show the usual graphs that we produce each year to track the trends in breeding numbers in set areas where we have been monitoring the longest. The first set of sites comprises 7 sites that we have been monitoring since 1986 and it is clear that at these sites, mostly in the eastern Big Desert region, breeding numbers were well down. Figure 3 shows a similar trend for a larger set of sites over a shorter period (sites monitored since 1996), and Figure 4 shows the same data broken down into regions. Breeding numbers in each of the three regions represented were clearly much lower in 2013 than in recent years.

Elsewhere, for example in the Little Desert and Wychitella areas, we don't have enough data yet to talk meaningfully about trends because we have not been monitoring in these areas for very long. Breeding numbers in the three Little Desert sites and four Wychitella sites were similar to last year, although a little less than breeding numbers 2-3 years ago.

- *Comparing 2012 results with previous seasons using ALL the data*

Figures 2-4 have been produced and updated in every monitoring report and provide a simple way to show trends in Victoria, but they are a little unsatisfying in that they only use a portion of the data collected each year; in order to show trends we just look at those sites that have been monitored for the longest period, keeping the sites and thus mounds we examine constant across the years.

Another way of representing how the results of the current year measures up against previous monitoring efforts is to compare the 2012 results directly with each of the previous years on a site by site basis (Figure 5). This approach uses virtually all the data collected, including historical data, and provides a more comprehensive way of visualising how current numbers compare with those in the past. Breeding numbers in the 2013 season in Victoria are shown in the chart to be lower than virtually any previous year with the exception of droughts.

- *Reasons for the low breeding numbers in the 2013 season*

Breeding numbers plummeted in 2013/14 and were in stark contrast to last year when numbers were astonishingly high. At first glance this was surprising because although rainfall was generally below average in 2013, it was generally higher than in 2012 when Malleefowl breeding was exceptionally high. Why then the difference?

In 2012, rainfall was generally low but there were significant falls in the 2011/12 summer, and the 2012 autumn and winter; thereafter conditions became dry in spring and 2012 summer (see last year's report), but by then the birds were already committed to breeding and we witnessed exceptionally high breeding numbers.

In 2013, the dry conditions continued through summer and autumn. In fact, rainfall for the 6 months from October 2012 to March 2013 in Malleefowl country was less than half the long term median – this was a long, dry 6 months that started as soon as the birds had committed to breeding! Thereafter, the 2013 April to June period in the mallee was good, with rainfall about 60% above the long-term median.

Malleefowl that endured the 6 month drought began renovating their mounds, but by mid-June dry conditions returned, at least for the northern mallee: July to September rainfall was down by about 40% in the north (Ouyen-Robinvale-Mildura) at the time when Malleefowl should have been completing their mounds and

committing to another breeding season. That many birds chose not to complete their mounds is not that surprising considering the very dry conditions that pertained for most of the previous 12 months. However, in the southern mallee July to September rainfall was actually pretty good and 20-40% higher than long-term averages (Horsham-Wedderburn). This is probably why the greatest declines in breeding numbers occurred in the north, whereas breeding numbers in the Little Desert and Wychitella areas were less affected.

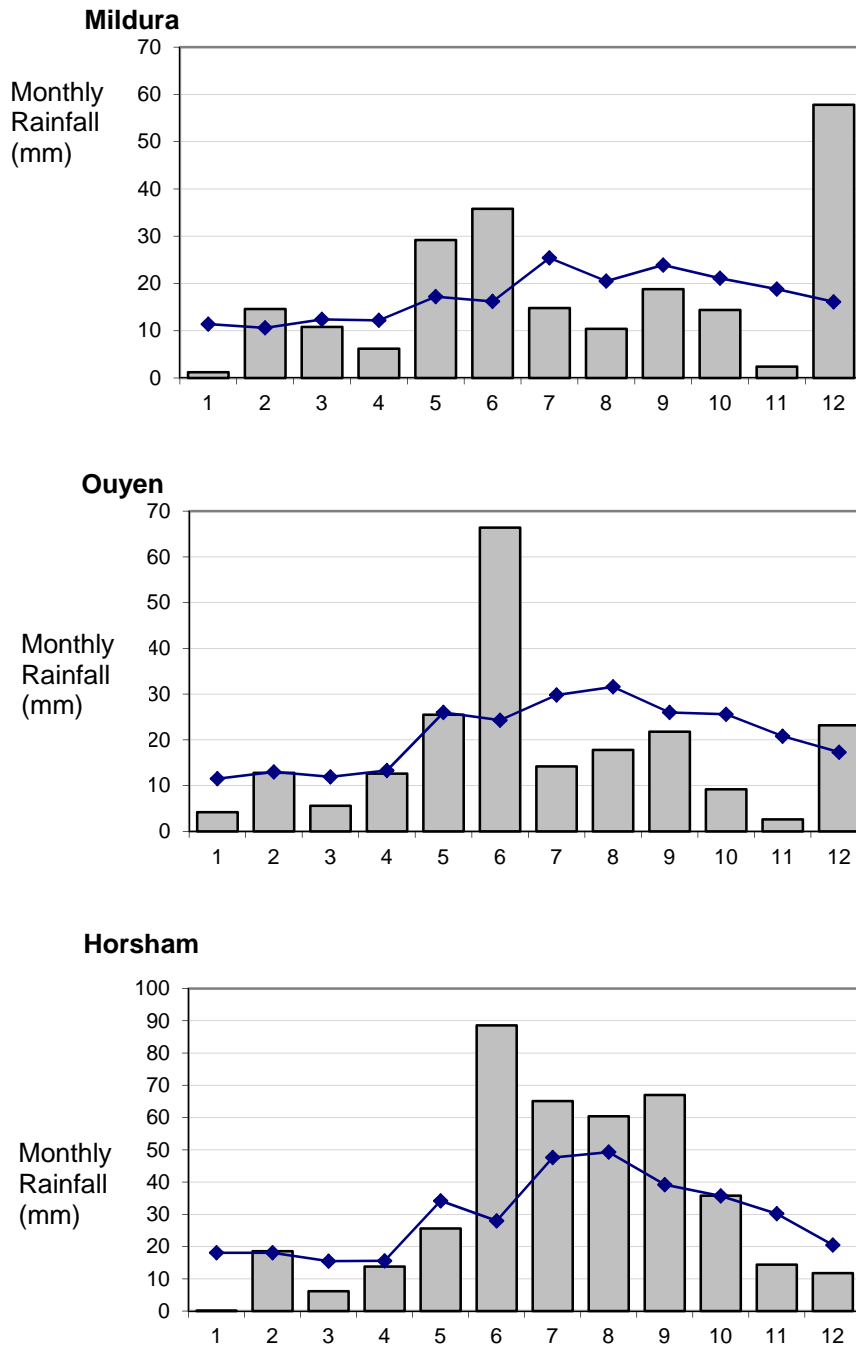


Figure 1. Rainfall at Mildura, Ouyen and Horsham in 2013 (bars) and median rainfall since early 1900s (line). (Data from the Bureau of Meteorology website).

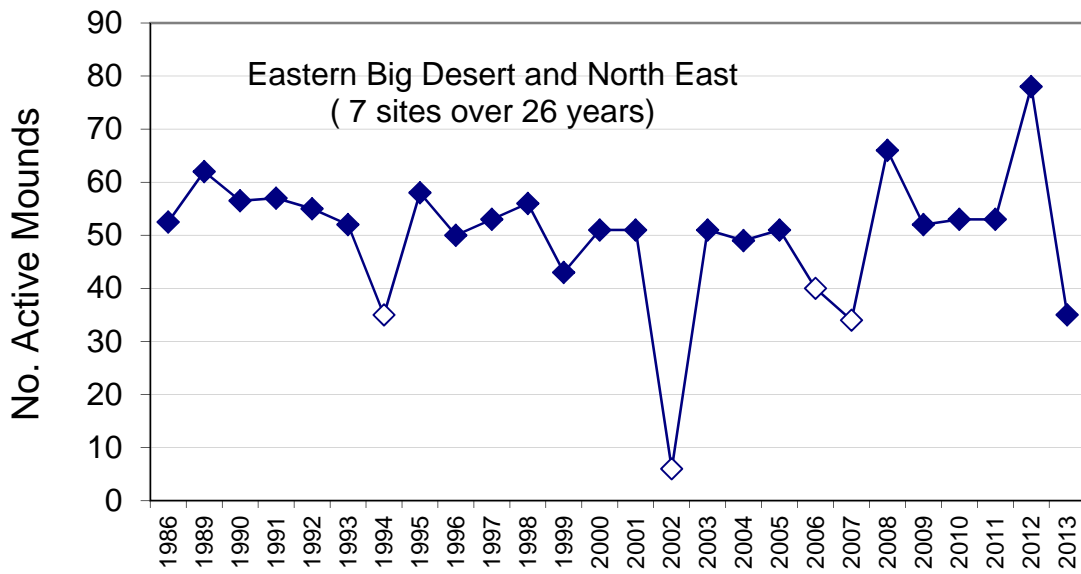


Figure 2. Trends in Malleefowl breeding numbers at 7 of the longest monitored sites over the past 26 years. 1994, 2002, 2006 and 2007 were major drought years (white points). Data comprise mounds in set areas across years in sites 01, 02, 03, 04, 07, 20 and 23.

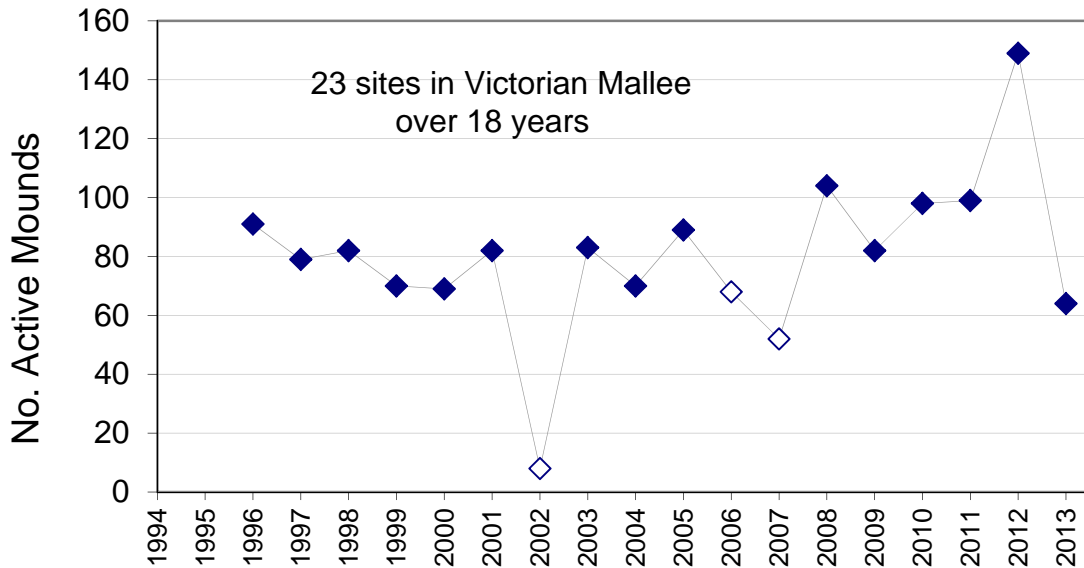


Figure 3. Trends in Malleefowl breeding numbers at 23 sites over the past 18 years shown as collective total. 1994, 2002, 2006 and 2007 were major drought years (white points). Data excludes mounds outside site boundaries. See figure 4 for regional breakdown.

