Government of South Australia
Department of Environment and Natural Resources

Malleefowl Monitoring Program: South Australian Murray Darling Basin 2010/2011

Final Report May 2011

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Acknowledgements

The Department of Environment and Natural Resources (DENR) and Mallee Eco Services would like to thank the following people for their valuable contributions to the Murraylands malleefowl monitoring program during the 2010/2011 breeding season. Without the assistance of these volunteers and landholders it would not be possible to conduct this monitoring program.

Kevin Smith, Friends of Riverland Parks, Grant Geyer, Community Land Management volunteers, Birds Australia (Gluepot Reserve) volunteers, Tony Chambers, Kevin Burrett, Bruce Gotch, Scientific Expedition Group volunteers, Dennis Matthews, Henry Short, Jason and Kathy Fullston and Darryn Burdett.

DENR and Mallee Eco Services would also like to thank Raya Giffard from the Department of Defence and range control staff for helping facilitate the survey of the malleefowl grid on the Murray Bridge Army Range.

This project was funded by the SA Murray Darling Basin Natural Resources Management Board.

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1.0 Introduction

In 2004, DENR initiated a project in the Murraylands Region to implement best practice monitoring of the existing network of malleefowl grids in the South Australian Murray Darling Basin. The initial aim was to adopt the monitoring system developed by the Victorian Malleefowl Recovery Group. This monitoring system was later adopted as the national standard and has since been implemented throughout South Australia as part of the DENR's ongoing commitment to the National Malleefowl Recovery Plan.

This report concludes the seventh year of the project. The focus of the project has progressed to the collection of related environmental data and the consolidation of a volunteer network, while continuing the annual surveys of all the regularly monitored grids in the region. The processing and entering of the monitoring data into the national malleefowl monitoring database has also become an integral part of the project. In recent years there has also been a greater emphasis on the analysis of the monitoring data to determine trends in breeding activity and rainfall for individual grids and across the region.

This report details the achievements of the latest stage of the project and includes summaries of the 2010/2011 breeding season monitoring results and volunteer hours contributed. Each project objective for the 2010/2011 season is addressed separately. The report also includes an updated analysis of breeding trends relative to rainfall for each grid, which has not been done since the 2007/2008 breeding season. Recommendations for the continuation of the project are included at the end of the report.

2.0 Monitoring results for the 2010/2011 breeding season

The following section has been split into subsections relating to the individual grids monitored in the project area this season. The identification numbers for each grid, as allocated under the national malleefowl monitoring database, have been included in the subsection titles. A summary of the monitoring results for the 2010/2011 season has been included in Appendix 1.

2.1 Cooltong Conservation Park (s03) grid

The survey of the Cooltong grid was conducted by the Friends of Riverland Parks (FORP). The survey was conducted on 6 and 7 November 2010. Survey kits were provided prior to the survey and collected afterwards.

A total of 40 mounds were surveyed at Cooltong and 1 of these mounds was active. No active mounds had been recorded on this grid for the previous 5 breeding seasons. Unfortunately, although the mound had been used to incubate eggs during the current breeding season, by the time of the survey the mound had been abandoned. The reason for this was not clear.

2.2 Danggali Conservation Park (s05 & s15) grids

The two Danggali grids were surveyed on 28 December 2010 by Community Land Management (CLM) volunteers, supervised by Grant Geyer. The CLM volunteers used their own monitoring kits and the survey data and photos were subsequently forwarded to us by Grant.

A total of 17 mounds were surveyed and 1 of these mounds was active (on the s05 grid). One active mound has been recorded on this grid during the last 2 breeding seasons.

2.3 Pooginook Conservation Park (s06) grid

The survey of the Pooginook grid was also conducted by the FORP. The survey was conducted on 1 and 28 November 2009. Survey kits were provided prior to the survey and collected afterwards.

A total of 33 mounds were surveyed at Pooginook and none of these mounds were active. The Bookmark fires of November and December 2006 burnt this grid after it was monitored in the 2006/2007 breeding season, so no active mounds were expected this season. At this stage, FORP have agreed to continue monitoring the grid on an annual basis to take advantage of the opportunity to record how the vegetation on the grid regenerates after the Bookmark fires. No active mounds have been recorded on this grid for the last 6 breeding seasons.

2.4 Bakara Conservation Park (s07) grid

The survey of the Bakara grid was conducted on 6 November 2010 by 6 members of the Scientific Expedition Group (SEG), supervised by Mallee Eco Services.

A total of 56 mounds were surveyed at Bakara and 1 of these mounds was active. One active mound was also recorded last season.

2.5 Short's Heritage Agreement (s08) grid

The survey of the Short's grid was conducted on 7 November 2010 by 7 members of the SEG, supervised by Mallee Eco Services.

A total of 41 mounds were surveyed at Short's and 1 of these mounds was active. The same number of active mounds was recorded in the 2009/2010 season.

2.6 Chowilla Regional Reserve (s09) grid

The Chowilla grid was surveyed on 28 December 2010 by CLM volunteers, supervised by Grant Geyer. The same arrangements were in place for this survey as for the Danggali survey.

A total of 18 mounds were surveyed and none of these mounds were active. Breeding activity was down on last season, when 1 active mound was found.

2.7 Ferries MacDonald Conservation Park (s10) grid

The Ferries MacDonald grid was surveyed on 10 December 2010 by Tony Chambers, Dennis Matthews and Mallee Eco Services.

A total of 61 mounds were surveyed and 6 of these mounds were active. Breeding activity was up on the previous season, when 4 active mounds were recorded. This season saw the highest number of active mounds recorded on the grid since the 2005/2006 season. One malleefowl sighting was also recorded this season.

Motion triggered cameras had been installed on 3 of the active mounds on the grid by Graeme Tonkin, under a DENR permit.

2.8 Peebinga Conservation Park (s44) grid

Mallee Eco Services surveyed the Peebinga grid over 2 visits, on 19 November 2010 and 18 January 2011.

A total of 54 mounds were surveyed, of which 10 mounds were active. Breeding activity was up on the previous season, when 4 active mounds were recorded. This season saw the highest number of active mounds ever recorded on this grid. Four malleefowl sightings were also recorded on the Peebinga grid this season.

2.9 Karte Conservation Park (s45) grid

The Karte grid was surveyed on 3 January 2011 by CLM volunteers, supervised by Grant Geyer. The same arrangements were in place for this survey as for the Danggali and Chowilla surveys.

A total of 24 mounds were surveyed and none of these mounds were active. No active mounds have been recorded on this grid for the last 2 breeding seasons.

2.10 Gluepot Station (s52, s54, s56, s57, s59, s60, s63) grids

Once again Kevin Smith coordinated these surveys, although we did provide monitoring kits prior to the surveys and collected them afterwards. The surveys were conducted between 15 and 17 November 2010.

A total of 107 mounds were surveyed in the 7 grids and 1 of these mounds was active (on the s57 grid). No active mounds had been recorded on the Gluepot grids for the previous 3 seasons. One new mound (not active) was also found on the s54 grid, although this may be a mound that had been originally mapped but not located again since the initial grid search.

The majority of grids s52 and s54 were burnt in the Bookmark fires of November and December 2006, so little or no breeding activity was expected on these grids. At this stage, Kevin is continuing to monitor these grids on an annual basis to take advantage of the opportunity to record the regeneration of the vegetation on these grids.

Kevin also organised the complete re-searching of the s60 grid on 9 and 10 October 2010 as part of the annual monitoring effort. One new mound was found during this search, although this may also be a mound that had been originally mapped but not located again since the initial grid search.

2.11 Bandon (Burdett's Heritage Agreement) (s67) grid

The Bandon grid was surveyed by Mallee Eco Services over 2 visits, on 28 November 2010 and 17 January 2011. Dennis Matthews assisted with the monitoring during the second visit.

A total of 59 mounds were surveyed and 6 of these mounds were active. Breeding activity was up on last season, when only 2 active mounds were recorded. This season saw the highest number of active mounds ever recorded on this grid.

2.12 Ettrick (Fullston's Heritage Agreement) (s68) grid

Tony Chambers, Kevin Burrett and Mallee Eco Services conducted the survey of the Ettrick grid on 17 November 2010.

A total of 24 mounds were surveyed and 2 of these mounds were active. Breeding activity was the same as last season.

2.13 Murray Bridge army training range (MBAR) (s69) grid

The MBAR grid was surveyed on 16 December 2010 by Tony Chambers, Kevin Burrett and Mallee Eco Services.

A total of 49 mounds were surveyed and 6 of these mounds were active. Breeding activity was up on last season, when 5 active mounds were recorded.

2.14 Summary of volunteer hours contributed

The total volunteer hours contributed during the 2010/2011 monitoring season were as follows:

Ferries MacDonald - 14 hours (T Chambers, D Matthews)
Pooginook - 27 hours (FORP)
Cooltong - 41 hours (FORP)
Ettrick - 11 hours (T Chambers, K Burrett)
Danggali, Chowilla & Karte - 174 hours (CLM)
Gluepot - 46 hours (K Smith, Birds Australia volunteers)
Gluepot (re-searching grid s60) - 94 hours (K Smith, Birds Australia volunteers)
Bakara - 33 hours (SEG)
Short's - 49 hours (SEG)
Murray Bridge Army Range - 16 hours (T Chambers, K Burrett)
Bandon – 6.5 hours (D Matthews)

Total 2010/2011 season – 511.5 hours

(Total 2009/2010 season - 483 hours)

3.0 Trends in breeding activity for each grid

The following section has been split into subsections relating to the individual grids in the project area. The identification numbers for each grid as allocated under the national database have been included in the subsection titles.

