



Connecting Country

Restoring landscapes across Mount Alexander

WOODLAND BIRD MONITORING PROGRAM

- SUMMARY OF RESULTS FROM 2010 TO 2017 -

INTRODUCTION

Connecting Country has embraced the use of birds, and woodland birds in particular, as focal species for landscape restoration. They are an ideal focal species, as different species tend to use different habitats – and their presence or absence is an indicator of habitat type and quality. The *Victorian Temperate Woodland Bird Community* is classified as threatened at the state-level. Many of the bird species within this community are also individually listed as threatened in Victoria (e.g. Barking Owl) and/or nationally on the *Environment Protection and Biodiversity Conservation Act 1999* (e.g. Swift Parrot, Painted Honeyeater).

Since 2010, Connecting Country has carried out regular surveys of woodland birds to monitor avian changes in the regional environment. This Summary Report presents the survey methodology and results of Connecting Country's long term woodland bird monitoring program. In 2013, Connecting Country developed a detailed 10-year Woodland Birds Action Plan for the Mount Alexander region with the assistance of external experts. In 2014, Connecting Country became formally affiliated with BirdLife Australia and developed a data sharing agreement. In early 2017, we used our monitoring data to update our Woodland Bird Action Plan and develop targeted and scientific-based projects.

Connecting Country's long-term bird monitoring program was developed with the assistance of expert advice from Professor Andrew Bennett. Survey sites are located across the Mount Alexander shire and surrounds in both public and private land. Bird surveys are conducted using a standard technique (2 hectare, 20 minute survey). We would like to thank our database volunteer Cara Byrt, who developed a comprehensive fauna database, which has enabled us to collate, analyse and export our data with confidence.

The woodland bird monitoring program would not have been possible without the participation of landholders from throughout the Mount Alexander region who have generously granted Connecting Country staff access to their land for the seasonal bird surveys. We thank them for their participation and hope that the findings with the Summary Report are of interest, and further inspiration for their ongoing land restoration efforts.

Finally, thanks must go to our growing band of "citizen scientists" who have contributed bird survey records from both their properties and surrounding bushland areas. Thanks to all of you, we are able to present these findings.



Tanya Loos
Connecting Country Monitoring Coordinator, August 2017

CRESTED SHRIKE-TIT, PHOTO BY GEOFF PARK

SUMMARY OF SURVEY RESULTS

Seasonal differences observed: with more bird species recorded in spring/summer compared to winter.

164 bird species recorded from 2010 – 2017. Of these, 6 species are introduced species, and 34 are either threatened or of conservation interest.

Greater numbers of woodland bird species have been recorded in gully sites compared to sites on slopes and hilltops, suggesting these habitats are of great importance.

For our target species over 2010-2017 period, the reporting rate was steady for 4 species (Brown Treecreeper, Jacky Winter, Dusky Woodswallow, Scarlet Robin), decreased in 2 species (Diamond Firetail, Crested Shrike-tit), and showed a slight increase in one species (Hooded Robins). There was insufficient data to determine any trend for the Painted Button-quail.

CONNECTING COUNTRY’S WOODLAND BIRD ACTION PLAN

Woodland birds are of significant conservation concern across the temperate woodland habitats of south-eastern Australia. The threatened Victorian Temperate Woodland Bird Community has been defined as a suite of particular bird species, mainly associated with drier woodlands on the slopes and plains north of the Great Dividing Range, that seem to have declined markedly in numbers since records began. The description of this community also includes additional “associated” bird species which we have also treated as being of conservation concern. In all, there are 34 bird species from Victorian Temperate Woodland Bird Community that occur locally and are therefore regarded as woodland birds of conservation concern, See Appendix One.

Connecting Country’s Action Plan for Woodland Bird focuses on eight woodland bird species. These eight were selected on the basis of many factors, including:

1. They are widespread across the Mount Alexander Shire and surrounds in treed habitats of conservation interest (e.g. alluvial woodlands)
2. As a suite, they are indicators of the health of the woodland bird community more generally and are sensitive to the threatening processes impacting on woodland birds.
3. There is adequate Bird Atlas data across the project area.

