2015 Fieldwork Grant Report

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Leptotes pirithous
(Lang's Short Tailed Blue)

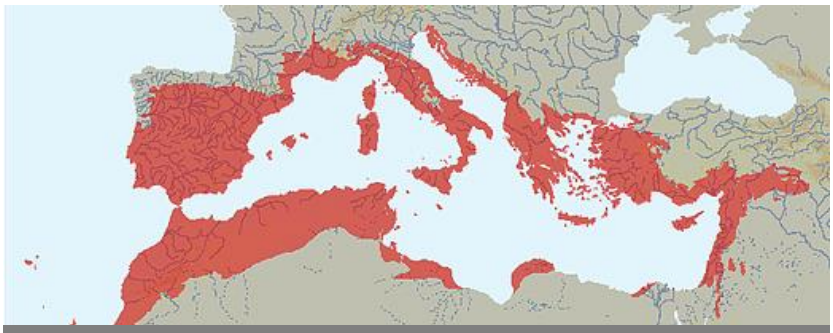
Exploring butterfly diversity in farming systems of the eastern Mediterranean:

The influence of linear semi-natural habitats

Background

Extensive research across much of temperate Europe has identified farmland intensification and the accompanying decline of traditional farming practices as one of the foremost threats to biodiversity in the region. Linear semi-natural habitat elements, such as field margins and wildflower strips, have been identified as important habitats for conservation of biodiversity in intensified farmland as they can provide vital foraging resources, nesting resources and shelter for a variety of wildlife, including butterflies and many other insects. More recently, riparian habitats, such as riverbank strips, have also been identified as potentially beneficial habitats for biodiversity in such farmland too. This is because they too have many of the same vital resources for wildlife that field margins and wildflower strips do.

In comparison to temperate Europe, research on the afore-mentioned topics has received very limited attention in the Mediterranean Basin. This is despite the region being identified as a global biodiversity hotspot and having a good proportion of its biodiversity strongly associated with traditional farmland practices. In many areas traditional practices are being lost through the introduction of more modern, intensive practices or through complete abandonment.



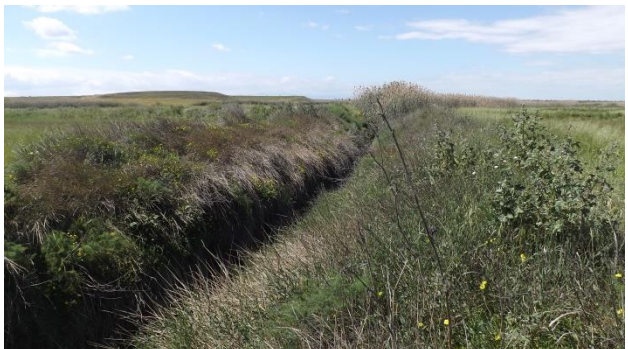
Mediterranean Global Biodiversity Hotspot.
Image from www.iucn.org

It is important to establish whether the attributes of linear semi-natural habitats that are beneficial for biodiversity in the intensively managed farmlands of temperate Europe, are also apparent in such habitats of Mediterranean farming systems. Mediterranean climatic conditions, particularly the long, hot and dry summer months, may be influential on how and when different types of linear semi-natural habitats may be to beneficial to biodiversity.

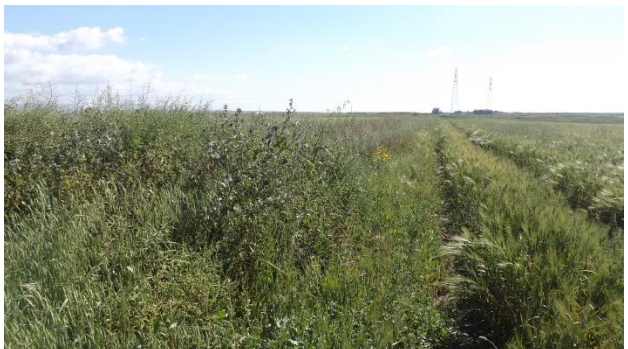
Lycaena thersamon
(Lesser Fiery Copper)