A summary of the historical monitoring results from 1989 to 2010 has been included in Appendix 2.

An analysis of the trends in breeding activity, total annual rainfall and total winter rainfall for each grid was included in the final report for the 2007/2008 breeding season (Mallee Eco Services, May 2008).

For the purposes of this report, the graphs previously included in the 2007/2008 report have been updated. The discussions of the trends in breeding activity and rainfall for each grid have also been updated but the more detailed discussions from the previous report have not been duplicated in this report. A brief summary of the previous findings has been included instead.

The total winter rainfall (May to September) has a pronounced effect on malleefowl breeding activity (Benshemesh, Barker & MacFarlane, 2006). An interesting observation from 2010 is that despite it being the wettest year in the project area since 1992, the total winter rainfall was above average but was not historically high. In fact, for the majority of the project area, the winter rainfall in 2010 was comparable to the previous 2 years.

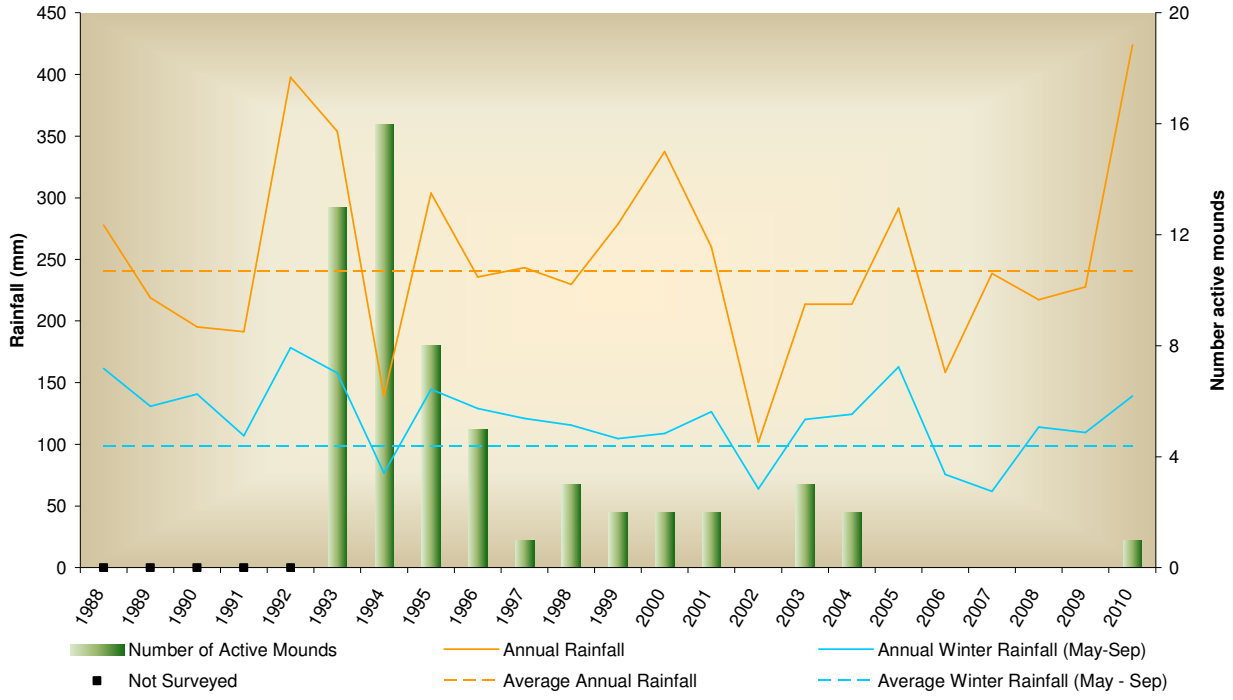
NOTE: The breaks in some of the rainfall line graphs represent years and/or May to September periods where the available rainfall data was incomplete.

3.1 Cooltong Conservation Park (s03) grid

The previous analysis found that the total annual rainfall and the total winter rainfall for this grid had been trending downward since 1988, although the downward trend in winter rainfall had been greater. By comparison, the decline in breeding activity had been much more exaggerated, suggesting that other factors may have been involved.

The inclusion of another 3 years of data has not altered any of these trends. The total annual rainfall in 2010 represented the wettest year since 1992, but the total winter rainfall only represented the fifth wettest winter since 1988. Of most concern is the fact that there has been only one active mound on the grid in the last 6 years and little or no response to years of average or above average rainfall during this time. This suggests that the birds have either moved off the grid to breed or that the population is no longer able to sustain itself.

Figure 1: Malleefowl breeding activity against rainfall - Cooltong CP s03



3.2 Danggali Conservation Park (s05 & s15) grids

The previous analysis found that the total annual rainfall and the total winter rainfall for these grids had been trending downward since 1988. Since 1999, the trend had been towards below average annual rainfall. A trend towards below average winter rainfall was also evident since 2002. With breeding activity having only been recorded on a combined total of 12 occasions for both grids since 1993, it is hard to propose any sort of trend, besides that breeding activity has been historically low.

The inclusion of another 3 years of data has not altered these trends, although historically it is significant that an active mound has been recorded on the s05 grid in 4 of the last 5 years. It should also be noted that a limited amount of up to date rainfall data was available, as complete rainfall figures have not been recorded since the departure of the on site manager.

It should also be noted that the combined area of these grids is only half the size of the recommended 400 hectares for a monitoring grid, so this also limits what can be interpreted from such a small sample area.

Figure 2: Malleefowl breeding activity against rainfall - Danggali CP 1 s05

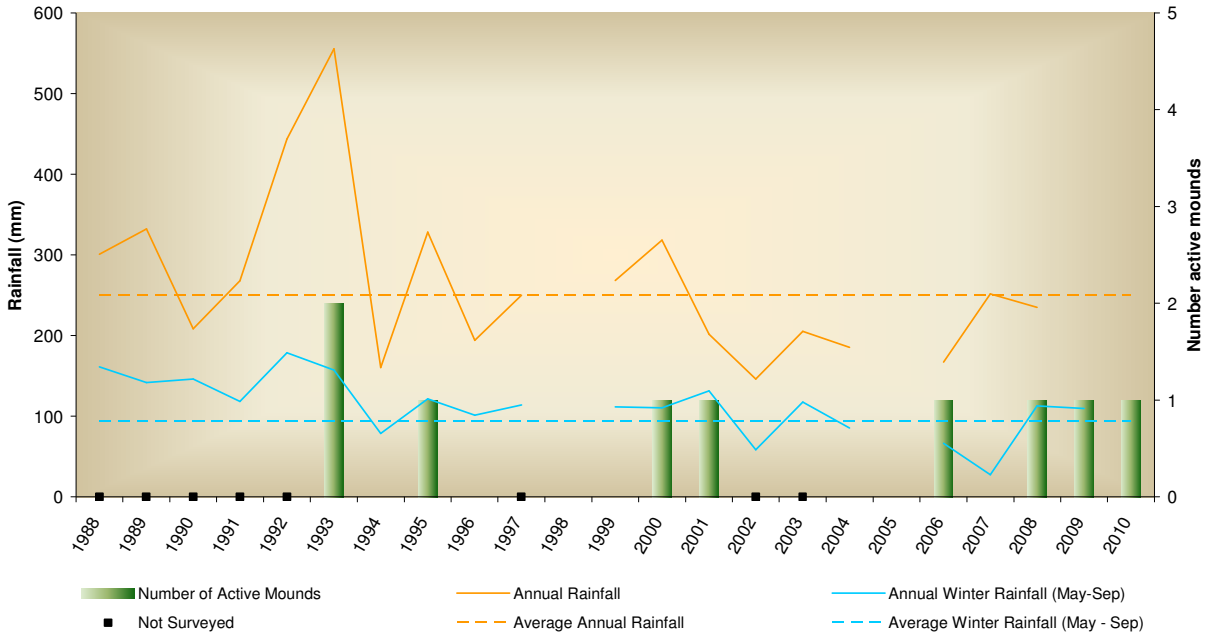
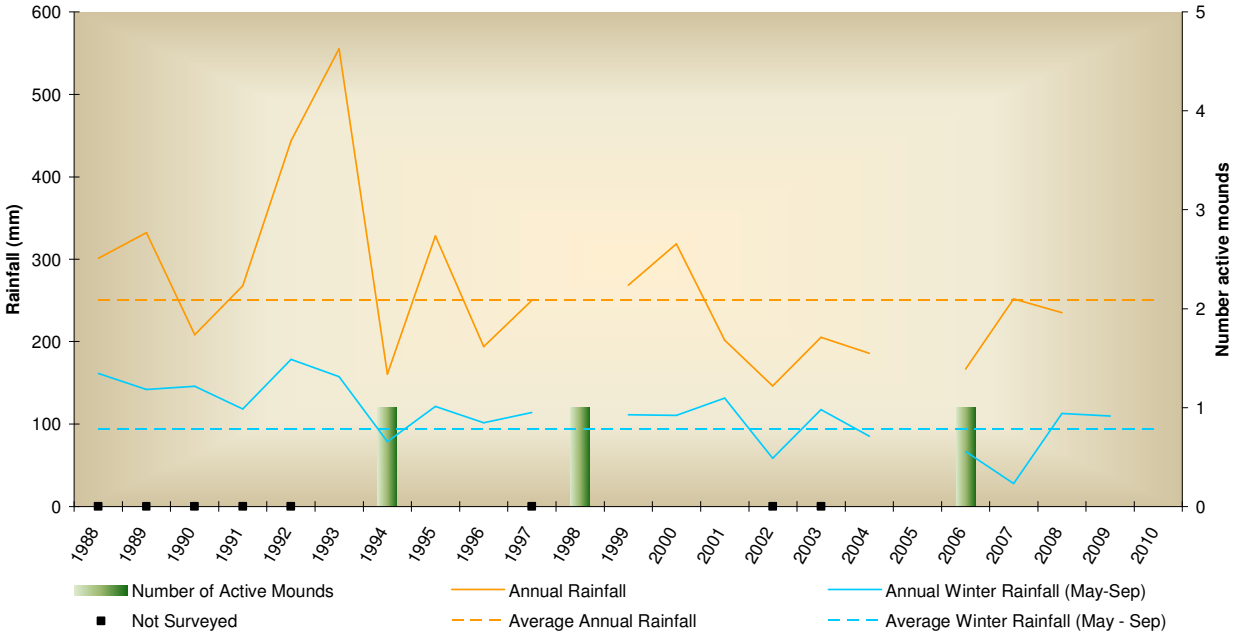