TABLE 1: CONNECTING COUNTRY’S EIGHT TARGET SPECIES

| Species | Status across the project area (in suitable habitat) | Part of the Victorian Threatened Woodland Bird Community |
|----------------------|---|---|
| Jacky Winter | Common resident | Yes |
| Brown Treecreeper | Common resident | Yes |
| Diamond Firetail | Uncommon resident | Yes |
| Hooded Robin | Uncommon resident | Yes |
| Painted Button-quail | Uncommon resident - cryptic | Yes |
| Crested Shrike-tit | Relatively common resident | Yes ¹ |
| Dusky Woodswallow | Relatively common/partial migrant | Yes ¹ |
| Scarlet Robin | Relatively common resident | No |

¹ Crested Shrike-tit and Dusky Woodswallow are on the supplementary list of associated woodland birds, as part of the FFG nomination and the Dusky Woodswallow is regarded as a species of concern more generally

METHODS

SITE SELECTION

In 2010, bird survey sites were selected across the Mount Alexander region, and comprised of both private and public land sites. There have been some minor adjustments to the sites made over time. There are now 51 survey sites spread across five sub-regions (north-east, north-west, central, south-east, south-west). Each survey site is placed into one of the following categories:

- a. *'Intact'* sites are located in forest/woodland vegetation of good quality in the region, and are usually part of larger patches of native vegetation. These sites are typical of the goal that the planned management and restoration actions are aiming to achieve. Intact sites are then classified into one of two sub-types:
 - *'Gully'* – Survey sites located woodland and forests in low-lying areas or riparian habitats - often dominated by Yellow Box and River Red Gum. These are considered to be areas of higher fertility.
 - *'Slopes'* - Survey sites located woodland and forests in on slopes and hilltops - often dominated by trees such as stringybark and Red Box. These are considered to be areas of lower fertility.
- b. *'Restoration'* sites are located in historically modified areas where habitat restoration actions are planned or are already being undertaken. The restoration sites used for the surveys span the range of habitat enhancement activities supported by Connecting Country's programs. Restoration sites are classified into one of two sub-types:
 - *'Paddock Revegetation'*- Land that was previously cleared completely or has a few remnant trees, but is now being restored by one or more of tubestock plantings, direct seeding and natural regeneration.
 - *'Sub-canopy Restoration'* – Land with an existing mature tree canopy and with heavily modified or absent lower habitat layers, but is now being managed to restore understorey and midstorey vegetation (e.g. encouraging the return of a shrub layer through direct plantings and/or fencing to remove herbivorous livestock).
- c. *'Modified'* – Agricultural grasslands used for livestock grazing or cropping, where there are few scattered trees or shrubs, if any at all.

TABLE 2: EXAMPLE OF THE TEN SURVEY SITES IN ONE OF THE FIVE GEOGRAPHIC SUB-REGIONS:

| Site Code | Landholder / Site | Comments |
|-----------|----------------------------|---|
| NE-GY-01 | Pilchers Bridge Reserve | Gully site within intact vegetation |
| NE-GY-03 | Harcourt Reservoir NE side | River red-gum with intact understorey |
| NE-SP-03 | Mt Alexander | Slope site on the side of Mt Alexander |
| NE-SP-02 | Private land | Intact bushland on the edge of Castlemaine Diggings HNP |
| NE-RS-01 | Private land | Revegetated creekline |
| NE-MF-02 | Private land | Paddock site on working farm |
| NE-RS-03 | Private land | Intact canopy with supplementary planting for midstorey |
| NE-RS-08 | Private land | Trust for Nature bushland with supplementary planting |
| NE-PR-01 | Private land | Tubestock planting on paddock near base of Mt Alexander |
| NE-PR-02 | Private land | Direct seeding on paddock near base of Mt Alexander |

Key to table: NE = Northeast, GY= Intact Gully, SP= Intact Slope, RS = Sub-canopy Restoration, PR = Paddock revegetation, MF = Modified

SURVEY METHODOLOGY

Surveyors: The 51 sites classified above are known as “Official” sites, and surveys at these sites from 2010 to 2017 have been undertaken by a Connecting Country staff member. This person is able to identify birds confidently both by both visual identification and – where necessary - by call only. Over the course of the monitoring program, four people have undertaken the surveys.

