Yarra River Corridor Abbotsford Bird Survey

Abbotsford Riverbankers Inc.

Project leader

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Abbotsford Riverbankers

This report has been written by April Newton and prepared by April Newton and Anna Ridgway.

Cover image: April Newton and Jonathan Tickner walking along the Main Yarra Trail while looking for birds in the canopy.
Photo © Anna Ridgway 2022

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Introduction

Aim

This survey measured bird species richness and abundance on the western bank of the Birrarung Yarra River in Abbotsford, within the area managed by Abbotsford Riverbankers, in order to provide baseline data and inform recommendations for ongoing rehabilitation and management of the site.

Rationale

Since 2018, Abbotsford Riverbankers have been implementing strategic land management activities to improve the health and resilience of the Yarra River Corridor in Abbotsford. During this time, Riverbankers have informally observed feeding and nesting activities by native bird species. This suggests that even in highly degraded urban river corridors, strengthening the health, resilience and structure of the native vegetation can improve habitat for wildlife. This project measures bird species richness and abundance as an indicator of the quality and connectedness of habitat in the survey area.

Monitoring the bird species present in the revegetation area, their numbers and how they are using the habitat will help the Abbotsford Riverbankers make adaptive management decisions regarding habitat structure and vegetation by highlighting what is working well and what is missing. The information gathered over repeated survey efforts will help define the value of the habitat as it improves under environmental stewardship and measure the effect of the rehabilitation that is taking place.

A measured increase in bird life on this stretch of the river corridor will exemplify the importance of the work done by Abbotsford Riverbankers and help communicate their successes to stakeholders and other groups.

Biological Population and Habitats

The project area sits on the eastern boundary of the Victorian Volcanic Plains bioregion. This is classified as Floodplain Riparian Woodland ecological vegetation class (EVC). Elements of other EVCs are also present, including Riparian Shrubland and Riverine Escarpment Scrub. Floodplain Riparian Woodland is characterised by a Eucalyptus canopy with around 20 percent canopy cover, a medium shrub layer and a ground layer consisting of aquatic herbs and sedges (DSE 2004).

Upstream, the Merri Creek and Yarra River converge above Dights Falls and run through a narrower channel below the falls, making this section of the Yarra floodplain prone to flash flooding. Changes to the natural Dights Falls formation, structural works over 170 years and vegetation clear felling have compromised the health, structural integrity and natural dynamism of the floodplain. Poor land management has produced and accelerated erosion, bank slump and collapse, making this ex-industrial area one of the most degraded sites on the Port Philip and Westernport Catchment Management Area (Beardsell 2004). Flooding and stormwater drains deposit rubbish onto the floodplain. Birds such as cormorants, ducks and gulls have been observed feeding among the rubbish-strewn river debris at the water edge.