Figure 3: Malleefowl breeding activity against rainfall - Danggali CP 2 s15

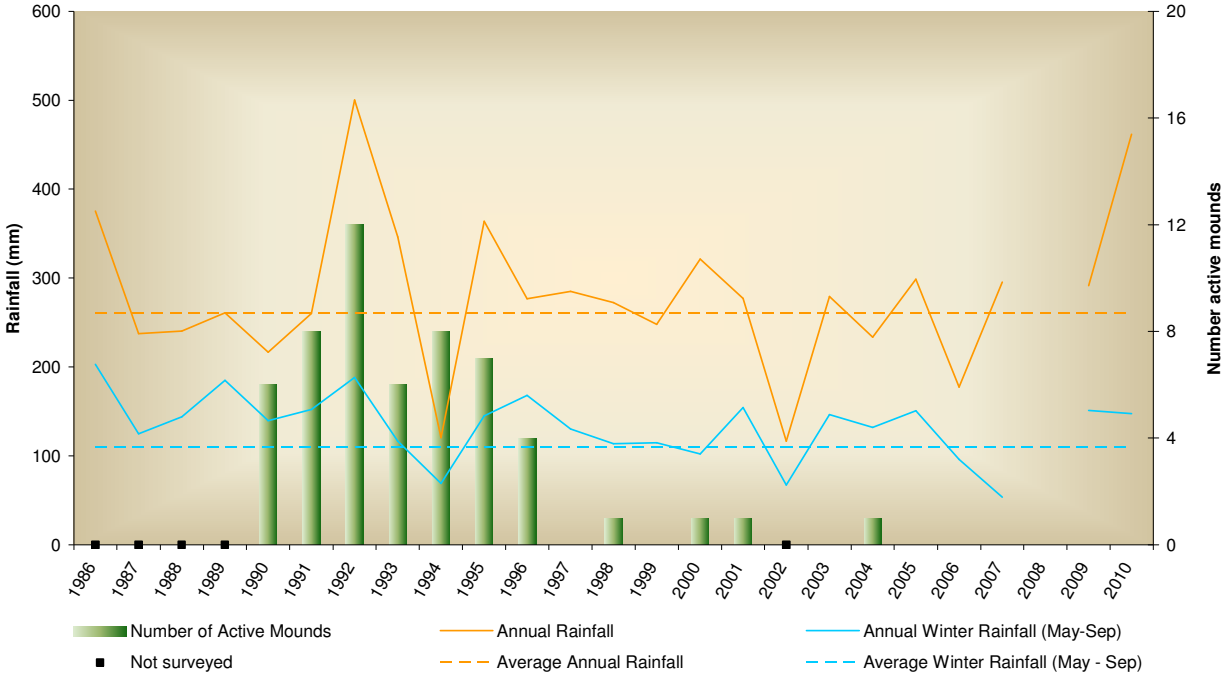


3.3 Pooginook Conservation Park (s06) grid

The previous trend analysis found that the total annual rainfall and the total winter rainfall for this grid had been trending downward since 1986 and to a generally similar extent. By comparison, the decline in breeding activity had been much more exaggerated, suggesting that other factors may have been involved.

The trend in breeding activity for this grid is startlingly similar to the Cooltong grid, although the decline in breeding activity has been even more pronounced. The inclusion of another 3 years of data has not changed these trends, although it must be remembered that the grid was burnt by the Bookmark bushfire of November and December 2006. This effectively means that the primary aim of monitoring of this grid for the last 4 years has been to record the post fire regeneration of the vegetation on the grid.

Figure 4: Malleefowl breeding activity against rainfall - Pooginook CP s06



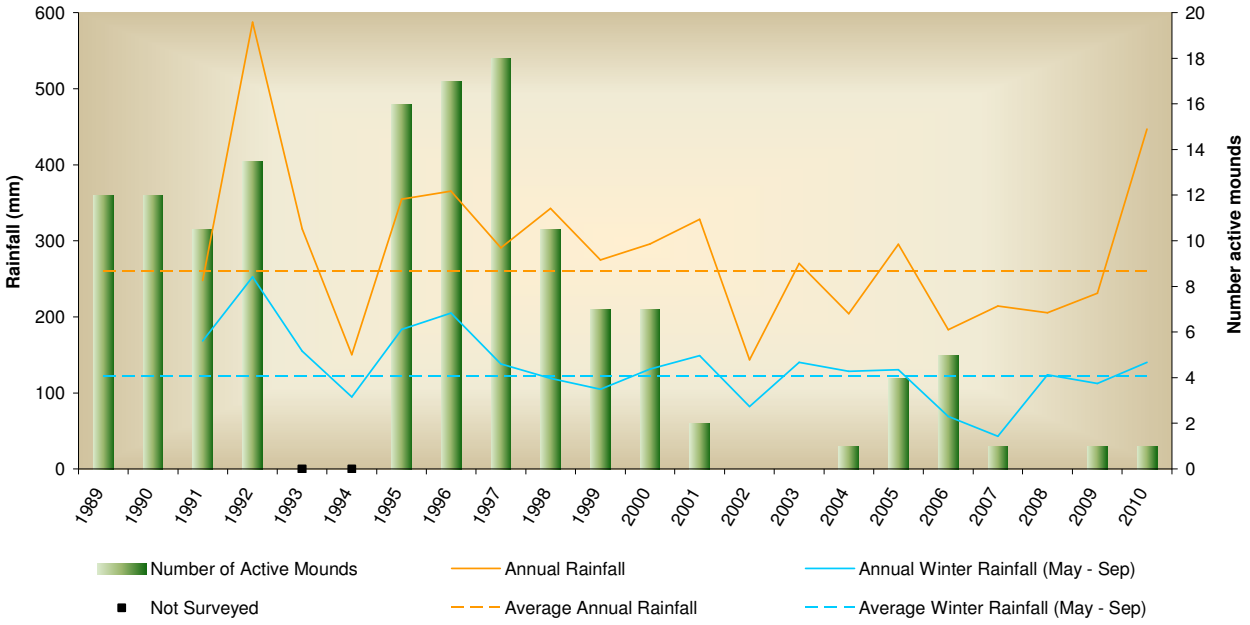
3.4 Bakara Conservation Park (s07) grid

The previous analysis found that both the total annual and total winter rainfall for this grid had been trending downwards since 1989 and to a generally similar extent. The downwards trend in rainfall had been more exaggerated than elsewhere in the project area, including north of the Murray River. The downward trend in breeding activity had generally mirrored the trend in declining rainfall.

The addition of data from the last 3 years has seen the declining trend in breeding activity become more exaggerated when compared with the corresponding decline in rainfall. This suggests that other factors may now be involved. The malleefowl population on the grid may now be markedly lower than it was prior to 2001, which marked the beginning of an extended period of overall rainfall deficits.

The monitoring results from the next breeding season will be significant. At this point, the data suggests that the birds have either moved off the grid to breed or that the population has been reduced to the point where it may no longer able to take advantage of improved conditions to increase breeding activity.

Figure 5: Malleefowl breeding activity against rainfall - Bakara CP s07



3.5 Short's Heritage Agreement (s08) grid

The previous trend analysis found that both the total annual and total winter rainfall for this grid had been trending downwards since 1992 and to a generally similar extent. As was the case with the nearby Bakara grid, the downwards trend in rainfall had been more exaggerated than elsewhere in the project area, including north of the Murray River. The downward trend in breeding activity had generally mirrored the decline in rainfall, although since 2002

breeding activity had remained low, despite 3 consecutive years of above average winter rainfall at that point. This suggested that there may have been other factors involved.