Survey timing and effort: In order to capture the seasonal differences in bird populations that occur in south-eastern Australia, surveys were carried out in two seasonal periods: Winter (non-breeding and winter migrants) and Spring (breeding and spring/summer migrants). Each site is visited once in the morning and once in the afternoon during each survey period, totalling four site visits per year. Thus, for 51 sites, this represents 204 surveys per year.

Survey methods: Bird surveys are carried out using a standard technique (2.0 ha, 20 minute survey) used by other studies in the Box-Ironbark region and by Birds Australia. This involves the following steps:

- A transect line 250 m in length, with an area 40 metres on either side of the line surveyed for birds (250 m x 80 m = 2.0 ha) was marked out. For a small number of sites, a circular site with a radius extending 70m from a central point was used instead to delineate the 2 hectare area.
- The start and finish of the transect line was permanently marked (e.g. using a star picket) and GPS locations recorded. Flagging tape was used around trees at regular intervals to mark the direction of the path along the line.
- The observer commenced the 20 minute survey at the start of the transect line and moved slowly along, pausing regularly, recording all species of birds seen or heard, noting those individuals ‘inside’ the 2.0 ha study area and those that are outside. Birds seen in flight over the survey area are considered ‘inside’.

Data collation and storage: The data is entered into a comprehensive FileMaker database designed specifically for this purpose. The monitoring data is coordinated and held by Connecting Country in the office, and with off-site back-ups, to ensure safe long-term storage. The bird data is sent annually to BirdLife Australia for inclusion in the national Bird Atlas. The collected data has influenced the development and review of our Woodland Bird Action Plan and associated projects. Results have been shared with participating landholders and in our newsletters, blog posts and media articles.

RESULTS

SEASONAL DIFFERENCES

Key finding: Seasonal differences observed, with more bird species recorded in spring surveys compared to winter surveys

Many bird species are seasonal visitors, either seen only in the winter surveys (e.g. Flame Robin, Swift Parrot) or spring (e.g. cuckoos). There are also many others that are resident year round (e.g. Brown Treecreeper, thornbills), or are unpredictable nomads that could visit the area at anytime (e.g. during a period of high resource availability – such as particular strong flowering event from a widespread eucalypt species).

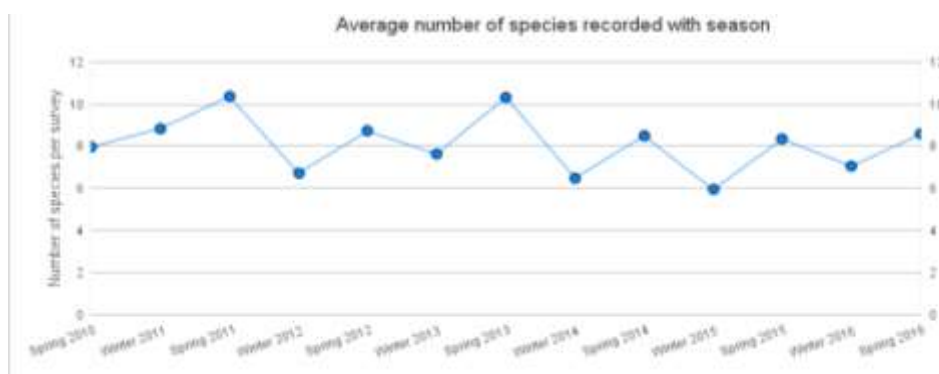


FIGURE 1.
AVERAGE
NUMBER OF BIRD
SPECIES
RECORDED PER
SURVEY WITH
SEASON.

