Malleefowl Monitoring in Victoria: 2014/15

Report to the Victorian Malleefowl Recovery Group

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Contents

Appendices

Note: The appendices that are usually printed with this report are available for member download from the national Malleefowl monitoring database.

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 1306 Malleefowl mounds during the 2014 (2014/15) breeding season (all 'sought and found', plus all 'new' mounds), including 6 newly listed mounds.

A total of 23 regular mounds appear to have been neither sought nor found during the 2014 season and these were scattered through 12 sites. Most (8) of these were at v38 (Tooan) and data may still be forthcoming as the mounds were apparently visited although the data has gone missing. There were also 7 regular mounds that were searched for but could not be found.

Overall, we managed to find 97.5% of the mounds that we set out to monitor (excluding newly added mounds).

Table 1. Effectiveness of the monitoring effort

	Total	*Regular*	*5yrold*	*5yrnew*	*Omitted*
Sought and found	**1288**	1158	107	22	1
New incidental	**18**	18	0	0	0
Sought, NOT found	**7**	7	0	0	0
NOT sought or found	**87**	23	52	12	0
Total	**1400**	**1206**	**159**	**34**	**1**

Last season 34 mounds were monitored as regular mounds and were 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 193, or about 14% of our monitoring target.

Optional mounds were also well represented in the mound visits considering there was no obligation to inspect them this year. Monitors inspected about two-thirds of the optional mounds this season (129 of 193), 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: how did the birds do?

Of the 1306 mounds that were monitored in Victoria in 2014/15, 147 were active compared with only 129 last season and 218 in 2012/13 (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 (Figure 2) and it is clear that at these sites, mostly in the eastern Big Desert region, breeding numbers were well down. One of our key sites, Bronzewing v04, which usually has

12-15 active mounds, was thoroughly burnt in January 2014 and consequently there was little breeding there this season (although, surprisingly, 3 mounds were active in 2014/15!). However, the low breeding numbers in the oldest set of monitored sites wasn't simply due to v04 being burnt as when data from this site are excluded the poor breeding numbers at other sites are apparent (Figure 2). In fact, breeding numbers for this set of 6 sites in 2014/15 was one of the lowest recorded over the past 27 years excluding drought years.

Figure 3 shows the trend for a larger set of 23 sites scattered over a much greater geographical area, albeit for a shorter period (sites monitored since 1996), and Figure 4 shows the same data broken down into regions. Breeding numbers have improved since last season in the North and North East, but have actually declined further since last season in the Eastern Big Desert.

Elsewhere, in the six main sites in and around the Little Desert (v24, v25, v28, v36, v38 and v39) breeding numbers were on par with previous years even though at Nurcong numbers were down to only four active mounds (usually 6-7). At the four Wychitella sites the was no breeding recorded in 2014 which is down from one last season, two active mounds in the 2011 and 2012, and 4 active mounds in 2009 and 2010.

Although we have only been monitoring the Mali Dunes (v41) for 3 years, the results there have been stunning and deserve special mention. This site is located on Bernie and Sue's property south of the Big Desert and since they have been monitoring (and land-managing) there, breeding numbers have increased substantially: in 2013 there was 1 active out of 3 known mounds, in 2013 there was 2 active out of 8, and in 2014 there was 7 out of 11 known mounds!

- *Comparing 2014 results with previous seasons using ALL the data*

Another way of representing how the results of the current year measures up against previous monitoring efforts is to compare the 2014 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 2014 season across Victoria are shown in the chart to be higher than last year but lower than most seasons since the breaking of the drought in 2008. 2014 breeding numbers were much lower than those recorded in the early year of monitoring before 1995 when most sites were in the eastern Big Desert, and this reflects both the loss of Bronzewing and the general downturn in breeding numbers in this region as outlined above and shown in Figure 4.

- *Reasons for the low breeding numbers in the 2014 season*

Once again, winter rains were lower than usual and this most likely led to the lower than hoped for breeding numbers. There was above average rainfall early in the season, but conditions became relatively dry when Malleefowl needed it the most. For instance, rainfall during the critical June to August period was down by 38% at Mildura, by a whopping 64% at Ouyen and 30% at Horsham. It seems likely that the poor Malleefowl breeding results for Malleefowl in the Eastern Big Desert in particular may be a reflection of the rainfall pattern recorded at Ouyen and

presumably typical of the middle mallee region. Further north at Mildura, reasonable rainfall was at least recorded in August, whereas further south at Horsham both June and July provided reasonable rains. There were much higher than usual rains recorded at Ouyen in September (mostly in the last week or so), but by then many birds would have been deterred from breeding.