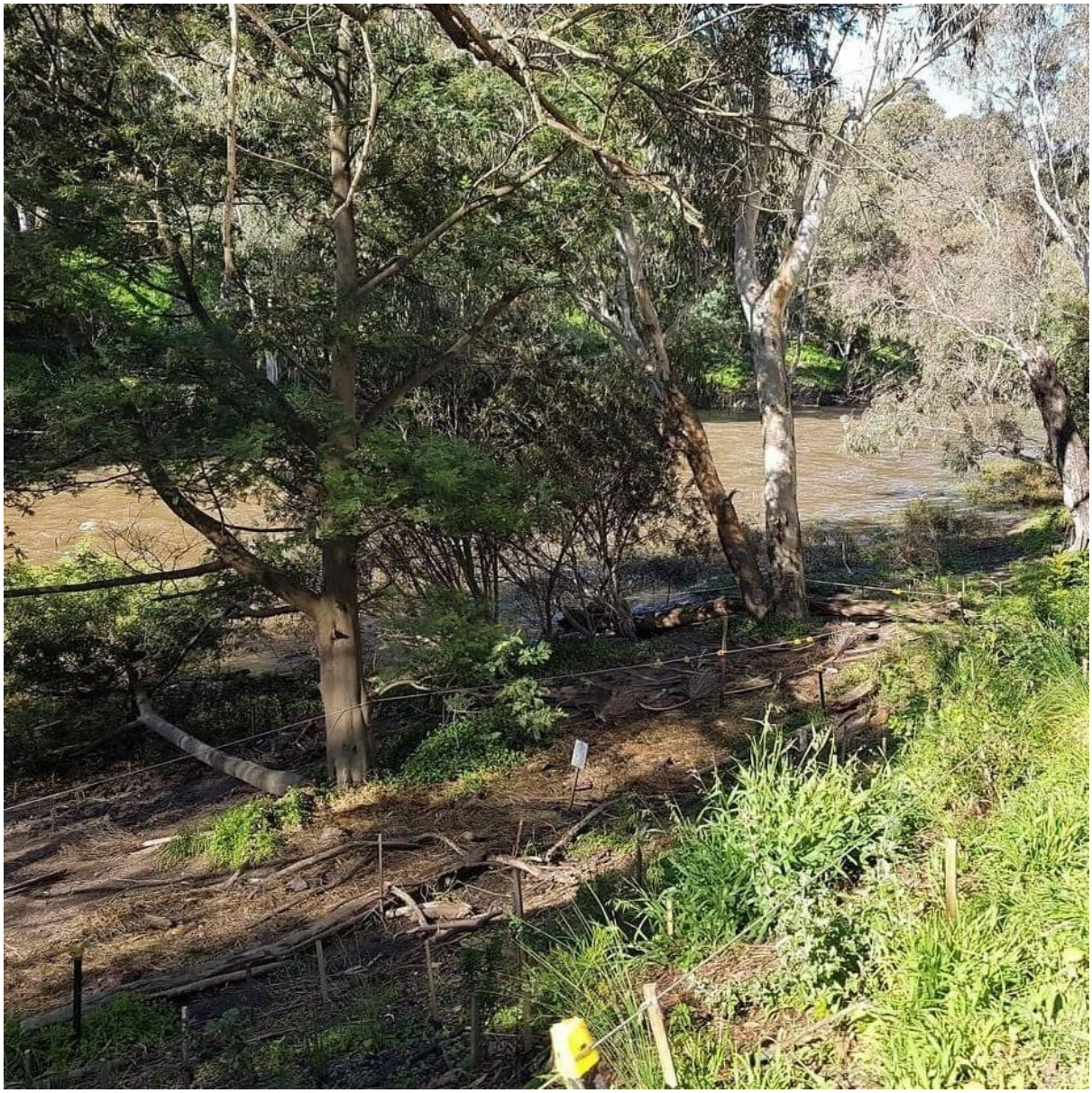

Figure 1. View from the Main Yarra Trail down to the Sea Kayak Floodplain, one of the areas most affected by flash flooding and the rubbish it leaves behind. River Red Gums and Black Wattle have re-established here, and Abbotsford Riverbankers are improving the understory through introduction of structural elements and native plants. Photo © Anna Ridgway 2021.

Introduced canopy species dominate in some sections, including the London Plane *Platanus x acerifolia*, Canary Island Date Palm *Phoenix canariensis*, Peppercorn *Schinus molle*, English Elm *Ulmus procera* and River Sheoak *Casaurina cunninghamiana.* Invasive Weeds of National Significance include Madeira Vine *Anredera cordifolia* and African Boxthorn *Lycium ferocissimum*. Other invasive species include Kikuyu grass *Cenchrus clandestinus*, Wandering Trad *Tradescantia fluminensis* and Couch grass *Elymus repens*.

Existing and naturally regenerating species include River Red Gum *Eucalyptus camaldulensis,* Black Wattle *Acacia mearnsii*, Blackwood *A. melynoxylon,* Slender Knotweed *Persicaria decipiens,* Water Pepper *P. hydropiper*, Nodding Saltbush *Einadia nutans*, Kangaroo Apple *Solanum aviculare* and Lesser Joyweed *Alternanthera denticulata*. There is good recruitment from these and an increasing number of EVC listed species, particularly in areas under weed management and revegetation by the Riverbankers.

On the other side of the river is Yarra Bend Park, an area with a more robust indigenous ecosystem and subject to less degradation than the western bank. Yarra Bend Park marks the beginning of the Gippsland Plains bioregion. Beyond the Floodplain Riparian Woodland on the eastern side of the river is Plains Grassy Woodland and Box Ironbark Forest (DELWP 2022). These habitats are home to a wide range of avian fauna which can cross the river and use the survey site.

Figure 2. View from Johnston Street Bridge, looking over the end of the survey site on the left and Yarra Bend Park on the right. Photo © Anna Ridgway 2021.

Site

The section of the riverbank this survey covers is approximately 5km north east of the Melbourne CBD. A map of the site's location can be found in *Appendix 1*.

The survey site is 1.1 hectares of river edge, floodplain and scrubby slope containing a range of regenerating native, introduced weeds and planted vegetation. The vegetation changes both across and along the survey route, resulting in distinct areas which are under varying levels of management. The site is bisected lengthways by the Main Yarra Trail, used by thousands of pedestrians and cyclists each day. The land drops away on the east of the trail down to the river and extends at various lengths to the west. There is good visibility from the trail into the vegetation on both sides.

Methodology

Equipment

- Binoculars
- Smart phone with Birdata application installed
- High vis vest
- Camera

Survey methods

Surveys took place on the first Monday or Thursday of each month (depending on surveyor availability) at 11:00 AEST and 10:00 AEDT. The survey ran from April 2021 to May 2022. No surveys were conducted in June 2021 or January 2022, owing to lockdown and storms respectively. A total of twelve surveys were conducted.

A fixed-route monitoring survey method was applied, following instructions set by Birdlife Australia (2022a). The method is easily repeated and allowed us to have confidence in the consistency of the data. We used the BirdLife Birdata app to conduct the survey and store survey data (see *Appendix 2*). The fixed-route monitoring survey method requires following the same route on each survey, conducting surveys at the same time each day and for the same duration, and works best when surveys are conducted once a month.