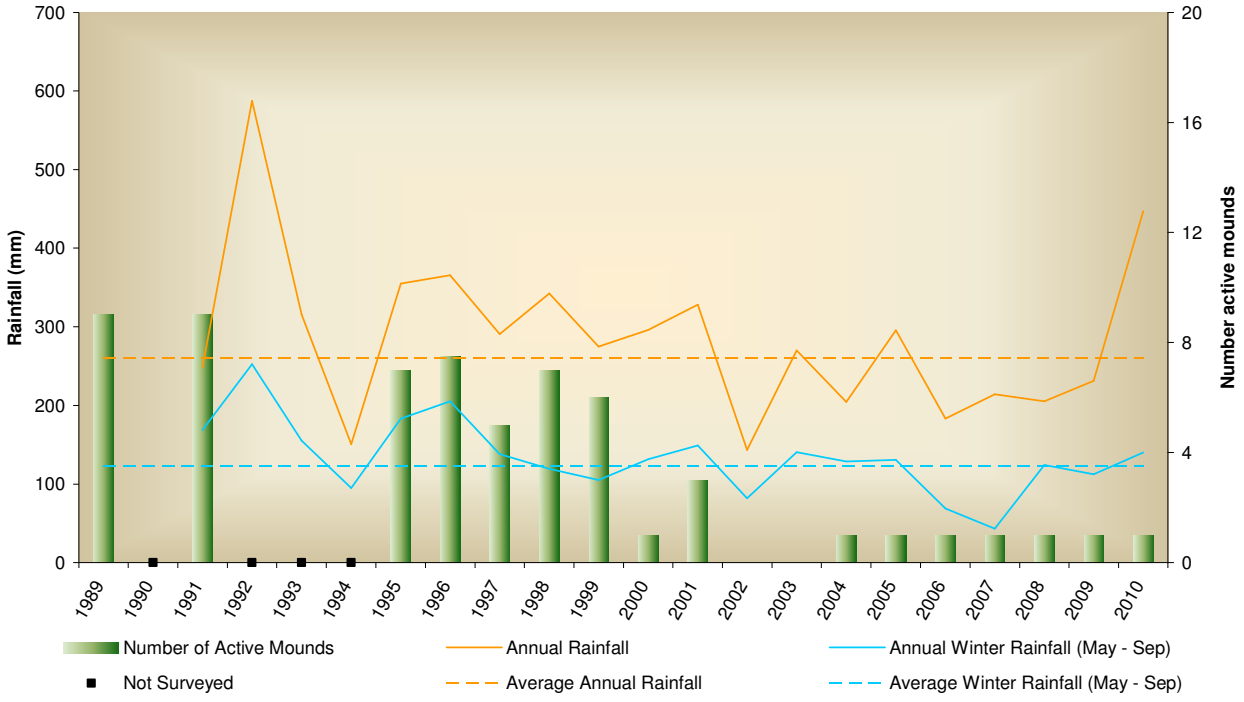
The addition of data from the last 3 years has seen the downward trend in breeding activity become more exaggerated when compared with the annual and winter rainfall trends. There has been a steady decline in both annual and winter rainfall in the area since 1992, but up until 2002 there was a recognisable correlation between rainfall and breeding activity. Since 2003, breeding activity has been maintained at a low level and shows no correlation with rainfall patterns. The total annual rainfall in 2010 represented the wettest year since 1992, but the total winter rainfall was only slightly above the long term average.

The trend in breeding activity for this grid is also very similar to the Cooltong and Pooginook grids, in that the decline in breeding activity is much more pronounced than the decline in total annual and winter rainfall.

The monitoring results from the next breeding season will be significant. At this point, the data suggests that the birds have either moved off the grid to breed or that the population has been reduced to the point where it may no longer able to take advantage of improved conditions to increase breeding activity.

It should also be noted that the area of these grids is only 250 hectares, compared to the recommended 400 hectares for a monitoring grid, so this also limits what can be interpreted from such a small sample area.

Figure 6: Malleefowl breeding activity against rainfall - Shorts HA s08



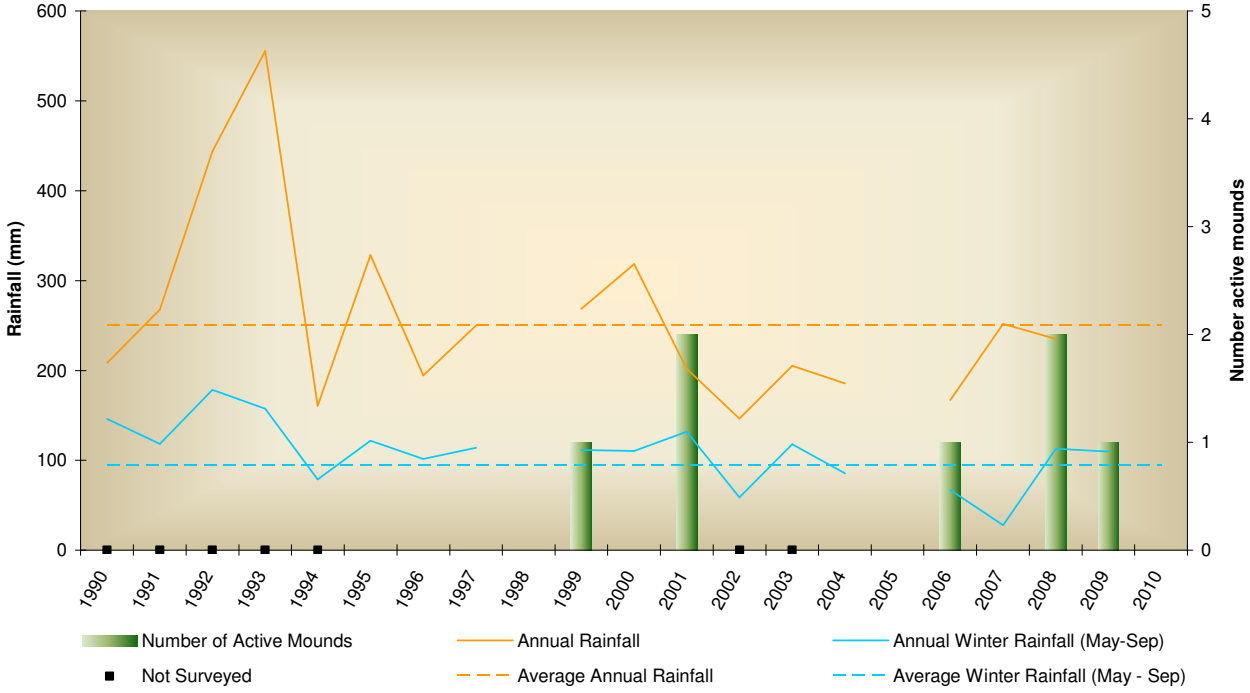
3.6 Chowilla Regional Reserve (s09) grid

The previous analysis found that both the total annual and total winter rainfall for this grid had been trending downwards since 1990 and to a generally similar extent. With breeding activity having only been recorded on 3 occasions since 1995 at that point, it was hard to propose any sort of trend, besides that breeding activity had been historically low.

The inclusion of another 3 years of data has seen the emergence of an upward trend in breeding activity, although surprisingly no active mounds were recorded this season. It should also be noted that a limited amount of up to date rainfall data was available, as due to the proximity of the grid to the Danggali grids, we had previously used the Danggali rainfall figures for this grid too.

It should also be noted that the area of this grid is only half the size of the recommended 400 hectares, so this also limits what can be interpreted from such a small sample area.

Figure 7: Malleefowl breeding activity against rainfall - Chowilla RR s09

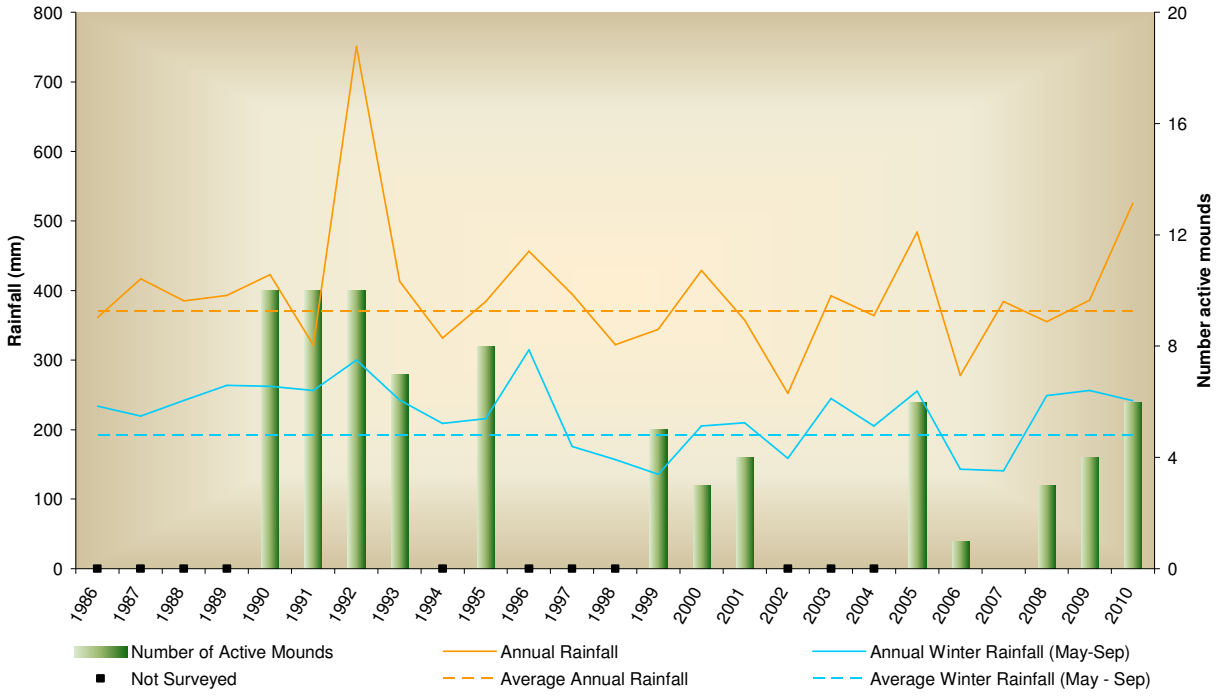


3.7 Ferries MacDonald Conservation Park (s10) grid

The previous analysis found that both the total annual and total winter rainfall had trended downwards for this grid since 1986 and to a generally similar extent. The downwards trend in rainfall had been less exaggerated than elsewhere in the project area. By comparison, the downward trend in breeding activity had been much more pronounced than the decline in rainfall, suggesting that there may be other factors involved. It should be noted that interpreting breeding activity trends for this grid is problematic, given that the grid was only partially surveyed or not surveyed in 8 of the 22 years since it was established.