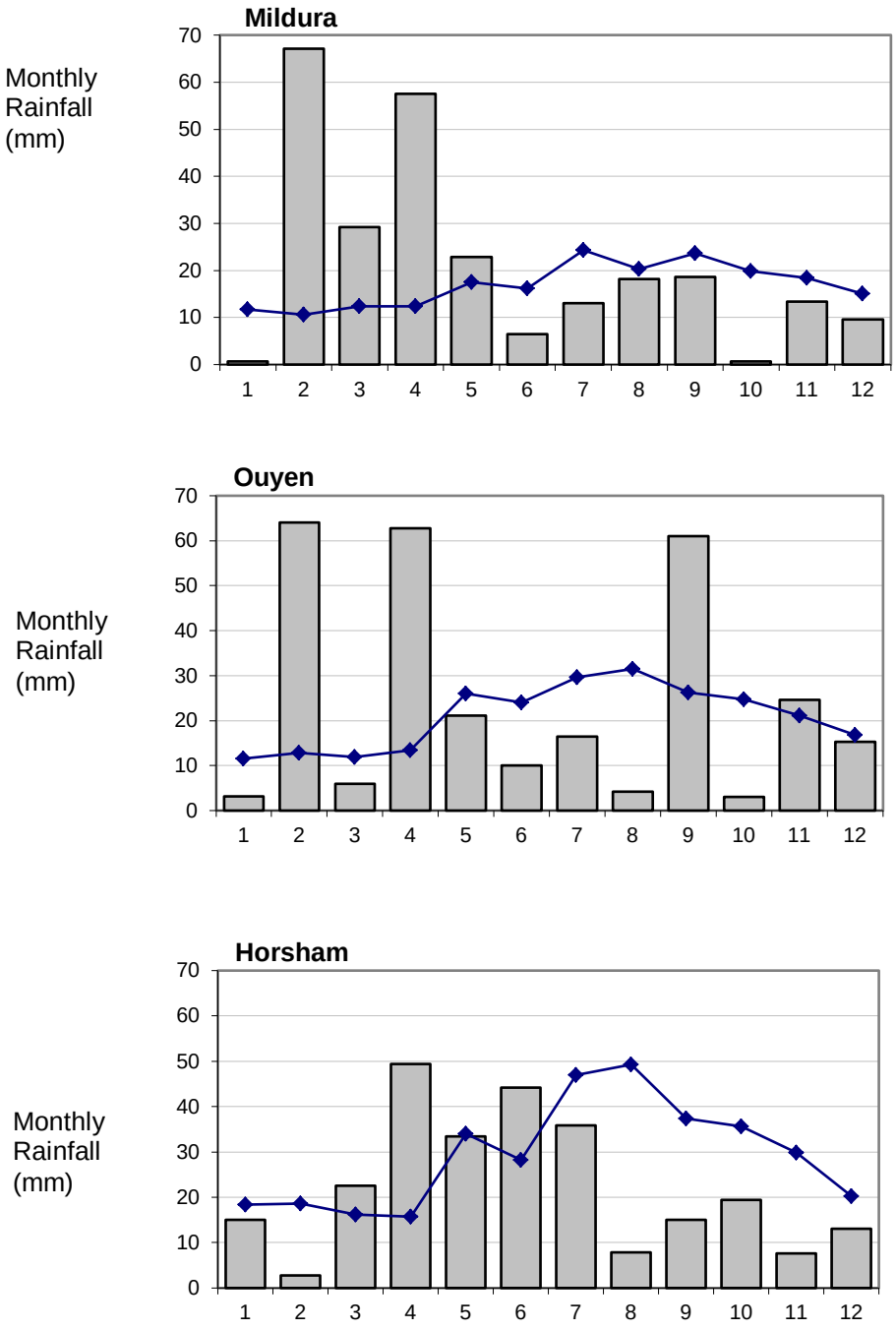

Figure 1. Rainfall at Mildura, Ouyen and Horsham in 2014(bars) and median rainfall since early 1900s (line). (Data from the Bureau of Meteorology website).