Aims & Outline of Hypotheses

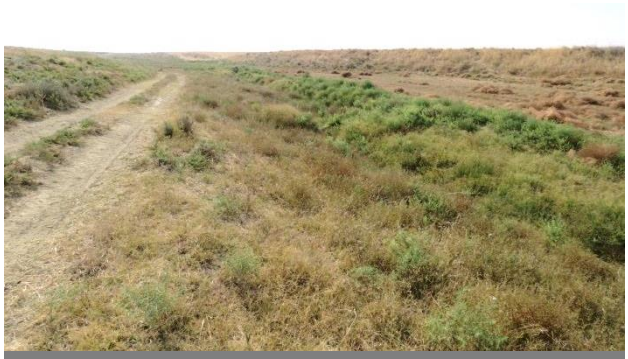
The aim of this research was to investigate if two different types of linear semi-natural habitats, specifically field margins (non-cropped semi-natural habitat between cropped fields) and riparian margins (non-cropped habitat between a riverbed and a cropped field), situated within a relatively intensively farmed region of Northern Cyprus supported similar levels of butterfly diversity throughout the year. The richness and abundance of butterflies each type of habitat can support may be influenced by the level of aridity (or water availability) in the surrounding farmland landscape. For example, in spring, when there are low levels of aridity, plant resources for butterflies are readily available across the wider landscape, and butterflies may consequently use both types of linear habitat to a similar extent. By late summer however, the wider landscape becomes completely dry and plant resources scarce. If riparian margins maintain higher levels of plant resources during summer months compared to field margins this may cause butterflies to use riparian habitats more at these times of year.