The survey route started at the northern end of the site, near the wooden steps leading up the embankment. Surveyors walked at a slow and steady pace along the Main Yarra Trail towards the Johnston Street Bridge, counting birds occurring down to the river, including in the water within two metres of the bank, on the trail and to the right of the trail to the edge of the vegetation, which is marked by either a concrete wall or metal fencing. Birds flying overhead without interacting with the habitat were not counted, as they were not considered to be using the site. The survey did not count the feral pigeons nesting under Johnston Street Bridge, unless they were observed using the site.

Each survey took 20 minutes, which allowed time to walk from one end of the site to the other. The lead surveyor entered the survey data in the Birdata app at the time of conducting the survey, and later upload this data to an Excel spreadsheet. The survey was conducted by volunteers using their own resources, so costs were minimal.

Figure 3. White-Plumed Honeyeater (foreground) and Willie Wagtail (behind) in one of the Eucalypts that make up the native canopy. White-Plumed Honeyeaters are strongly associated with River Red Gums, of which there are several on site.

Photo © Jonathan Tickner 2021.

Results

The survey recorded 20 native bird species and three introduced species using the various habitats across the site over the twelve survey months (see *Appendix 2* for full survey results).

The species with the highest capture rate was the Common Myna, followed by the Spotted Dove (see *Table 1*). The Common Myna was also the most abundant species recorded in the survey.

Table 1: Capture rates for each species recorded in twelve months. Capture rates are calculated as number of surveys in which the species was recorded, divided by total number of surveys, multiplied by 100 for a percentage, which is rounded to the nearest whole number. * Indicates an introduced species.

Species	Rate	Species	Rate
Australian Wood Duck	8%	Silver Gull	58%
Brown Thornbill	33%	Spotted Pardalote	17%
Chestnut Teal	17%	Superb Fairy-Wren	25%
Grey Fantail	8%	Tawny Frogmouth	25%
Little Black Cormorant	17%	White-Browed Scrubwren	17%
Little Raven	8%	White-Faced Heron	25%
Magpie-Lark	42%	White-Plumed Honeyeater	50%
Noisy Miner	8%	Willie Wagtail	25%
Pacific Black Duck	8%	Blackbird*	8%
Pied Currawong	8%	Common Myna*	92%
Rainbow lLorikeet	25%	Spotted Dove*	75%
Red Wattlebird	58%		

In terms of distribution of species across the year, the highest species richness was recorded in October, followed by November and February (see *Figure 4*).

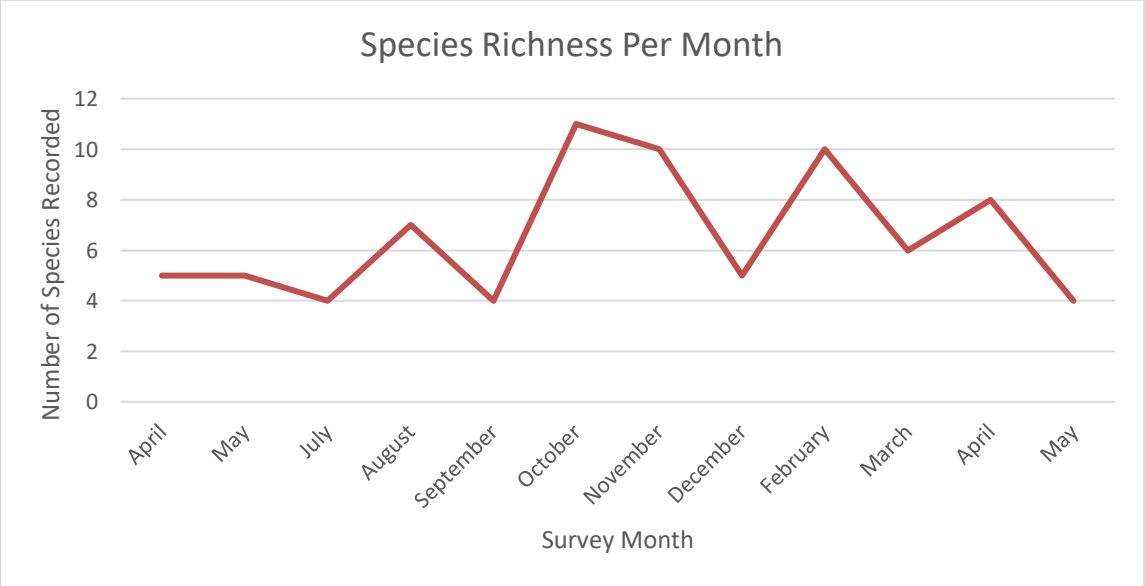

Figure 4: Graph showing the number of species (species richness) recorded for each survey. Months with no surveys are not included.

