



# Managing vegetation on farm targeting pollinators and farm resilience

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*Annual Report by Wendy Wilkins & Mike Christensen*

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# Contents

Executive Summary .....	1
1. Project Description .....	2
1.1 <i>Background</i> .....	2
2. Progress made towards outcomes in MERI Plan .....	2
2.1 <i>By June 2019 the numbers and types of beneficial insects and pollinators occurring on a site growing canola and on another in a fruit orchard in the South West region of WA are documented</i> .....	2
2.2 <i>By June 2019 20 farmers involved in the canola and fruit orchard industries in the South West region of WA have a better understanding of the role that beneficial insects and pollinators play in maintaining and/or improving on-farm production</i> .....	3
3. Key achievements of the project .....	3
4. Key issues and their management .....	5
5. Evaluation of the Outcomes .....	6

## Executive Summary

The “*Managing vegetation on farm targeting pollinators and farm resilience*” one-year project aimed to document pollinators and their role in production for farmers and to educate farmers about this. The project was one of five submitted to the Australian government for funding through the Regional Landcare Program and was initially funded as a one-year project, with a four-year extension being granted in March 2019.

Dr Mike Christensen (Program Manager) developed the original project concept and set up the extension, and now oversees the project with Wendy Wilkins and with support from Peter Clifton (Regional Agriculture Landcare Facilitator).



As a result of the project there is improved knowledge about what pollinators occur on the two demonstration farms (canola and fruit orchard) and information about the role insects play in production of crops. Fruiting/flowering calendars have been created that will guide revegetation species lists to provide habitat, food and shelter to insects throughout the year. This information has been used to develop broad management recommendations on incorporating additional plant species into planting mixes for revegetation purposes to improve the availability of food sources for pollinators.

Key to the success of the project has been the strong partnerships with the Bridgetown Environment Society (BES) and the Wagin-Woodanilling Landcare Zone (WWLZ). BES and WWLZ have worked tirelessly to achieve the planned outcomes in the 9 months available due to the late signing of the contract, and our contractors implementing the bird and mammal surveys have also done exemplary work. SWCC would like to thank all those involved in the project in this first year for their commitment, professionalism and attention to detail that has ensured that the project achieved so much and will leave a lasting legacy for the South West region.

*Ngala kaaditj Noongar moort keyen kaadak nitja boodja.*

*We acknowledge the Noongar people as the traditional custodians of the land that we live and work on.*

# 1. Project Description

## 1.1 Background

The project worked with farmers to improve the pollination services provided by beneficial insects and other pollinators through revegetation programs with perennials and/or native vegetation that enhances food availability for these pollinators and indirectly improves the pollination and biodiversity services provided. This targets the investment priority through targeting revegetation to improve both biodiversity and pollination services, ensuring the farm is more resilient and can better withstand the impacts of a changing climate.

The project also provided farmers with information and support to enable them to link this management practice to changing market requirements to boost marketability and profitability, e.g. by adopting IPM practices. Through this, a farmer can improve the survival of pollinators and other beneficial insects, increase productivity and demonstrate to consumers that their product meets the growing demand for healthy and safe food, improving their market resilience.

## 2. Progress made towards outcomes in MERI Plan

### 2.1 By June 2019 the numbers and types of beneficial insects and pollinators occurring on a site growing canola and on another in a fruit orchard in the South West region of WA are documented

Four insect surveys at each site have been undertaken using the Protocol to Detect and Monitor Pollinator Communities (FAO). Unfortunately, due to the late sign-off of the project, the spring survey was conducted in October when canola flowering had finished so there is no survey that reflects what insects occur during canola flowering, but these will now be done in spring 2019. There have been 64 different insects recorded across the two sites including flies, moths, beetles, native bees, hoverflies, midges, butterflies, mosquitos, spiders, termites, wasps, ants and honeybees. These have been identified by a qualified entomologist.

All the surveys at the canola site were carried out along the same transect in an almost 100ha wandoo remnant adjacent to a canola crop. The insects collected during the surveys therefore show what occurs in remnants during the survey periods.

The orchard site has less remnant vegetation on the property, so the insect survey transect was placed where most of the vegetation exists along the stream and alongside the orchard. Insects caught during the surveys show what insects occur and when.

