Operation Rainbow Roost
BirdLife Western Australia
May 2017

A report of BirdLife Western Australia.
Prepared by Robyn Pickering of Perth Birds and Bush.
Acknowledgements

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Project Summary

Rainbow Lorikeets were introduced to Perth in the 1960’s (Chapman 2005, Chapman and Massam 2006). Their population has increased rapidly since then and this has been detrimental to locally native fauna. An estimated 40,000+ Rainbow Lorikeets (RL) are now believed to be living in the greater Perth Metropolitan Area (Reeves and Scourse 2015, citing Ron Johnstone). These birds pose a major risk to Western Australian community values such as damage to infrastructure, displacement of native species, fouling and damage to private and public amenities and the potential to spread bird diseases. The Department of Food and Agriculture Western Australia (DAFWA) declared the Rainbow Lorikeet a pest species in the southern parts of the state in 2001 (Edwards 2002, Massam, Sinclair and Mawson 2006, Chapman and Massam 2006 and Massam and Wright 2008). Operation Rainbow Roost was commenced in March 2016 to address the management of Rainbow Lorikeets in the greater Perth Metropolitan Area.

The project aimed to provide a reporting tool for the community that is easy to use, is referenced to GPS systems and links to existing reporting mechanisms so that pest birds can be reported quickly and easily.

In September 2016 BirdLife Australia released the phone app “Birdata” for both Apple and Android phones. It was also released as a computer web-based system, allowing users to use their phones, tablets or computers to report bird data. This app includes several project specific sections, including those for Operation Rainbow Roost. This immediate email reports to the Department of Agriculture and Food Western Australia (DAFWA) of any Rainbow Lorikeets recorded outside of their control line. The Rainbow Lorikeet modifications to the Birdata app were launched in October 2016. Between the launch and the 15 March 2017 a total of 262 Western Australians had entered 2,439 surveys in the Birdata app.

BirdLife’s volunteer network was asked to seek out and map Rainbow Lorikeet Roost sites in southwest Western Australia. The mapping and counting of lorikeet roosts provide the best way to estimate the population of this highly invasive species. Over the course of the project 31 roost sites were found and confirmed. During the month of February 2017 volunteers were asked to count lorikeets at these roost sites to start assessing the population of Rainbow Lorikeets in the Perth region. During February a total of 13,047 lorikeets were counted at 27 of these roost sites and at a minimum a total of 480 lorikeets were estimated to be present at the remaining four sites. Further roost sites will be found and confirmed before the 2018 February roost count.

Data from a number of BirdLife databases were used to map the current distribution of the Rainbow Lorikeet. Rainbow Lorikeet breeding data was also extracted from the Birdata database/phone app. The database does not have many breeding records, however, with further community engagement it is expected that breeding records entered into the database will increase.

The Birdata database shows that across Perth the numbers of Rainbow Lorikeets are rapidly increasing, whereas the numbers of Red-capped Parrots and Australian Ringnecks are rapidly decreasing. In parts of the inner western
suburbs the Red-capped Parrot is now absent. In this same area the Australian Ringneck is now very uncommon.

Volunteers contributed to the project in several different ways. These were:
- Conducting bird surveys and entering the data into Birdata
- Reporting information to the Operation Rainbow Roost email and website form
- Conducting Rainbow Lorikeet roost counts.

In total the volunteer effort for the project is estimated to be 1386.5 hours. At a cost rate of $30 per hour this is estimated to represent $41,595.

Figure 1: Rainbow Lorikeets usually feed on nectar and pollen which is a food used by many other native species (Photograph by Bill Betts)
Introduction

An estimated 40,000+ Rainbow Lorikeets are now believed to be living in the greater Perth Metropolitan Area (Reeves and Scourse 2015 citing Ron Johnstone). These birds pose a major risk to Western Australian community values such as damage to infrastructure, displacement of native species, fouling and damage to private and public amenities and the potential to spread bird diseases.

To be able to manage the problems caused by pest birds we need to know the locations where the birds can be found and the numbers of birds in a specific area so that it is possible to determine the number of pest birds in the area.

The project aims to provide a reporting tool for the community that is easy to use, is referenced to GPS systems and links to existing reporting mechanisms so that pest birds can be reported quickly and easily and locations of key roosting sites identified. BirdLife has also mobilised its extensive volunteer network to seek out and map Rainbow Lorikeet Roost sites in southwest Western Australia.

This project is Stage 1 of a series of projects designed to manage Rainbow Lorikeets working with multiple stakeholders.

- Stage 1: Working with Community and BirdLife Western Australia to report Roosting Sites utilising phone app.
- Stage 2: Test the concept of Rainbow Lorikeet sterilisation with input from Universities and Stakeholders.
- Stage 3: Field trials and evaluation of sterilisation with stakeholder support (WALGA, etc.) based on the outcomes from Stage 1 and 2.

The app can also be used by the Department of Agriculture and Food WA (DAFWA) to review data on other pest birds in Western Australia.