The addition of data from the last 3 years has not altered these trends. Three consecutive years of above average winter rainfall has seen an increase in breeding activity over the last 3 years. Nevertheless, the longer term downward trend in breeding activity is much more pronounced than the corresponding decline in rainfall. The downward trend in breeding activity is also very similar to the situation on the Cooltong, Pooginook and Short's grids.

Figure 8: Malleefowl breeding activity against rainfall - Ferries MacDonald NP s10

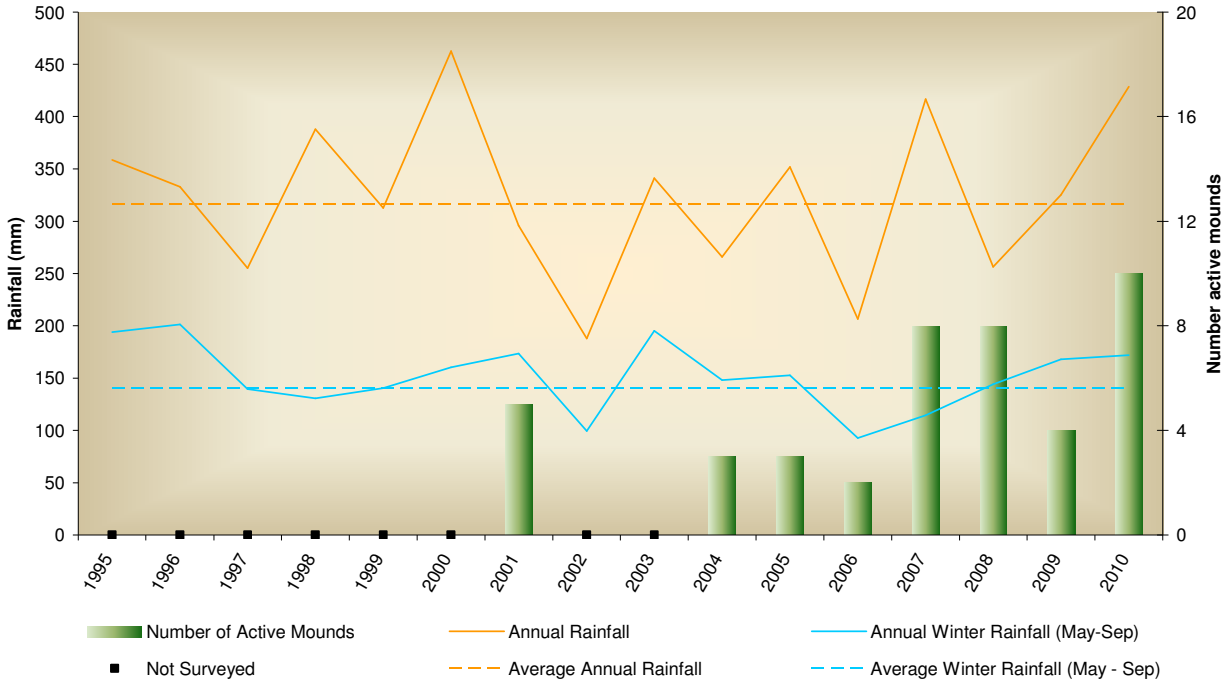


3.8 Peebinga Conservation Park (s44) grid

The previous analysis found that both the total annual rainfall and the total winter rainfall had been trending downward since 1995, with the decline in winter rainfall being to a slightly greater extent. Breeding activity had generally mirrored the rainfall pattern, with some evidence of a positive lag effect from above average winter rainfall. As the grid had only been monitored since 2001 and wasn't monitored in 2002 or 2003, the limited monitoring data available made it difficult to propose any sort of overall trend in breeding activity at that stage.

The inclusion of another 3 years of data has seen the emergence of an upwards trend in breeding activity. The downwards trend in rainfall has also become less exaggerated than elsewhere in the project area, although the decline in winter rainfall is still greater than the decline in total annual rainfall. The upwards trend in breeding activity could be explained by the rainfall patterns in the last 8 years, during which time there have been 5 years of average or above average annual rainfall and 6 years of average or above average winter rainfall. This also suggests that, unlike elsewhere, the population at Peebinga is still viable enough to be able to respond to better conditions by increasing breeding activity.

Figure 9: Malleefowl breeding activity against rainfall - Peebinga CP s44



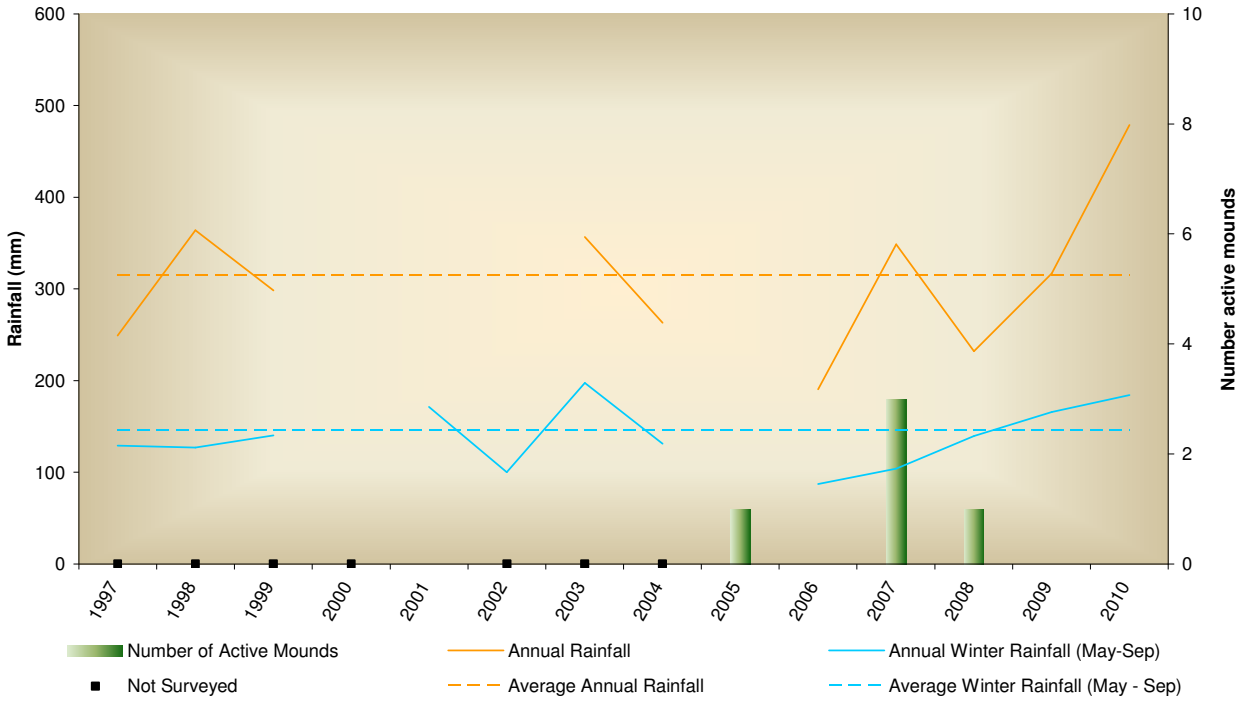
3.9 Karte Conservation Park (s45) grid

The Karte grid has been established for 10 years, but was not surveyed in 3 of those years. Of the 7 surveys that have been done, no active mounds have been recorded on 4 of those occasions. This makes it difficult to propose any sort of overall trend in breeding activity at this stage. With only 1 active mound having been recorded in the last 3 seasons, the addition of the updated data has not changed this situation.

The trend in rainfall is also hard to determine, due to incomplete rainfall data, particularly for the annual figures. However, the winter rainfall data is more complete and this appears to indicate that the winter rainfall has remained around the long term average over the last 10 years.

The results from the next breeding season will be important in clarifying whether the malleefowl population on this grid is able to sustain itself by responding to favourable breeding conditions. Despite this, it is of concern that increased breeding activity was not recorded this season.

Figure 10: Malleefowl breeding activity against rainfall - Karte CP s45



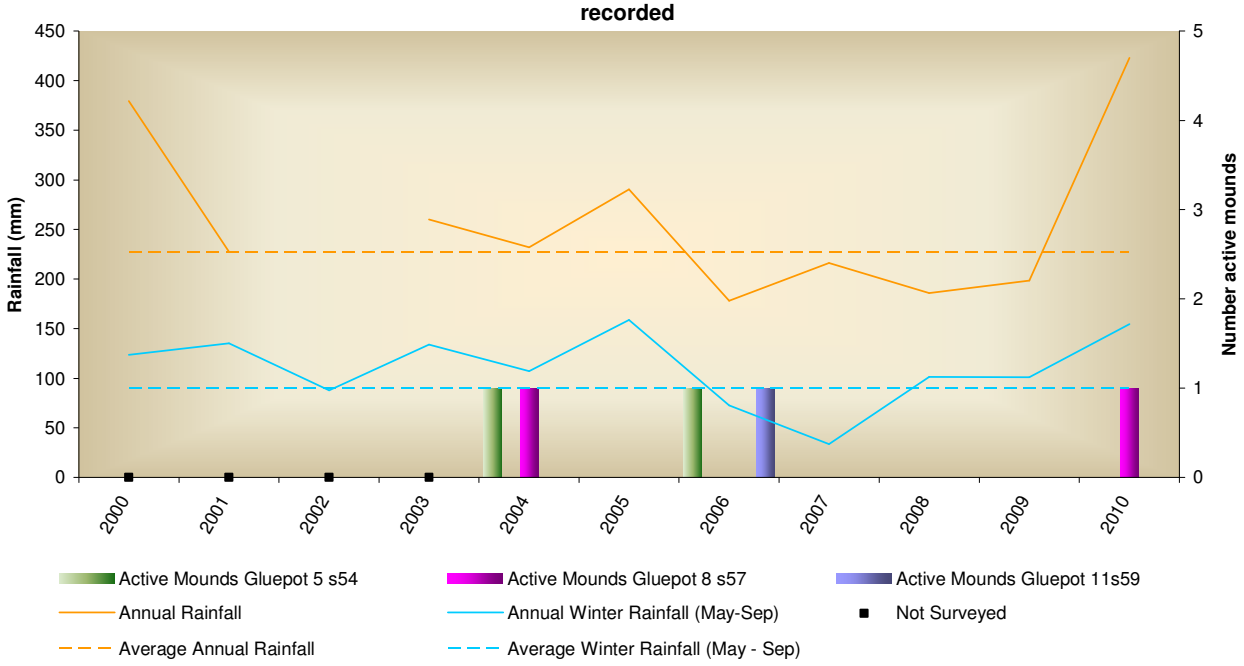
3.10 Gluepot Station (s52, s54, s56, s57, s59, s60, s63) grids