Observations of what is flowering in remnant vegetation at the time of the surveys are recorded in the site notes which assist in the development of the flowering/fruiting calendars that will be used to determine revegetation species lists. Observations of what insects visit particular flowers is also recorded to assist with the development of the revegetation species lists.



## 2.2 By June 2019 20 farmers involved in the canola and fruit orchard industries in the South West region of WA have a better understanding of the role that beneficial insects and pollinators play in maintaining and/or improving on-farm production

The three events that were held for this project had a total attendance of 63 people, the large majority of which were farmers or small landholders (84%, 30% and 86%). Landcare officers and consultants/researchers also attended these events and the information they obtained will flow to farmers/landholders. The events focussed on the role of pollination and beneficial insects in food production. Evaluations of the events were conducted for all those who attended. Feedback was extremely positive and showed that knowledge on the subject had increased (in general from a score of 3 to 4.5).

As an example of this, the orchard manager of the site in Balingup reported to the Project Manager that he knows a lot more about insects as a result of the project, and it is clear that his workers do too. When the SWCC Project Manager was at the orchard conducting the summer insect survey, one of the senior staff approached her with a photo of an insect he had found in the orchard that he wanted identified. The SWCC officer uploaded the photo to the MyPest App and relayed the identification to the worker.



Given that the orchard is owned by Casotti Enterprises, the largest fruit producer in the state, the information from the various activities of the project at the orchard site will be shared amongst the other orchard managers working for Casotti and no doubt other orchardists at industry events.

## 3. Key achievements of the project

As a result of the project there is an improved knowledge about what pollinators occur on the two demonstration farms (canola and fruit orchard) and information about the role insects play in crop pollination, IPM and the overall production of crops.

The development of flowering/fruitlet calendars for both areas has been another major achievement. These calendars have already been used in the selection of plants for revegetation with the aim of providing food and shelter for pollinating and beneficial insects that will in turn positively impact on production (and biodiversity). The calendars will also be made available to the public and promoted through social media in the coming financial year, which will ensure that they are used more widely. Some community nurseries have already reported that they are getting requests for flowering plants that support insects no doubt due to the media focus on the importance of insects and their decline in some parts of the world, and these calendars will provide

Guide to species		Flower colour	Condition	Flowering time												Seed / fruiting collection time											
Species Name	Common Name			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	Acacia saligna	Wattle	Yellow																								
2	Acacia saligna	Wattle	Yellow																								
3	Acacia saligna	Wattle	Yellow																								
4	Acacia saligna	Wattle	Yellow																								
5	Acacia saligna	Wattle	Yellow																								
6	Acacia saligna	Wattle	Yellow																								
7	Acacia saligna	Wattle	Yellow																								
8	Acacia saligna	Wattle	Yellow																								
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24	Acacia saligna	Wattle	Yellow																								
25	Acacia saligna	Wattle	Yellow																								

some useful input into that selection.

The site implementation plans for the two sites have also proven very beneficial, particularly for the land managers, who have had input into their development. These plans have also been used to guide the 4-year extension of the project.

The Functional Diversity Report prepared through the project is another publicly-available document that has created an opportunity to discuss the importance of diversifying agricultural landscapes to marry agricultural production and environmental quality in order to become more resilient in the face of a changing climate. The report can also be used to demonstrate the importance of what they are doing to the land managers of the four new sites for the 4-year project extension.



Finally, there is much greater awareness of the role of pollinators and beneficial insects in food production as a result of the three events and associated media delivered for the project throughout the region.

On-ground works at both sites have been undertaken including fencing, weed control and site preparation for revegetation.

## 4. Key issues and their management

The late sign-off (October) of a one-year pilot project meant that spring fauna surveys were delayed, particularly for canola which had finished flowering. There was also an impact on on-ground works on the two sites in that there was less time to undertake works. In fact, the late sign-off shortened the entire pilot project duration, making it more difficult to achieve what had been planned. This delay was unfortunate, but the continuing activities in the upcoming 4-year extension will recover that lost 'ground'.