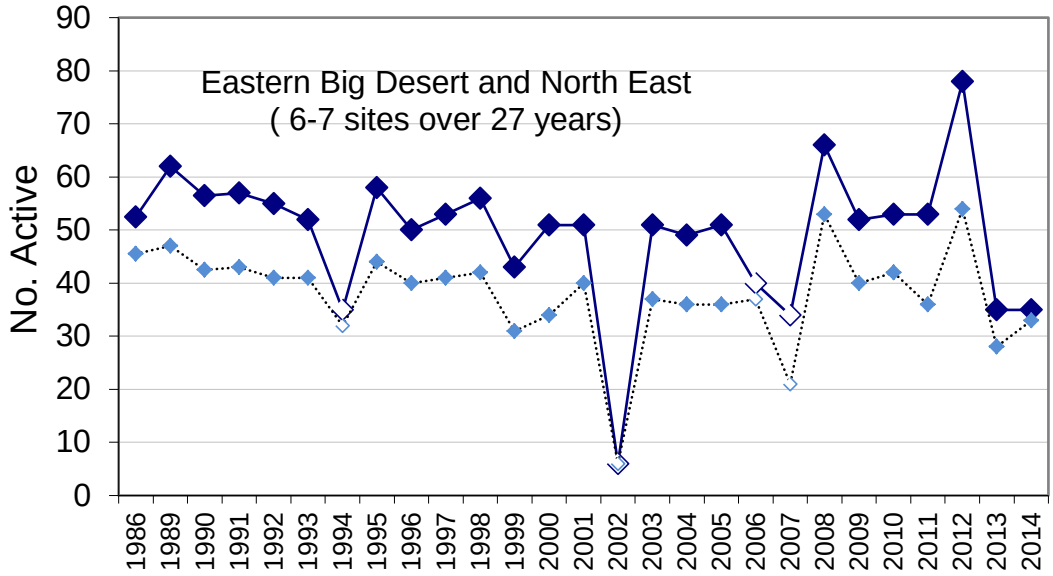

Figure 2. Trends in Malleefowl breeding numbers at 7 of the longest monitored sites over the past 27 years (upper graph), and at 6 of these sites excluding v04 (lower graph). 1994, 2002, 2006 and 2007 were major drought years (white points). Data comprise mounds in set areas across years in sites 01, 02, 03, 04, 07, 20 and 23.

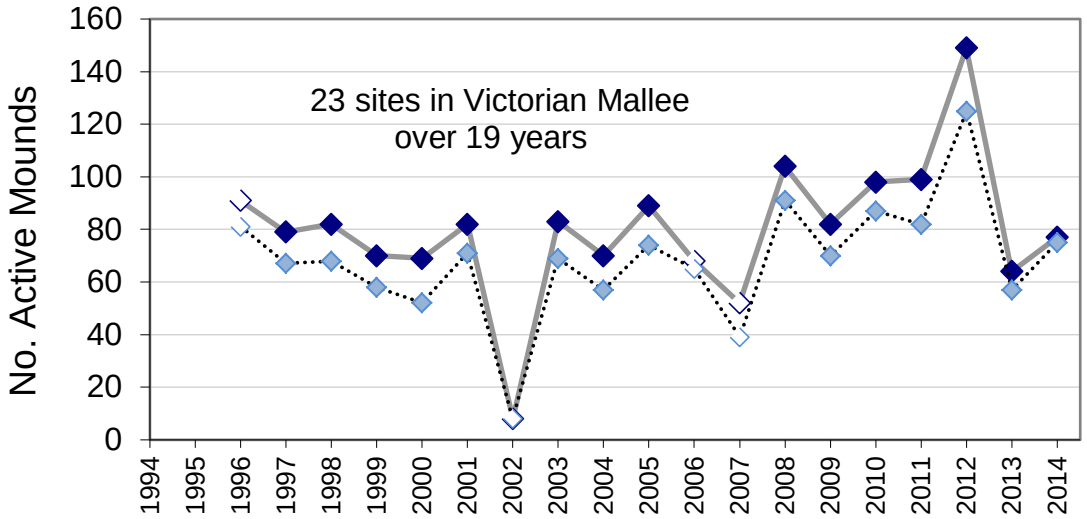

Figure 3. Trends in Malleefowl breeding numbers at 23 sites over the past 19 years (upper graph), and at 22 of these sites excluding v04 (lower graph). 1994, 2002, 2006 and 2007 were major drought years (white points). Data excludes mounds outside site boundaries. See figure 4 for regional breakdown.