Project Aims

This Stage 1 project aims to:

- Provide a reporting tool for the community that is easy to use, is referenced to GPS systems and links to existing reporting mechanisms so that pest birds can be reported quickly and easily and locations of key roosting sites identified.
- Seek out, map and count Rainbow Lorikeet Roost sites in southwest Western Australia.
- Determine the current distribution
- Increase awareness of this introduced pest species.
Results

Birdata app and website

In September 2016 BirdLife Australia released the phone app “Birdata” for both Apple and Android phones. It was also released as a computer web-based system, allowing users to use their phones, tablets or computers to report bird data. This app included several project specific sections, including those for Operation Rainbow Roost. This enabled immediate email reporting to the Department of Agriculture and Food Western Australia (DAFWA) of any Rainbow Lorikeets recorded outside of their control line (Figure 2). The Rainbow Lorikeet modifications to the Birdata app were launched in October 2016.

Figure 2: DAFWA Rainbow Lorikeet Control Line
Between the launch of Birdata and the 15 March 2017 a total of 262 Western Australians were using the app. These volunteers had entered 2,439 surveys in the Birdata app. During that time a total of 171 records of Rainbow Lorikeet in southwest Australia were entered into the Birdata database. From 1/1/2016 until the 31/12/2016 a total of 373 record of Rainbow Lorikeet in southwest Australia were entered into the Birdata database.

Distribution

Rainbow Lorikeets are largely confined to the urban areas in the Perth Metropolitan Area and its surrounds (Figure 3). They are found from Yanchep to Mandurah but are more densely populated in the inner metropolitan areas.

Figure 3: Birdata Rainbow Lorikeet records 1 Jan 2010 to 15 March 2017 and Aussie Backyard Bird Count data from October 2016.
Roost Sites

A total of 31 roost sites were confirmed. These are mapped in Figure 3 and listed in Appendix 1. Table 1 provides a guide to the number of roosts sites found in each local council area. The number of roosts per council area is largely related to the size of the council area and where active volunteers are located.

Figure 4: Confirmed Rainbow Lorikeet Roost Sites (blue dots) and lorikeet records (black dots)
Table 1: Number of Roost sites confirmed in each Local Government Area.

<table>
<thead>
<tr>
<th>Local Government Area</th>
<th>Number of Roosts Confirmed</th>
<th>Local Government Area</th>
<th>Number of Roosts Confirmed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armadale</td>
<td>3</td>
<td>Melville</td>
<td>6*</td>
</tr>
<tr>
<td>Belmont</td>
<td>1</td>
<td>Mundaring</td>
<td>1</td>
</tr>
<tr>
<td>Cambridge</td>
<td>1</td>
<td>Nedlands</td>
<td>1</td>
</tr>
<tr>
<td>Cannington</td>
<td>3</td>
<td>South Perth</td>
<td>1</td>
</tr>
<tr>
<td>Cottesloe</td>
<td>1</td>
<td>Stirling</td>
<td>4*</td>
</tr>
<tr>
<td>East Fremantle</td>
<td>1</td>
<td>Victoria Park</td>
<td>1</td>
</tr>
<tr>
<td>Gosnells</td>
<td>2</td>
<td>Vincent</td>
<td>1</td>
</tr>
<tr>
<td>Joondalup</td>
<td>3</td>
<td>Wanneroo</td>
<td>1</td>
</tr>
</tbody>
</table>

*Some data skew due to where active volunteers were located

Counts

Over the course of the project 31 roost sites were found and confirmed. During the month of February volunteers were asked to count lorikeets at these roost sites to start assessing the population of Rainbow Lorikeets in the Perth region. During February a total of 13,047 Lorikeets were counted at 27 of these roost sites and at a minimum a total of 480 lorikeets were estimated to be present at the remaining four sites. Appendix 1 shows the counts at each roost site. This data accounts for approximately 13,500 lorikeets or about one third of the current estimated population.

Further roost sites will be found and confirmed before the 2018 February roost count.

From the February 2017 roost counts the sites were categorised by roost size. Table 2 shows the categories used and the number of roosts that fall into each category for roost sites that were counted (i.e. not estimated).

Table 2: Roost site categories

<table>
<thead>
<tr>
<th>Number of lorikeets</th>
<th>Category</th>
<th>Number of roosts in each category</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-50</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>51-150</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>151-500</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>501-1500</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>1501-5000</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

The roosts with the highest counts were at Cottesloe and Cannington with counts of 3567 and 3093 lorikeets respectively.

Figure 5 is a map of the roost sites and their categories.
Aussie Backyard Bird Count

The BirdLife Australia Aussie Backyard Bird Count was conducted across Australia in October 2017. This is an ongoing BirdLife project that was first conducted in October 2015. While not a part of the Operation Rainbow Roost project, it provides some information to the project.

