

Metapopulation dynamics and habitat preferences of the marsh fritillary butterfly (*Euphydryas aurinia*) in calcareous grassland

Introduction

- The marsh fritillary butterfly (*Euphydryas aurinia*) has experienced population declines throughout Europe and is now classified as vulnerable in Sweden.
- The species occurs in metapopulations, which are populations that are distributed within networks of habitat patches where local populations are spatially restricted and linked by occasional migrations.

Aims

- My aim was to assess variables influencing metapopulation dynamics (e.g. extinction, colonization, and occupancy) as well as variables influencing larvae presence on a large (one hectare) and small (0.5 m²) scale.
- I also aimed to estimate the metapopulation size and checked the nectar preference for the species.

Methods

The species was studied in the calcareous grasslands of Gotland, Sweden. Data on the adults was collected during the summer (from late May to late June), using presence-absence and capture mark-release surveys (Figure 1). Simultaneously, nectar data was gathered by compiling information on flowering species and registering the species used by butterflies.

The larvae survey was carried out during the autumn. The larvae of the marsh fritillary spin silken nests (Figure 2) around the host plant (*Succisa pratensis*) (Figure 3), and these nests were counted in transects along with vegetation data.



Figure 1: marking the wings of a marsh fritillary



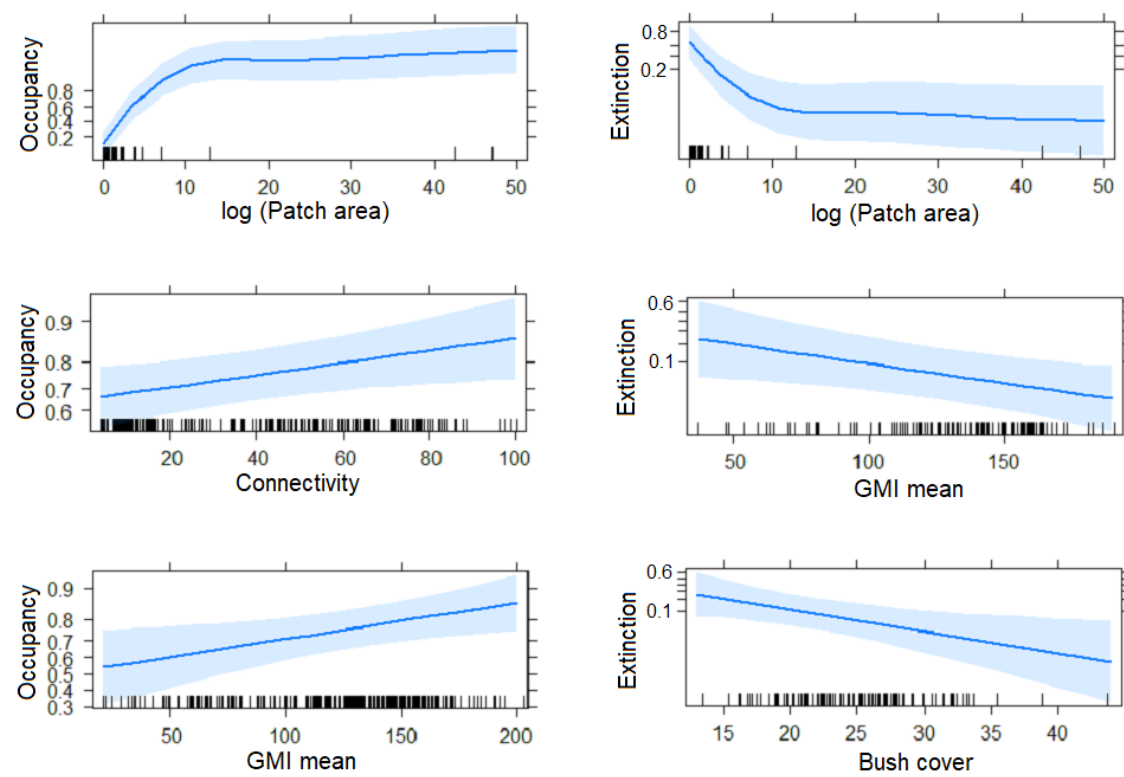
Figure 2: marsh fritillary's larvae nest