The seasonal variation in bird species abundance is demonstrated in Figure 1. With the exception of 2010-11, the winter surveys have always had a lower bird diversity than the spring periods on either side of it. Figure 1 shows that Winter 2011 supported a higher average number of species per survey (~9) than subsequent Winters (ranging from 6 to 8). This spike in bird diversity may have been due to the break of the drought, and associated record-breaking rainfall in central and northern Victoria, during the summer of 2010-2011.

BIRD SPECIES RECORDED

Key Finding: 164 bird species recorded across all surveys from 2010 to 2017. Of these, 6 species are introduced species, and 34 are of conservation concern.

From more than 1200 surveys undertaken since 2010, 164 different bird species have been recorded. This includes the nationally endangered Swift Parrot and Painted Honeyeater, as well as species considered threatened in Victoria such as the Diamond Firetail, Hooded Robin. Many of the bird species have been recorded on less than 5 occasions (e.g. Banded Lapwing, Painted Button-quail, Stubble Quail).

When surveys are undertaken, both the 2 ha 20 minute surveys are carried out, as well as noting incidental records. Of the 164 species, 154 were recorded on our official monitoring sites. The number of introduced bird species, and their occurrence has been very low throughout. A slight increase in the occurrence of Common Myna has been detected over the course of the surveys.

Key Finding: Bird species vary according to whether site is paddock, restoration or intact.

The highest number of bird species and abundance was usually within the *intact* sites. Species with specialized woodland habitat requirements were more likely to be recorded at the *intact* sites (e.g. Crested Bellbird, Hooded Robin). Further discussion about the difference in the numbers of bird species between intact gully and slope sites is provided in the next section of the results.

As anticipated, the *modified* sites - located in agricultural paddocks - supported fewer species than any other habitat type. The birds seen most regularly in modified sites are typical of open country and grasslands (e.g. Australasian Pipit, Flame Robin).

The *restoration* sites tend to support a number of bird species somewhere between the *intact* sites and the *modified* sites. Small insectivorous species (e.g. thornbills) were often prevalent within the *restoration* sites; particularly those sites with a dense regenerating understorey. When considering specialised woodland birds only, no significant differences were detected between *Sub-canopy Restoration* sites and *Paddock Revegetation* sites (as displayed in Figure 2)

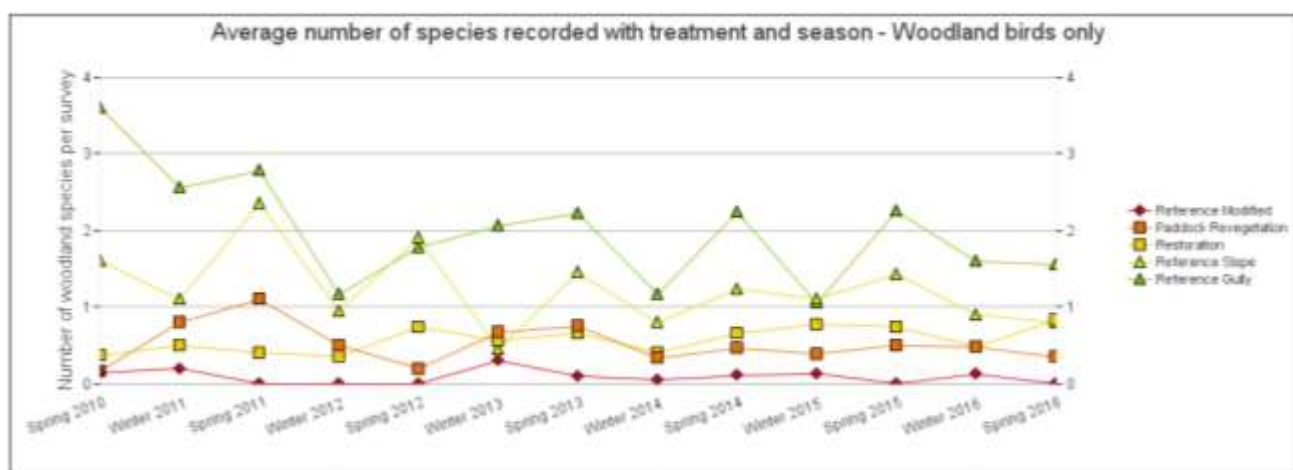


FIGURE 2. AVERAGE NUMBER OF SPECIALISED WOODLAND BIRD SPECIES RECORDED WITHIN EACH TYPE OF HABITAT OVER TIME

Key Finding: Greater numbers of woodland bird species are recorded in intact gully sites compared to any other location, suggesting these habitats are of great importance.