Recorded species were sorted into the following feeding guilds:

- Insectivorous
  – in flight (catching insects on the wing)
  – multi-layer (feeding from the ground up to the canopy)
  – ground layer (feeding on the ground and amongst leaf litter)
- Dabblers (feeding in shallows and from water surface)
- Divers (feeding below surface and on river bed)
- Nectar Feeders
- Generalists (omnivorous diet obtained by scavenging and/or hunting across multiple habitats)
- Grazers

Most species belong to only one guild. However, the Tawny Frogmouth, Willy Wagtail, Noisy Miner and White-plumed Honeyeater occupy two, owing to varied feeding patterns. See *Appendix 2* for a breakdown of the guilds.

The feeding guild with the highest species diversity was Insectivorous – ground layer, with seven species represented (see *Figure 5*).

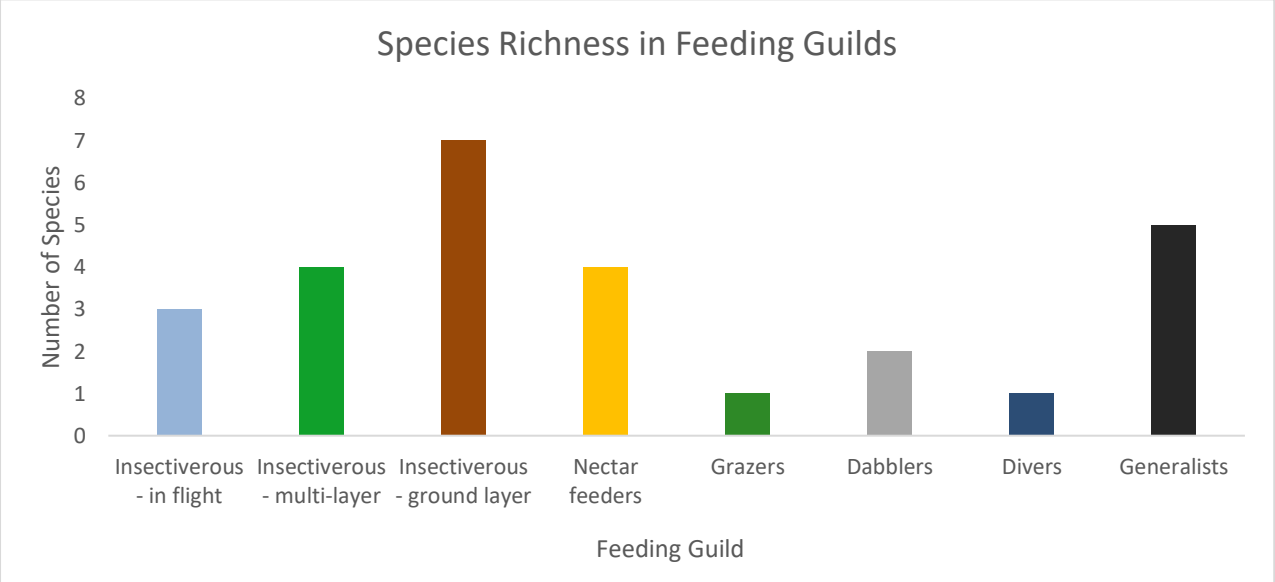

Figure 5: Graph showing the distribution of species across eight feeding guilds.

Discussion

The results show that the Yarra River Corridor in Abbotsford is home to a diverse suite of native bird species at various levels of abundance, as well as some introduced species occurring in high numbers.

Feeding Guilds

When grouped into feeding guilds, the results show a high proportion of insectivorous ground feeders. There are several reasons why this may be the case. Since 2018 Abbotsford Riverbankers have worked to remove invasive weeds which were choking the understory, at the same time re-introducing native plants and improving the ground layer through terracing and spreading of Eucalyptus leaf mulch collected from Yarra Bend Park. These activities have altered the structure of the habitat – in many

cases making it more varied, with dense shrubby areas and alternating open spaces. The re-introduction of native flowering plants combined with the movement of leaf mulch produced by the Box-Ironbark Forest of Yarra Bend Park has likely boosted insect numbers, improving food resources for insectivorous species. The other Insectivorous Guilds are also well represented and two insectivorous species, the Tawny Frogmouth, Spotted Pardalote, have been recorded breeding on site. These factors suggest that the food and nesting resources required by these species are improved under the Abbotsford Riverbanker's care, although further surveys and a control site would be required to measure the extent of this improvement compared to neglected areas.

Introduced vs. Native

The species recorded most frequently and in some of the highest numbers was the Common Myna, an introduced bird that has become common throughout urban areas and competes with native birds for nesting hollows and food resources (Birdlife Australia 2022b). As a generalist and a scavenger, this species can take advantage of a variety of resources.

The survey site has proximity to housing and commercial buildings, with plenty of human waste and food scraps, as well as Yarra Bend Park and the riverbank for nesting hollows. The Common Myna is both difficult and controversial to control (Perkins 2022), and its presence on the site is most likely the result of a widespread abundance throughout Melbourne.

Figure 6. Common Myna in an introduced Ash tree in the survey area. This introduced species competes with native birds for food and nesting resources. Photo © Jonathan Tickner 2021.

Despite the predominant Common Myna presence, there was a much greater diversity of native species compared with introduced, and no evidence was recorded to suggest that the Common Myna presence in the site is limiting native bird activities. Efforts to improve habitat for the native species will also reduce habitat suitability for this and other introduced species.