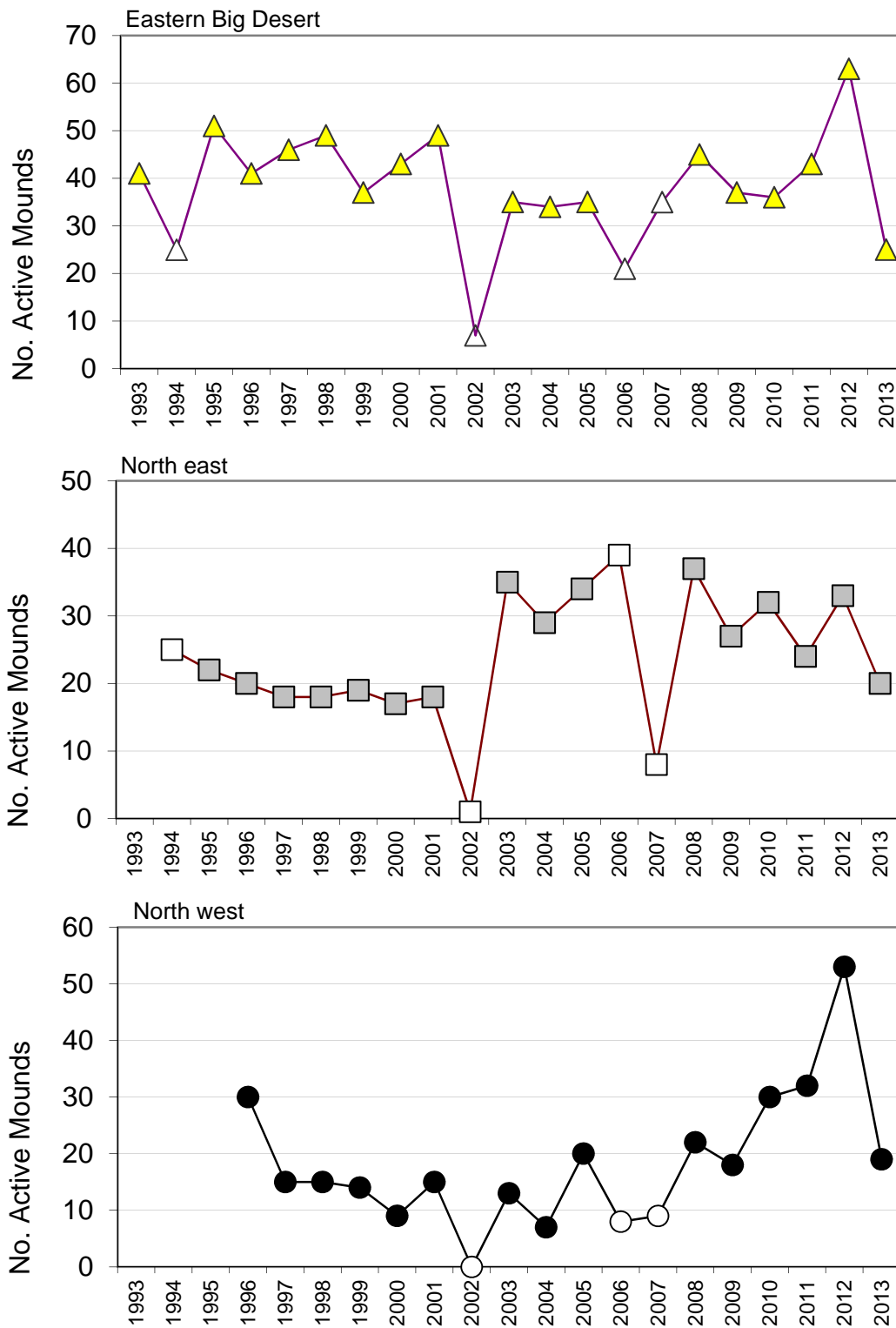


Figure 4. Trends in Malleefowl breeding numbers at 22 sites over the past 18-21 years shown by region. Eastern Big Desert comprise 6 sites over 21 years (triangles), North East comprise 4 sites over 20 years (shaded squares), and North West comprises 12 sites over 18 years (solid circles). 1994, 2002, 2006 and 2007 were major drought years in many areas. Data excludes mounds outside site boundaries.

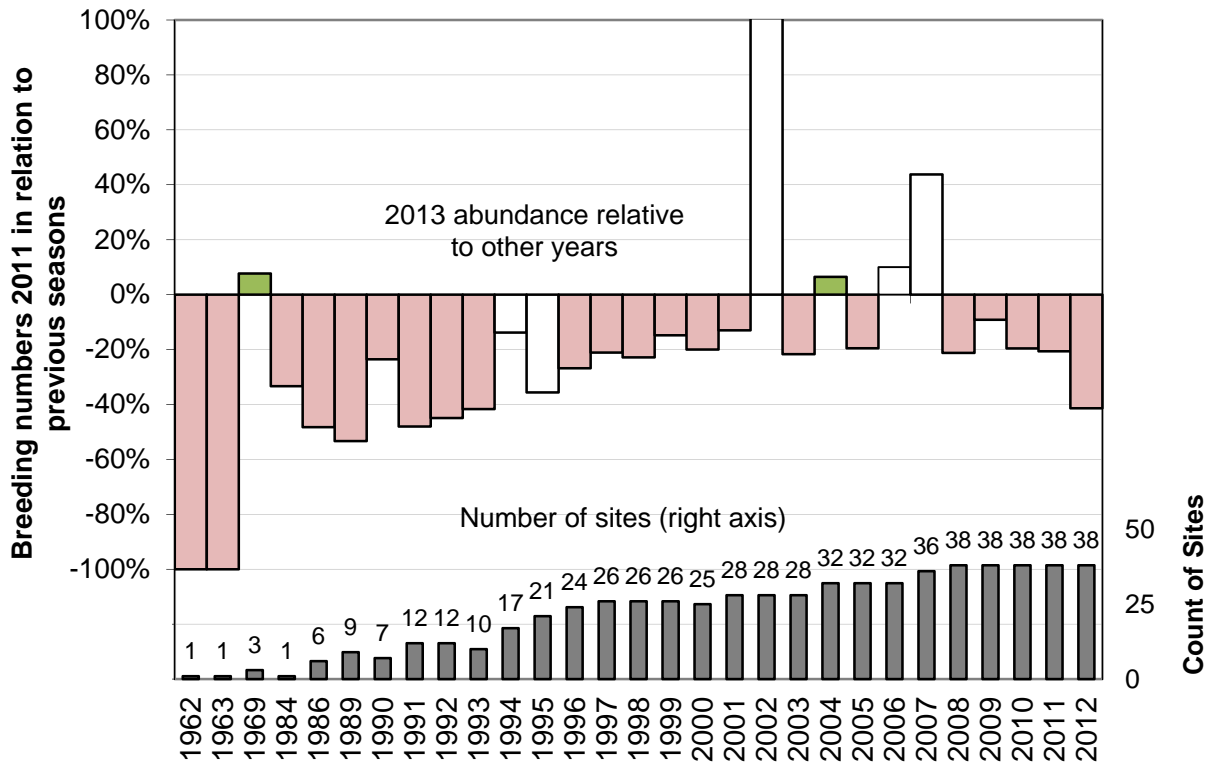


Figure 5. Breeding numbers of Malleefowl in the 2013 season compared with all previous seasons (upper chart) and the number of sites involved (lower chart). The zero line in the chart indicates no difference, whereas values above zero indicate that breeding numbers in the current season were above those in the past, and values below zero indicate a decline. Drought years are indicated by unfilled columns; in the 2002 drought there was virtually no breeding in Victoria and the 2013 breeding number was more than 900% that recorded in 2002.

For example, breeding numbers in 2013 were about 40% below those in 2012 and only slightly higher than those in 1969,. The bottom chart shows the number of sites involved and provides an index of the reliability of the comparisons: the comparison with 2012 is based on 38 sites and is thus very reliable, whereas the comparisons with 1969 are based on only a three sites and probably do not reliably reflect general trends.

Individual Site trends

Appendix B shows the histograms of grid trends from historical records to 2013/14. For each site, the bar graph displays the number of active mounds within the same area across years. The value (i.e. number of active nests) for each histogram bar is also shown so that you can distinguish between seasons when there was no breeding at a site, and seasons when the site was not monitored. Sites are represented in numerical order.

3. Changes to data recorded in the field

There were no major changes to the Cybertracker sequence this season. The Mobilemappers performed well for the majority of people but there were some problems; thankfully only a few people were affected.

As indicated in last year's report, we will be making the transition to Android smartphones soon. All the issues with these devices have been resolved and you can expect to see some at the training weekend in October and have the option of using them in the field as well.

4. Lerp

This season was the 8th time we have recorded the occurrence of lerp (the sweet and nutritious casing of psyllid sap-sucking insects that fall from leaves) on Malleefowl mounds, but very few were recorded (Appendix A VIII).

5. Fox scats

Fox scats were collected at 499 mounds in 2013 and weighed a total of 9.3 kg, a result that is similar to last season (Table 2). Figure 6 shows the average weight of fox scats collected per mound monitored since the mid-1990s for the same set of 20 sites and provides a better comparison across the 18 years of data during which many sites have been added. The graph shows that there was a steep decline in fox scat weights between 1996 and 2000 which coincides with, and probably reflects, the decline of rabbits due to RHD and consequent adjustments to fox populations. But there is also a clear and increasing trend over the past decade suggesting that fox numbers are on the rise again, a trend certainly supported by anecdotal reports from various sources in the mallee. In fact the average fox scat weights per mound for these sites are approaching levels not seen for at least 15 years. Our analyses so far of long term trends suggest that fox numbers do not have a much impact on Malleefowl numbers; it's clear that foxes eat Malleefowl of all ages but this does not seem to impact on population levels. Nonetheless, the rise in fox numbers is of concern and we will be watching carefully, thanks to the collective efforts of lots of volunteers.

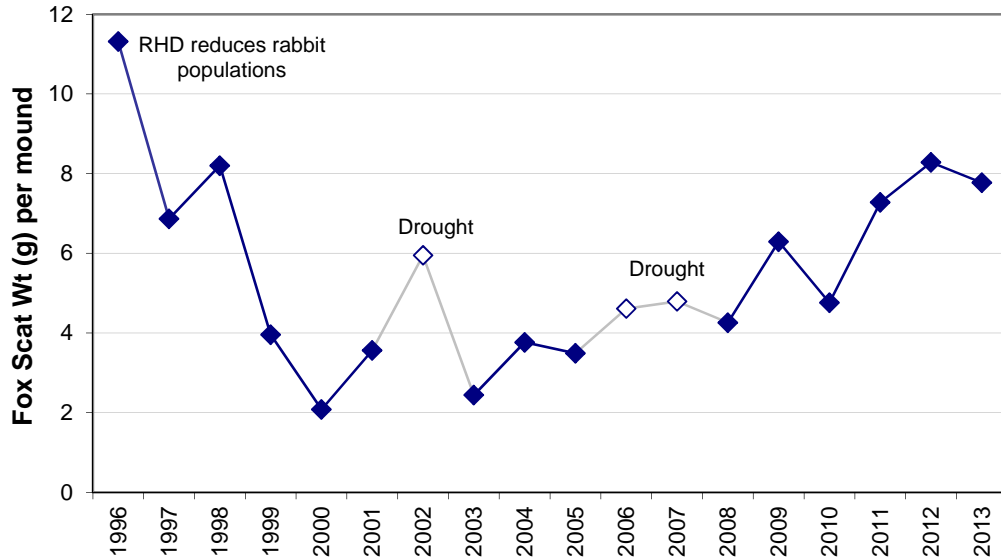


Figure 6. Trends in the average fox scat weight per mound at 20 sites over 18 years. No attempt has been made to control for biases due to variations in the proportion of active mounds (more likely to be marked with fox scats) or changes in the proportion of very old and inconspicuous mounds (less likely to be marked by foxes); values and patterns might change if these biases were considered (especially comparisons over large timeframes).