Spring – Riparian Margin Habitat

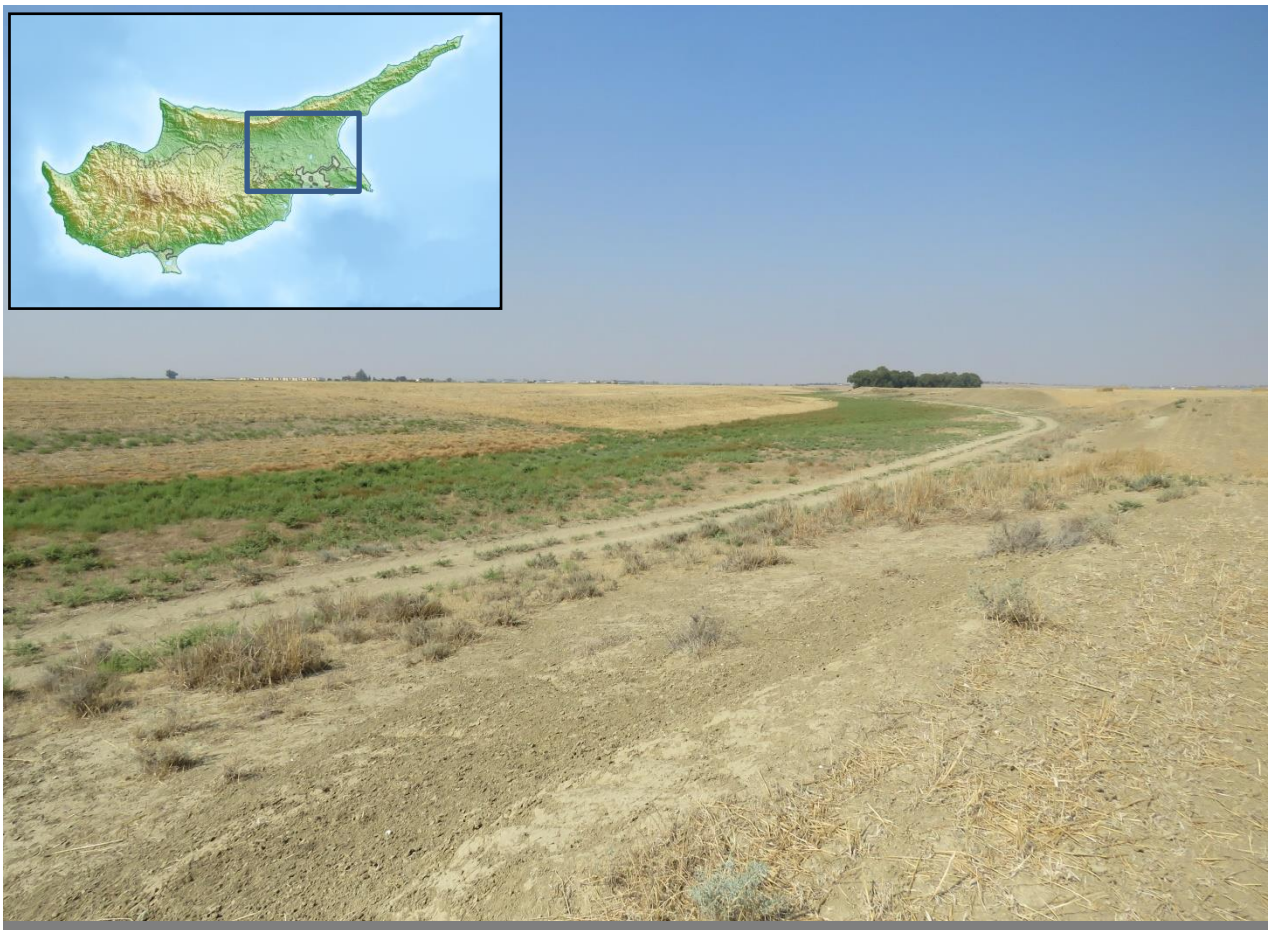


Spring – Field Margin Habitat



Summer – Riparian Margin Habitat

Summer – Field Margin Habitat



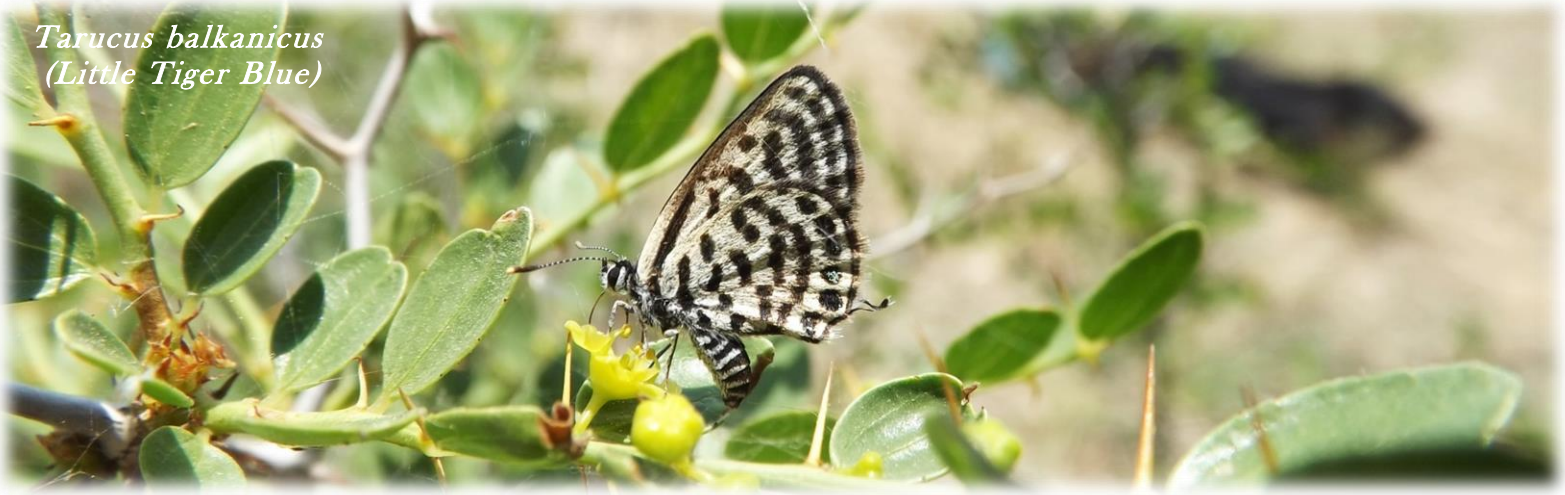
View of a riverbed and surrounding farmland landscape in the Mesaoria Plain region of Northern Cyprus (map inset) in the height of summer