Constraints

The survey was intended as a baseline, to provide data on species richness an abundance which could provide a basis for comparison in future surveys. Because of this, any speculations on an increase in avian fauna or a comparison between the rehabilitation site and nearby areas of neglect are tenuous and need to be backed up by further data. Similarly, there is not yet enough data to determine a trend in species recorded at different times of year. Though this survey did show different results in different months, multiple years of surveying are required to determine whether this is owing to seasonal factors.

Though every effort was made to ensure robust, consistent data, there were some external factors that affected this. Inclement weather and travel restrictions were the most disruptive factors and were difficult to mitigate. On occasion the survey ran over time due to time taken to identify species, or were completed more quickly, allowing surveyors to backtrack along the route and pick up any birds that may have been missed. A team of surveyors helped increase the number of birds that were spotted, but large groups had the potential to block the trail or scare birds away. A group of two surveyors was found to be ideal.

The survey did not distinguish between zones within the survey site, which are vastly different in terms of vegetation, structure and management. However, it did record the species that are currently using the entire site of Abbotsford Riverbankers operations, regardless of the level of health or native vegetation of each zone. These records may help the Riverbankers plan revegetation in allowing us to consider how we might improve the site for the native species that are already there, rather than the species we hope to see.

Figure 7. Below: Little Black Cormorant perched in a rock placed in the shallows by Abbotsford Riverbanker volunteers. This species is frequently seen fishing up and down the river's edge, sometimes in groups of six or more. Right: White-Faced Heron perched on river's edge with aquatic prey. This species hunts in the shallows as well as in the areas of Kikuyu grass where lizards and beetles are plentiful. Photos © Jonathan Tickner 2021.

Recommendations

Future surveys

The time of year had an impact on the number of species recorded, with the highest species richness occurring in spring. There are several factors that may contribute to this including weather, migration and breeding success. Continued surveys across multiple years are needed to detect any trend in this area.

Though there is some evidence from the survey results to suggest that Abbotsford Riverbanker activities are improving the habitat for bird species, this cannot be certain without the inclusion of a control site in the survey.

Including a control site was beyond the scope of this survey due to time and resource constraints on the part of the surveyors. If resources are available, future surveys may benefit from conducting an identical survey on an unmanaged control site (the other side of the Johnston Street Bridge has potential) to determine if there is any difference between areas of rehabilitation and areas of neglect.

General

As shown in the Results and Discussion, the survey site currently supports a stable population of native insectivorous bird species. The Abbotsford Riverbankers should use the presence and feeding habits of these and the other native species recorded on the site to guide rehabilitation efforts. The results suggest that the work done by the organisation so far has increased insect numbers – and subsequently the amount of food available for birds – to a level which supports breeding in some species. Continued efforts to boost insect numbers, through increasing the presence of native flowering plants and improving the structure of the ground layer through leaf mulch, logs and rocks, will help support larger numbers of native insectivorous bird species and may attract more species from the adjacent Yarra Bend Park and other parklands along the river corridor.

The insectivorous species share the habitat with a range of nectar feeders whose high sugar diet results in territorialism and aggression, even towards birds who do not share their food source (Low 2017). Both insectivorous and nectar feeders are at risk from the generalist species, such as the Pied Currawong, who predate on the eggs and chicks of other species. As such, the insectivorous species will also benefit from a dense, shrubby understory of prickly native plants, within which they can shelter and nest. This is an important consideration when dense infestations of weeds – which may have been filling this habitat requirement – are removed.

For the nectar feeding species, retaining the canopy and promoting recruitment of River Red Gums is the best course of action. It is recommended that the majority of introduced canopy species are also retained, as they provide cover and nesting sites as well as contribute to the corridor that allows species to move through the landscape.

Figure 8. Tawny Frogmouth sitting on a nest built from Black Wattle foliage, in an introduced canopy tree over the Sea Kayak Floodplain. Two chicks were subsequently fledged. Photo © Jonathan Tickner 2021.

The Dabblers and Divers – species that feed in the river – could be best supported by the installation of more structural elements along the river bank. Boulders, such as those already installed by the Riverbankers, provide perching sites for cormorants and ducks and shelter for the small fish and macroinvertebrates they prey on (see *Figure 7*, page 10). The White-Faced Heron – a familiar face throughout the varied areas in the survey site – would also benefit from these features and from open areas with plenty of sunlight, where skinks and beetles can be caught.

All the wildlife using the site benefit from consistent litter-picking, particularly after floodwaters leave substantial amounts of small plastic waste behind. As mentioned in the Introduction, the site has a history of neglect and degradation, with hazardous materials such as asbestos still present in some of the soils. In recent decades the area has been allowed to heal largely unmanaged, resulting in some regeneration of native species which have been able to hold there own against infestations of vigorous weeds. As the site began to heal, native fauna recolonised via remnant vegetation corridors. The results from this survey, combined with the on-ground success of Abbotsford Riverbankers rehabilitation work, show that even highly degraded, human dominated urban environments can support valuable habitat. These places are worth observing, studying and caring for.

