

Supplementary Material – Nyffeler & Bonte

Where have all the spiders gone? Observations of a dramatic population density decline in the once very abundant garden spider, *Araneus diadematus* (Araneae: Araneidae), in the Swiss midland

Table S1. Area size (m²) of the study areas

Habitat type	Geographic region	Study area (m ²)
<u>Historical data</u>		
Fallow grassland, plot 1	Canton Zurich, Switzerl.	~1000
Fallow grassland, plot 2	Canton Zurich, Switzerl.	~1000
Fallow grassland, plot 3	Canton Zurich, Switzerl.	~1000
Fallow grassland, plot 4	Canton Zurich, Switzerl.	~1000
Shrubs	Canton Zurich, Switzerl.	~1000
Organic garden	Canton Zurich, Switzerl.	450
Glasshouses Botanical Garden Bern	Canton Bern, Switzerl.	965
Fallow grassland	Germany	4 x 625
Fallow grassland	Germany	90
Fallow grassland	France	3000
Hedgerow/grassland	France	~400*
Hedgerow	Italy	2000
Pine stand	Poland	100
Clearing-forest ecotone	Poland	100
Scotch pine wood	Netherland	157.5**
Oak wood	Netherland	17.5
Oak stand	UK	2500
Heathland	UK	1450
<u>Present-day data (2019)</u>		
Forest road, Degersheim	Canton St. Gallen.	1000
Forest edge + suburb, Arlesheim	Canton Baselland	500
Forest road, Reinacherheide	Canton Baselland	200
Forest edge, Münchenstein	Canton Baselland	500
Forest edge, Bottmingen	Canton Baselland	200
Forest edge, Rheinach	Canton Baselland	200
Forest road, Leymen	Alsace, France***	500
Organic garden, Flawil	Canton St. Gallen	800
Organic garden, Himmelried	Canton Solothurn	330
Organic garden + shrubs, Dornach	Canton Solothurn	500
Graveyard shrubs, Binningen	Canton Baselland	200
Graveyard shrubs, Oberwil	Canton Baselland	500
Public park, Riehen	Canton Basel	200
Suburb, Höggerberg	Canton Zurich	1000

Suburb, Zürichberg	Canton Zurich	1000
Suburb, Rheinfelden	Canton Aargau	1000
Hedgerow, Reinach	Canton Baselland	200
Hedgerow, Schönenbuch	Canton Baselland	200
Hedgerow + reedbelt, Sempach	Canton Luzern	200
Hedgerow + shrubs along a river bank, Oberengstringen	Canton Zurich	1000

Additional information to Table S1

* Roughly estimated based on information (i.e., map of web distribution) found in Le Berre, M.; Ramousse, R.; Le Guelte, L. Eco-éthologie des Argiopidae: 1. Evolution temporelle d'une population d'*Araneus diadematus* Clerck dans son milieu naturel. Atti. Soc. Toscana Sci. Nat. P. V. Mem. Ser. B **1981**, *88*, 72-83.

** $20.5 \text{ ind}/(9 \times 17.5 \text{ m}^2) = 20.5 \text{ ind}/157.5 \text{ m}^2 = 0.130 \text{ ind}/\text{m}^2$

*** Location in France, only 1.5 km from the Swiss border (Basel region)

Table S2. Mean number of prey per web counted in mid-afternoon as a proxy for the daily prey capture rate of large orb-weaving spiders in western European habitats: Historical values vs. present day value. References found in the paper.

Spider species	Habitat type	Year of investigation	\bar{x} prey web ⁻¹	Reference
<u>Historical data:</u>				
<i>Araneus diadematus</i>	Grassland, September	1979	13.5	Nyffeler 1982
<i>Araneus diadematus</i>	Grassland, August	1990	4.3	Malt 1996
<i>Araneus diadematus</i>	Grassland, September	1990	9.2	Malt 1996
<i>Araneus diadematus</i>	Maize field margins, July/August	2003	12.5	Ludy 2007
<i>Araneus quadratus</i>	Grassland, July	1979	21	Nyffeler 1982
<i>Araneus quadratus</i>	Grassland, August	1979	14	Nyffeler 1982
<i>Araneus quadratus</i>	Grassland, September	1979	20	Nyffeler 1982
<i>Araneus quadratus</i>	Grassland, August	1990	7.3	Malt 1996
<i>Araneus quadratus</i>	Grassland, September	1990	36.4	Malt 1996
<i>Araneus marmoreus</i>	Grassland	<1984	14.1	Pasquet 1984
<i>Larinioides cornutus</i>	Grassland, June/July	1979	18	Nyffeler 1982
<i>Larinioides cornutus</i>	Rye field	1976	15	Nyffeler 1982
Overall mean ± SE			15.44 ± 2.37	

Present-day data:

<i>Araneus diadematus</i>	Diverse habitats August/September	2.74	This paper
Overall mean ± SE		2.74 ± 0.98	
