Assessing the importance of field margins for bat species and communities in intensive agricultural landscapes - Data

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# Assessing the importance of field margins for bat species and communities in intensive agricultural landscapes - Data

### 2021-05-25

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#### Abstract

Landscape simplification and degradation through agricultural intensification is widely recognized as a main driver of biodiversity loss. In intensively used agricultural landscapes, patches of semi-natural habitats and particularly connections between them are of high importance for many taxa. Vegetated connections like hedgerows are especially important for foraging and commuting of mobile taxa such as bats. However, the interest of another treeless linear habitat – herbaceous field margins – remains unstudied for insectivorous bats. Field margins are nevertheless known as an important habitat for other taxa, including bat prey. Here we assessed the importance of field margins for bats compared to other landscape variables. We measured bat activity based on a repeated passive acoustic monitoring during 17 complete nights in summer on 112 study sites in an intensively used agricultural landscape. Each night, we sampled bat species activity and community metrics (i.e. species richness and community habitat specialization index) at different distances to field margins, and along a gradient of relative density of field margins. To compare field margin effects with other landscape variables, the sampled sites were selected by keeping a large variability in these other variables (land-cover Shannon diversity index, forests, hedgerows, water bodies, main roads, urban areas, grasslands, number of crops and rapeseed percentage). Only Myotis sp. were affected by herbaceous field margins. Specifically, the Myotis group activity decreased with the distance to herbaceous field margins (i.e. towards field crop cores), and positively correlated with relative density of herbaceous field margins, for which the effect size was comparable to other landscape variables. However, other landscape variables such as the proportion of and the distance to forests, the relative density of and the distance to hedgerows or land-cover Shannon diversity index, affected species richness, community specialization index, and bat activity of species from open, edge and narrow-space foragers, including the Myotis group as well. Our results highlight that herbaceous field margins have a positive effect on the activity of narrow-space bat foragers as Myotis species, but do not replace other landscape variables that drive the activity of the whole community.

#### Metadata Provider

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#### Associated parties

#### Keywords

* Acoustic monitoring
* Bat community
* Farmland biodiversity
* Field borders
* Habitat specialisation
* Landscape composition

#### Annotations

* biodiversity  <http://aims.fao.org/aos/agrovoc/c_33949>
* mammals  <http://aims.fao.org/aos/agrovoc/c_4560>
* chiroptera  <http://aims.fao.org/aos/agrovoc/c_1560>
* bats  <http://aims.fao.org/aos/agrovoc/c_1560>
* Landscape  <http://www.eionet.europa.eu/gemet/concept/4648>
* Ecosystem  <http://www.eionet.europa.eu/gemet/concept/2519>
* Animal ecology  <http://www.eionet.europa.eu/gemet/concept/420>