Figure 2 demonstrates that a greater number of specialised woodland bird species are consistently recorded in the fertile gullies and river red gum flats that are recorded for any other habitat type. A riparian site within the Muckleford Nature Conservation Reserve, and a private land site in Strangways, are good examples of this. This supports recent research undertaken by the technical advisor to our monitoring programs, Prof. Andrew Bennett², which also demonstrated the important influence of waterways on bird diversity and abundance.

Woodland birds prefer large connected patches of continuous bushland, and as such are recorded in the intact sites, both gully and slope, at greater numbers than the restoration sites or modified sites.

When a graph is generated for all bird species (and not just specialised woodland birds), see Figure 3, it is interesting to note that the number of species using the restoration sites increases considerably, and there is no clear or consistent differences between intact and restoration sites. This is a pleasing outcome as it indicates that the habitat restoration activities being undertaken by landholders, Landcare groups and Connecting Country is contributing to an increase in native species diversity across the landscape.

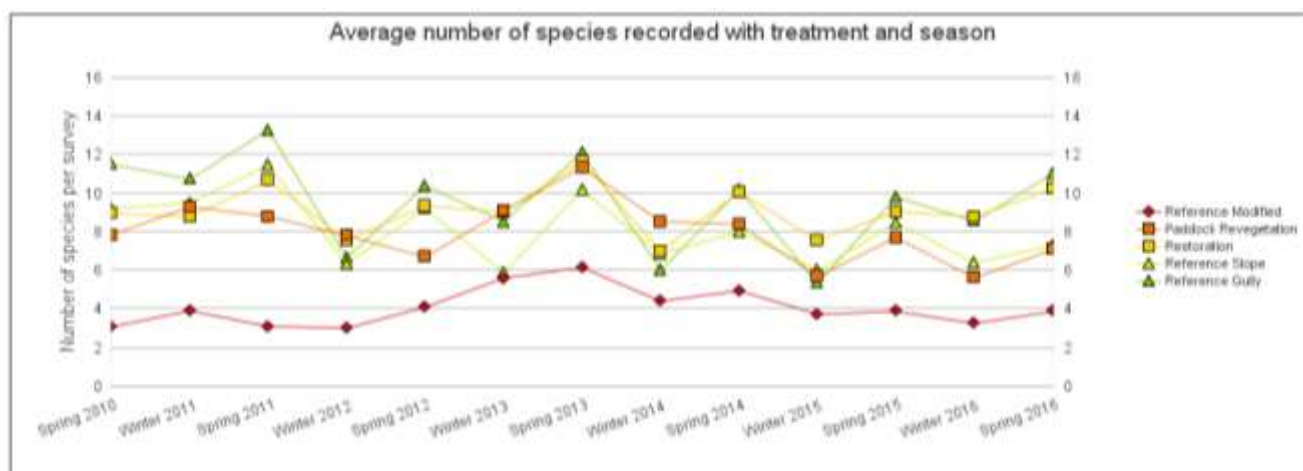


FIGURE 3. AVERAGE NUMBER OF BIRD SPECIES RECORDED WITH TREATMENT AND SEASON- ALL SPECIES

Key Finding: Bird abundance and distribution vary across habitat type in intact sites.

Some species, such as the Brown Treecreeper, have been observed in both gully and slope sites throughout the survey period (see Figure 4). Other species, such as the Yellow-tufted Honeyeater are almost exclusively recorded in gully sites (Figure 5) or conversely, the Speckled Warbler on slope sites (Figure 6). These graphs demonstrate a need to conserve a variety of habitats across the landscape, to encompass all woodland bird species of conservation concern.

