

SCARCE LARGE BLUE



The Scarce Large Blue (*Maculinea teleius*) has light grey-brown underwings with two rows of dark spots. The marginal spots often appear diffused. The butterfly is an indicator species for extensively used moist mesophile grasslands like litter meadows, tall herb communities, and wet meadows, all mostly poor in nutrients. The species has suffered a strong decrease all over Europe and is listed in Appendix II and IV of the EU Habitats Directive.

In Bavaria *M. teleius* is significantly rarer than its sister species *M. nausithous*. It is regarded as highly threatened and a species of prominent nature conservation concern. Bavaria is a centre for the species in Germany and has a special responsibility for its conservation.

Do not eat too much!

M. teleius lays its eggs in the buds of the sole host plant (*Sanguisorba officinalis*). The caterpillars feed in the buds for the first few weeks but are then adopted by ants and spend the rest of their lives below ground in ants' nests. An essential requirement is sufficient nest densities of specific host ant species.

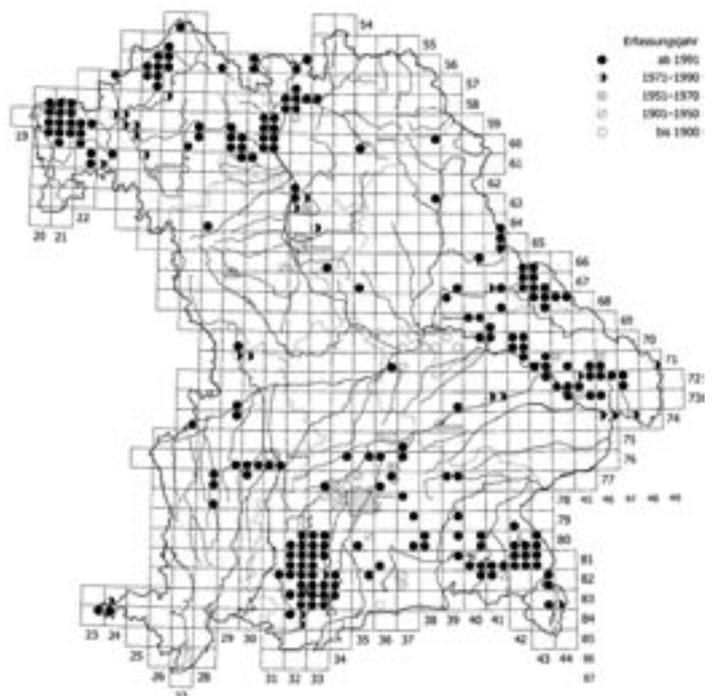
The caterpillars produce specific host ant's pheromones, which prevent the caterpillars from being attacked by the ants, even when they start to feed on the host ant's own brood. *M. teleius* is regarded to be a "predator species", which means that its caterpillars eat the ant brood and are not directly fed by the ants. The enormous consumption of ant brood allows only a few caterpillars per host ant's nest. A very high density of *M. teleius* larvae could even lead to a serious threat for the long-term existence of a host ant's nest.

The key to success – Suitable land use systems

The habitats of *M. teleius* need to be kept open by regular mowing or in a few cases by grazing. If mowing takes place too often or too infrequent it can lead to adverse habitat conditions for the host plant or the host ants. Adverse mowing can seriously reduce the chance of finding the right host ant and being adopted successfully. Another risk is mowing too early, which can lead to the destruction of the young caterpillars, which still live in the buds of the host plants. The wrong frequency or date of mowing can cause the local extinction of *M. teleius* populations.

Research for the Scarce Large Blue

The multitude of questions about how to design suitable land use systems in the different habitat types called for detailed research. The Bavarian Academy for Nature Conservation and Landscape management (ANL) consequently started a research project about the impact of land uses systems on *M. teleius*. Fortunately we had the chance to integrate our investigations in the EU research project "MacMan" (EVK2-CT-2001-00126) which brought us to a very fruitful cooperation with many butterfly experts all over Europe.