Acknowledgements

This survey could not have run for as long or as consistently as it did without the help and dedication of members of Abbotsford Riverbankers, the Melburnian birding community and Birdlife Australia. Particularly I would like to thank Jonathan Tickner for his invaluable knowledge and experience in bird identification as well as his superb photography skills. I would also like to thank the members of the Abbotsford Riverbankers committee and everyone who joined in for one or multiple surveys. Many thanks to Andrew Silcocks, Birdata Project Manager at Birdlife Australia, who set up the shared survey site on the app that allowed us to record and store robust data.

Last but not least I would like to thank Anna Ridgway for her enduring support of the survey through lockdowns, travel restrictions, storms and floods. Without her tireless work this survey might not have survived the chaos of the times, and the section of the river corridor would not have nearly as much worth recording.

Figure 9. Magpie-Lark foraging in the Sea Kayak Floodplain, one of the areas that is regularly inundated by floods and the rubbish that they bring. It is also an area that has seen striking transformation under Abbotsford Riverbanker care.

Photo © Jonathan Tickner 2022.

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Appendices

Appendix 1: Maps

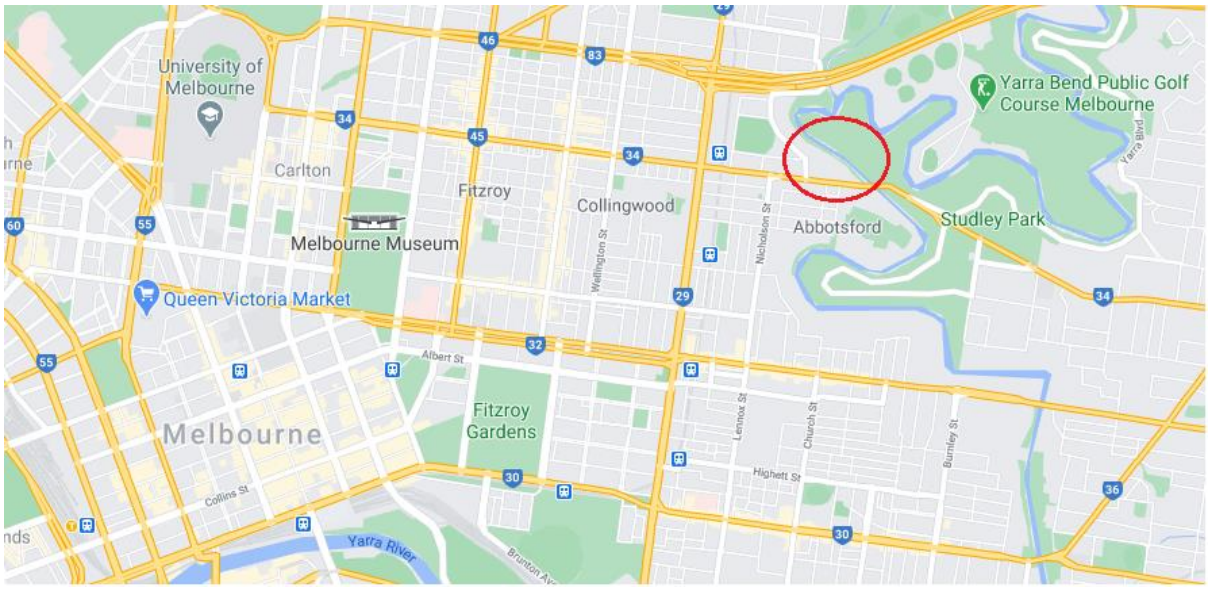

Figure 10: The section of the riverbank cared for by Abbotsford Riverbankers (circled in red) in relation to the Melbourne CBD.