² Nimmo, D. G., Haslem, A., Radford, J. Q., Hall, M. and Bennett, A. F. (2016), Riparian tree cover enhances the resistance and stability of woodland bird communities during an extreme climatic event. J Appl Ecol, 53: 449–458. doi:10.1111/1365-2664.12535

Brown Treecreeper

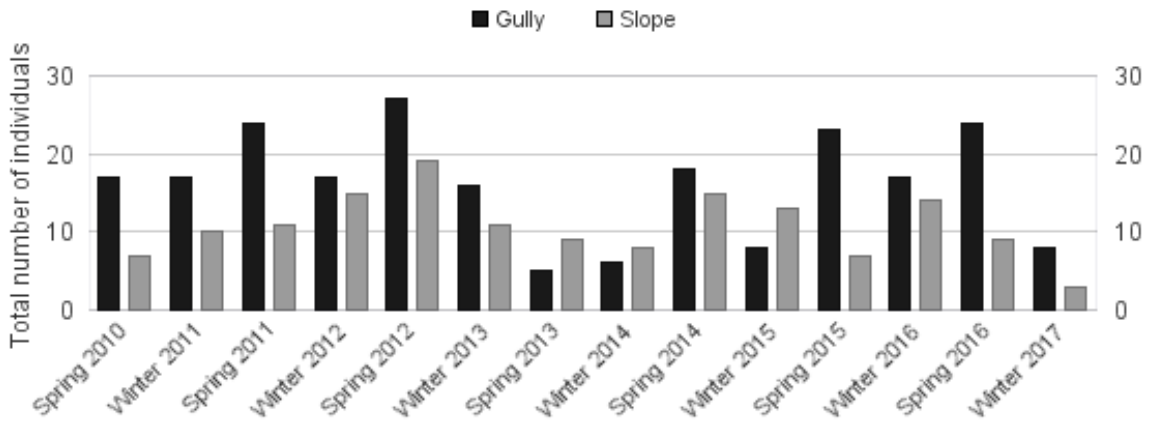


FIGURE 4. NUMBERS OF INDIVIDUALS RECORDED EACH SEASON, IN GULLY OR SLOPE SITES, FOR THE BROWN TREECREEPER.