Which brings us, as always, to reiterate:

May we remind everyone once again of the importance of being very systematic with fox scat collection. We must search the mound surface very carefully for a full minute to be to absolutely sure that we get all the scats, as emphasised in the manual and during the training weekends.

Table 2. The total weight of fox scats, the number of mounds at which fox scats were collected, for both 2013 and the previous year (*italics*). Malleefowl scats and feathers were also collected in 2013 but numbers have not been tabulated.

Grid	Name	Fox Scats		<i>2012</i> Wt (g)	<i>2012</i> Count
		2013 Wt (g)	2013 Count		
v01	Dattuck	240	18	<i>321</i>	<i>15</i>
v02	Torpeys	58	8	<i>383</i>	<i>19</i>
v03	Wathe SW	173	12	<i>845</i>	<i>82</i>
v04	Bronzewing	1546	68	<i>1377</i>	<i>65</i>
v05	Colignan	248	13	<i>31</i>	<i>2</i>
v07	Annuello	388	23	<i>308</i>	<i>18</i>
v08	Powerline	183	7	<i>225</i>	<i>8</i>
v09	Mt Hattah	99	6	<i>106</i>	<i>7</i>
v11	Mopoke	195	13	<i>127</i>	<i>8</i>
v12	Pheeneys	396	16	<i>423</i>	<i>17</i>
v13	Bambill	424	22	<i>458</i>	<i>24</i>
v14	Menzies	170	8	<i>153</i>	<i>8</i>
v15	Wandown	299	23	<i>130</i>	<i>13</i>
v16	South Bore	352	26	<i>456</i>	<i>27</i>
v18	Washing Machine	34	4	<i>96</i>	<i>10</i>
v19	Underbool	311	13	<i>350</i>	<i>14</i>
v20	Lowan	850	34	<i>265</i>	<i>21</i>
v21	Dumosa	368	20	<i>176</i>	<i>19</i>
V22	Dennyning	35	4		
v23	Moonah	861	51	<i>1459</i>	<i>52</i>
v24	Kiata	24	1	<i>107</i>	<i>7</i>
v26	Hattah Tracks	331	17	<i>295</i>	<i>16</i>
v27	O'Brees	106	8	<i>156</i>	<i>11</i>
v28	Nurcoung	180	9	<i>179</i>	<i>11</i>
v29	Wedderburn	40	2	<i>11</i>	<i>3</i>
v30	Hattah South	54	5	<i>37</i>	<i>5</i>
v31	Skinnners Flat	64	5	<i>56</i>	<i>8</i>
v32	Wychitella	48	8	<i>30</i>	<i>2</i>
v33	Korong Vale	21	2	<i>49</i>	<i>4</i>
v34	Paradise	828	31	<i>606</i>	<i>35</i>
v35	Broken Bucket	16	3	<i>141</i>	<i>5</i>
v36	Broughtons WH	0	0	<i>0</i>	<i>0</i>
V37	Wisemans	17	5	<i>38</i>	<i>7</i>
v38	Tooan	96	6	<i>40</i>	<i>3</i>
V39	Oldfields	197	6	<i>69</i>	<i>4</i>
V41	Mali Dunes	5	1	<i>0</i>	<i>0</i>
V42	Nurcong Farmers	5	1		
		<i>9,262</i>	<i>499</i>	<i>9,503</i>	<i>550</i>

6. Concluding comments: Great data and the camera project

The VMRG has once again made a critically important contribution to Malleefowl conservation by monitoring trends in Malleefowl breeding numbers and collecting important information on trends in numbers of foxes and other species, and foods such as lerp. The data collected is of excellent quality, and are being used to evaluate the trends and requirements of the species. In particular, the Adaptive Management project led by Drs Michael Bode, Cindy Hauser and Jose Lahoz-Monfort at Melbourne University is now gearing up to develop a program that will make the best use of the ongoing flow of monitoring data to better manage Malleefowl.

One important area in which our data collecting could be improved is in regard to other species, especially predators such as foxes, cats, but also other pests such as rabbits, goats, and natives such as kangaroos. All of these animals are likely to affect Malleefowl to some degree, and of course that is why we take the time to examine mounds for prints and scats. The problem is that these indicators of animal abundance are subject to a lot of variation and are hard to interpret: people differ markedly in their ability to spot scats and tracks, weather conditions have a great bearing on the persistence of these signs, and we don't really know how the abundance of scats and tracks on mounds relates to the actual abundance of the animals in question. The data we have been collecting is very valuable because it gives us some information, but it is far from ideal.

- *The motion-sensitive camera project*

Over the past 12 months we have been trialling the use of motion-sensitive cameras at Wandown and Menzies (v15 and v14) to collect information on all of these animals simultaneously. These cameras (24 in total) have been set up with solar panels and batteries and scattered through the mallee (not at mounds) to patiently take photos of any animal or other object that passes in front of them, day and night, 365 days a year. The idea is that ultimately we will only visit them once a year during the monitoring to swap memory cards, so the effort by monitoring folk in the field will be small, but the rewards will be substantial in terms of estimating the populations of other animals.

Apart from monitoring all-the-other-animals, the cameras also promise something very special: the potential to detect the years in which young Malleefowl survive to adulthood. We know from Malleefowl life-history that the overwhelming majority of Malleefowl die young and that to maintain populations as few as 1-2% of young need to survive to breeding adults. We also know that this small amount of recruitment could happen any time over the 10-20 year period that Malleefowl seem to survive as breeding adults. But we really don't have any idea when this essential recruitment might occur: perhaps a few young birds survive only when predator numbers are unusually low, or after heavy rain at a particular time; maybe it is related to lerp outbreaks, or something we have not even imagined. The point is that we really have no idea! But if we did know, we might be able to manipulate the system to benefit Malleefowl and improve their conservation.

We are pleased to report that the trials at have been very successful. We have shown that the camera set-up works and captures great (and sometimes amusing) photos of a range of species of interest that provides valuable data. Processing the photos is time consuming, but not nearly as tedious as we feared. An important part of the camera trial project was to see if VMRG members were interested and able to sort through the large number of photos. So we sent out DVDs with about 5,000 photos (about a half to a third of what we would expect from a site per year) to 16 volunteers to see how they would go, without any direct training (but lots of instructions). The results so far (14 responses) have been very pleasing:

- Different people who were sent the same photos came up with very similar results.
- The average time to sort photos was 50min per 1000 photos. At this rate it would take about 8-12 hours to sort all the photos from a site each year (less than 2 minutes/day spread out over the year).
- Sorters tended to get faster as they became more experienced, averaging about 40min for the last batch of 1000 photos.
- 100% of respondents said they enjoyed the sorting experience.
- 100% of respondents said they would do it again.
- 92% of respondents said they would be happy to do 10,000 to 15,000 photos a year (the number of photos we expect to get per site per year). The only respondent who was unsure (she said “possibly”) about sorting up to 15,000 photos per year was using a Mac rather than a PC, and her progress was much slower than others because she was unable to use the recommended software and techniques.
- Once sorted by volunteers, the photo data are easily transferred to a database. The database for the trial now has over 90,000 photos indexed with details of subject (many are nulls, such as moving foliage), date, time and location.
- The data provide a wonderfully detailed representation of what animals are out there, how many there are, and when they are moving about.

So with these results in hand we are very excited about the prospect of purchasing more cameras to provide information on the predators and other animals that may affect Malleefowl conservation. These data will be passed on to the AM team and will be an invaluable component of the environmental modelling.

Finally, it is with great sadness that we note the premature passing of Peter Sandell. ‘Big Pete’ was chair of the National Recovery Team for many years, a long term member of the VMRG and current vice president, and fought many battles within Parks Victoria and the government on behalf of Malleefowl and the mallee in general. He was also an especially gentle and considerate fellow and will be greatly missed.

Joe Benshemesh and Peter Stokie, April 2014

Appendix A 1. 2013/14 Mound Inspection Report for All Victorian Sites

Mounds that will be included in future annual lists.

Sites	1	2	3	4	5	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43		
Sought and found	1143	77	52	80	96	15	52	17	14		15	25	39	23	85	42		26	22	63	33	12	62	10	8	23	20	19	9	9	10	16	5	50	13	8	54	18	11		3	7		
New incidental	6							1																				2											1		2			
Sought, NOT found	10																								2					2				1	1	1	2	1						
NOT sought or found	47															27																7	2			2			1	5		3		
Total	1206	77	52	80	96	15	52	17	15		15	25	39	23	85	42	27	26	22	63	33	12	62	10	8	25	20	21	9	9	10	18	5	57	16	9	57	20	14	5	5	10		

Previously Marked Mounds that will be checked every 5th year.

Sites	1	2	3	4	5	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43				
Sought and found	35			1		1	2			1	3			3			1	1			3	6					1		1	4	3	3			1											
New incidental																																														
Sought, NOT found																																														
NOT sought or found	70	1	3	13	9				3				6	9						5	4	1	8				1	1		4	1				1											
Total	105	1	3	13	10		1	2		3	1	3		6	12		1	1		5	7	7	8				2	1	1	8	4	3			2											

Newly Marked Mounds that will be checked every 5th year.

Sites	1	2	3	4	5	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43				
Sought and found	7		1		1									1															1			2					1									
New incidental																																														
Sought, NOT found																																														
NOT sought or found	51	2		8	3								1	2		4				3								1	1			26														
Total	58	2	1	8	4								1	3		4				3								1	2		28					1										

Mounds that will be omitted from annual lists (erroneous records, and mounds well outside grid boundaries).

Sites	1	2	3	4	5	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43					
Sought and found	1																																														
New incidental																																															
Sought, NOT found	1																										1																				
NOT sought or found																																															
Total	2																											1																			

Grand Total	1371	80	56	101	110	15	53	19	15	3	16	28	39	30	100	42	31	27	23	63	41	19	69	18	8	25	20	24	11	10	20	22	8	86	16	11	57	21	14	5	5	10	0
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Appendix A 2. 2013/14 Details of Mounds Not found, New, or Omitted

These mounds will be included in future annual lists.

Previously known mounds that were neither sought nor found.