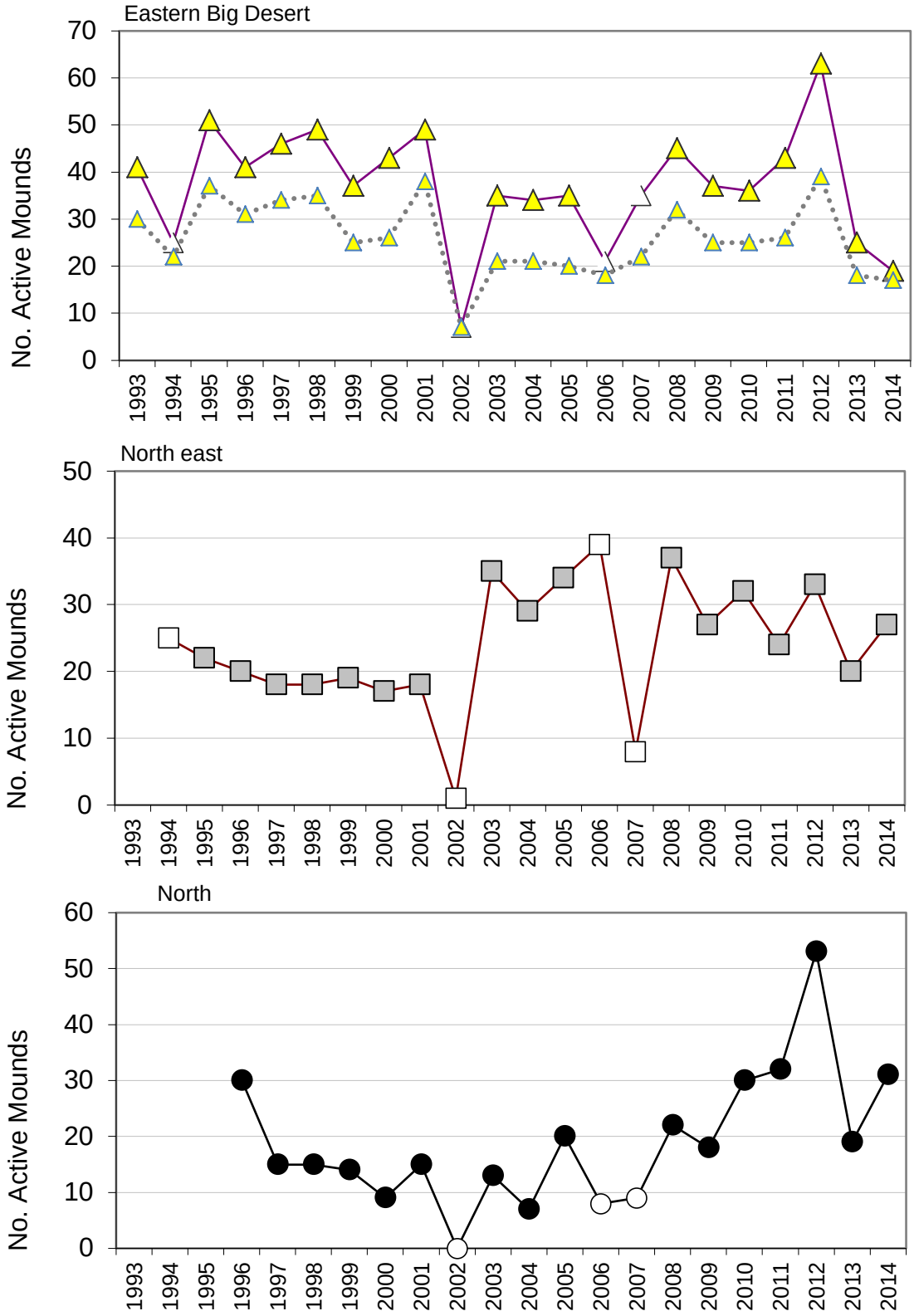

Figure 4. Trends in Malleefowl breeding numbers at 22 sites over the past 19-22 years shown by region. Eastern Big Desert (triangles) comprise 6 sites over 21 years (upper graph), and 5 sites excluding v04 (lower graph), North East comprise 4 sites over 21 years (shaded squares), and North West comprises 12 sites over 19 years (solid circles). 1994, 2002, 2006 and 2007 were major drought years in many areas. Data excludes mounds outside site boundaries.