Methods

Fifteen sites throughout the Mesaoria Plain region of Northern Cyprus were used to carry out surveys. This region is one of the most intensively farmed areas in Cyprus and is mainly farmed with cereal crops. Within each a site a pair of 500m transects were established. One transect followed along a riparian margin and the other along a field margin which ran roughly parallel to the riparian margin. Pairs of transects were surveyed for butterflies and potential nectar resources (flowering plants) four times throughout 2015. Initial surveys took place in spring (March/April), and subsequent surveys took place in early summer (May/June), mid-summer (July/August) and late summer (August/September) in order to encompass low to high levels of aridity (dryness) in the surrounding landscapes.

Preliminary Results

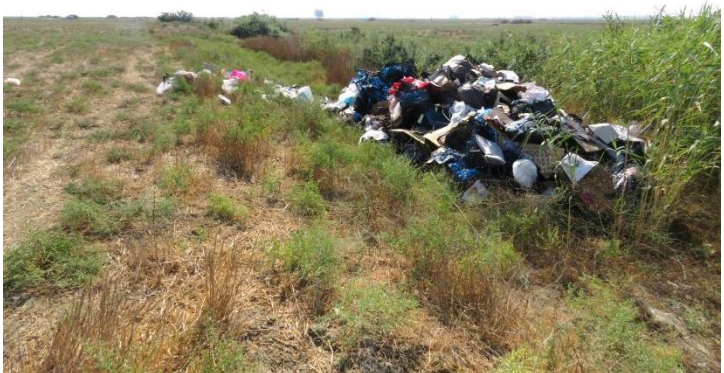
Although full analyses are still ongoing, preliminary results suggest that in spring-time, butterfly species richness is similar in both field margins and riparian margins. However, as summer progresses species richness in field margins starts a consistent decline all the way through until late summer (September) where on average only a single species tends to be seen. In contrast species richness in riparian margins increases during summer months and only starts to show a decline in late summer. It is intended that the full results of this project, including considerations of potential drivers of these trends, will be published in a scientific journal in the near future.



Tarucus balkanicus (Little Tiger Blue)

Conclusions and Future Work

Provisional conclusions from this work suggest that in more intensively farmed regions of the Mediterranean priority should possibly be given to protect and develop riparian margins over non-riparian semi-natural habitats in order to benefit farmland biodiversity. Although in this study riparian habitats overall exhibited greater butterfly diversity than field margin habitats, there was great variation within the riparian habitats and this should be considered within future research. Several of the riparian habitats used in this study were quite degraded and/or polluted with waste. Many also likely become prematurely dry as water is diverted from them for human and agricultural uses in the area.



General waste dumped in a riverbed

This study focused solely butterflies, and future work would benefit from including a wider range of wildlife, from other insects through to plants and birds, to see if all such taxa exhibited similar trends. Definitive management recommendations can't be made without such work and it is hoped the research carried out here will encourage similar research in Mediterranean farmlands.

Acknowledgements

I am extremely grateful to the Alice McCosh Trust for the generous financial support that enabled me to complete this research project. The support has provided essential data for my PhD research and it is intended that at least two scientific publications will result from the research work that the funding supported. It is hoped in the long-term that as this work is disseminated further work in farmland systems of the Mediterranean will ensue, and that future management regimes in the region will be adapted to incorporate and benefit the biodiversity of the region.

Polyommatus icarus (Common Blue)

Useful References

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