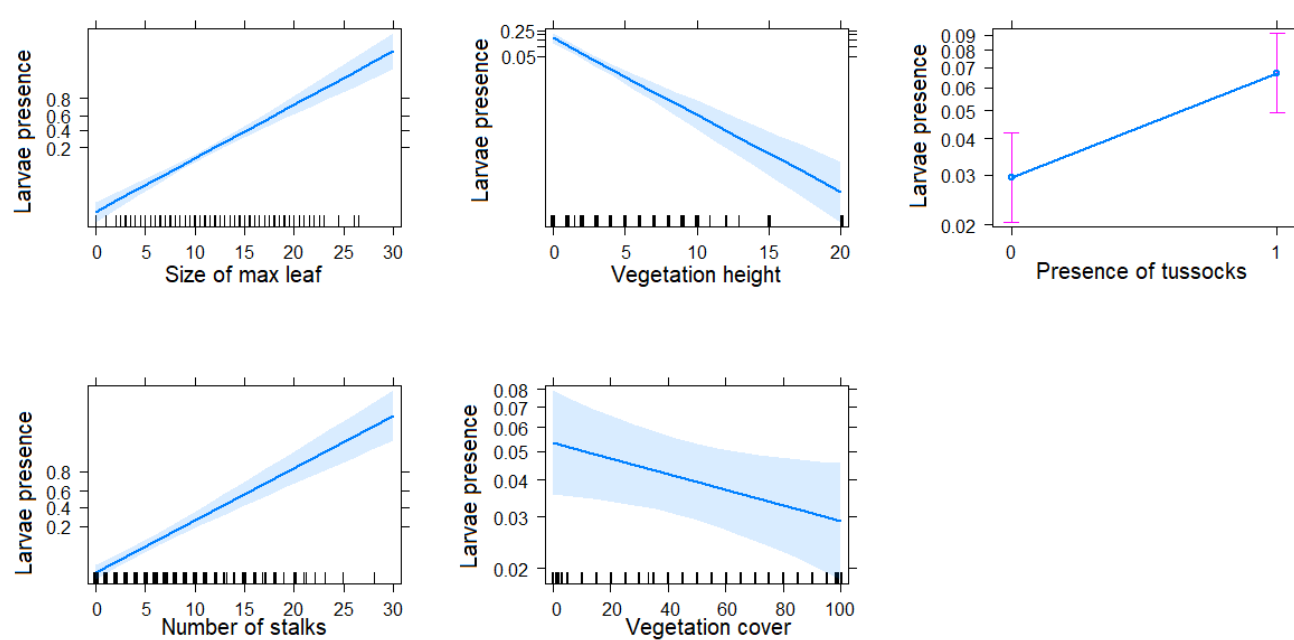
Figure 3: marsh fritillary's host plant.

Results

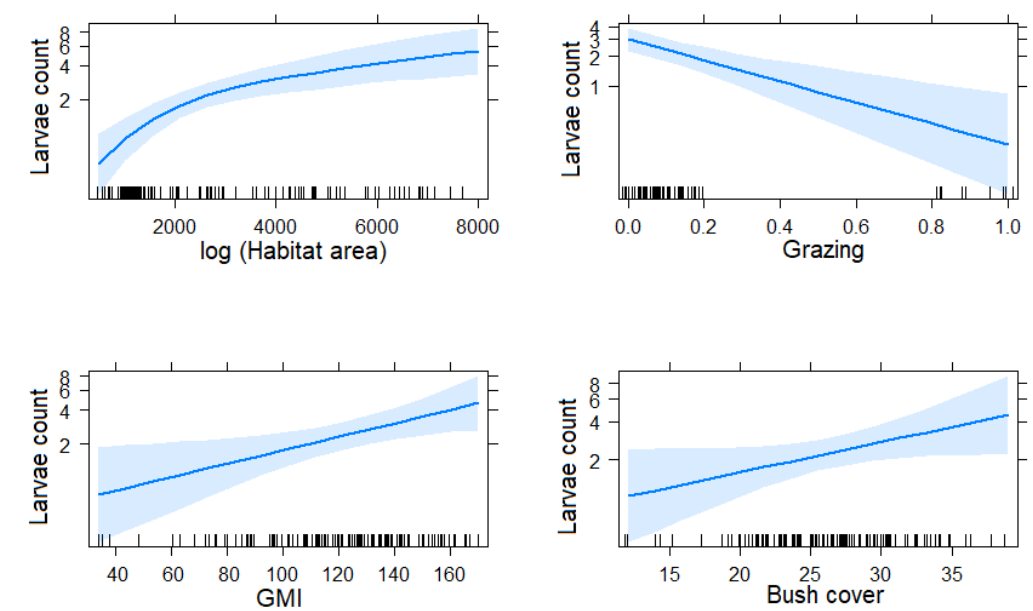
Metapopulation dynamics - no variable explained colonization