A total of 6154 people participated in the count in Western Australia. The bird species with the highest number of counts nationally and within Western Australia was the Rainbow Lorikeet (see Appendix 2). While Rainbow Lorikeets are native species in other Australian states, only the related Red-collared Lorikeet is present naturally in Western Australia. In total 11,897 Rainbow Lorikeets were counted during the Aussie Backyard Bird Count in Western Australia. The next most commonly counted species in Western Australia was the New Holland Honeyeater with 8,643 counted. Rainbow Lorikeets outnumbered New Holland Honeyeaters which are a very common and abundant locally native species with a much larger distribution in Western Australia.
Breeding records

The Birdata database has few records of Rainbow Lorikeet breeding. However, many Birdata survey volunteers do not note breeding records. A total of 47 breeding records have been recorded between October 1998 and March 2017. Figure 6 shows a histogram of these breeding records across each month of the year. This indicates that Rainbow Lorikeets have an extended breeding season which peaks in spring.

![Rainbow Lorikeet Atlas Breeding Data](image)

**Figure 6: Birdata Rainbow Lorikeet breeding records October 1998 to March 2017**

Lorikeets roost at their nesting site during the breeding season and roost sites have fewer Rainbow Lorikeets present. This was noticeable at sites where counts were repeated at different times of the year. Figure 7 shows the results of repeated roost counts at a roost site in Canning Vale. While Figure 8 shows the results of repeated roost counts at a roost site in Cottesloe.
Figure 7: Roost counts from Canning Vale during between March 2016 and March 2017.

Figure 8: Roost counts from Cottesloe during between March 2016 and March 2017.

Figure 9: This Rainbow Lorikeet took over a Striated Pardalote nesting hollow (Photograph by Bill Betts)
Increasing Awareness

A number of different media were used to increase awareness of this introduced pest species to members of BirdLife and the general public (Appendix 3). The media used were:

- Facebook posts by both BirdLife Australia and BirdLife Western Australia.
- Articles in BirdLife Western Australia’s Bird Notes, BirdLife Western Australia’s E-news and BirdLife Australia’s e-news.
- Article in the Urban Bushland Telegraph (August 2016).
- A media release resulted in radio interviews, printed newspaper articles and web based news reporting. Radio interviews were on ABC radio (December 2016 and January 2017) and 6PR (January 2017). Other reporting included The Wanneroo Times, North Coast Times, Joondalup Times, Kalumunda Reporter, The Advocate, and Mandurah Mail.
Volunteer effort

Volunteers contributed to the project in several different ways. These were:
- Conducting bird surveys and entering the data into Birdata
- Reporting information to the Operation Rainbow Roost email and website form
- Conducting Rainbow Lorikeet roost counts.

Operation Rainbow Roost was conducted from March 2016 until March 2017. During this time 370 Birdata surveys were entered with records of Rainbow Lorikeets within south Western Australia. Thirty eight of these surveys were over one day in duration and were not used in the survey statistics. The remaining surveys were:
- on average 64 minutes long,
- had a maximum survey time of 5 hours,
- had a minimum survey time of 1 minute,
- and a combined total survey time of 13.5 days (323 hours)

For the 38 longer surveys an estimate of 24 hours effort per survey was used as many of these surveys were weeklong surveys at the volunteer homes or workplaces and the survey time didn’t actually reflect the volunteer hours. Therefore an additional 912 hours of volunteer time was estimated as a total from these 38 longer surveys.

A total of 98 people contacted Birdlife to provide information about lorikeets in southwestern Australia. It is estimated that each person provided 15 minutes of their time to email or telephone BirdLife. This equates to 24.5 hours.

A total of 6184 people also provided survey data to the Aussie Backyard Bird Count for BirdLife Australia. No estimate of time was included for the volunteer effort.

During the project 102 roost counts were conducted with an average survey time of 35 minutes. It is estimated the average time the survey volunteers would have taken travelling to conduct the count was 40 minutes for a return journey. This brings the total estimated volunteer effort per survey to approximately 75 minutes or a total of 127 hours.

In total the volunteer effort for the project is estimated to be 1386.5 hours. At a cost rate of $30 per hour this is estimated to represent $41,595.
Discussion

Birdata App
The upgrades to Birdata and the introduction of the phone app and modifications for Rainbow Lorikeet reports in Western Australia are a major benefit for the current and future projects relating to the Rainbow Lorikeets. It provides additional data such as tree types being used, the lorikeet activities and a requirement for surveys to include counts of lorikeets. This is also providing data to DAFWA to ensure control of any lorikeets outside of the control line.

Distribution
Since Rainbow Lorikeets were first released in Western Australia in the 1960’s the population and distribution of the species has increased rapidly (Chapman 2005). Figure 11 shows the historic distribution of the Rainbow Lorikeet increased from a small area west of the City of Perth in 1968 to the present distribution covering the area from Yanchep to Mandurah and East to Northam (Figure 3).

![PERTH AREA DISTRIBUTION OF RAINBOW LORIKEETS 2009](image)

**Figure 11: Historic Rainbow Lorikeet Distribution (Department of Agriculture and Food, WA)**

In 2005 Chapman estimated that the population of Rainbow Lorikeets was 8,400, covered an area of 174 km² and was expanding its range at 0.7 km per year. In 2017 Rainbow Lorikeets now cover an area of 2950 km². In 2013 the population was estimated at 20,000 (DEC and DAFWA 2013) and this estimate was increased to 40,000 (Reeves and Scourse 2015 citing Ron Johnstone).