### Temporal coverage

| Start date | End date |
| --- | --- |
| 2015-07-08 | 2015-08-02 |

### Geographic coverage

**Yvelines - Essonne - Seine et Marne**

West: 1.60296  
East: 3.56409  
North: 49.08428  
South: 48.12266

### Taxonomic coverage

| Family | Genus | Species | Common name |
| --- | --- | --- | --- |

### Data tables

data\_blary\_&\_al.tsv

, 112 records

,

Content of data\_blary\_&\_al.txt

Physical: data\_blary\_&\_al.txt

| attribute name | definition | format, unit or codes |
| --- | --- | --- |
| Id | Sampling site ID |  |
| dist\_field\_margin | Distance to the nearest field margin element (in meters) | meter |
| dist\_hedgerow | Distance to the nearest hedgerow element (in meters) | meter |
| dist\_forest | Distance to the nearest forest element (in meters) | meter |
| dist\_road | Distance to the nearest road element (in meters) | meter |
| dist\_water | Distance to the nearest water body element (in meters) | meter |
| dist\_urban | Distance to the nearest urban element (in meters) | meter |
| density\_field\_margins\_250m | Relative density of field margins in a 250 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_field\_margins\_500m | Relative density of filed margins in a 500 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_field\_margins\_750m | Relative density of filed margins in a 750 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_field\_margins\_1000m | Relative density of filed margins in a 1000 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_field\_margins\_1500m | Relative density of filed margins in a 1500 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_field\_margins\_2000m | Relative density of filed margins in a 2000 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_field\_margins\_4000m | Relative density of filed margins in a 4000 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_roads\_250m | Relative density of roads in a 250 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_roads\_500m | Relative density of roads in a 500 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_roads\_750m | Relative density of roads in a 750 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_roads\_1000m | Description for density\_roads\_1000m | dimensionless |
| density\_roads\_1500m | Relative density of roads in a 1500 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_roads\_2000m | Relative density of roads in a 2000 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_roads\_4000m | Relative density of roads in a 4000 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_hedgerows\_250m | Relative density of hedgerows in a 250 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_hedgerows\_500m | Relative density of hedgerows in a 500 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_hedgerows\_750m | Relative density of hedgerows in a 750 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_hedgerows\_1000m | Relative density of hedgerows in a 1000 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_hedgerows\_1500m | Relative density of hedgerows in a 1500 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_hedgerows\_2000m | Relative density of hedgerows in a 2000 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| density\_hedgerows\_4000m | Relative density of hedgerows in a 4000 meters buffer around the sampling site (in meters per hectare) | dimensionless |
| shannon\_250m | Land-cover Shannon diversity index in 250 meters buffer around the sampling site (no unit of measurement) | dimensionless |
| shannon\_500m | Land-cover Shannon diversity index in 500 meters buffer around the sampling site (no unit of measurement) | dimensionless |
| shannon\_750m | Land-cover Shannon diversity index in 750 meters buffer around the sampling site (no unit of measurement) | dimensionless |
| shannon\_1000m | Land-cover Shannon diversity index in 1000 meters buffer around the sampling site (no unit of measurement) | dimensionless |
| shannon\_1500m | Land-cover Shannon diversity index in 1500 meters buffer around the sampling site (no unit of measurement) | dimensionless |
| shannon\_2000m | Land-cover Shannon diversity index in 2000 meters buffer around the sampling site (no unit of measurement) | dimensionless |
| shannon\_4000m | Land-cover Shannon diversity index in 4000 meters buffer around the sampling site (no unit of measurement) | dimensionless |
| grassland\_250 | Percentage of land covered by grassland in different 250 m buffer sizes | percent |
| forest\_250m | Percentage of land covered by forest in different 250 m buffer sizes | percent |
| urban\_250m | Percentage of land covered by urban area in different 250 m buffer sizes | percent |
| grassland\_500 | Percentage of land covered by grassland in different 500 m buffer sizes | percent |
| forest\_500m | Percentage of land covered by forest in different 500 m buffer sizes | percent |
| urban\_500m | Percentage of land covered by urban area in different 500 m buffer sizes | percent |
| grassland\_750 | Percentage of land covered by grassland in different 750 m buffer sizes | percent |
| forest\_750m | Percentage of land covered by forest in different 750 m buffer sizes | percent |
| urban\_750m | Percentage of land covered by urban area in different 750 m buffer sizes | percent |
