Enhancing Native Butterfly Populations in the Waipara Valley

Mark Gillespie, PhD candidate, Bio-Protection Research Centre, Lincoln University
Enhancing Native Butterfly Populations in the Waipara Valley

Why research butterfly populations in Waipara?

The answer is that agriculture, including viticulture, damages biodiversity and has probably caused major declines in New Zealand’s butterfly populations. This work examines the factors influencing the remaining butterfly populations in Waipara and is trying to develop grower-friendly ways of enhancing them. This is a short report on some results of the summer of fieldwork conducted in the 2008/09 season in Waipara as part of Mark Gillespie’s PhD project on the conservation of native butterfly species in the region.

Our goals

The aims of the work were to investigate which butterflies occur in habitat types typical of the region, their relative abundance and which vegetation types are most important for different species. To do this, a walking route (a transect) was designed which passed through representative vegetation types on and around six vineyards in Waipara: Waipara West, Dunstaffnage, Dickson Vineyard, Greystone Wines, Mountford Estate and Fancrest Estate. Every two weeks, beginning
at the start of the “butterfly season” in October, the same route was walked at a steady pace, making a note of every butterfly seen and determining its species, sex, behaviour and plant species utilised. Detailed information on the composition of the different vegetation types was also collected.

**Key butterflies found**

The most abundant butterflies in all vineyards were the blues. There are two species of blue butterfly in New Zealand, the common blue (*Zizina labradus*, Figure 1) which is thought to have arrived from Australia after human settlement and occurs mainly in the north of the country, and the closely-related southern blue (*Zizina oxleyi*), an endemic New Zealand species usually confined to the south. Both these species occur in Waipara and it is thought that they may hybridise. This has not yet been confirmed, but in a separate experiment DNA analysis is being used to find out if this is the case. It is quite difficult to distinguish between these two species and their hybrids with the naked eye without catching each one, so for the purposes of the fieldwork part of this study the blue butterflies were treated as one species.

The other frequently spotted species was the common copper (*Lycaena salustius*, Figure 1). This endemic species occurs throughout the country, wherever its larval host plants, *Muehlenbeckia* species, are found. Other species recorded in this study included the cabbage white, boulder copper, glade copper, red and yellow admirals, monarch, and the Australian vagrant, the spectacular blue moon, although apart
from the cabbage white and boulder copper, these species were not seen regularly.

Figure 1: The more common butterflies of Waipara: 1) Common blue, Zizina labradus, 2) Common copper, Lycaena salustius, 3) Yellow admiral, Bassaris itea, 4) Red admiral, Bassaris gonerilla; 5) Boulder copper, Lycaena boldenarum; 6) Cabbage white, Pieris rapae.
Initially, work was also carried out at the nature reserve at Claremont Luxury Estate and on the proposed site of the Mainpower wind farm at Mount Cass. While these were good sites for butterflies, time was a limiting factor in data collection. The resulting monthly visits were not frequent enough to yield data for use in this study. However, the sites did show encouraging signs that good local populations of butterflies are located close to the vineyard study properties. Claremont supports healthy populations of blues, common coppers, boulder coppers, and tussock ringlets and the Mount Cass ridge provides good habitat for common coppers and tussock ringlets and has the potential to be a locally important site for red admirals.

More details

The main results from the survey work showed separate patterns for the most common species of butterfly. The host-specific common copper was found almost exclusively in the remnant areas where its larval host plants are present, and the survey data (Figure 2) demonstrate two clear generation peaks over the season. This graph illustrates two points: The majority of the common coppers counted occurred on the north-facing habitat remnants on properties found closer to the Waipara river (Waipara West, Dunstaffnage, Dickson Vineyard), rather than the south-facing remnants at the hillside sites (Greystone, Mountford, Fancrest). Also, the two generation peaks of the butterflies at the riverside sites occurred earlier than those of the hillside sites. This information demonstrates the importance of the warmth and prolonged sunshine hours of north facing remnant habitats to this species of butterfly.
Figure 2: The average number of common copper butterflies seen per 100m of transect on “Riverside” properties and “Hillside” properties.

The blue butterflies are more generalist species and can make use of many of the vegetation types in agricultural land, due to the ubiquity of their host plants in the pea and bean family (Leguminosae). The patterns in Figure 3 are not as clear cut as those for the common copper. It is more difficult to determine generational peaks for the blues, as these species thrive in a variety of habitats. However, the graph does show that the hillside sites are more important for these species. Here, the cultivated north-facing slopes rather than the flatter river terraces of the riverside sites warm up more quickly and stay warm for a greater proportion of the day. Coupled with the presence of the all-important larval food plants, this makes the hillside sites more suitable for the blue species.
What does it all mean?

So what does this say about the health of butterfly habitats in Waipara vineyards? While New Zealand butterflies are not endangered, the reduction of their habitat across much of the country is cause for concern, and the low number of species observed in 2008/9 confirms this. Similarly, while vineyards appear to be good habitats for the blue butterflies, the confinement of the copper species to marginal parcels of land is typical of managed landscapes the world over. Despite this, and although no effect of Greening Waipara plantings was observed, the commitment of landowners to returning native biodiversity to managed landscapes is encouraging. The lack of use by butterflies of the planting sites is likely to be due to the plantings’ being recent and their isolation from more established remnant vegetation. The long-term vision of the Greening Waipara project is, however,
likely to improve the habitat provision for native butterflies, if the following recommendations are adopted:

1. Plant more of the important larval host plants of the rarer butterflies in vineyard plantings and in and around vegetation remnants and/or marginal lands. Plants should include *Muehlenbeckia* species (coppers), European and native nettle species (yellow and red admirals) and tussock grasses (ringlets), as well as important flowering species such as Hebes which provide adults with nectar and which seem to be largely absent in Waipara.

2. Conserve and enhance existing remnant native vegetation through extra planting and restriction of grazing.

3. Link planted areas to remnant vegetation sites through the establishment of hedgerows or the planting of bushy, native species along fence lines. This helps to increase breeding habitat and facilitate butterfly dispersal.

Take-home message

Overall, the message is that there is potential for enhancing butterflies in Waipara, but this is likely to require a long-term effort rather than quick fixes.

Thanks for helping

Many thanks to collaborating vineyard properties Waipara West, Dunstaffnage, Dickson Vineyard, Greystone, Mountford and Fancrest, and to those neighbouring properties that were incorporated into transect walks. Thanks also to Four Leaf (Japan) Co. Ltd., the Bio-Protection Research Centre based at Lincoln University and to Education New Zealand for funding. If you have any questions, please do not hesitate to contact Mark Gillespie or Steve Wratten (see below or on the back cover).

Mark Gillespie
PhD student
Bio-Protection Research Centre
Lincoln University
Lincoln 7647
Email: Mark.Gillespie@lincolnuni.ac.nz
Phone: 03 325 2811 ext. 8386

Mark’s PhD Supervisor:
Prof Steve Wratten
Email: Steve.Wratten@lincoln.ac.nz
DDI: 03 321 8221
This booklet was produced by the Bio-Protection Research Centre, Lincoln University

www.bioprotection.org.nz