During this time control activities have been conducted by fruit growers, the Department of Parks and Wildlife and the Department of Agriculture and Food
Western Australia. Between 2007 and 2013 a total of 35,424 lorikeets were culled (DEC and DAFWA 2013). Further culling has occurred since 2013 by fruit growers and government agencies.

BirdLife databases and local birdwatchers have documented the spread of the Rainbow Lorikeet across the suburbs of Perth. The BirdLife WA database shows Rainbow Lorikeets were first recorded at Lake Joondalup in 1991 and personal survey data shows they reached Edgewater in 1992 (Neil Hamilton pers. comm.). During the February 2016 roost counts a single roost in Edgewater had at least 1005 Rainbow Lorikeets present. Other roosts nearby also hosted Rainbow Lorikeets.

Other first records for various suburbs are shown in Table 3.

Table 3: First records of Rainbow Lorikeet at locations across Perth

<table>
<thead>
<tr>
<th>Northern Suburbs</th>
<th>First Record</th>
<th>Southern Suburbs</th>
<th>First Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herdsman Lake</td>
<td>Prior to 1989*</td>
<td>Alfred Cove</td>
<td>1990*</td>
</tr>
<tr>
<td>Lake Joondalup</td>
<td>1991*</td>
<td>Blue Gum Lake</td>
<td>1994*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bibra Lake</td>
<td>1995*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yangebup Lake</td>
<td>2000*</td>
</tr>
<tr>
<td>Eastern Suburbs</td>
<td>First Record</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ray Marshall Park</td>
<td>Prior to 1999*</td>
<td>Kogolup Lake</td>
<td>2002*</td>
</tr>
<tr>
<td>Bickley Brook</td>
<td>2002*</td>
<td>Thomson’s Lake</td>
<td>2007*</td>
</tr>
<tr>
<td>Ellis Brook</td>
<td>2002*</td>
<td>Wellard Wetlands</td>
<td>2008*</td>
</tr>
<tr>
<td>Bungendore</td>
<td>2012*</td>
<td>Lake McLarty</td>
<td>2014*</td>
</tr>
</tbody>
</table>

*=BirdLife WA database

Counts

The February 2017 roost counts provided a starting point to future assessment of the Rainbow Lorikeet population. In February 2017 a total of 13,500 lorikeets were counted at 31 roost sites. However, many more roost sites need to be found and counted. BirdLife has received funding from State Natural Resource Management for 2017/2018 to continue and broaden the project (Stage 2a). This will enable more roost sites to be confirmed and counted in February 2018.

Previous data on counts of Rainbow Lorikeets include:
- February 2008 count at Perth Airport by DAFWA of 4154 and in February 2009 of 3984 lorikeets (DAFWA pers. comm.)

With many roosts to be found in the northern suburbs, eastern suburbs and areas south of the City Of Cockburn it is likely the next roost count will be closer to the population estimate of 40,000+ lorikeets (Reeves and Scourse 2015 quoting Ron Johnstone). Further publicity and work finding roost sites will enable a better understanding of the population and areas of larger density of the species.
There appears to be a geometric pattern in the locations of roost sites with sites approximately 5 kilometers apart. While this pattern is not consistent across the Perth region it may be useful in identifying other roost sites. Figure 12 shows all the confirmed roost sites and their categories with 5 kilometer buffers around roost sites from Category 2 to 5 (i.e. sites containing 51 to 5000 Rainbow Lorikeets). Often roost sites are located on the buffer line from the next roost site. This somewhat orderly nature of roost site locations may be related to geographical features, food resources and feeding distances.

Figure 12: Roost Sites with 5 km buffers around category 2 to 5 roosts. Rainbow Lorikeet Roost Categories: Red=Category 5, Orange=Category 4, Yellow=Category 3, Green=Category 2 and Blue=Category 1

Some volunteers have suggested improvements for the 2018 count. These included arriving 15 minutes prior to the count to determine the best viewing site and wearing a badge to identify other people involved in the count.
Breeding Records

Relatively few breeding records have been recorded in the Birddata database since 1998. It appears that few users of the database report breeding records. Further publicity among users should enable a better picture of breeding timing and locations.

In Perth they are known to nest in eucalypt hollows and in the dead leaves and frond bases of Cotton Palm and Date Palm according to Chapman and Massam (2006) and Higgins (1999) (citing Lamont 1996). In other parts of Australia they are known to nest in *Eucalyptus*, *Angophora* or *Melaleuca* trees and artificial sites (Higgins 1999). During this project several Rainbow Lorikeets were seen nesting in artificial nest boxes.

It is believed that the species is monogamous and probably pair for life and that the pairs remain close to each other at all times (Higgins 1999). This is noticeable at roost sites where most birds arriving will arrive in pairs. Captive birds are sexually mature at 18 to 24 months old (Higgins 1999 quoting Sindel). Clutch sizes ranch from 2 to 4 but usually 2 (Higgins 1999).