Yellow-tufted Honeyeater

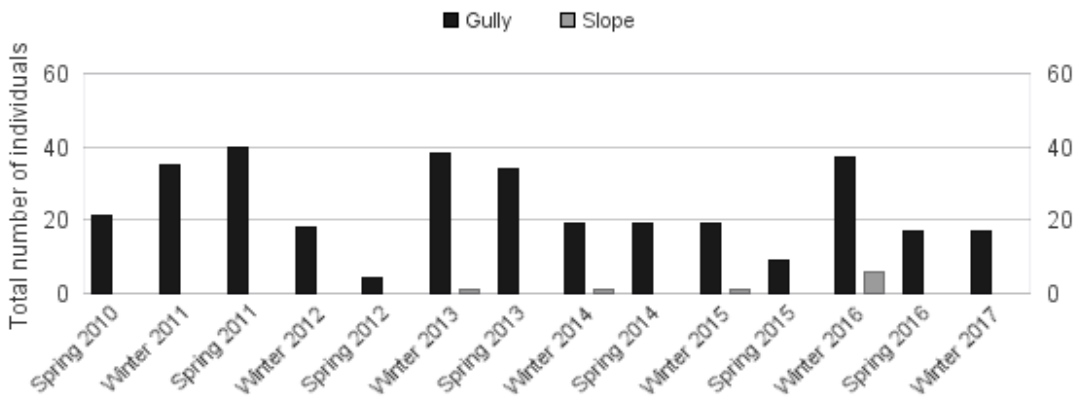


FIGURE 5. NUMBERS OF INDIVIDUALS RECORDED EACH SEASON, IN GULLY OR SLOPE SITES, FOR YELLOW-TUFTED HONEYEATER

Speckled Warbler

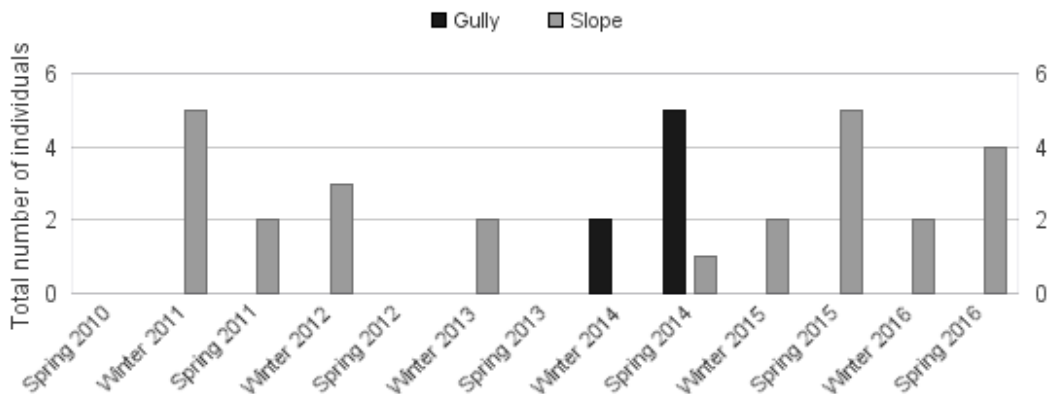


FIGURE 6. NUMBERS OF INDIVIDUALS RECORDED EACH SEASON, IN GULLY OR SLOPE SITES, FOR THE SPECKLED WARBLER

REPORTING RATE FOR CONNECTING COUNTRY’S TARGET SPECIES

Connecting Country’s Woodland Bird Action Plan uses a metric known as “reporting rate” to provide an indication of species abundance in any given area. Reporting rate is calculated from the number of surveys in which a particular species was recorded divided by the total number of surveys undertaken.

$$\text{Reporting Rate (\%)} = \frac{\text{Number of surveys where a species was detected}}{\text{Total number of surveys undertaken}} \times 100$$

There are some biases with this method, which we are mindful of when drawing conclusions, but Reporting Rate is generally considered to be the best available measure for our purposes.

The table below shows how the eight target species from our Woodland Bird Action Plan are faring in the Mount Alexander Shire and immediate surrounds. This has been analysed using both Connecting Country monitoring data, and also data from Birdlife Australia Bird Atlas.

TABLE 3: TRENDS OBSERVED AFTER ANALYSIS OF DATA FROM BOTH CONNECTING COUNTRY’S MONITORING PROGRAM AND BIRDLIFE AUSTRALIA RECORDS SINCE 2010 FOR THE MOUNT ALEXANDER SHIRE AND SURROUNDS (MAS REGION)

| Species | Reporting Rate trend within the MAS region | Comments |
|----------------------|--|---|
| Jacky Winter | Stable | This species is considered to be declining in other parts of Victoria, so a seemingly stable population in our area is good news! Woody debris and protection from introduced predators are important ongoing actions for this species to encourage a population increase. |
| Painted Button-quail | Insufficient data | Very few sightings at all over the past 7 years. The encouragement of grass tussocks and woody debris in forests and woodlands will assist this species. |
| Hooded Robin | Increasing | This is a wonderful finding as this species is decline in other parts of Victoria. With continued habitat restoration, we hope that this increasing trend persists. The species is recovering from greatly diminished population levels in our region. |
| Brown Treecreeper | Stable | This species is locally common wherever it occurs. It would be good to see numbers increase in the Metcalfe/Sutton Grange region. Retention of coarse woody debris in woodlands and forests is important for this species. |
| Diamond Firetail | Declining | New records of this species in the Guildford/Strangways area are heartening, however the figures show still declining overall in our region. We may need to plant more food plants (e.g. sheoaks, native grasses), and provide more protection from predators. |
| Crested Shrike-tit | Declining | This charismatic bird peels bark with its hooked beak to glean large insects. It has possibly been badly affected by drought conditions. The additional protection of existing large trees, the continued restoration of woodland and forest habitats, and increased habitat connectivity, may help slow or even reverse this trend. |
| Scarlet Robin | Stable | This species has just been listed as Vulnerable in NSW due to declining populations – and declines have been reported in Victoria also. As such, a stable reporting rate over the past 7 years for our area is an encouraging outcome. Increased habitat connectivity and sub-canopy restoration are valuable actions for this species. |
| Dusky Woodswallow | Stable | This species has also recently been listed as threatened in NSW due to plummeting numbers, so a stable population is somewhat encouraging. Habitat restoration actions as listed for the Crested Shrike-tit are expected to also benefit Dusky Woodswallow. |