Site	Mound	Monitor's Notes	Co-ordinator's Comments	Ecologist's Comments and Change Log
17	2			Missing record auto created and validated, no photo exists.
17	3			Missing record auto created and validated, no photo exists.
17	4			Missing record auto created and validated, no photo exists.
17	5			Missing record auto created and validated, no photo exists.
17	6			Missing record auto created and validated, no photo exists.
17	7			Missing record auto created and validated, no photo exists.
17	8			Missing record auto created and validated, no photo exists.
17	9			Missing record auto created and validated, no photo exists.
17	12			Missing record auto created and validated, no photo exists.
17	13			Missing record auto created and validated, no photo exists.
17	14			Missing record auto created and validated, no photo exists.
17	15			Missing record auto created and validated, no photo exists.
17	18			Missing record auto created and validated, no photo exists.
17	19			Missing record auto created and validated, no photo exists.
17	20			Missing record auto created and validated, no photo exists.
17	21			Missing record auto created and validated, no photo exists.
17	23			Missing record auto created and validated, no photo exists.
17	24			Missing record auto created and validated, no photo exists.
17	25			Missing record auto created and validated, no photo exists.
17	26			Missing record auto created and validated, no photo exists.
17	29			Missing record auto created and validated, no photo exists.
17	32			Missing record auto created and validated, no photo exists.
17	33			Missing record auto created and validated, no photo exists.
17	34			Missing record auto created and validated, no photo exists.
17	35			Missing record auto created and validated, no photo exists.
17	38			Missing record auto created and validated, no photo exists.
17	40			Missing record auto created and validated, no photo exists.
34	15			Missing record auto created and validated, no photo exists.
34	20			Missing record auto created and validated, no photo exists.
34	48			Missing record auto created and validated, no photo exists.
34	50			Missing record auto created and validated, no photo exists.
34	79			Missing record auto created and validated, no photo exists.
34	96			Missing record auto created and validated, no photo exists.
34	97			Missing record auto created and validated, no photo exists.
35	10			Missing record auto created and validated, no photo exists.
35	11			Missing record auto created and validated, no photo exists.
37	13			Missing record auto created and validated, no photo exists.
37	45			Missing record auto created and validated, no photo exists.
39	1			Missing record auto created and validated, no photo exists.
40	2			Missing record auto created and validated, no photo exists.
40	3			Missing record auto created and validated, no photo exists.
40	4			Missing record auto created and validated, no photo exists.
40	5			Missing record auto created and validated, no photo exists.
40	7			Missing record auto created and validated, no photo exists.
42	2			Missing record auto created and validated, no photo exists.
42	9			Missing record auto created and validated, no photo exists.
42	10			Missing record auto created and validated, no photo exists.

Previously recorded and sought in monitoring, but not found.

Site	Mound	Monitor's Notes	Co-ordinator's Comments	Ecologist's Comments and Change Log
26	25			
26	28	not a mound; butt a pile of dirt from graded track		photo is not of v26_028 but a soil heap as comment suggests. However, v26_028 is a good mound, p3 last year, and apparently MISSED. Spoke with Alec (20/12/13) and this is all they found. He provided the loc of this soil heap (-34.78811, 142.33028) which is about 80m from 26_28 recorded for the first time last year (on mm) and only about 12m from the track so it should be clearly visible from the track.
32	16	cva recird no mound found		found April 2013 by CVA but now considered by Peter Stokie to not be a mound; nothing found in vicinity. Photo may exist from search on CT (PS). Data Collector requested this mound be omitted: OMITTED after inspecting data (no photos or history)
32	21	mine hole not a mound cva searcg identified		2013 Data Collector requested this mound be omitted: OMITTED after inspecting data, photos and history
35	12			new mound found in CVA search august 2013: maybe dodgy loc??
36	11	no mound evident - searched for 30m - had not been able to find last season	delete from monitoring list, no mound here (pjs)	jb2013 deleted as never found
37	30			
38	12	open country. near gravel exrtractii		11/12/13:" We searched for a long while for this mound and could find nothing. Please regard as a dud. Peter". thus deleted
38	21	searched 30m radias. no result		try one more time?
39	13	no evidence of mound in 50m - cva search		not found despite 50m search. Found in sept 2013 in CVA search. Try one more season then delete if still no sign.

New mounds encountered incidentally during monitoring.

Site	Mound	Monitor's Notes	Co-ordinator's Comments	Ecologist's Comments and Change Log
9	15			Not labelled in photo or record, but Location and time show this as #15. RELABELLED #15
28	21			Location way off but ID can't be 100% confirmed by comparing photo with previous years as background muddled...i think its the same
28	23			
39	3	new to database		recorded as a new mound (17), by photo this is actually #3 and not new at all.
41	4			
41	5	mound 41 05 found april 2013 with eggshell = not in existence april 2012		found april 2013 with eggshell = not in existence april 2012

These mounds have been marked for monitoring only every fifth year.

Previously known mounds that were neither sought nor found.

Site	Mound	Monitor's Notes	Co-ordinator's Comments	Ecologist's Comments and Change Log
1	2			Missing record auto created and validated, no photo exists.
1	32			Missing record auto created and validated, no photo exists.
1	67			Missing record auto created and validated, no photo exists.
2	47			Missing record auto created and validated, no photo exists.
2	52			Missing record auto created and validated, no photo exists.
2	59			Missing record auto created and validated, no photo exists.
3	3			Missing record auto created and validated, no photo exists.
3	4			Missing record auto created and validated, no photo exists.
3	5			Missing record auto created and validated, no photo exists.
3	9			Missing record auto created and validated, no photo exists.
3	17			Missing record auto created and validated, no photo exists.
3	39			Missing record auto created and validated, no photo exists.
3	43			Missing record auto created and validated, no photo exists.
3	46			Missing record auto created and validated, no photo exists.
3	50			Missing record auto created and validated, no photo exists.
3	60			Missing record auto created and validated, no photo exists.
3	70			Missing record auto created and validated, no photo exists.
3	78			Missing record auto created and validated, no photo exists.
3	80			Missing record auto created and validated, no photo exists.
3	90			Missing record auto created and validated, no photo exists.
3	95			Missing record auto created and validated, no photo exists.
3	97			Missing record auto created and validated, no photo exists.
3	98			Missing record auto created and validated, no photo exists.
3	103			Missing record auto created and validated, no photo exists.
3	105			Missing record auto created and validated, no photo exists.
3	107			Missing record auto created and validated, no photo exists.
3	130			Missing record auto created and validated, no photo exists.
4	5			Missing record auto created and validated, no photo exists.
4	16			Missing record auto created and validated, no photo exists.
4	42			Missing record auto created and validated, no photo exists.
4	48			Missing record auto created and validated, no photo exists.
4	56			Missing record auto created and validated, no photo exists.
4	68			Missing record auto created and validated, no photo exists.
4	69			Missing record auto created and validated, no photo exists.
4	75			Missing record auto created and validated, no photo exists.
4	88			Missing record auto created and validated, no photo exists.
4	95			Missing record auto created and validated, no photo exists.
4	113			Missing record auto created and validated, no photo exists.
4	119			Missing record auto created and validated, no photo exists.
10	1			Missing record auto created and validated, no photo exists.
10	2			Missing record auto created and validated, no photo exists.
10	3			Missing record auto created and validated, no photo exists.
14	5			Missing record auto created and validated, no photo exists.
14	14			Missing record auto created and validated, no photo exists.
14	15			Missing record auto created and validated, no photo exists.
14	26			Missing record auto created and validated, no photo exists.
14	30			Missing record auto created and validated, no photo exists.
14	34			Missing record auto created and validated, no photo exists.

34	28			Missing record auto created and validated, no photo exists.
34	29			Missing record auto created and validated, no photo exists.
34	30			Missing record auto created and validated, no photo exists.
34	32			Missing record auto created and validated, no photo exists.
34	33			Missing record auto created and validated, no photo exists.
34	42			Missing record auto created and validated, no photo exists.
34	52			Missing record auto created and validated, no photo exists.
34	55			Missing record auto created and validated, no photo exists.
34	59			Missing record auto created and validated, no photo exists.
34	64			Missing record auto created and validated, no photo exists.
34	66			Missing record auto created and validated, no photo exists.
34	69			Missing record auto created and validated, no photo exists.
34	73			Missing record auto created and validated, no photo exists.
34	74			Missing record auto created and validated, no photo exists.
34	77			Missing record auto created and validated, no photo exists.
34	85			Missing record auto created and validated, no photo exists.
34	87			Missing record auto created and validated, no photo exists.
34	88			Missing record auto created and validated, no photo exists.
34	89			Missing record auto created and validated, no photo exists.
34	95			Missing record auto created and validated, no photo exists.
36	-99			Missing record auto created and validated, no photo exists.

Previously recorded as 5y and sought and found

Site	Mound	Monitor's Notes	Co-ordinator's Comments	Ecologist's Comments and Change Log
2	56			Photo exists but no data so Date, Sought and Found have been set to defaults. photocard says v02 56
4	33			
4	50			
7	102	5 year mound		
8	14			Location way off but ID confirmed by comparing photo with previous years
8	17			
11	7			Location way off but ID confirmed by comparing photo with previous years
12	19			
12	21			
12	26			
15	27			Photo exists but no data so Date, Sought and Found have been set to defaults.
15	223			Photo exists but no data so Date, Sought and Found have been set to defaults.
15	227			
15	274			Photo exists but no data so Date, Sought and Found have been set to defaults.
18	17			Location way off but ID confirmed by comparing photo with previous years
19	23			
22	12	5 year		Data Collector requested this mound be placed on 5yr list: ADDED TO 5YR after inspecting data, photos and history
22	14			
22	18			
23	6			

23	8			
23	53			
23	55			
23	56			
23	65			
28	38	not a nest-recommended 5year		collector: "not a nest-recommended 5year" but was already on 5yr list
30	3	recomjend be deleted. no evidece that it is next		
31	8			
31	11			Location way off but ID confirmed by comparing photo with previous years
31	17		This is not a mound but a gold mining digging. See photo and request removing from database (Annette Robertson and Peter Stokie)	
31	18			
31	19		Listed as a 5 yr mound, but this is not a mound at all, but a mining digging -see photo - request moving from the database completely (Annette Robertson and Peter Stokie)	Location way off but ID can't be confirmed by comparing photo with previous years (too close)
32	3			
32	7			
32	14			Photo exists but no data so Date, Sought and Found have been set to defaults.
33	4			
33	5			certainly been played with Location way off but ID confirmed by comparing photo with previous years
33	8			Location way off but ID confirmed by comparing photo with previous years
34	21			looks different but i think its the same mound with photo taken from more clockwise
34	90			No location but ID confirmed by comparing photo with previous years. was a pathetic 5yr: now taken off 5yr list for 2014
36	5			
38	22	mound out of site		

These mounds will be omitted from future lists.

Previously known mounds that were neither sought nor found.

Previously recorded and sought in monitoring, but not found.

Site	Mound	Monitor's Notes	Co-ordinator's Comments	Ecologist's Comments and Change Log
28	42	line searched 4 people 100m west still not found. knowledge important for proposed burning.	Joe, I don't think this mound exists, there was a vague sandy slightly hilled patch in the original search which was called a mound, but has not been relocated in any year since the original search	omitted as requested. examination of photos for #43 in 2011 and #42 in 2012 (yes, #42 was recorded as found in 2012) shows that these are in fact the same mound. Accordingly, #42 omitted as of 2011 when first recorded

Other reasons.