| grassland\_1000 | Percentage of land covered by grassland in different 1000 m buffer sizes | percent |
| forest\_1000m | Percentage of land covered by forest in different 1000 m buffer sizes | percent |
| urban\_1000m | Percentage of land covered by urban area in different 1000 m buffer sizes | percent |
| grassland\_1500 | Percentage of land covered by grassland in different 1500 m buffer sizes | percent |
| forest\_1500m | Percentage of land covered by forest in different 1500 m buffer sizes | percent |
| urban\_1500m | Percentage of land covered by urban area in different 1500 m buffer sizes | percent |
| grassland\_2000 | Percentage of land covered by grassland in different 2000 m buffer sizes | percent |
| forest\_2000m | Description for forest\_2000m | percent |
| urban\_2000m | Percentage of land covered by urban area in different 2000 m buffer sizes | percent |
| grassland\_4000 | Percentage of land covered by grassland in different 4000 m buffer sizes | percent |
| forest\_4000m | Percentage of land covered by forest in different 4000 m buffer sizes | percent |
| urban\_4000m | Percentage of land covered by urban area in different 4000 m buffer sizes | percent |
| perc\_rapeseed | Percentage of rapeseed crops in a 100 m radius around each site at the sampling date | percent |
| nb\_crops | Number of different crops in a 100 m radius around each site at the sampling date | number |
| date | Description for date | YYYY-MM-DD |
| X | Sampling site longitude | dimensionless |
| Y | Sampling site latitude | dimensionless |
| recorder | Recorder ID used for data collection on the sampling site | 10250 = Value: 10250 for attribute: recorder 11693 = Value: 11693 for attribute: recorder 13289 = Value: 13289 for attribute: recorder 13676 = Value: 13676 for attribute: recorder 13733 = Value: 13733 for attribute: recorder 13740 = Value: 13740 for attribute: recorder 17232 = Value: 17232 for attribute: recorder 17329 = Value: 17329 for attribute: recorder 17573 = Value: 17573 for attribute: recorder 17578 = Value: 17578 for attribute: recorder 17598 = Value: 17598 for attribute: recorder 17601 = Value: 17601 for attribute: recorder 17607 = Value: 17607 for attribute: recorder 17608 = Value: 17608 for attribute: recorder 3760 = Value: 3760 for attribute: recorder |
| min\_t | Minimum temperature recorded on the sampling area during the sampling night (in celsius) | celsius |
| max\_wind | Maximum wind speed recorded on the sampling area during the sampling night (in km/h) | kilometerPerHour |
| CSI\_ER05 | Community specialization index calculated from species level activity on the 0.5 maximum error rate tolerance threshold | dimensionless |
| CSI\_ER01 | Community specialization index calculated from species level activity on the 0.1 maximum error rate tolerance threshold | dimensionless |
| richness\_ER05 | Species richness calculated from species level activity on the 0.5 maximum error rate tolerance threshold | dimensionless |
| richness\_ER01 | Species richness calculated from species level activity on the 0.1 maximum error rate tolerance threshold | dimensionless |
| Nyclei\_ER05 | Number of bat passes of Nyclei specie or group recorded during the sampling night on the 0.5 maximum error rate tolerance threshold | number |
| Nyclei\_ER01 | Number of bat passes of Nyclei specie or group recorded during the sampling night on the 0.1 maximum error rate tolerance threshold | number |
| Pippip\_ER05 | Number of bat passes of Pippip specie or group recorded during the sampling night on the 0.5 maximum error rate tolerance threshold | number |
| Pippip\_ER01 | Number of bat passes of Pippip specie or group recorded during the sampling night on the 0.1 maximum error rate tolerance threshold | number |
| Eptser\_ER05 | Number of bat passes of Epster specie or group recorded during the sampling night on the 0.5 maximum error rate tolerance threshold | number |
| Eptser\_ER01 | Number of bat passes of Epster specie or group recorded during the sampling night on the 0.1 maximum error rate tolerance threshold | number |
| Nycnoc\_ER05 | Number of bat passes of Nycnoc specie or group recorded during the sampling night on the 0.5 maximum error rate tolerance threshold | number |
| Nycnoc\_ER01 | Number of bat passes of Nycnoc specie or group recorded during the sampling night on the 0.1 maximum error rate tolerance threshold | number |
| Myo\_ER05 | Number of bat passes of Myo specie or group recorded during the sampling night on the 0.5 maximum error rate tolerance threshold | number |
| Myo\_ER01 | Number of bat passes of Myo specie or group recorded during the sampling night on the 0.1 maximum error rate tolerance threshold | number |
| Ple\_ER05 | Number of bat passes of Ple specie or group recorded during the sampling night on the 0.5 maximum error rate tolerance threshold | number |
| Ple\_ER01 | Number of bat passes of Ple specie or group recorded during the sampling night on the 0.1 maximum error rate tolerance threshold | number |

### Spatial Rasters

### Spatial Vectors

### Custom units

| unit name | parent SI unit | unit type | description |
| --- | --- | --- | --- |

### Other entities

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