Impacts of Rainbow Lorikeets

The introduction of Rainbow Lorikeets to Perth has resulted in many impacts. These include:

- A threat to the locally declining Red-capped Parrot, Western Rosella and Australian Ringneck from nesting hollows competition. They are known to kill the nestlings of other species (Chapman 2005).
- Threats to the endangered Carnaby’s Black-Cockatoo, Forest Red-tailed Black-Cockatoo and Baudin’s Black-Cockatoo (http://birdlife.org.au/projects/southwest-black-cockatoo-recovery) due to flow on nest hollow displacement by the other parrot or cockatoo species (Ron Johnstone per. comm.) and food competition, as Rainbow Lorikeets eat seeds, including those from pine trees.
- Threats to nectar feeding birds and other animals due to food competition.
- Potential to spread bird diseases including *psittacine* beak and feather disease to native bird species (Chapman and Massam 2006, DEC and DAFWA 2013).
- Damage to private and commercial fruit crops (Chapman 2005, Chapman and Massam 2006). The Department of Agriculture and Food, WA estimate Rainbow Lorikeets to damage approximately $3 million worth of commercial fruit crops each year in south west Australia (Cook 2014).
- Damage to infrastructure, fouling and damage to private and public amenities (Chapman 2005, Chapman and Massam 2006).
- The large roost of over 1000 birds at Perth airport may also pose a risk of bird-strike to aircraft (Chapman 2005, Chapman and Massam 2006).

The impact of the Rainbow Lorikeet on locally native species is difficult to quantify. A major difficulty is that differences in species presence over time may be due to multiple factors including the degree of urbanisation, Rainbow Lorikeet presence and other factors.
Data from the Birdata database indicates that the Red-capped Parrot has declined while the Rainbow Lorikeet continues to increase in number and range. Figure 13 shows that in the historic distribution area of the Rainbow Lorikeet from the late 1960’s there are currently very few records of Red-capped Parrot presence. It is likely that a combination of urbanisation and the long term presence of Rainbow Lorikeet in this area west of the City of Perth have impacted the Red-capped Parrot population. Both of these species nest in tree hollows.

Long term residents in this area have reported that Red-capped Parrot was previously present in areas such as Nedlands but have not been seen in recent years. People who have reported the loss of this species feel that the Rainbow Lorikeet has driven the local parrot species out of this area (S. Mather pers. comm.).

The Birdata database also shows the Australian Ringneck is declining across the metropolitan area and this is supported by anecdotal reports from birdwatchers. Figure 14 compares the Birdata records of Rainbow Lorikeet and Australian Ringneck for 500m surveys undertaken between 2010 and 2017. This again shows a reduced presence of Australian Ringneck within the historic area of Rainbow Lorikeet presence.

Between 2010 and 2017 there were 107 records of Rainbow Lorikeets near to Herdsman Lake while only 12 records of Australian Ringnecks, no records of Red-capped Parrots, 60 records of New Holland Honeyeaters, 92 records of Brown Honeyeaters, 113 records of Singing Honeyeaters and 118 records of Red Wattlebirds. While not conclusive this suggests that the parrots and some of the honeyeater species may be impacted upon by Rainbow Lorikeets and/or urbanisation.
Compare this to the 500m survey data for the period 1/1/1998 to 1/1/2005 (Figure 15). This shows that during this earlier seven year period the Australian Ringneck was more abundant at Herdsman Lake with a total of 52 records compared with 132 records of Rainbow Lorikeets in the area around Herdsman Lake. For the period 1998 to 2005 Rainbow Lorikeet were reported 2.5 times for every Australian Ringneck reported, while in the period 2010 to 2017 Rainbow Lorikeet were reported 8.9 times for every Australian Ringneck reported for the area surrounding Herdsman Lake. It is useful to compare the data at Herdsman Lake as many surveys are conducted at this location by a number of different volunteers providing better statistical comparisons. Further data is compared in Table 4.
Table 4 compares the number of Australian Ringneck and Rainbow Lorikeet records from Birdata 500 meter survey at various locations across Perth. This data showed that from 1998 to 2005 at most sites Australian Ringneck was more likely to be encountered than Rainbow Lorikeet. But during the period 2010 to 2017 Rainbow Lorikeet was more likely to be encountered than Australian Ringneck at all of these locations. There has been an observable decrease in Australian Ringneck records compared to Rainbow Lorikeet records.

Table 4: Number of Birdata Records of Australian Ringneck and Rainbow Lorikeet at locations across Perth and the ratio of these.