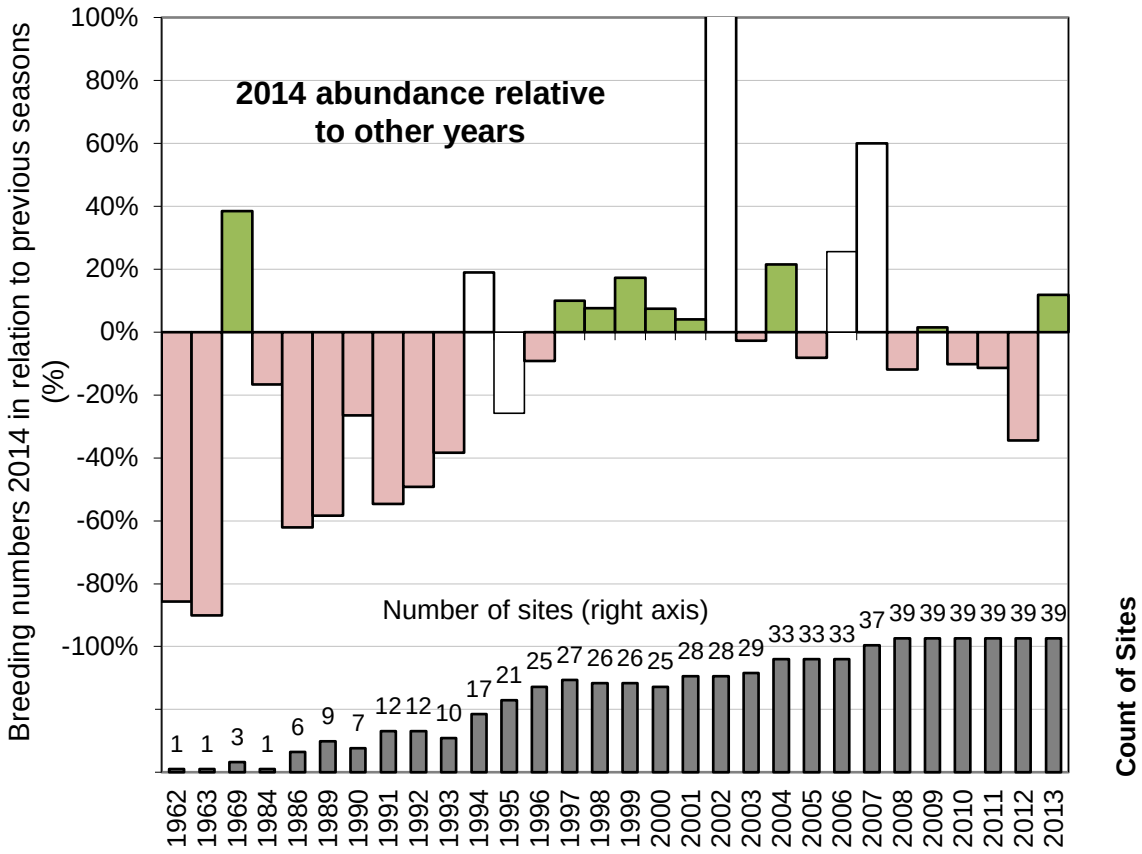

Figure 5. Breeding numbers of Malleefowl in the 2014 season compared with all previous seasons (upper chart) and the number of sites involved (lower chart). The zero line in the chart indicates no difference, whereas values above zero indicate that breeding numbers in the current season were above those 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 2014 breeding number was more than 1,000% that recorded in 2002.

For example, breeding numbers in 2014 were about 35% below those in 2012 but nearly 40% 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 39 sites and is thus very reliable, whereas the comparisons with 1969 is based on only a 3 sites and probably does not reliably reflect general trends.

Individual Site trends

Rather than print out the 40 odd histograms showing site trends, these will be available for download from the NMMD (National Malleefowl Monitoring database) along with all the usual database reports that comprise the appendices of previous monitoring reports.

3. Changes to data recorded in the field

There were no major changes to the Cybertracker sequence this season. Most people used the LG smartphones and few problems were reported.

4. Lerp

This was the 9th season that we recorded the occurrence of lerp on Malleefowl mounds and the results showed that lerp was abundant in the northern mallee during the time we were monitoring and the birds were breeding. Lerp are sweet and nutritious shelters that are built by psillid sap-sucking insects and are occasionally super-abundant; when they fall from the mallee leaves they provide a valuable energy source for adult and especially young Malleefowl. While the season may have been marred by low rainfall during the winter, chicks that did emerge from mounds this season would have benefitted from an abundance of lerp in some areas.

Figure 6 shows the proportion of mounds on which lerp were detected in each season since we started collecting these data; lerp abundance was clearly exceptionally high in current season with 24% of mounds showing at least some lerp, and 7% showing 'lots' of lerp (more than 10 lerp).

Figure 7 provides a regional breakdown of lerp occurrence on mounds and shows that the outbreak was mostly in the northern areas where lerp were recorded on 40-60% of mounds, whereas very few lerp occurred on mounds at sites in or around the Big Desert, Little Desert or Wychitella areas.

These data were collected by volunteers between October and January. One of us (JB) had the opportunity to visit Wandown and Menzies (NorthEast) in late April and was surprised to find that lerp was still very abundant at those sites at that time.