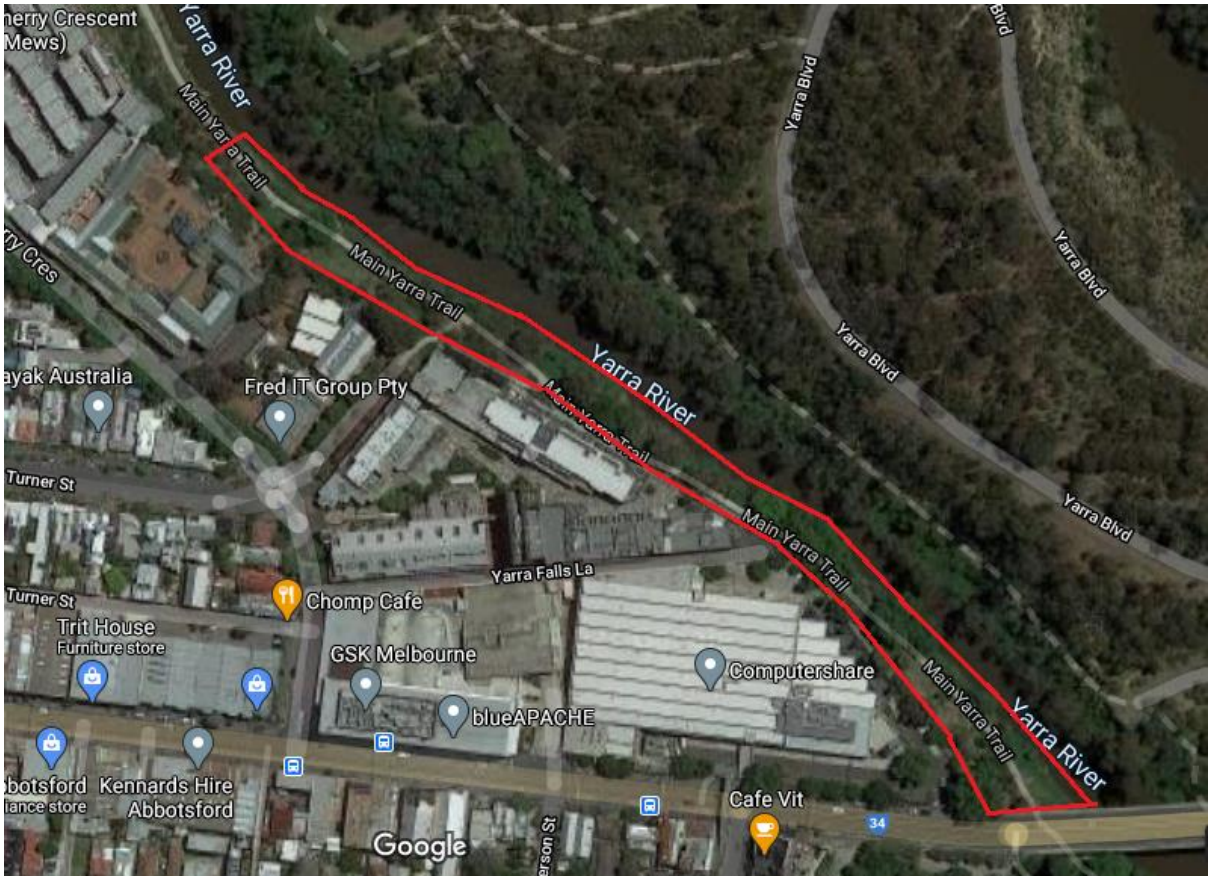

Figure 11: Survey area outlined in red.

Appendix 2: Survey Results

Table 2. Combined survey results, showing the conditions, species and numbers they occurred in for each survey month.

Month	Conditions	Species	Number
2021			
April	26°C, sunny, still	Common Myna	9
		Superb fairy-wren	4
		Magpie lark	1
		White-plumed honeyeater	4
		Spotted dove	2
May	14°C, sunny, still	Common Myna	4
		Magpie lark	3
		Rainbow lorikeet	2
		Spotted dove	2
		Silver gull	1
June	Lockdown No formal survey		
July	16°C, sunny, breezy	Willie wagtail	1
		White-plumed honeyeater	1
		Common myna	6
		Red wattlebird	1
		Rainbow lorikeet	5
August	15°C, overcast, breezy	Silver gull	2
		Spotted dove	2
		White-plumed honeyeater	2
September	24°C, sunny, windy	White-plumed honeyeater	1
		Australian wood duck	1
		Common myna	2
		Brown thornbill	2
October	15°C, overcast, windy	White-plumed honeyeater	3
		White-faced heron	2
		Common myna	2
		Silver gull	3
		Little raven	2
		Red wattlebird	2
		Little black cormorant	1
		Chestnut teal	3
		Tawny frogmouth	1
		Pied currawong	1
		Spotted dove	1
November	17°C, sunny, still	White-browed scrubwren	1
		White-faced heron	4
		Common myna	2
		Silver gull	1
		Magpie lark	1
		Red wattlebird	3
		Little black cormorant	1
		Spotted pardalote	1

		Tawny frogmouth	1
		Spotted dove	1
December	18°C, sunny, still	Common myna	1
		Silver gull	2
		Red wattlebird	1
		Tawny frogmouth	3
		Spotted dove	1
2022			
January	Storms No formal survey		
February	18°C, overcast, still	Superb fairy-wren	3
		Silver gull	1
		Red wattlebird	1
		Pacific black duck	3
		Welcome swallow	3
		Pied currawong	1
		White-plumed honeyeater	2
		Noisy miner	4
		Common myna	1
		Magpie lark	4
		Brown thornbill	2
		Chestnut teal	2
March	18°C, sunny, still	Superb fairy-wren	4
		Willie wagtail	3
		Red wattlebird	1
		White-browed scrubwren	2
		Spotted dove	1
		White-plumed honeyeater	3
April	17°C, overcast, still	Grey fantail	1
		Blackbird	1
		Willie wagtail	1
		Silver gull	1
		Spotted dove	1
		Common myna	2
		White-faced heron	1
		Rainbow lorikeet	3
		White-plumed honeyeater	3
May		Spotted dove	1
		Red wattlebird	3
		Brown thornbill	1
		Common myna	6

Table 3. Survey results with species sorted into Feeding Guilds, determined by their main feeding behaviour. Species with mixed behaviours, such as the Tawny Frogmouth which captures prey on the ground as well as in flight, have been included in two guilds.