The Gluepot grids have had historically low levels of breeding activity since they were established, although we only have reliable monitoring data from 2004 onwards. Active mounds have only been recorded in 3 years (2004, 2006 and 2010) on 3 of the 7 grids. This makes it difficult to propose any sort of overall trend in breeding activity at this stage. With only 1 active mound having been recorded on 1 of the grids in the last 3 seasons, the addition of the updated data has not changed this situation.

The inclusion of the rainfall data for the last 10 years indicates that there is a trend towards declining annual and winter rainfall, although the decline in winter rainfall appears to be less pronounced. There also seems to be some evidence of a positive lag effect in breeding activity from good winter rains. On the other hand, there also seems to be evidence of a negative lag effect from very dry winters (eg. 2007) too.

It should also be noted that the areas of these grids is only half the size of the recommended 400 hectares for a monitoring grid, so this also limits what can be interpreted from such small sample areas. Even so, with 7 regularly monitored grids on the reserve, the total area being monitored is statistically significant.

Figure 11: Malleefowl breeding activity against rainfall - Gluepot grids with active mounds recorded

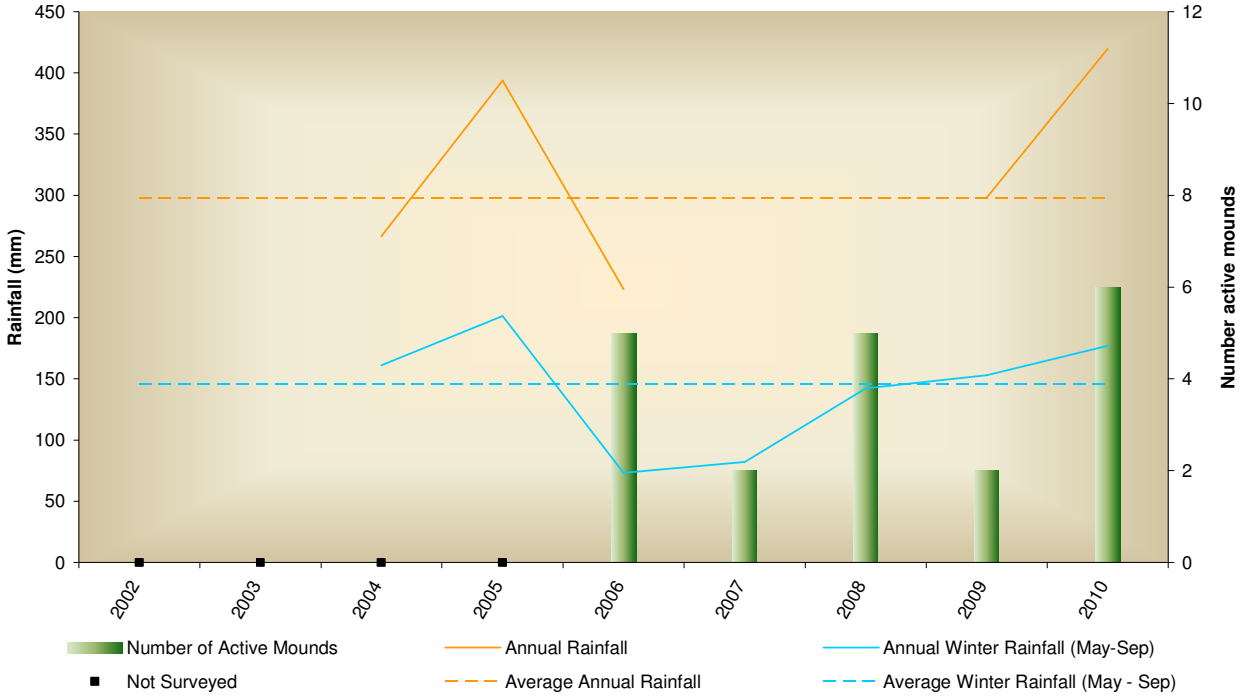


3.11 Bandon (Burdett's Heritage Agreement) (s67) grid

This grid has only been fully monitored since 2006, which makes it hard to propose a trend in breeding activity. Overall, the breeding activity seems to follow the pattern of winter rainfall. The annual rainfall data is too incomplete to propose any trends, but the winter rainfall data is complete for the last 7 years. There seems to be some evidence of both positive and negative lag effects on breeding activity from the winter rainfall, although 2009 does not fit this pattern. Five of the last 7 years have seen average or above average winter rainfall, which would have contributed to the reliable breeding activity. The malleefowl population on the grid also seems to be able to respond positively to favourable conditions, which is a good sign.

An automatic weather station will be installed on the grid in 2011 with the landholder's consent. This will mean that we will have complete and accurate rainfall figures available for analysis in future.

Figure 12: Malleefowl breeding activity against rainfall - Bandon (Burdetts HA) s67

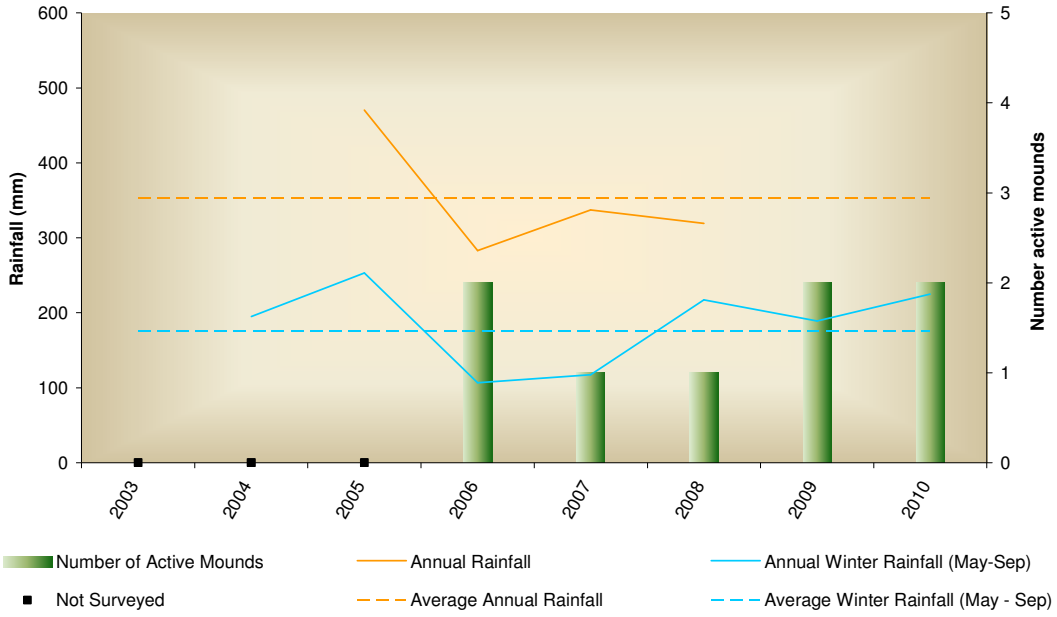


3.12 Ettrick (Fullston's Heritage Agreement) (s68) grid

This grid has only been fully monitored since 2006, which makes proposing a trend in breeding activity difficult. During this time, breeding activity has broadly followed the pattern of winter rainfall. Although we have located a BOM rain gauge on a neighbouring property, there are only 4 complete years of relevant rainfall data available (from 2005 to 2008). However, the winter rainfall data is complete for 7 years (from 2004 to 2010). Although the data is limited, it does suggest a positive lag effect on breeding activity from above average winter rainfall and a negative lag effect from below average winter rainfall.

It should also be noted that this grid is less than half the size of the recommended 400 hectares and so there are also limitations to what can be interpreted from such a small sample area.