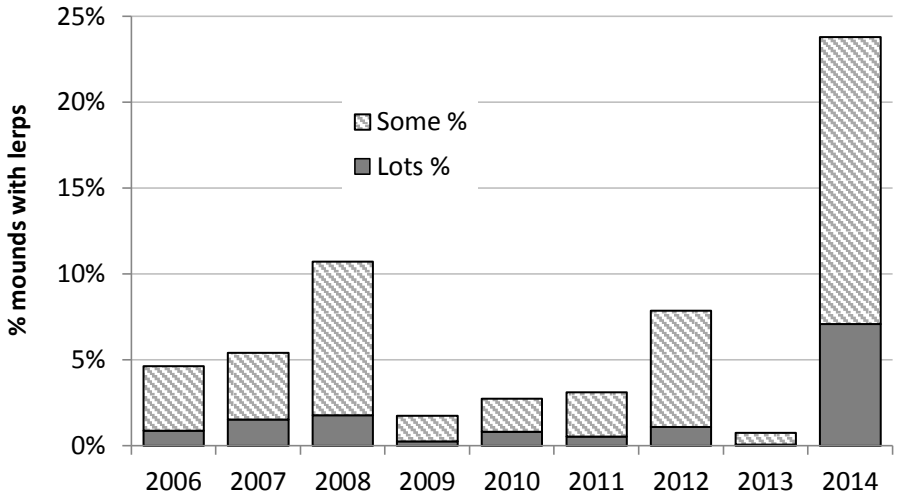

Figure 6. Proportion of mounds on which lerp were detected in each season since 2006.

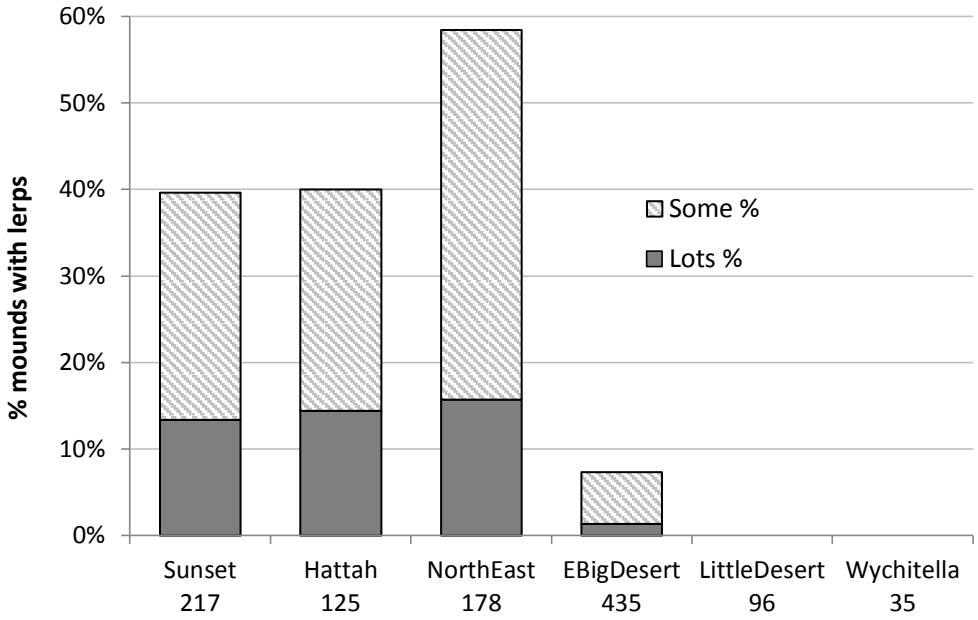

Figure 7. Regional breakdown of lerp occurrence on mounds in the 2014 season.

5. Fox scats

Fox scats were collected at 442 mounds in 2014 and weighed a total of 7.1 kg, a result that is lower than last season (Table 2). Figure 8 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 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. There is also an 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. However, this season's result suggests that the trend may have peaked. Nonetheless, the rise in fox numbers is of concern and we will be watching carefully, thanks to the collective efforts of lots of volunteers.