Note: when the ratio is greater than 1 then fewer Rainbow Lorikeets are observed compared to Australian Ringneck and when the ratio is less than 1 then Rainbow Lorikeets are detected more often.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Australian Ringneck</strong></td>
<td><strong>Rainbow Lorikeet</strong></td>
<td><strong>Australian Ringneck</strong></td>
<td><strong>Rainbow Lorikeet</strong></td>
<td><strong>ratio</strong></td>
<td><strong>ratio</strong></td>
</tr>
<tr>
<td>Joondalup Lake</td>
<td>25</td>
<td>16</td>
<td>1.56</td>
<td>158</td>
<td>214</td>
</tr>
<tr>
<td>Herdsman Lake</td>
<td>52</td>
<td>132</td>
<td>0.39</td>
<td>12</td>
<td>107</td>
</tr>
<tr>
<td>Lake Claremont</td>
<td>28</td>
<td>28</td>
<td>1.00</td>
<td>7</td>
<td>33</td>
</tr>
<tr>
<td>Kings Park</td>
<td>74</td>
<td>90</td>
<td>0.82</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Alfred Cove</td>
<td>55</td>
<td>55</td>
<td>1.00</td>
<td>27</td>
<td>60</td>
</tr>
<tr>
<td>Bull Creek</td>
<td>90</td>
<td>112</td>
<td>0.80</td>
<td>35</td>
<td>48</td>
</tr>
<tr>
<td>Bibra Lake</td>
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<td>53</td>
<td>1.57</td>
<td>27</td>
<td>45</td>
</tr>
<tr>
<td>Yangebup Lake</td>
<td>28</td>
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<td>2.83</td>
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Similarly Table 5 compared the number of Red-capped Parrot and Rainbow Lorikeet records from Birdata 500 meter surveys at various locations across Perth. These data showed that from 1998 to 2005 at most sites Red-capped Parrot was only more likely to be encountered than Rainbow Lorikeet at Thomson’s Lake and was absent in the inner north-western suburbs. During the period 2010 to 2017 Rainbow Lorikeet was more likely to be encountered than Red-capped Parrot at all of these locations and the ratios of Red-capped Parrot to Rainbow Lorikeet had dropped at most sites.
Table 5: Number of Birddata Records of Red-capped Parrot and Rainbow Lorikeet at locations across Perth and the ratio of these. Note: when the ratio is greater than 1 then fewer Rainbow Lorikeets are observed compared to Red-capped Parrots and when the ratio is less than 1 then Rainbow Lorikeets are detected more often.

<table>
<thead>
<tr>
<th></th>
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<tr>
<td></td>
<td>Red-capped Parrot</td>
<td>Rainbow Lorikeet</td>
<td>ratio</td>
</tr>
<tr>
<td>Joondalup Lake</td>
<td>4</td>
<td>16</td>
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<tr>
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<tr>
<td>Alfred Cove</td>
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<td>0.13</td>
</tr>
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<td>Bull Creek</td>
<td>31</td>
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<td>Bibra Lake</td>
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<tr>
<td>Thomson’s Lake</td>
<td>17</td>
<td>6</td>
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Further research is required to estimate the impact of Rainbow Lorikeet. Long term monitoring data such as the BirdLife Western Australia database and Birddata are extremely important tools for measuring impacts.

DAFWA estimate that Rainbow Lorikeet damage approximately $3 million worth of commercial fruit crops each year in south west Australia (Cook 2014). DAFWA are controlling lorikeets to a containment line (Figure 1) to ensure that the species does not establish within the major fruit production areas of the south west such as Margaret River.

**Rainbow Lorikeet Management**

In 2005 Chapman recommended a Rainbow Lorikeet management program should include the following objectives:

1. Investigate sources and obtain the funding to manage the population.

2. Estimate the number of birds in the Perth population, establish its distribution and locate major roost sites.

3. Alter the status of the rainbow lorikeet in south-west Western Australia so that it is a declared pest in the metropolitan area (alter to A2; ‘subject to eradication in the wild’ south of the 20th parallel of latitude, and A5; ‘numbers to be reduced/controlled’ in the Perth metropolitan area).

4. Investigate methods of population reduction in the metropolitan area and document their effectiveness.
5. Educate the public on the impacts of Rainbow Lorikeets and the need for control.

6. Eradicate Rainbow Lorikeets that are sighted outside the metropolitan area.

7. Investigate and document the effectiveness of methods for the mitigation of agricultural damage.

8. Conduct a cost/benefit analysis of the damage caused by Rainbow Lorikeets and lorikeet control.

9. Develop a molecular approach to population control and management.

10. Review standards for the import and keeping of Rainbow Lorikeets to reduce the risk of aviary escapes.

(extract from Chapman 2005)

Many of these actions have occurred or have commenced. The present work being undertaken in this report addresses recommendation 2.

In 2006 DAFWA altered the declared status of the Rainbow Lorikeet as recommended by (Chapman 2005), to also include the Perth metropolitan area Massam & Wright 2008). The current status of the Rainbow Lorikeet can be found in the Western Australian Organism List at https://www.agric.wa.gov.au/bam/western-australian-organism-list-waol.

Figure 16 Rainbow Lorikeet Pest Status on 27/4/17 (https://www.agric.wa.gov.au/organisms/118586?search_string=Rainbow%20lorikeet &per-page=20&sort-by=taxon&order-by=asc)

NOTES: C1 - Exclusion / Exempt: Organisms which should be excluded from part or all of Western Australia. C3 - Management / Exempt: Organisms that should have some form of management applied that will alleviate the harmful impact of the organism, reduce the numbers or distribution of the organism or prevent or contain the spread of the organism.
Anyone who owns a Rainbow Lorikeet is required to have a Department of Parks and Wildlife Avicultural License.