Figure 13: Malleefowl breeding activity against rainfall - Ettrick (Fullstons HA) s68

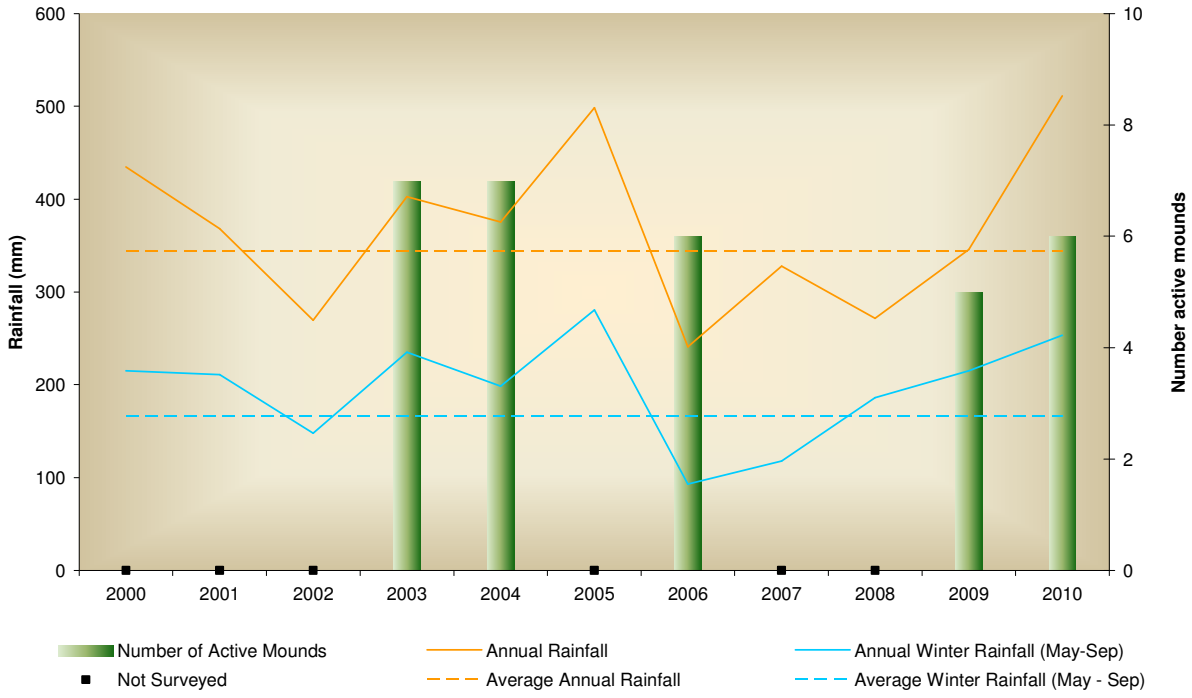


3.13 Murray Bridge army training range (MBAR) (s69) grid

Although this grid was established in 2000, it has only been fully monitored on 5 occasions. Breeding activity has been consistent, but with the limited amount of data available, it is difficult to propose a trend in breeding activity. The grid has only been monitored 3 times in the last 6 years, but with an arrangement now in place with the Department of Defence, annual monitoring data will be available for future analysis.

The inclusion of the updated data has highlighted the comparatively higher and more consistent rainfall in this part of the project area. Annual and winter rainfall is more likely to follow the same general pattern from year to year. The decline in annual and winter rainfall over the last decade is also much less pronounced than in areas further north east. Breeding activity seems to broadly follow the rainfall pattern during this time.

Figure 14: Malleefowl breeding activity against rainfall - Murray Bridge Army Range s69



4.0 Management of 2010/2011 monitoring data

The monitoring kits were collected after each survey and the data was downloaded to a Cybertracker database on a desktop computer. The only exception was the Cybertracker data from the Danggali, Chowilla and Karte surveys, which was forwarded by Grant Geyer. An initial check of the data was done to confirm that it was complete. The data was then reformatted as csv files for each grid for uploading to the national database.

The mound photos were downloaded from the digital cameras and relabelled with the grid number, the mound number and the year. The mound photos from the Danggali, Chowilla and Karte surveys were forwarded by Grant Geyer. The photos were then resized for uploading to the national database.

The monitoring data, including the mound photos, was then uploaded directly to the national database via the internet. At this point the data goes through an automatic validation process which we then cross checked and confirmed before incorporating the data into the database.

A back up copy of all the monitoring data, including the mound photos, was submitted to DENR in conjunction with the submission of this report. A copy is also kept by Mallee Eco Services as an additional back up.

5.0 Changing mound monitoring frequency for remnant mounds

Many of the malleefowl mounds on the grids in the project area are remnant mounds. The national database now provides a system whereby remnant mounds can be flagged for monitoring every 5 years instead of every year.

In general, the rules for flagging a mound for monitoring every 5 years are that it must never have been recorded as active, and the height of the mound should be less than or equal to 10cm. Mounds that fit this description are rarely re-activated, but it does happen (J Benshemesh, pers. comm.).

Although observers are able to recommend that mounds be flagged for less frequent monitoring, the final decision is at the discretion of a coordinator or ecologist who has monitoring data management privileges on the national database. In this situation, the historical monitoring data and photos for the individual mounds are cross checked before the final decision is made.

At the conclusion of the 2010/2011 breeding season a review of remnant mounds in the project area was undertaken. A summary of the results is included in the following table.

The Pooginook and Gluepot 3 grids, which were burnt during the Bookmark fires of 2006, were not included in the review process. The FORP continue to survey these grids primarily to monitor the post fire regeneration of the vegetation.

Murraylands Region mound review results, May 2011

Grid name	Total mounds	Annual monitoring	5 yearly monitoring
Cooltong (s03)	40	40	0
Danggali 1 (s05)	11	9	2
Pooginook (s06)	33	33	0
Bakara (s07)	56	51	5
Shorts (s08)	41	37	4
Chowilla (s09)	18	15	3
Ferries MacDonald (s10)	61	44	17
Danggali 2 (s15)	7	5	2
Peebinga (s44)	54	47	7
Karte (s45)	24	19	5
Gluepot 3 (s52)	23	23	0
Gluepot 5 (s54)	16	14	2
Gluepot 7 (s56)	15	12	3
Gluepot 8 (s57)	10	8	2
Gluepot 11 (s59)	15	12	3
Gluepot 12 (s60)	15	10	5
Gluepot 15 (s63)	13	11	2
Bandon (s67)	59	47	12
Ettrick (s68)	26	22	4
MBAR (s69)	49	42	7
TOTALS:	**586**	**501**	**85**

6.0 Contributions to State and National Recovery Team activities

Mallee Eco Services is a member of the committee which is overseeing the development of the national malleefowl monitoring database. We provided feedback to the committee on the user friendliness of the database, which we based on trials of the system at the end of the 2009/2010 breeding season. We also provided recommendations as to how the operations of the database could be improved and how handling the raw data could be streamlined further.

During the 2010/2011 breeding season, samples of feathers were collected during grid monitoring for the National Malleefowl Conservation Genetics Study. Incidental malleefowl feathers were collected from 21 mounds on 9 grids in the region. The feathers were forwarded to Taneal Cope in March 2011 for analysis.

Mallee Eco Services also assisted with a DENR research project which examined the effects of the Australian plague locust control program in the region on malleefowl breeding activity. The project ran concurrently with the monitoring program and Murraylands monitoring volunteers also assisted DENR staff with the fieldwork.

Mallee Eco Services provided input and advice to the newly formed Malleefowl Monarto group in relation to the proposed upgrade of Ferries MacDonald Road and associated potential impacts on the Ferries MacDonald Conservation Park. Feedback and advice was also provided to the Malleefowl Preservation Group (WA) and Malleefowl Monarto in relation to a proposed re-surveying of the existing grid at Ferries MacDonald Conservation Park and a search for malleefowl mounds in the remainder of the Park.

Mallee Eco Services is also currently assisting DENR with preparations for the 4th National Malleefowl Forum to be held in Renmark later this year.

7.0 Promoting the adoption of the standard survey protocols

This objective has been largely achieved over the course of the last 7 years. All the main groups and individuals involved in regular malleefowl monitoring across the region are now using the new standard monitoring procedures and all of the monitoring data being collected is being captured by the national database.

8.0 Volunteer training

No new volunteers were trained during the 2010/2011 season, but refresher training was provided during surveys for existing volunteers as required.

Occupational health and safety protocols were implemented this season as required by DENR. This mainly involved the use of the DENR duty officer for checking in and checking out of grids. Handheld UHF radios were also used during surveys where multiple groups of volunteers were on grids at the same time.

Murraylands volunteers were kept up to date on monitoring progress throughout the season and a copy of this report will be forwarded to all volunteers involved in the monitoring program, as has happened in previous years.

9.0 Trialling MobileMappers

After investigations and trials at the national level, Magellan MobileMappers were recommended as the best option to replace the ageing Palm 3xe units in the monitoring kits.

One MobileMapper was provided by DENR this season for trialling. It soon became apparent that it would be inappropriate to attempt to trial the unit with volunteers until we had had the opportunity to fully familiarise ourselves with the operation of the units and their idiosyncrasies.

To this end we set up a unit for monitoring and trialled the unit ourselves, although the trialling was limited to surveys later in the season that we attended ourselves.

At this point it is too early to provide detailed feedback on the operation and performance of the units, but we will be in a better position to trial the units with experienced volunteers next season.

We will also continue to maintain contact with other MobileMapper users in SA and interstate to progress the phasing in of these units.

10.0 Issues raised during the 2010/2011 season

10.1 Murraylands volunteer network

If DENR wishes to continue expanding the network of volunteers for malleefowl monitoring in the Murraylands Region then the focus should be on recruiting volunteers from outside the region. It is obvious that there is considerable local interest in malleefowl conservation, but it is proving difficult to translate this interest into local people volunteering their time for grid monitoring and this has always been the case.

Despite this, the Murraylands volunteer network has expanded over the last few seasons, to the point where we now only have trouble finding volunteers for the Bandon and Peebinga grids. This is mainly due to their relatively remote locations and the large number of mounds on these grids.

Another potential way of recruiting volunteers has also recently become available. Icare Communities (River Murray Urban Users) is an Adelaide based organisation which administers a community hub website that links environmental volunteers to events. Mallee Eco Services intends to register the Murraylands malleefowl monitoring program with this organisation on a trial basis.

10.2 Collection of environmental data

Work is continuing on compiling historical monthly rainfall figures and locating rain gauges that are both regularly monitored and as close as possible to each grid.