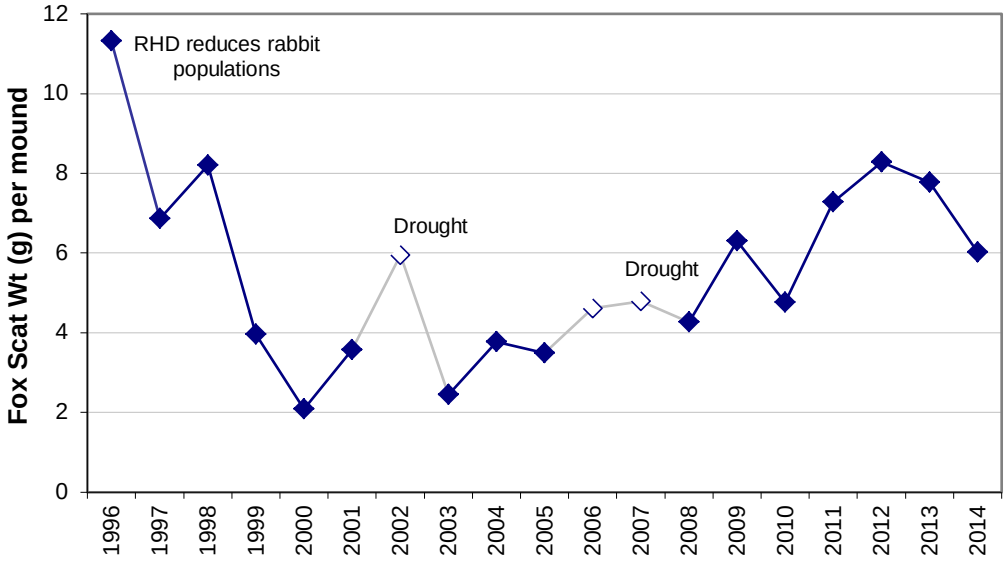

Figure 8. Trends in the average fox scat weight per mound at 20 sites over 19 years. No attempt has been made to control for biases due to variations in the proportion of active mounds (more likely to be marked with fox scats) or changes in the proportion of very old and inconspicuous mounds

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 <u>for a full minute</u> 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 2014 and the previous year (italics). Malleefowl scats and feathers were also collected in 2014 but numbers have not been tabulated.

		Fox Scats			
Grid	Name	2014 Wt (g)	2014 Count	*2013 Wt (g)*	*2013 Count*
v01	Dattuck	691	27	*240*	*18*
v02	Torpeys	134	10	*58*	*8*
v03	Wathe SW	607	40	*173*	*12*
v04	Bronzewing	727	47	*1546*	*68*
v05	Colignan	13	3	*248*	*13*
v07	Annuello	424	32	*388*	*23*
v08	Powerline	74	5	*183*	*7*
v09	Mt Hattah	19	5	*99*	*6*
v11	Mopoke	135	8	*195*	*13*
v12	Pheeneys	270	13	*396*	*16*
v13	Bambill	189	14	*424*	*22*
v14	Menzies	51	6	*170*	*8*
v15	Wandown	196	17	*299*	*23*
v16	South Bore	303	19	*352*	*26*
V17	OneTreePlain	121	8		
v18	Washing Machine	110	6	*34*	*4*
v19	Underbool	65	8	*311*	*13*
v20	Lowan	417	25	*850*	*34*
v21	Dumosa	248	16	*368*	*20*
V22	Dennying	61	4	*35*	*4*
v23	Moonah	857	49	*861*	*51*
v24	Kiata	163	5	*24*	*1*
v26	Hattah Tracks	300	20	*331*	*17*
v27	O'Brees	57	8	*106*	*8*
v28	Nurcoung	147	7	*180*	*9*
v29	Wedderburn	24	2	*40*	*2*
v30	Hattah South	61	3	*54*	*5*
v31	Skinners Flat	37	4	*64*	*5*
v32	Wychitella	44	4	*48*	*8*
v33	Korong Vale	13	1	*21*	*2*
v34	Paradise	310	11	*828*	*31*
v35	Broken Bucket	21	3	*16*	*3*
v36	Broughtons WH	0	0	*0*	*0*
V37	Wisemans	185	11	*17*	*5*
v38	Tooan	96	6	*96*	*6*
V39	Oldfields	10	1	*197*	*6*
V41	Mali Dunes	0	0	*5*	*1*
V42	Nurcong Farmers			*5*	*1*
		7,084	*442*	*9,503*	*550*

6. Participation and in-kind contribution

This year, 73 VMRG members and 7 non-members participated in the monitoring, totalling about 1058 monitoring hours in the field. In addition, VMRG members totalled over 512 hours driving to and from monitoring sites (these hours relate to vehicles rather than individuals; often two or more people travelled in one vehicle but passenger time has not been tallied). Assuming the time spent by VMRG members is worth $29/hr*, we estimate the field component of the monitoring represents at least $45,530 in in-kind support.