BirdLife Australia has two policies relevant to pest species management. These are the Invasive Species Policy and the Pest Bird Management Policy (http://birdlife.org.au/conservation/advocacy/policies). The Invasive Species Policy states that “BirdLife Australia supports control of invasive fauna by lethal means (e.g. culling) where proven necessary to protect biodiversity or native ecosystems provided that controls are undertaken within the appropriate legal frameworks, are humane, and designed to be effective and lasting.”. The Pest Bird Management Policy states that “BirdLife Australia supports efforts to limit the negative impacts on native biodiversity of pest species, including birds, whether introduced or native.”.

However, these statements are qualified with:
- Using an “evidence-based approach to defining and controlling the social, economic and environmental impacts of pest species and supports research aimed at providing that evidence.”
- Using a ”planning approach within existing regulatory frameworks. This should be based on science and community participation to manage wildlife populations in the context of their environment – both natural and anthropogenic.”
- And “Pest bird management should focus on identifying and managing impacts to acceptable levels and involve ethical considerations.”

As such BirdLife Western Australia recommends further research into assessing the impacts of the Rainbow Lorikeet on native bird species and non-lethal management options. But it is also supportive of control measures being undertaken by government organisations and fruit growers as long as these control measures are within appropriate legal frameworks, are humane and designed to be effective and lasting.

One method of potentially reducing the increase in the Rainbow Lorikeet population is to reduce breeding sites that are not used by other species. The Department of Parks and Wildlife has a factsheet on proper maintenance of palm fronds to reduce lorikeet nesting opportunities (Appendix 4). Rainbow Lorikeets nest in the bases of fronds of some species of palm as well as tree hollows (Chapman and Massam 2006). Management actions such as palm maintenance will aid in reducing breeding and ensure population increases will be limited.
Conclusions and Recommendations

Operation Rainbow Roost has successfully met the aims of the project. The Birdata app has been launched and is providing data to BirdLife Australia and the Department of Food and Agriculture about Rainbow Lorikeets in southwest Australia. Further publicity is recommended to ensure more bird watchers commence adding data to Birdata. DAFWA are already receiving reports of Rainbow Lorikeets outside of their control line and will take action to control birds outside of this area to protect fruit growers.

Since Rainbow Lorikeets were first released in Western Australia in the 1960’s the population and distribution of the species has increased rapidly (Chapman 2005, DEC and DAFWA 2013). This change in distribution has been documented in the Birdata database and BirdLife Western Australia bird database.

A shocking reflection of the sheer abundance of the species is evident during the annual BirdLife Australia Aussie Backyard Bird Count. In total 11,897 Rainbow Lorikeets were counted during the Aussie Backyard Bird Count in Western Australia in 2016. The next most commonly counted species in Western Australia was the New Holland Honeyeater with 8,643 counted. It is alarming that Rainbow Lorikeet outnumbered New Holland Honeyeater which is a very common and abundant locally native species with a much larger distribution in Western Australia than the lorikeets.

Relatively few breeding records have been recorded in the Birdata database since 1998. It appears that few users of the database report breeding records. It is recommended that users are requested to report breeding records.

In February 2017 a total of 13,500 lorikeets were counted at 31 roost sites. However, many more roost sites need to be found and counted. With many roosts to be found in the northern suburbs, eastern suburbs and areas south of the City Of Cockburn it is likely the next roost count in February 2018 will be closer to the population estimate of 40,000+ lorikeets (Reeves and Scourse 2015 citing Ron Johnstone). It is recommended that further publicity and work finding roost sites is done prior to the February 2018 roost count.

Birdata records indicate that as Rainbow Lorikeets have increased in numbers and range, the locally native Red-capped Parrot and Australian Ringneck have declined dramatically. This change in the bird community is supported further by comments from the long term bird watching community. Further work on documenting impacts to native species and documenting observations of local birdwatchers is recommended.

With many impacts from this pest species it is recommended that pest bird management techniques need to be reviewed and adopted. BirdLife Western Australia recommends further research into assessing the impacts of the Rainbow Lorikeet on native bird species and non-lethal management options.

This project is Stage 1 of a series of projects designed to manage Rainbow Lorikeets.

- Stage 1: Working with Community and BirdLife Western Australia to report Roosting Sites utilising phone app.
- Stage 2: Prove the concept of Rainbow Lorikeet sterilisation with input from Universities and stakeholders.
- Stage 3: Field trials and evaluation of sterilisation with stakeholder support (WALGA, etc.) based on the Stage 1 and 2.

Birdlife has received funding from State Natural Resource Management to continue working on Stage 1 by documenting roost sites and to commence work on Stage 2 by trialling nectar feeders at locations across Perth. The nectar feeders will only contain nectar and will be used purely to determine what species visit these feeders (Stage 2a). This work will be undertaken between April 2017 and July 2018. This extension of the project will better inform government for control and management actions.