The aim with the collation of rainfall figures is to be able to graph breeding activity for each grid against annual rainfall and rainfall during the critical May to September period.

Mallee Eco Services is also currently assisting DENR to install an automatic weather station at the Bandon grid, which will be functioning later in 2011.

11.0 Recommendations for the continuation of the project

1. Ensure all available historical monitoring data has been entered onto the national database.

2. Continue the process of replacing the Palm 3xe units in the monitoring kits with MobileMappers.

3. Continue to identify a network of rain gauges in the project area for all existing grids. This should include landholders if their gauges are closest to the grids. Rainfall figures should indicate monthly totals as a minimum level of detail and be as close to the grids as possible.

4. Continue efforts to collect and collate historical rainfall figures as required. Rainfall data should be compiled from 2 to 3 years before the establishment of each grid to the present.

5. Purchase handheld UHF radios for the Murraylands monitoring kits. Five megawatt radios would give the best coverage.

6. Consider implementation of a simple uniform system for collecting fox baiting data across the SAMDB for all groups conducting fox baiting for malleefowl conservation eg. GPS and Palm system.

7. DENR should actively pursue adaptive management opportunities to progress the National Recovery Plan at a regional level. This would be a natural progression from the work done to date, which has mainly focussed on monitoring. One priority in the Murraylands Region would be fire management, as the understorey in many of the Murraylands parks is senescing (eg. Karte Conservation Park and Ferries MacDonald Conservation Park). Patchy, low intensity prescribed burns have the potential to rejuvenate the understorey, which is the vegetation layer that commonly contains plant species that provide food resources for malleefowl. Another priority would be fox baiting, which has become a contentious issue since the 2006 analysis of historical monitoring data, which did not conclusively show a benefit to malleefowl breeding activity from fox baiting.

12.0 References

Benshemesh, J. (2011)
Personal communication.

Benshemesh, J; Barker, R and MacFarlane, R (2006)
"Trend Analysis of Malleefowl monitoring data"
(Milestone 3 report to the Mallee CMA, Victorian Malleefowl Recovery
Group, and multi-regional "National Malleefowl Monitoring, Population Assessment and Conservation Action Project" steering committee).

Bureau of Meteorology (2011). Monthly rainfall totals provided from Renmark Irrigation, Renmark, Callington, Murray Bridge, Monarto Zoological Park, Danggali Conservation Park (Canopus), Waikerie, Waikerie Council Depot and Peebinga rain gauges for 2008, 2009 and 2010.

Short, H (2011)
Monthly rainfall totals provided for 2008, 2009 and 2010 for the Short's grid (s08).

Appendix 1: Survey results for the 2010/2011 breeding season

Grid	Mounds Visited	Active Mounds	New Mounds	Sightings
Bakara CP s07	56	1	0	0
Bandon (Burdett's HA) s67	59	6	0	0
Chowilla RR s09	18	0	0	0
Cooltong CP s03	40	1	0	0
Danggali CP 1 s05	10	1	0	0
Danggali CP 2 s15	7	0	0	0
Ettrick (Fullston's HA) s68	24	2	0	0
Ferries McDonald CP s10	61	6	0	1
Gluepot 11 s59	15	0	0	0
Gluepot 12 s60	15	0	0	0
Gluepot 15 s63	13	0	0	0
Gluepot 3 s52	23	0	0	0
Gluepot 5 s54	16	0	1	0
Gluepot 7 s56	15	0	0	0
Gluepot 8 s57	10	1	0	0
Karte CP s45	24	0	0	0
Murray Bridge AR s69	49	6	0	0
Peebinga CP s44	54	10	0	4
Pooginook CP s06	33	0	0	0
Shorts HA s08	41	1	0	0

Appendix 2: Murraylands Malleefowl Data Summary 1989 – 2010

Grid	Grid Area (ha)	Total number of mounds visited (number of active mounds)										
		1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
03 - Cooltong CP	400					36(13)	36(16)	40(8)	43(5)	41(1)	43(3)	43(2)
05 - Danggali CP 1	100					(2)	(0)	(1)	(0)	NS	(0)	(0)
06 - Pooginook CP	400		(6)	(8)	(12)	27(6)	(8)	(7)	(4)	33(0)	33(1)	33(0)
07 - Bakara CP	420	(12)	(12)	(10.5)	(13.5)	NA	NS	58(16)	59(17)	58(18)	(10.5)	56(7)
08 - Shorts HA	250	(9)	NS	(9)	NA	NS	NS	42(7)	(7.5)	(5)	45(7)	41(6)
09 - Chowilla RR	200						NS	18(0)	19(0)	19(0)	19(0)	20(1)
10 - Ferries McDonald CP	350	PS	(10)	41(10)	(10)	49(7)	NS	(8)	PS	NS	NS	60(5)
15 - Danggali CP 2	100					(0)	(1)	(0)	(0)	NS	(1)	(0)
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
03 - Cooltong CP	400	43(2)	43(2)	41(0)	41(3)	40(2)	41(0)	40(0)	39(0)	40(0)	40(0)	40(1)
05 - Danggali CP 1	100	(1)	(1)	NS	NS	(0)	(0)	10(1)	10(0)	10(1)	11(1)	10(1)
06 - Pooginook CP	400	33(1)	33(1)	NS	33(0)	33(1)	32(0)	33(0)	33(0)	33(0)	33(0)	33(0)
07 - Bakara CP	420	53(7)	55(2)	55(0)	56(0)	55(1)	56(4)	56(5)	56(1)	56(0)	56(1)	56(1)
08 - Shorts HA	250	40(1)	(3)	42(0)	42(0)	41(1)	41(1)	41(1)	41(1)	41(1)	41(1)	41(1)
09 - Chowilla RR	200	20(0)	20(2)	NS	NS	18(0)	18(0)	18(1)	18(0)	18(2)	18(1)	18(0)
10 - Ferries McDonald CP	350	60(3)	59(4)	NS	NS	31(3)	62(6)	61(1)	61(0)	61(3)	61(4)	61(6)
15 - Danggali CP 2	100	(0)	(0)	NS	NS	(0)	(0)	7(1)	6(0)	7(0)	7(0)	7(0)
44 - Peebinga CP	400		61(5)	NS	NS	50(3)	47(3)	50(2)	53(8)	53(8)	54(4)	54(10)
45 - Karte CP	400		21(0)	NS	NS	NS	18(1)	18(0)	24(3)	24(1)	24(0)	24(0)
46 - Billiatt CP	400		13(0)	NS	NS	NS	9(1)	NS	NS	NS	NS	NS
47/48/49 - Ngarkat CP	1200		34(1)	NS	NS	NS	17(0)	NS	NS	NS	NS	NS
52 - Gluepot 3	200					NS	9(0)	20(0)	23(0)	23(0)	23(0)	23(0)
54 - Gluepot 5	200					16(1)	15(0)	15(1)	15(0)	15(0)	15(0)	16(0)
56 - Gluepot 7	200					10(0)	13(0)	13(0)	15(0)	15(0)	15(0)	15(0)
57 - Gluepot 8	200					10(1)	9(0)	9(0)	9(0)	10(0)	10(0)	10(1)
59 - Gluepot 11	200					11(0)	12(0)	12(1)	12(0)	12(0)	15(0)	15(0)
60 - Gluepot 12	200					15(0)	14(0)	14(0)	14(0)	14(0)	14(0)	15(0)
63 - Gluepot 15	200					13(0)	13(0)	13(0)	13(0)	13(0)	13(0)	13(0)
67 - Bandon	675							58(5)	58(2)	58(5)	59(2)	59(6)
68 - Ettrick	155							26(2)	26(1)	26(1)	26(2)	24(2)
69 - Murray Bridge AR	375	NS	NS	NS	48(7)	49(7)	NS	48(6)*	NS	NS	48(5)	48(6)

NA = data not available
NS = not surveyed
PS = partial survey only (less than 10 mounds)
Partial survey - not all mounds visited
NOTE: Where the number of active mounds in brackets is the only figured included, these figures have been taken from the 2006 "Trend analysis of monitoring data"
** An additional 39(7) opportunistic mounds were surveyed outside grid*

Appendix 3: Rainfall data sources utilised in trend analyses

Grid	Bureau of Meteorology Station No.	Station Name	Comments
Cooltong CP s03	24003	Renmark Irrigation	All data and median rainfall figures
Danggali CP 1 s05 Danggali CP 2 s15 Chowilla RR s09	20044	Danggali Conservation Park (Canopus)	All data and median rainfall figures
Pooginook CP s06	24029	Waikerie (Eremophila Park)	All data and median rainfall figures
	24038	Waikerie Council Works Depot	Rainfall figures for Dec 2006 & May 2007
Bakara CP s07	n/a	Henry Short's Back Gauge	All data
Shorts HA s08	24535	Swan Reach	Median rainfall figures used only
Ferries MacDonald NP s10	24508	Callington	Median rainfall figures Data from 1986 – 1997 Rainfall figures for Oct 1999; Apr, Sept & Nov 2000; Oct 2001; Dec 2005; May 2006;Sept 2008; Dec 2009
	24582	Monarto Zoological Park	All data from 1998 onwards
Peebinga CP s44	25023	Peebinga	All data and median rainfall figures
Karte CP s45	25046	Pinnaroo (Kombali)	All data and median rainfall figures
Bandon (Burdetts HA) s67	25040	Bowhill	All data and median rainfall figures
Ettrick (Fullstons HA) s68	24510	Woodlands	All data and median rainfall figures
Murray Bridge Army Range s69	24521	Murray Bridge Comparison	All data and median rainfall figures
Gluepot Grids	20228	Gluepot Reserve (Gluepot)	All data and median rainfall figures