Wolli Creek Birdos Statistical Analyses

Summary Report, 2020

# Introduction

These analyses of the WCPS bird survey data were conducted by a group of final year undergraduate students of Statistics from Macquarie University, as part of their studies. I would like to thank Angela Powell, who arranged the contact and Drs Ayse Bilgin & Hassan Doosti for approving the project.

The purpose of the research was to look at the differences in the populations of birds seen in the 3 time periods 1994-1999, 2008-2013 and 2014-2019. These periods are the last 5 years of surveys Neil Rankin did and 2 sets of 6 year periods from the current surveys. This keeps the time dimension fairly constant while analysing the changes in occurrence (number of times the species was seen) or abundance (number of birds seen – only recorded for 2008-2013 and 2014-2019).

Initial analyses looked at simple comparisons that were largely done in spreadsheets. These are summarised below with links to the detailed reports in DropBox. They have been distributed previously and shared on the Wolli Birds FaceBook page. This is a combination of all those FaceBook posts <https://www.facebook.com/WolliCreekBirdos>

Because of problems with the Wolli Birds email list, I am resending the report links for those who may not have received them.

Maps of the current survey sites are at:

<https://www.dropbox.com/s/55d6p97n2qjgfgv/SurveyMaps-2020.pptx?dl=0>

The final analyses were full statistical analyses using methods such a regression analysis and T-test. The purpose was to confirm that the changes seen by simpler analyses are valid changes, not just the result of intermittent surveys & some differences in survey methods. For example, some teams don’t record counts for birds heard only, other teams estimate the number of birds & record that. There are also changes in the areas surveyed over time. We are not entirely sure of Neil Rankin’s survey routes so the mapping between them & the current routes is an estimate only.

The overall results show a general decline in occurrence between the 20th Century records & the 21st Century records. There is overall no difference between the 2 sets of 21st century data, but a more detailed analysis shows variations in some groups.

Details of the report can be found at DropBox share

The records used in these analyses are made available by the Wolli Creek Preservation Society [www.wollicreek.org.au](http://www.wollicreek.org.au/) under a Creative Commons Attribution 3.0 Australia license.

# Summary of Reports

This is a summary of the contents of each report. The details can be seen by following the Dropbox link. The reports are also on Facebook: <https://www.facebook.com/WolliCreekBirdos> is a public site for our news, details of our survey sites and other important info.

## Report 1 – Records per Year

A graph showing the number of bird sightings recorded per year. Its purpose is to see the fluctuations in survey activity over time.

DropBox share <https://www.dropbox.com/s/4hv58fl2qa2u5ri/AnalysisReport1.pdf?dl=0>

## Report 2 – Surveys per Site

This table shows the number of surveys conducted for each site and the amount of other data recorded about the surveys. Its main purpose is to align the data for the areas surveyed by Neil Rankin against the areas surveyed by the Current Teams, so that we can compare like with like.

DropBox share <https://www.dropbox.com/s/4hv58fl2qa2u5ri/AnalysisReport1.pdf?dl=0>

## Report 3 - Most Common Species

This is a list of the most common species then (Neil Rankin’s data) & now (Current surveys). This analysis looks at the number of times a species was seen. We don’t have counts for Neil’s records so we don’t know if the populations are increasing or decreasing. Future reports will look at this for the Current Surveys.

This chart compares the most commonly observed species in Neil Rankin’s time (pre 2000) with the most common from our current surveys, looking at the Eastern end of the valley only (the area that Neil surveyed). The most notable changes:

* The foreigners - starling, sparrow & rock dove have gone with spotted dove moved down to #17 & common myna to #18.
* Yes, the big birds – rainbow lorikeet & currawong have moved in, along with the sulphur crested cockatoo, while ravens & magpies are still much the same. But quite a lot of small birds are holding their own – silvereyes, superb fairy wrens, bulbuls, welcome swallows & magpie larks.
* Some new small birds have moved in too – honeyeaters, pardalote, red-browed finch & white-browed scrubwren.
* The most notable loss is the black-faced cuckoo shrike, which has moved to the western end of the valley.
* The waterbirds have apparently gone too, but the pre-2000 data includes Barton Park (aka Landing Lights Wetland), which is no longer surveyed.

So the situation looks quite good.

Dropbox link <https://www.dropbox.com/s/t2t5jmtlx69jhyb/Wolli%20creek%20top%2020%20observed%20species.pdf?dl=0>

**Report on least common species**

The students also produced this report from the ALA database. As such, it only includes birds seen on surveys. It does not include the incidental sightings reported by email – there are over 1000 of these which have not been entered in the database. So the report is not published as it is not a comprehensive list.

## Report 4 - ‘Neil Rankin’ Report

This is the nearest I can get to a sequitur for Neil Rankin’s publication. It compares species over the 3 periods - 1994-99 Data (without Barton Park and Arncliffe Park), 2008-2013 Data and 2014-2019 Data, based on the % of times the species was seen, compared to the number of surveys where it could have been seen. This was the method used in the publication.

Dropbox link <https://www.dropbox.com/s/nl5wccgub091s05/Wolli%20creek%2094-99%2C%2008-13%2C%2014-19%20worked.xlsx?dl=0>

## Report 5 - ‘Statistical Analysis

The final analyses were full statistical analyses using methods such a regression analysis and T-test. The purpose was to confirm that the changes seen by simpler analyses are valid changes, not just the result of intermittent surveys & some differences in survey methods. For example, some teams don’t record counts for birds heard only, other teams estimate the number of birds & record that. There are also changes in the areas surveyed over time. We are not entirely sure of Neil Rankin’s survey routes so the mapping between them & the current routes is an estimate only.

The overall results show a general decline in occurrence between the 20th Century records & the 21st Century records. There is overall no difference between the 2 sets of 21st century data, but a more detailed analysis shows variations in some groups.

Details of the report can be found at DropBox share

<https://www.dropbox.com/s/lkct1be7hh8h4et/Wolli%20Creek%20Birdos%20Statistical%20Analyses.docx?dl=0>