CONCLUSION

Through Connecting Country’s Long-Term Bird Monitoring program, we have been able to build up a comprehensive picture of bird species and distribution across the landscape in a wide variety of habitats – including those that are ‘intact’, highly modified and being actively restored. This has helped Connecting Country and our participating landholders understand how different species indicate the ecosystem health of the landscape. And, very importantly, how our past management actions have contributed to improving avian species diversity and abundance.

We have also been able to use the data to inform the development of our Woodland Bird Action Plan, and to assist us in applying for grants in a targeted and scientific manner. For example, as a result of our survey findings, gully and riparian areas across the Mount Alexander Shire are now earmarked as high priority for current and ongoing restoration works, see Appendix Two for a map of these areas. This helps us guide our on-ground works programs, and that of local landholders and the 31 Landcare groups in this region.



FIGURE 7. CONNECTING COUNTRY’S FOCUS ON WOODLAND BIRDS HAS NOT ONLY PROVED TO BE USEFUL IN OUR LANDSCAPE RESTORATION WORK, BUT VERY ENGAGING TO THE LOCAL COMMUNITY.

APPENDIX 1: WOODLAND BIRDS OF CONSERVATION IN THE MOUNT ALEXANDER REGION

The Victorian Temperate Woodland Bird Community (TWBC), listed as threatened under the *Flora and Fauna Guarantee Act 1988*, includes both “listed” and “associated” birds. ‘Locally significant’ species are those that have been identified as birds of interest by local experts during the development of Connecting Country’s Woodland Bird Action Plan.

| Species name | Listed TWBC | Associated TWBC | Locally significant |
|-----------------------------|-------------|-----------------|---------------------|
| Peaceful Dove | | | X |
| Square-tailed Kite | | x | |
| Painted Button-quail | X | | |
| Little Lorikeet | X | | |
| Purple-crowned Lorikeet | | | X |
| Swift Parrot | x | | |
| Powerful Owl | | x | |
| Barking Owl | x | | |
| Sacred Kingfisher | | | X |
| Australian Owlet-nightjar | | | X |
| Brown Treecreeper | x | | |
| Chestnut-rumped Heathwren | | | X |
| Speckled Warbler | x | | |
| Western Gerygone | x | | |
| Southern Whiteface | | x | |
| Yellow-tufted Honeyeater | x | | |
| Fuscous Honeyeater | x | | |
| Black-chinned Honeyeater | x | | |
| Brown-headed Honeyeater | x | | |
| Painted Honeyeater | x | | |
| White-browed Babbler | | x | |
| Spotted Quail-thrush | | | X |
| Varied Sitella | | x | |
| White-bellied Cuckoo-shrike | | | X |
| Crested Shrike-tit | | x | |
| Crested Bellbird | | x | |
| White-browed Woodswallow | | x | |
| Dusky Woodswallow | | x | |
| Restless Flycatcher | | x | |
| Jacky Winter | x | | |
| Scarlet Robin | | | X |
| Red-capped Robin | x | | |
| Hooded Robin | x | | |
| Diamond Firetail | x | | |

APPENDIX 2. THE MOUNT ALEXANDER REGION WOODLAND BIRD PRIORITY ZONES, WITH EXISTING AREAS OF RIPARIAN AND GULLY ECOLOGICAL VEGETATION CLASSES HIGHLIGHTED