During the current project the Rainbow Lorikeet Working group was re-established to provide input to the project and ensure various agencies are up to date with research and management progress. It is recommended that this group continues to meet to ensure options for future management and control of the species by DAFWA and DPaW occurs sooner rather than later.
References


Department of Environment and Conservation and Department of Agriculture and Food Western Australia (2013). Introduced Corella and Rainbow Lorikeet Response Strategy 2013. Developed by the Department of Environment and Conservation and the Department of Agriculture and Food, WA.


Reeves, Andrew and Scourse, Brett (2015). Situation Statement: Rainbow Lorikeet. The Department of Agriculture and Food, WA.
Appendix 1

February 2017 Roost counts

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<td><strong>480</strong></td>
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Appendix 2
2016 Aussie Backyard Bird Count Infographic

Australia counted 1,398,487 birds!

Compared to:
- 1,009,894 (2015)
- 852,318 (2014)

583 different species


583 different species

Birds counted in each state:
- NSW 489,210
- QLD 373,520
- VIC 234,693
- WA 140,494
- SA 77,094
- NT 40,686
- TAS 22,030
- ACT 14,979

61,418 people participated

45,411 checklists submitted
Next year’s Aussie Backyard Bird Count will be held from 23 - 29 OCTOBER 2017
Appendix 3
Awareness Raising/Media reports

There were posts to BirdLife Western Australia Facebook page on 23/6/2016 (28 shares), 26/7/2016, 27/11/2016, 10/1/2017 (51 shares) and 16/2/2017.

There was one post to the BirdLife Australia Facebook page on 10 January 2017 which received 241 likes and 59 shares to other pages, reaching over 4,500 people.
Appendix 3
Awareness Raising/Media reports

Western Australian Bird Notes
September 2016

Urban Bushland Telegraph
August 2016
The rainbow lorikeet may look a pretty bird, but experts say they are an aggressive pest. Picture: Maris Lauva

PEOPLE are being encouraged to join in a bird count to track the number of rainbow lorikeets around Perth.

BirdLife WA and the Department of Food and Agriculture WA have launched Operation Rainbow Roost aiming at recording the population of the pretty pest.

The avian organisation estimates more than 40,000 rainbow lorikeets are present from Yanchep to Mandurah and east to Chidlow, a dramatic increase since the 1960s when 10 birds were released.

BirdLife WA chairman Mike Bamford said the birds were aggressive and detrimental to local parrot populations.

“The red-capped parrot is now almost extinct from a large part of the Perth metropolitan area and it’s likely that the rainbow lorikeets have been a significant contributor to this loss,” he said.

Mr Bamford said the lorikeets also threatened the endangered Carnaby’s black cockatoo, as they displaced the cockatoos from tree hollows where they both nest.

People are encouraged to report sites where the lorikeets roost at night, as well as any sightings outside the metropolitan area.

Visit the Birdlife WA site or call 9383 7749.
Appendix 4
Department of Parks and Wildlife Palm Maintenance Fact Sheet.

Information for landowners and land managers

Maintaining palms to limit breeding habitat for introduced rainbow lorikeets

Rainbow lorikeets (Trichoglossus haematodus) (figure 1) are an attractive but troublesome introduced bird inhabiting many areas in the Perth metropolitan area. Rainbow lorikeets are listed as a declared pest in the southern parts of Western Australia due to the risk to the agricultural industry through direct impacts on fruit crops. They also pose a threat to native wildlife through competition for nest hollows and food, and are a community concern due to the noise they can make in roosts, fouling under roost trees, and other matters including aircraft collisions if roosting in the vicinity of airfields.

In WA, only the red-collared subspecies of the rainbow lorikeet occurs naturally, in the Kimberley region. In Perth, rainbow lorikeets were first recorded in central and western suburbs of Perth in the 1960s. Since their establishment they have increased in number and continued to spread, covering an estimated 174km² by 2006.

A targeted strategy to manage the impacts of introduced rainbow lorikeets in the Perth area was undertaken between 2006 and 2013. During this time, the Department of Parks and Wildlife with support from the Department of Agriculture and Food, the Swan Valley Declared Species Group and private managers, removed over 34,000 rainbow lorikeets.

The residual populations of rainbow lorikeets that remained are again increasing and land managers across all land tenures need to take action to prevent these birds again posing a significant threat to native wildlife and agriculture.

The Department of Parks and Wildlife has identified palm trees as important breeding habitat for introduced rainbow lorikeets. During the breeding season individual palm trees often have multiple pairs of these birds nesting in behind the old leaf bases (leaf sheath and petiole) (see figure 2 & 4). By simply cutting away any old leaf bases, leaving just the trunk to the crown, removes this breeding habitat (see figure 3).
Maintaining palm trees is an effective non-lethal and pro-active action that landowners and land managers can do to limit the amount of breeding habitat available and help limit the impact that rainbow lorikeets are having on native wildlife and fruit growers. Pruning should be done outside of the rainbow lorikeet breeding period (September – November) as a humane measure to avoid destroying active nests.

Land managers in Perth are encouraged to maintain palm trees in this manner to reduce the breeding opportunities for rainbow lorikeets.