Site	Mound	Monitor's Notes	Co-ordinator's Comments	Ecologist's Comments and Change Log
34	3			taken from notes not at mound; no gps or photo to validate

Appendix A 3a. 2013/14 Activity by Site (Grid)

Site	Part	Total Mounds	Active	Not Active	Not Found	Active Last Year	Change
1	A	53	1	49	3	4	↓
1	B	27	2	25		2	
2	A	55		51	3	4	↓
3	A	85	4	64	17	11	↓
4	A	56	3	43	10	13	↓
4	B	32	4	28		11	↓
5	A	15	2	13		5	↓
7	A	20	2	18		3	↓
7	B	8	1	7		1	
7	C	10		10		3	↓
8	A	18		18		6	↓
9	A	16	1	15		2	↓
11	A	16	2	13		7	↓
12	A	26		26		6	↓
13	A	39	2	37		6	↓
14	A	30	3	20	7	6	↓
15	A	40	10	29	1	17	↓
15	B	18	4	10	4	6	↓
15	C	26	8	15	3	11	↓
15	T	16	4	9	3	3	↑
16	A	42		42		4	↓
18	A	27	2	25		4	↓
19	A	23		23		5	↓
20	A	48	3	45		2	↑
20	B	15		15			
21	A	36	7	21	8	7	
22	A	17	3	10	4	1	↑
23	A	51	8	38	1	16	↓
24	A	17	2	8	7	1	↑
25	A	8	1	7		1	
26	A	26	8	17	2	5	↑
27	A	20	4	16		3	↑
28	A	24	7	15	2	6	↑
29	A	10		8	2		
29	T	1		1			
30	A	10	1	9		3	↓
31	A	21		11	5		
32	A	15	1	11	1	1	
32	T	7		5	2		
33	A	8		8		1	↓
34	A	86	11	41	33	12	↓
35	A	13	1	9	3		↑
35	B	3	2	1			↑
36	A	5		4			
36	B	5	1	3	1	1	
37	A	58	1	54	3	1	
38	A	21	3	14	2	1	↑
39	A	14	1	11	2		↑
40	A	5			5		
41	A	8	2	6		1	↑
42	A	10		7	3	1	↓
Totals		1294	122	985	171	205	↓

Appendix A 3b. 2013/14 Activity Out Of Site Boundaries

Site	Part	Total	Active	Not Active	Not Found	Active Last Year	Change
2	O	1	0	1	0	0	
3	O	17	1	12	4	1	
4	O	23	0	21	2	6	↓
7	O	16	2	14	0	2	
8	O	1	0	1	0	0	
12	O	2	1	1	0	1	
21	O	5	0	5	0	1	↓
22	O	2	0	2	0	0	
23	O	18	3	13	0	3	
24	O	1	0	0	1	0	
36	O	1	0	0	1	0	
Totals		87	7	70	8	14	↓

Appendix A 4. 2013/14 Nests Needing Tags or Stakes

Site			Mound	Note
v01 needs	0	stakes,	1	v01_082 Needs Tag
v04 needs	1	stakes,	1	v04_120 Needs Stake & Tag
v12 needs	1	stakes,	1	v12_028 Needs Stake & Tag
v13 needs	1	stakes,	1	v13_040 Needs Stake & Tag
v15 needs	0	stakes,	1	v15_246 Needs Tag
v18 needs	0	stakes,	1	v18_025 Needs Tag
v20 needs	1	stakes,	0	v20_044 Needs Stake
v22 needs	1	stakes,	1	v22_020 Needs Stake & Tag
v23 needs	2	stakes,	2	v23_071 Needs Stake & Tag
				v23_072 Needs Stake & Tag
v26 needs	1	stakes,	2	v26_024 Needs Stake & Tag
				v26_028 Needs Tag
v31 needs	1	stakes,	1	v31_017 Needs Stake & Tag
v32 needs	1	stakes,	1	v32_003 Needs Stake & Tag
v36 needs	0	stakes,	1	v36_010 Needs Tag
v37 needs	4	stakes,	4	v37_007 Needs Stake & Tag
				v37_012 Needs Stake & Tag
				v37_014 Needs Stake & Tag
				v37_039 Needs Stake & Tag
v38 needs	1	stakes,	1	v38_022 Needs Stake & Tag
v39 needs	0	stakes,	3	v39_004 Needs Tag
				v39_005 Needs Tag
				v39_007 Needs Tag
v42 needs	0	stakes,	2	v42_001 Needs Tag
				v42_003 Needs Tag

Appendix A 6. 2013/14 Frequencies of Animal Scats at Mounds

Site	Average Date	Mounds	Malleefowl	Fox	Kangaroo	Rabbit	Goat	Sheep	Emu	Echidna	Human	Dog	Cat
1	29/03/2013	77	5%	25%	21%	1%	1%		1%				
2	20/11/2013	53	6%	13%	38%								
3	15/12/2013	81	9%	47%	38%	1%						1%	
4	30/10/2013	99	24%	68%	21%	2%			2%				
5	19/11/2013	15	67%	87%	87%	7%			7%				
7	24/02/2011	54	24%	48%	6%								
8	7/12/2013	19	5%	42%	79%		26%						
9	8/12/2013	16		38%	63%	6%	50%						
11	15/10/2013	16	19%	81%	13%								
12	2/11/2013	28	7%	64%									
13	21/10/2013	39	15%	56%	8%								
14	30/10/2013	23	26%	30%	4%					4%			
15	15/11/2013	89	37%	26%	12%								
16	14/12/2013	42	55%	60%	71%		2%						
18	29/11/2013	27	33%	19%	15%		15%						
19	17/10/2013	23	22%	48%	43%		4%						
20	10/12/2013	63	13%	51%	49%	11%			2%			2%	
21	6/12/2013	33	67%	61%	61%				3%				
22	12/02/2013	15	27%	27%	27%								
23	5/01/2014	68	38%	74%	72%	1%	1%		1%				
24	1/04/2007	10	20%	10%	30%								
25	1/04/2007	8			63%								
26	20/11/2013	24	63%	67%	25%								
27	30/11/2013	20	25%	45%	80%								
28	3/11/2013	22	9%	32%	41%				9%				
29	28/10/2013	9		22%	89%								
30	26/10/2013	10	40%	40%	70%		20%		20%				
31	29/10/2013	16		31%	63%								
32	27/11/2013	19	11%	21%	68%	5%							
33	2/11/2013	8	25%	38%	38%	13%							
34	27/09/2013	53	17%	53%								2%	
35	25/01/2014	13	38%	31%	69%				8%				
36	26/02/2014	9			56%								
37	21/11/2013	55	2%	9%	45%		7%					2%	
38	29/11/2013	19	5%	32%	21%							5%	
39	25/02/2014	12	8%	58%	83%								
41	4/02/2014	8	63%	13%	50%	50%							
42	30/11/2013	7		14%	71%	29%							
Totals	30/11/2013	1202	22%	43%	36%	2%	2%		1%	0%		0%	

Appendix A 7. 2012/13 Frequencies of Animal Prints at Mounds

Site	Average Date	Mounds	Malleefowl	Fox	Kangaroo	Rabbit	Goat	Sheep	Emu	Echidna	Human	Dog	Cat
1	29/03/2013	77	6%	10%	39%				1%				
2	20/11/2013	53	11%	11%	55%				2%				
3	15/12/2013	81	27%	20%	36%				6%			1%	
4	30/10/2013	99	37%	35%	29%				5%	2%			
5	19/11/2013	15	73%	60%	33%				20%				
7	24/02/2011	54	61%	17%	17%		6%			2%			
8	7/12/2013	19	16%	47%	58%		5%		16%				
9	8/12/2013	16	44%		19%		44%						
11	15/10/2013	16	25%	38%	6%								
12	2/11/2013	28	39%	54%	7%	4%	21%			4%			
13	21/10/2013	39	23%	28%	38%		10%			3%			
14	30/10/2013	23	57%	48%	26%					13%			
15	15/11/2013	89	66%	44%	29%				1%	4%			
16	14/12/2013	42	21%	24%	10%		2%						
18	29/11/2013	27	26%	4%	7%		11%						
19	17/10/2013	23	4%		4%		26%						
20	10/12/2013	63	14%	5%	29%	2%			3%			2%	
21	6/12/2013	33	24%	9%	15%				3%				
22	12/02/2013	15	40%	13%	20%								7%
23	5/01/2014	68	75%	21%	34%	1%			9%				
24	1/04/2007	10	30%	10%	20%								
25	1/04/2007	8			50%								
26	20/11/2013	24	75%	58%	38%		4%						
27	30/11/2013	20	30%	5%	45%							5%	5%
28	3/11/2013	22	41%	5%	23%				9%	9%			
29	28/10/2013	9			11%								
30	26/10/2013	10	40%	30%	30%		20%		10%				
31	29/10/2013	16			13%								
32	27/11/2013	19	5%		26%								
33	2/11/2013	8											
34	27/09/2013	53	77%	30%	21%				9%				2%
35	25/01/2014	13	15%	8%	23%					8%			
36	26/02/2014	9	11%	11%	56%								
37	21/11/2013	55	2%	11%	53%				11%				
38	29/11/2013	19	11%	16%	16%								
39	25/02/2014	12		8%	42%	8%							
41	4/02/2014	8	25%										
42	30/11/2013	7			29%								
Totals	30/11/2013	1202	33%	21%	29%	0%	3%		3%	1%		0%	0%

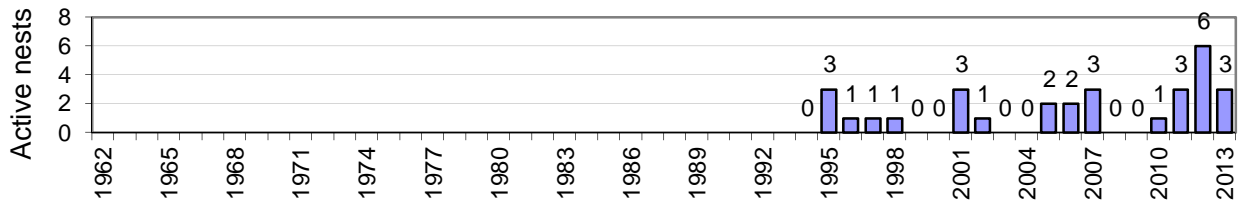
Appendix A 8. 2012/13 Lerp on Malleefowl Mounds

Site	Average Date	Mounds	None	Some	Lots	Any %	Some %	Lots %
1	11/12/2013	77	76	1		1%	1%	
2	20/11/2013	53	50	2		4%	4%	
3	15/12/2013	81	81					
4	30/10/2013	99	98	1		1%	1%	
5	19/11/2013	15	15					
7	31/10/2013	54	52	1		2%	2%	
8	7/12/2013	19	19					
9	8/12/2013	16	16					
11	15/10/2013	16	15					
12	2/11/2013	28	28					
13	21/10/2013	39	39					
14	30/10/2013	23	23					
15	15/11/2013	89	84					
16	14/12/2013	42	42					
18	29/11/2013	27	26	1		4%	4%	
19	17/10/2013	23	23					
20	10/12/2013	63	62		1	2%		2%
21	6/12/2013	33	33					
22	7/01/2014	15	15					
23	5/01/2014	68	61	1		1%	1%	
24	8/11/2013	10	10					
25	2/11/2013	8	8					
26	20/11/2013	24	24					
27	30/11/2013	20	20					
28	3/11/2013	22	22					
29	28/10/2013	9	9					
30	26/10/2013	10	10					
31	29/10/2013	16	11					
32	27/11/2013	19	16					
33	2/11/2013	8	8					
34	26/11/2013	53	52					
35	25/01/2014	13	12	1		8%	8%	
36	26/02/2014	9	8					
37	21/11/2013	55	53					
38	29/11/2013	19	17					
39	25/02/2014	12	12					
41	4/02/2014	8	8					
42	30/11/2013	7	7					
Totals	29/11/2013	1202	1165	8	1	1%	1%	0%