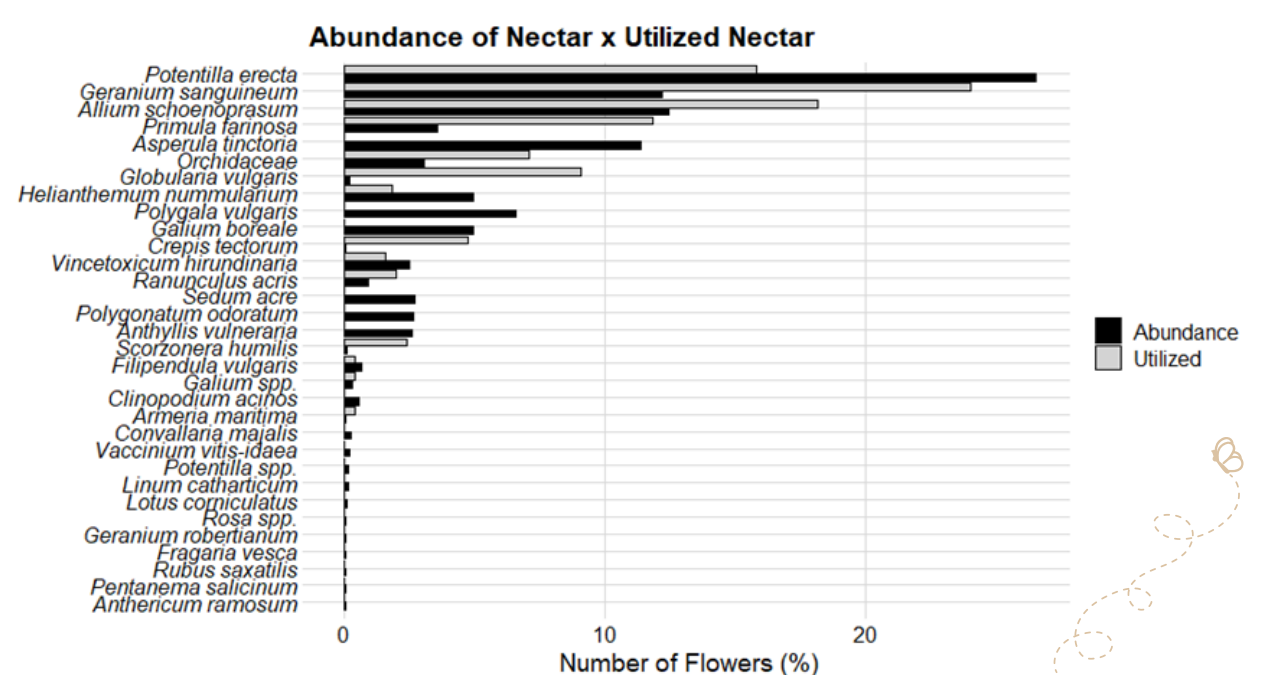
Small scale (0.5 m²) larvae study



Larvae scale (one hectare) larvae study



	Estimation of population size	Number of grid cells	Habitat area (ha)	Density per hectare	Unique individuals
Site A	2683.97	67	27.67	97	1141
Site B	223.088	40	15.38	15	93
Site C	2909.72	12	10.16	286	795
Site D	2735.58	19	16.79	163	620



Conclusion

- To provide a better habitat for the marsh fritillary the area should be managed by focusing on keeping the beneficial variables for both adult and larvae
- The nectar use is targeted to some species, however further studies could be done to describe better the preferred species
- Compared with previous studies in the area the population size is increasing, therefore recovering from the previous weather event that the area suffered