There was also a very late start to the wet season this year, coupled with an almost total failure of the flowering of the marri/red gum (*Corymbia calophylla*) during summer/autumn – a rare occurrence. This has certainly impacted on pollinators and beneficial insects, with our mid-summer surveys showing very low numbers. The flowering of the Marri is key to honey production in WA and relied on by beekeepers as it grows in a large range of the SW region and flowers when not much else is flowering. It is also an important food source for wildlife including its seed which is heavily utilised by the threatened black cockatoos



Both the late start to rain and lack of flowering of a major species are indicators of a changing climate. Given the project has a focus on resilience on farms, it has had the advantage of creating an awareness amongst farmers that a changing climate is an issue, so they may more readily take up some of the suggested strategies. It has also emphasised the importance of selecting the correct species for the revegetation programs to reduce the risk of relying too heavily on one species flowering at a particular time. The project is therefore recommending that lists should include at least three species that flower at similar times in case one or more fails to flower.



*Marri (Corymbia calophylla) in flower. Photo by Cas Liber*

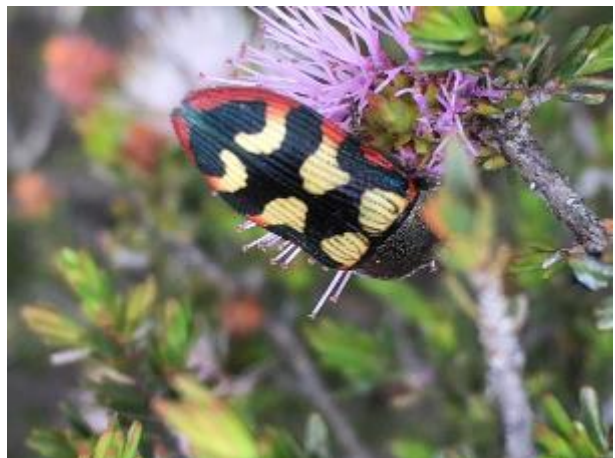
## 5. Evaluation of the Outcomes

- Despite not having the full year to complete the project, the planned activities were achieved with the resources available. This was achieved by having experienced staff and partners managing the project.
- Undertaking fauna surveys was chosen to gain baseline data in order to demonstrate whether the activities planned will have the desired effect. The project elected to use the Protocol to Detect and Monitor Pollinator Communities (FAO) as the method to monitor insects as it can be replicated by anyone and also ensures that the data gathered can be used for international comparisons.
- As this was a short one-year pilot project, there has not been a lot of measurable impact on the ground, although awareness of the benefits of insects and other pollinators has been increased through the various events and associated media. Likewise, there is a lot more knowledge of what insects and other pollinators occur on the two working farms.
- The project has delivered the desired results as efficiently as possible with the resources available and having skilled and experienced staff managing the project made this possible. Having the full year to deliver the project would have been helpful, particularly to gain an understanding of what insects occur in spring during flowering of canola and several of the fruit varieties.
- The project has achieved quite a legacy in a short period. Both the flowering/fruitlet calendars will be available on request and can be used across the three IBRA sub-regions by Landcare professionals and others to guide the choice of species to plant in revegetation projects. The documents are 'living documents' and will be updated through those with the appropriate skills adding their knowledge to them. The Functional Diversity Report will also be available to farmers and the community generally and will also be updated and reviewed as further information is gathered.

The project has also improved knowledge of the role insects play in productivity. General knowledge of what pollinators occur on the two farm sites has been documented. Considerable knowledge has also been gained of the value of a number of plants as food sources for pollinators.

All on-ground works that occurred on the two farms are long-term and will be in place for 10 years or more.

- A casual get-together of all consultants, the community group and landholder working on various aspects of the project site in the canola belt late in the project was also very beneficial. Many of these people met at the event for the first time. The experts in their various disciplines shared valuable knowledge that will benefit the project, e.g. the consultant undertaking the bird surveys advised that he had not seen the Tawny crowned honeyeater (*Glyciphila melanops*) on this site previously but had observed it feeding from *Astroloma epacridis* which was the only plant flowering on site at the time. We





can therefore assume the honeyeater is a pollinator of that plant species and that it is a useful food source during the late summer period.

Although these types of facilitated get-togethers weren't originally planned in the 4-year extension to the project, they will now be held at least annually with all project stakeholders. This will enable the discussion about the project's goals and planned work to optimise the future outcomes.