Appendix B Site Trends

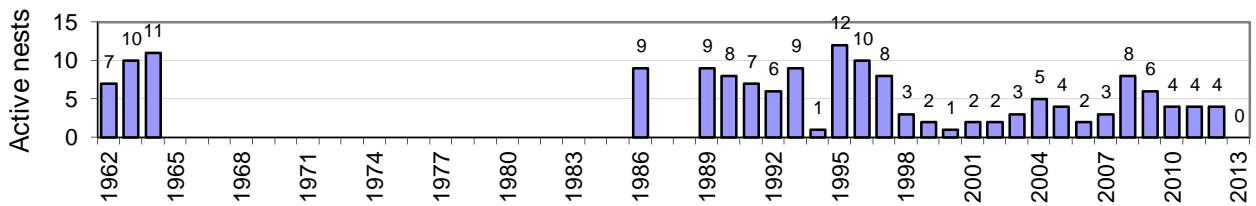
01 Dattuck

Eastern Big Desert



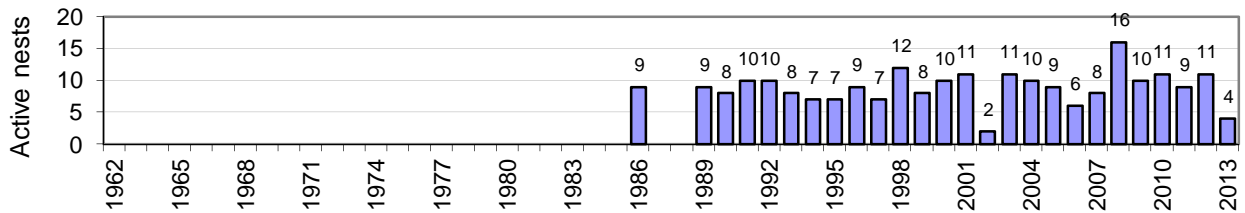
02 Torpey's

Eastern Big Desert



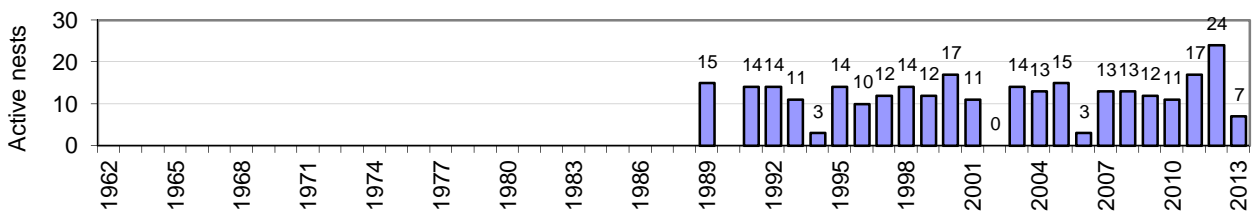
03 Wathe SW

Eastern Big Desert



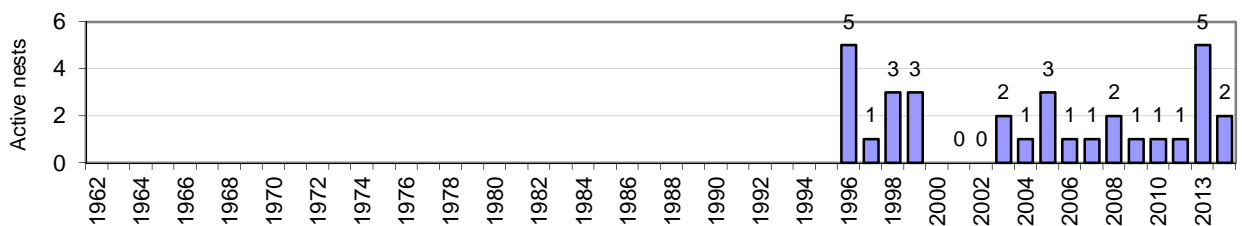
04 Bronzewing

Eastern Big Desert



05 Coligan

North West

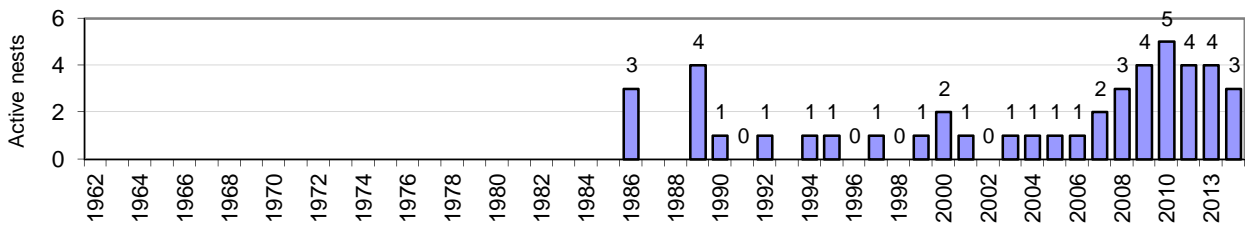


Season

07 Annuello

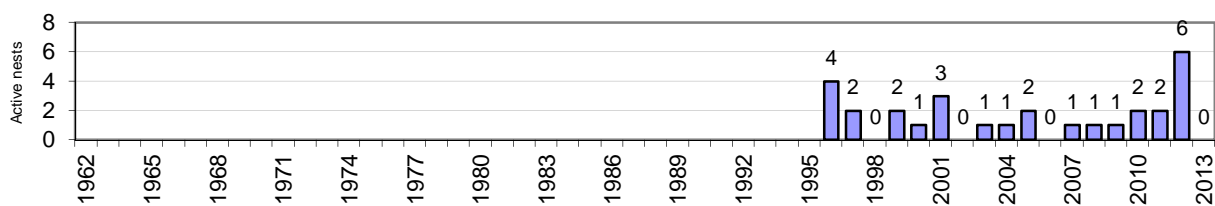
Note: active mounds in 07 part C not shown