Distribution of the Scarce Large Blue in Bavaria (Source: Artenschutzkartierung Bayern und Datenbank der ABE, Stand: 05.2007)

An important Key factor – Mowing frequency

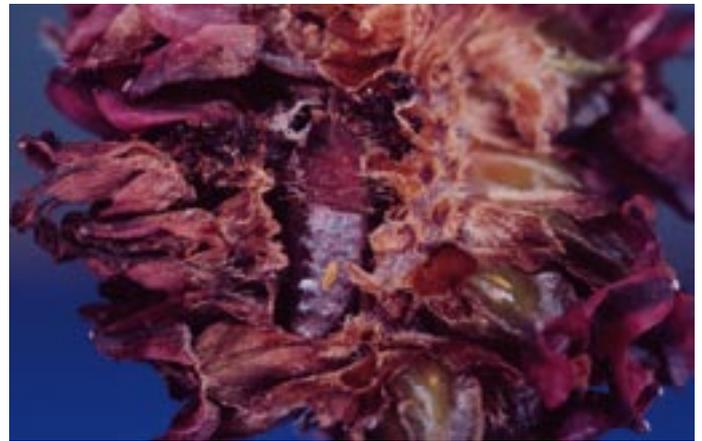
Studies in 67 research areas (spread over the whole of Bavaria) proved that the frequency of mowing is a fundamental factor for populations of *M. teleius*. We correlated the adoption probability (tested by baiting with sugar cubes) and vegetation structure with regard to mowing frequency. Our results showed that mowing frequency has a strong impact on vegetation structure and microclimate, which in turn determines the presence of suitable host ant species.

Searching for caterpillars in ant nests revealed that in Bavaria, besides the main host ant *Myrmica scabrinodis*, the ant species *M. rubra* and *M. ruginodis* can serve as host ants too. This finding corresponds with the results made by other working groups within the MacMan project.

M. scabrinodis prefers relative humid conditions and not too dense vegetation. To meet this habitat requirement, mowing frequency has to be adjusted to the specific productivity and vegetation structure of the habitat (see chart below). More details about management guidelines can be found in STETTNER et al. (in prep.) and VÖLKL et al. (in prep.). We would like to stress that our guidelines could need some further adjustments if the requirements of other important species have to be considered.

The right timing

There are considerable variations of the flight period of *M. teleius* in Bavaria. This fact has to be considered in management guidelines as it requires specific adjustments of the mowing dates.



Caterpillar in the bud of *Sanguisorba officinalis*

The flight period in the southern parts of the pre-alpine region starts already at the end of May and lasts until mid-July. This early appearance makes two cuts per year impossible, whereas one cut at the end of summer is a good management option for such populations.

In most Bavarian regions, *M. teleius* appears at the beginning of July and flies until mid-August. Mowing at the beginning of September is rather early for these populations and can lead to some loss of young caterpillars in the buds. In our opinion such losses can be tolerated in most cases. *M. teleius* is a predator species, which in seasons of high abundance can harm the host ant populations. A moderate loss of young larvae counteracts this risk and does not threaten the long-term survival of the population.

Type of Vegetation	Management guideline (prealpine region)	Management guideline (most of Bavaria)
Litter meadow (<i>Molinion</i>), low productivity.	One cut every second year, at the beginning of September	One cut every second year, at the beginning of September
Litter meadow (<i>Molinion</i>), moderate productivity	One cut every year, at the beginning of September	One cut every year, at the beginning of September
Moist grassland (<i>Calthion</i>), low up to moderate productivity.	One cut every year, at the beginning of September	One cut every year, between end of may until end of June or around beginning of September
Moist grassland (<i>Calthion</i>), moderate up to medium productivity	One cut every year, at the beginning of Sep- tember (if necessary around mid-August)	Two cuts every year, between end of may until end of June and at the beginning of September
Extensively used greenland (<i>Arrhenatheri- on</i>), low up to moderate productivity	One cut every year, at the beginning of Sep- tember (if necessary around mid-August)	One cut every year, between end of may until end of June or at the beginning of September
Extensively used greenland (<i>Arrhenatheri- on</i>), moderate up to medium productivity	One cut every year, at the beginning of Sep- tember (if necessary around mid-August)	Two cuts every year, between end of may until end of June and at the beginning of September
Tall herb vegetation, moderate up to high productivity (<i>Filipendulion</i>)	One cut every second year, at the beginning of September	One cut every second or third year, at the beginning of September

Literary quotes:

STETTNER, C., BRÄU, M., BINZEHÖFER, M., REISER, M. & J. SETTELE (in prep.):
Pflegeempfehlungen für das Management der Ameisen-Bläulinge *Maculinea teleius*, *Maculinea
nausithous* und *Maculinea alcon* – Ein Wegweiser für die Naturschutzpraxis. Natur und Land-
schaft

VÖLKL, R.; REISER, T.; STETTNER, C. BRÄU, M. & J. SETTELE (in prep.):
Auswirkungen von Mahdterminen und -turnus auf Populationen der Ameisen-Bläulinge *Maculinea
teleius* und *Maculinea nausithous*

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