Feeding Guild	Species	Feeding Guild	Species
Insectivores – in flight	Grey Fantail	Grazers	Australian Wood Duck
	Tawny Frogmouth	Dabblers	Chestnut Teal
	Willy Wagtail		Pacific Black Duck
Insectivores – multi-layer	Brown Thornbill	Divers	Little Black Cormorant
	Noisy Miner	Nectar feeders	Red Wattlebird
	Spotted Pardalote		White-Plumed Honeyeater
	White-Plumed Honeyeater		Rainbow Lorikeet
Insectivores – ground layer	Magpie-Lark		Noisy Niner
	Superb Fairy-Wren	Generalists	Little Raven
	Tawny Frogmouth		Pied Currawong
	White-Browed Scrubwren		Silver Gull
	Willy Wagtail		White-Faced Heron
	Blackbird		Common Myna
	Spotted Dove		

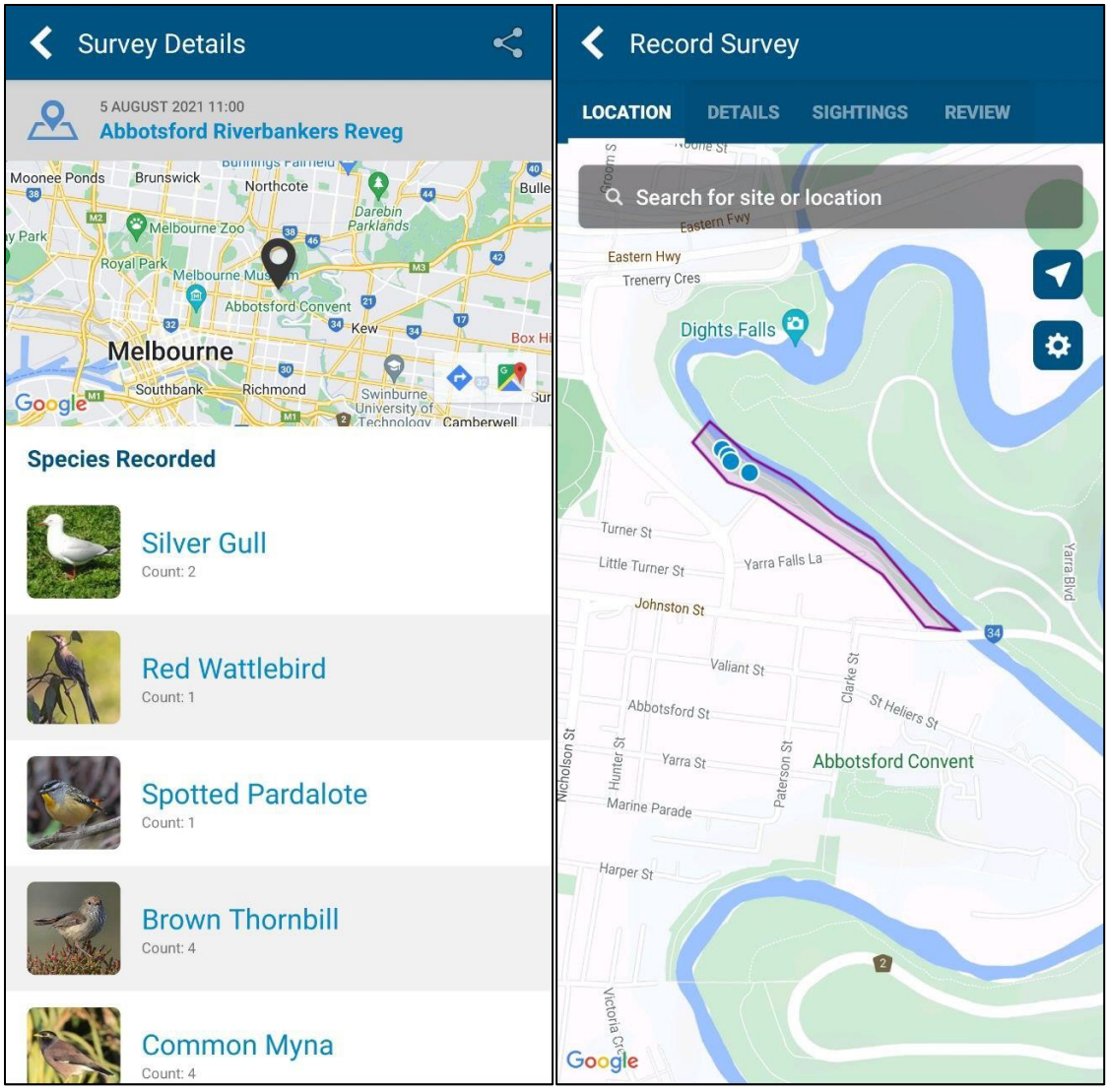

Figure 12. Example of the survey data stored in the Birdata mobile app, and the shared site used to record the surveys.