North East



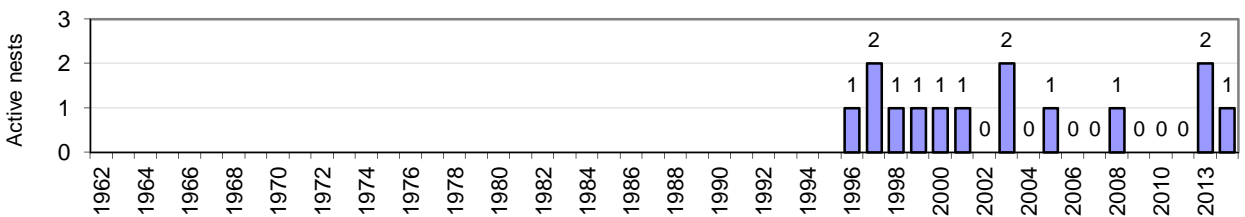
08 Powerline

North West



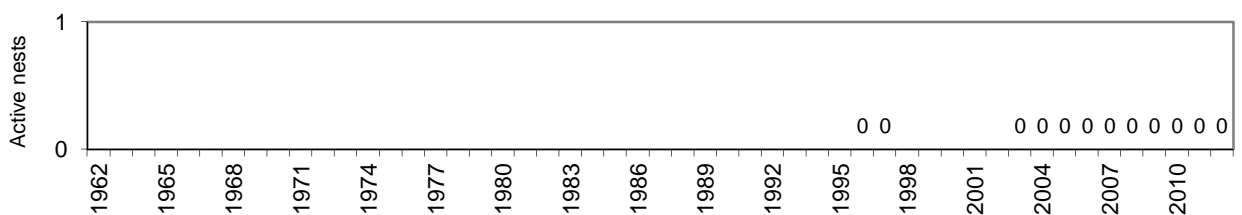
09 Mt Hattah

North West



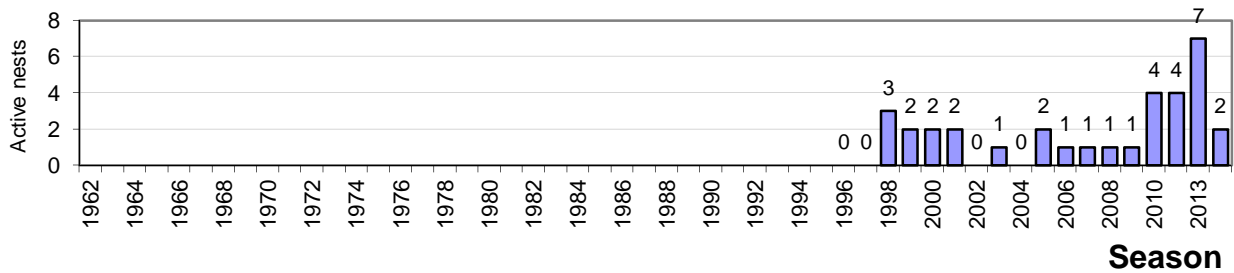
10 1 Tree BNT

North West



11 Mopoke

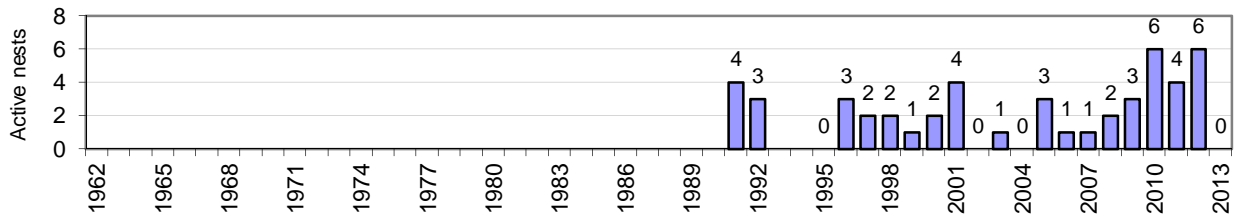
North West



Season

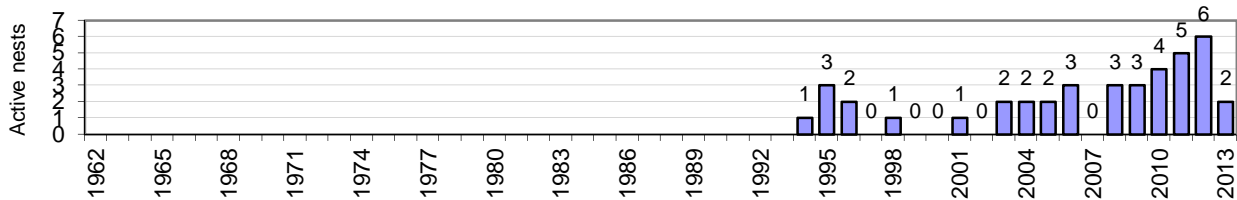
12 Pheeneys

North West



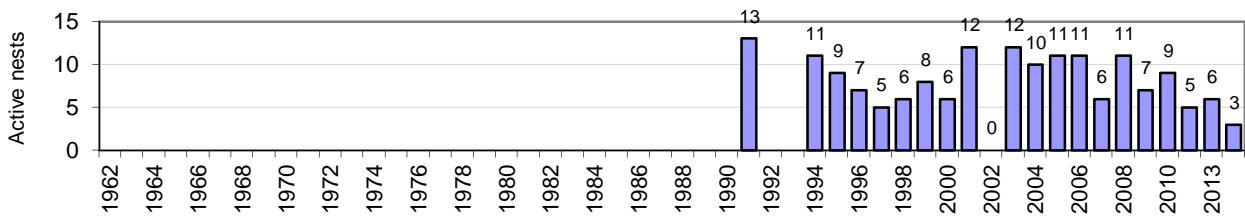
13 Bambill

North West



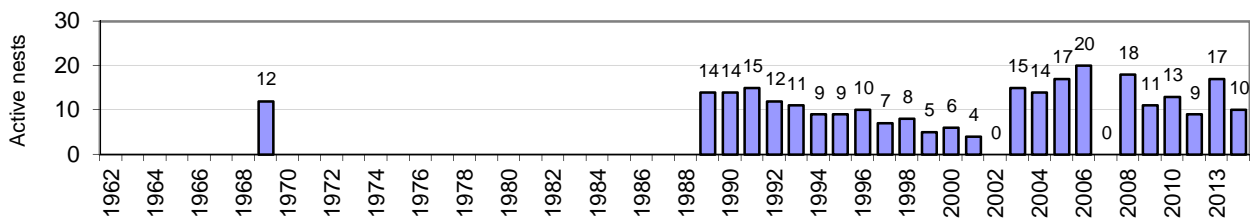
14 Menzies

North East



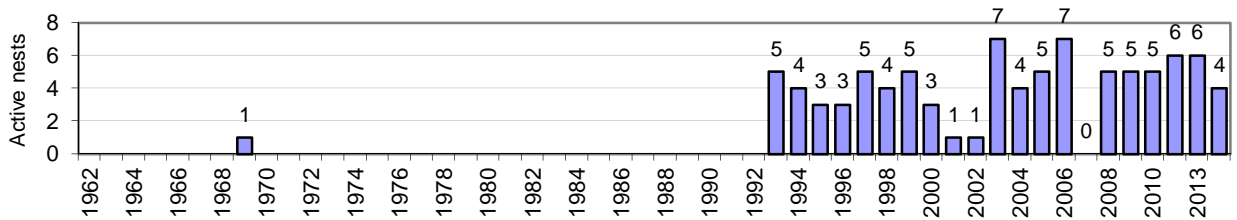
15 Wandown Part A

North East



15 Wandown Part B

North East

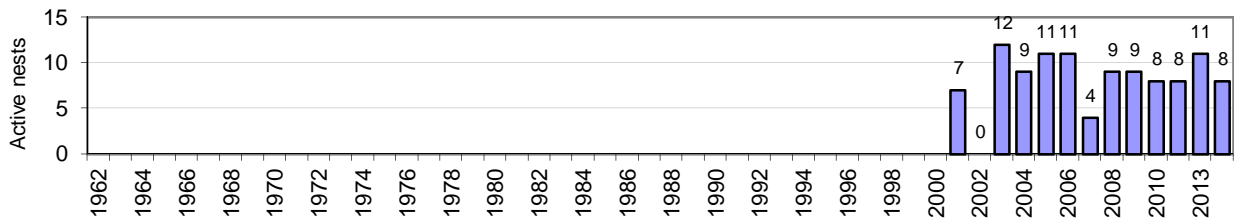


Season

15 Wandown Part C

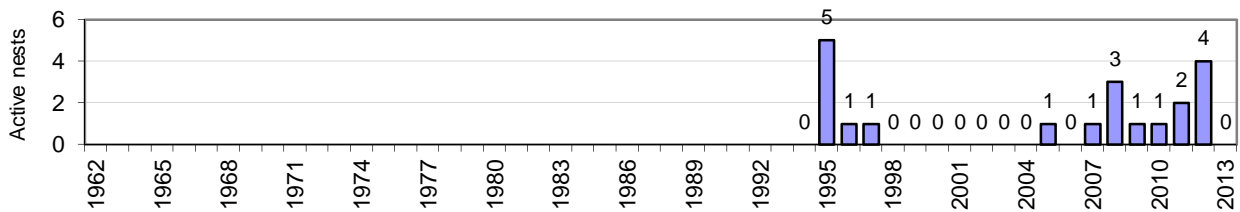
Note: active mounds in 15 part D not shown