Of course the VMRG in-kind contribution extends further than just the field component of monitoring. We estimate that an additional 120 hours were contributed in managing the monitoring effort (preparing data and equipment, posting, uploading and managing data on the NMMD), and at least 150 hours were contributed freely by VMRG members to the motion camera project (installing, checking and downloading cameras in the field, sorting photos and reporting). Other large unpaid contributions in 2014/15 include committee meetings, training weekends or reporting back meetings, which collectively involved well over 160 unpaid hours, and a site search at Tooan which involved about 80 person hours. Together, these activities totalled about 510 hours and were worth at least another $14,790.

Thus, we estimate the in-kind value of the VMRG activities to be about $60,320.

*estimate for volunteer hour value in 2011 from: Ironmonger, D. (2012). The Economic Value of Volunteering in Victoria. The Department of Planning and Community Development (Ed.): Victorian Government.

7. Concluding comments

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 the numbers of foxes and other species, and availability of foods such as lerp. The VMRG contribution is substantial in terms of effort, data quantity and quality, and the conservation of Malleefowl in general.

A huge amount of excellent data has been collected enabling the trends and requirements of the species to be evaluated. In particular, the Adaptive Management project led by Drs Michael Bode, Cindy Hauser and Jose Lahoz-Monfort at Melbourne University is currently developing a program that will make the best use of the ongoing flow of monitoring data to better manage Malleefowl.

- *Update on the motion-sensitive camera project*

As discussed in last year's report, an important area in which our data collecting could be improved is in regard to other species, especially predators such as 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. The data we have been collecting by visiting mounds is very valuable because it gives us some information on these other animals, but it is far from ideal.

Last year we reported on the trial of the motion-sensitive cameras at Wandown and Menzies (v15 and v14) to collect information on all of these animals simultaneously. In brief, the trial was very successful and numerous VMRG members helped set up the cameras and sort through the very large number of photos that were collected (nearly 100,000!).

On the basis of these successes, and the enthusiasm shown by VMRG members that have so far been involved in the project, we received funding from the Iluka Malleefowl management Committee to buy a further 50 cameras with solar panels, batteries and stakes (no more moving trees!) and will be installing these at a range of our monitoring sites in May and June. As with the trial, we will be scattering these through the mallee (not at mounds) at our monitoring sites 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.

Rosanna van Hespen, a Masters student at Melbourne University, is currently undertaking further analyses of the camera data under the supervision of Jose and Cindy. In particular, Rosanna will be looking at the number of cameras we need to characterise fox activity at each site and other aspects that will refine our methods.

These data will be passed on to the AM team and will be an invaluable component of the environmental modelling. The AM project itself is progressing well as many will be aware from the presentations at the Dubbo Malleefowl Forum last year, and the articles written by the team in Around the Mounds. Tim Burnard, the coordinator of the National Malleefowl Recovery Team, has been very busy, and very successful, in involving various government and non-government agencies across Australia in the initial phase of the AM project examining the benefits of Fox control, adding value to the enormous contribution of volunteers across the continent that monitor Malleefowl populations.

Joe Benshemesh and Peter Stokie, May 2015

Appendix A 1. 2014/15 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	1158	69	51	74	97	14	52	17	16		14	24	39	21	86	41	27	26	21	57	33	13	61	10	8	28	20	21	9	9	9	10	5	58	13	8	55	10	10	1	11	7	3
New incidental	18		2	1		1	2					1			2	1							1			2												4				1	
Sought, NOT found	7																																			3		3			1	
NOT sought or found	23		1		1		1					1				1				1			1							1	1			3			8		3				
Total	1206	69	54	75	98	15	55	17	16		14	26	39	21	88	43	27	26	21	58	33	13	63	10	8	30	20	21	9	9	10	11	5	58	16	8	58	22	13	4	11	9	3

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	107	3	4	19	12		1	2		3					1		4	1	1		7	6	6					2		1	3	3		27		1								
New incidental																																												
Sought, NOT found																																											
NOT sought or found	52			2	1						1	3		7	14						1		1	8				2		6	1	3			1		1					
Total	159	3	4	21	13		1	2		3	1	3		7	15		4	1	1		8	6	7	8				2	2	1	9	4	3	27		2		1					

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	22	8		6		1									1				1												1							3	1				
New incidental																																												
Sought, NOT found																																											
NOT sought or found	12			1							1			2						4											4												
Total	34	8		7		1					1			2	1				1	4										1	4						3	1				

Mounds that will be omitted from annual lists (erronous 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				1																																						
New incidental																																											
Sought, NOT found																																											
NOT sought or found																																											
Total	1				1																																						

Grand Total	1400	80	58	103	112	16	56	19	16	3	16	29	39	30	104	43	31	27	23	62	41	19	70	18	8	30	20	23	11	10	20	19	8	85	16	10	58	26	14	4	11	9	3