North East



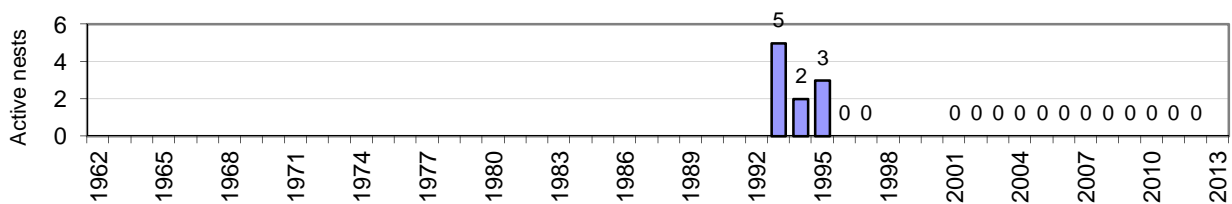
16 South Bore

North West



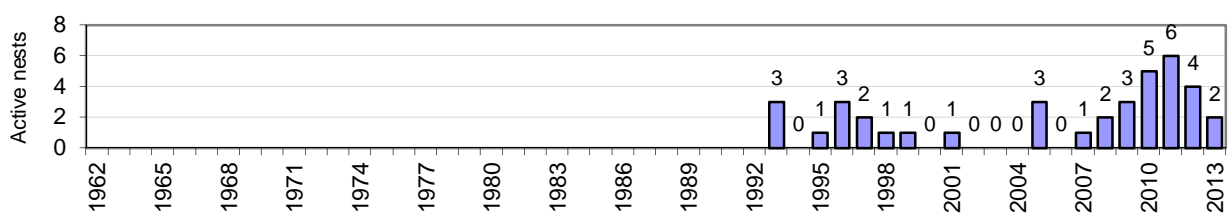
17 One Tree Plain

North West



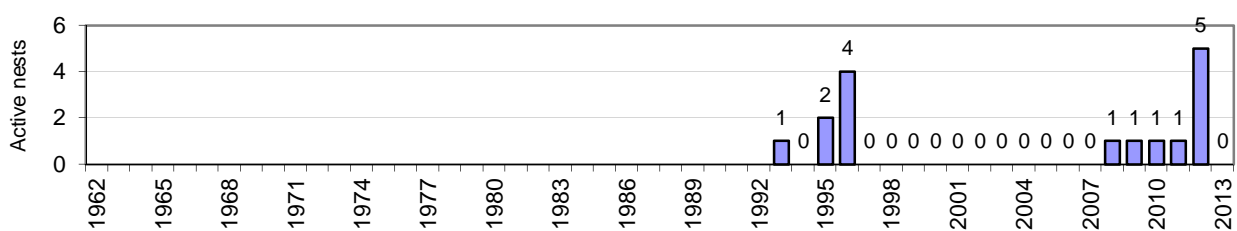
18 Washing Machine

North West



19 Cowangie/Underbool

North West

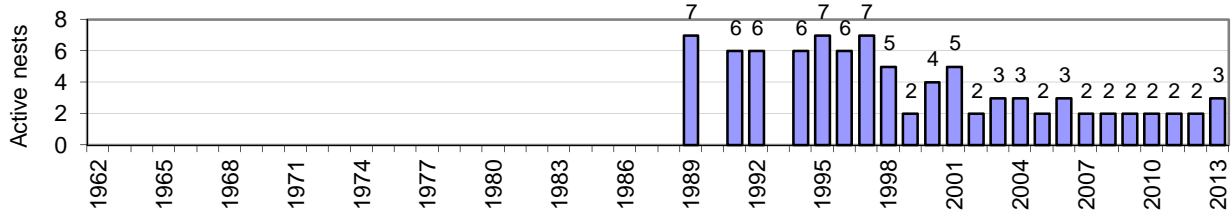


Season

Appendix B Site Trends

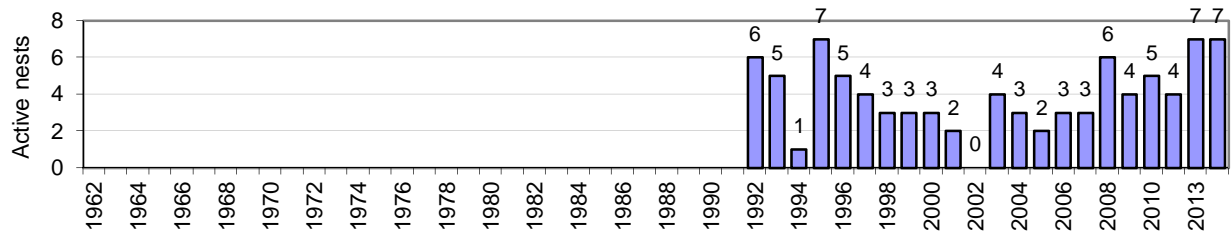
20 Lowan

Eastern Big Desert



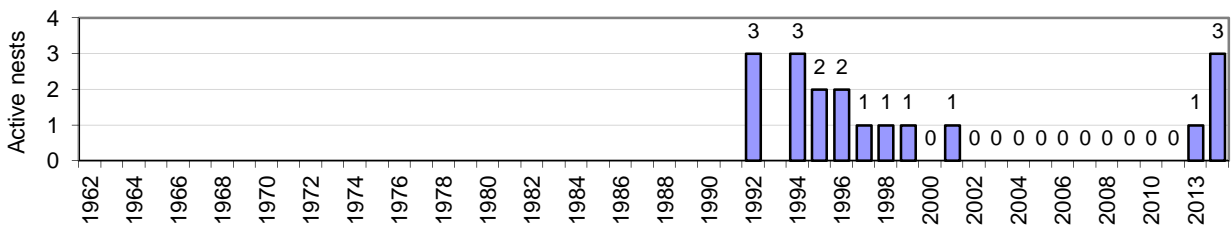
21 Dumosa

North West



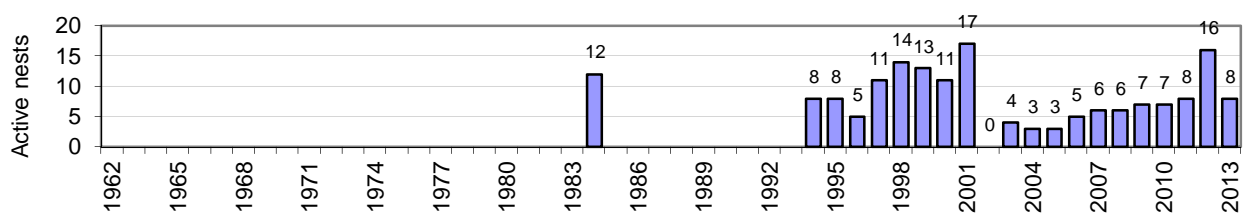
22 Denning

North West



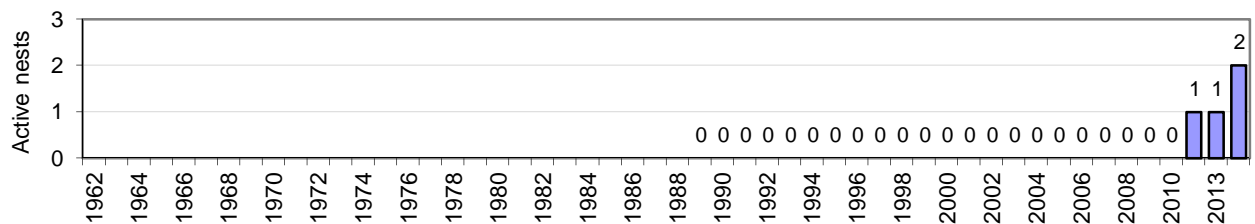
23 Moonah

Eastern Big Desert



24 Kiata

North East

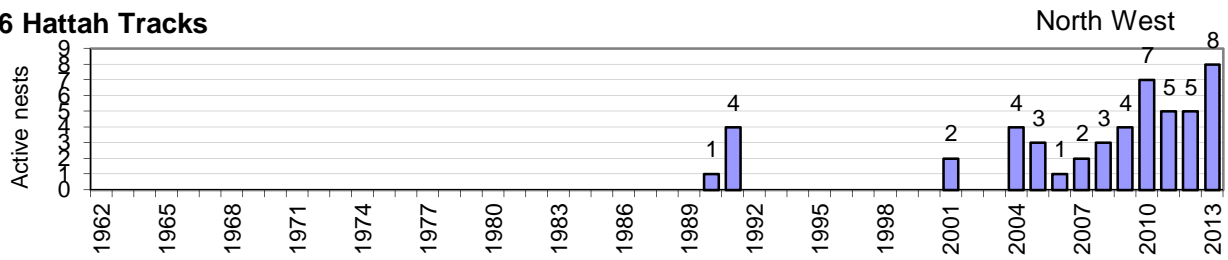


v25 does not exist

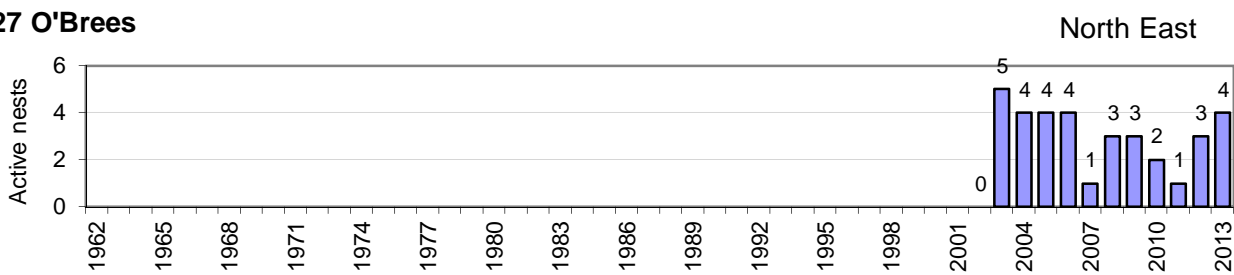
Season

Appendix B Site Trends

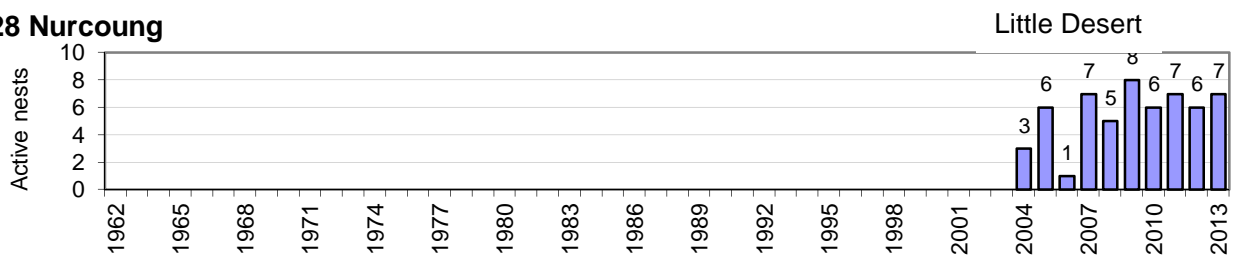
26 Hattah Tracks



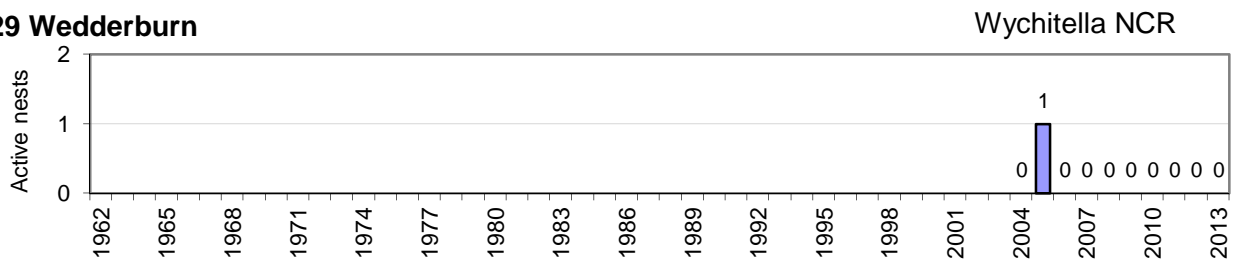
27 O'Brees



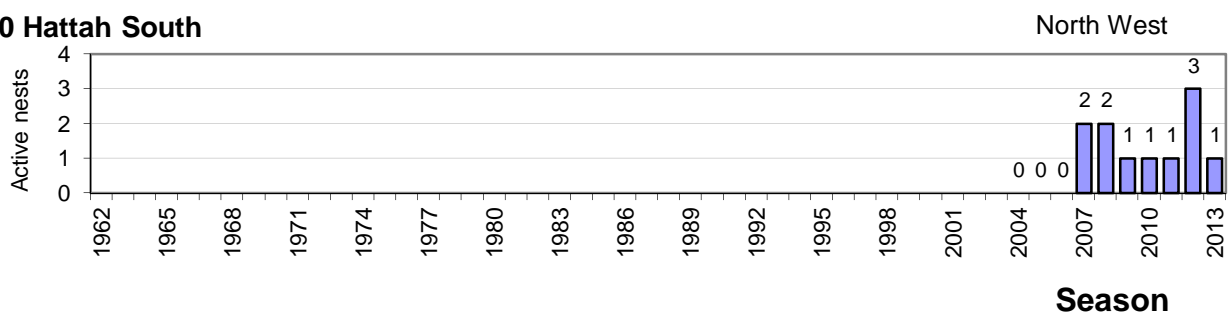
28 Nurcoung



29 Wedderburn

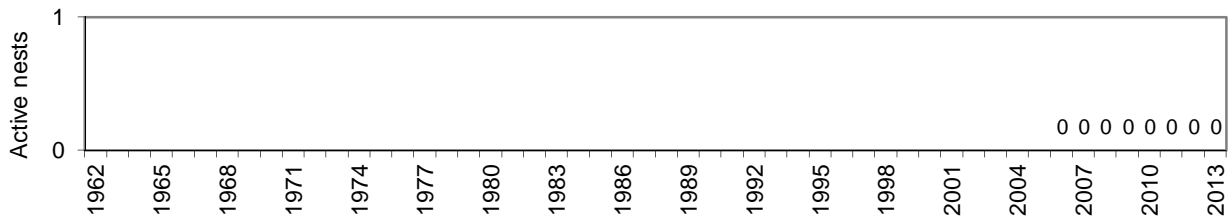


30 Hattah South



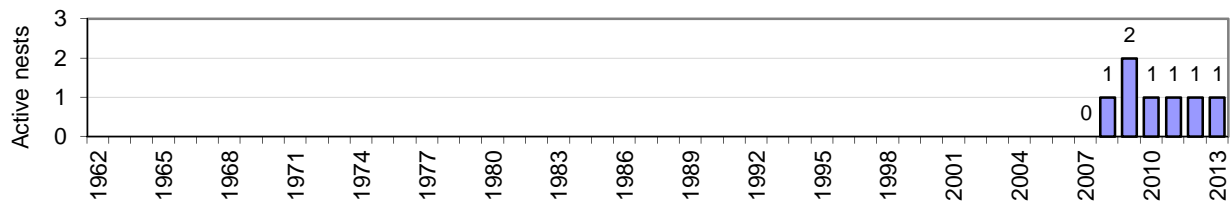
31 Skinners Flat

Wychitella NCR



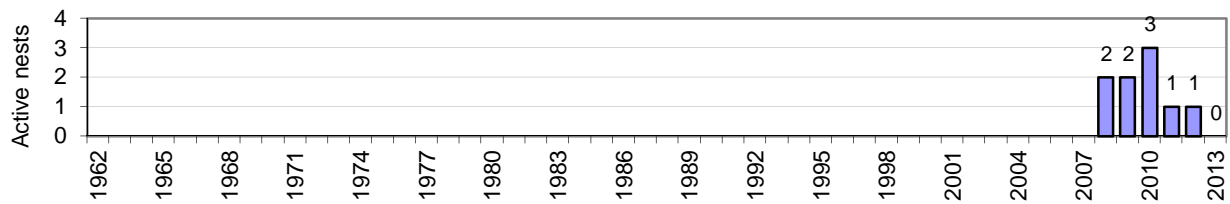
32 Wychitella

Wychitella NCR



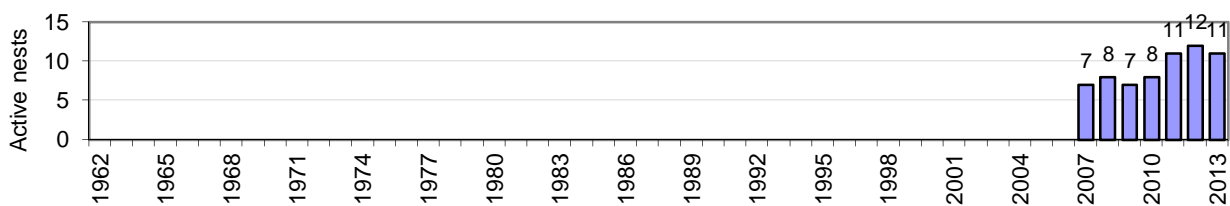
33 Korong Vale

Wychitella NCR



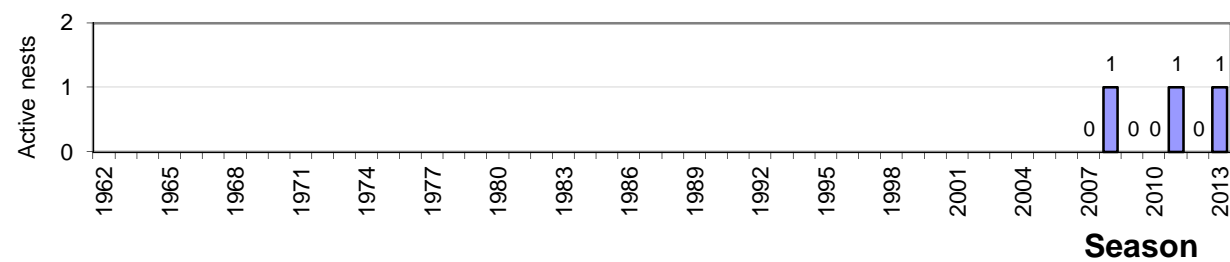
34 Paradise

Eastern Big Desert



35 Broken Bucket

Western Big Desert



Season

36 Boughtons WH

Little Desert

