

# Schmetterlinge-Kartierung- Monitoring



## CITY NATURE - WORKSHOP II

Monitoring Butterflies

13th Aug. 2019, Manfred Pendl



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# Butterflies of Vienna

- Table of contents
  - Butterflies and moth data: status quo
  - Butterfly Monitoring method - Pollard walk
  - Monitoring in CITY NATUR

## Butterflies and moth data: status quo

**4.071 species in Austria** (Huemer 2013)

**Lower Austria 3.511**

**Styria 2.917**

**Vienna 2.554**

**Burgenland 2.415**

Arten von Schmetterlingen in Österreich und in den Bundesländern,  
Niederösterreich, Steiermark, Wien, Burgenland

## Butterflies and moth data: status quo

**208 butterflies in AUT**

104 butterflies in Vienna



*Libythea celtis*

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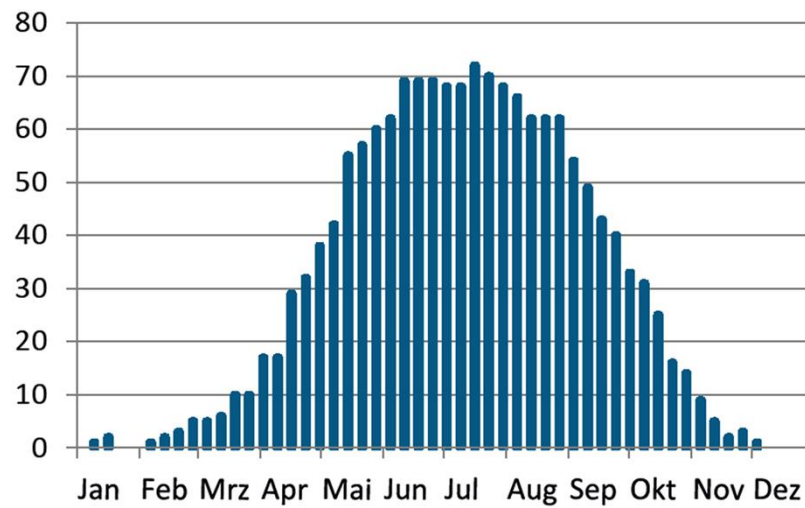
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208 Tagfalter gibt es in Wien 104 derzeit in Wien

Zürgelbaum-Zipfelfalter kam neu hinzu (eingewandert)

# Butterflies and moth data: status quo

## Number of species during the year



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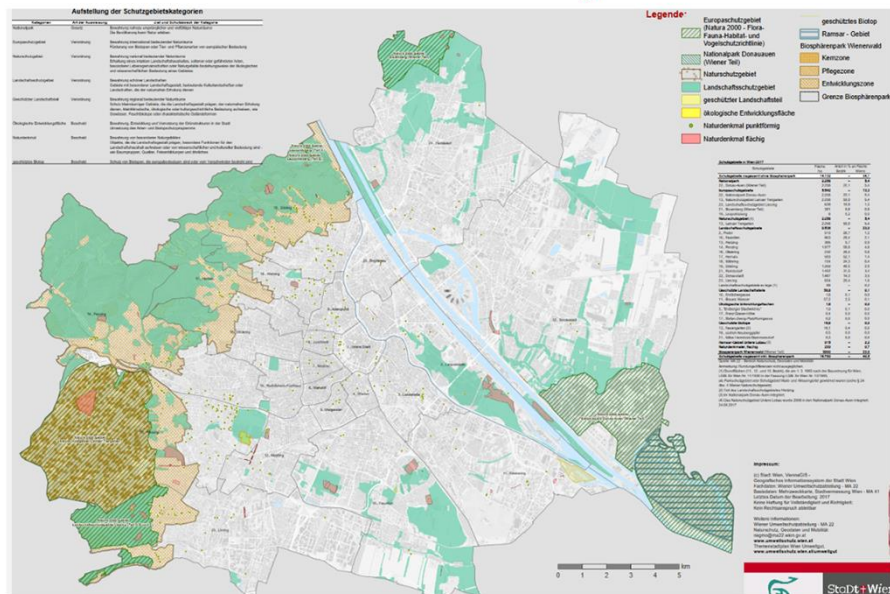
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Artenanzahl die im Jahresverlauf in Wien beobachtet werden kann

# Vienna and butterfly habitats



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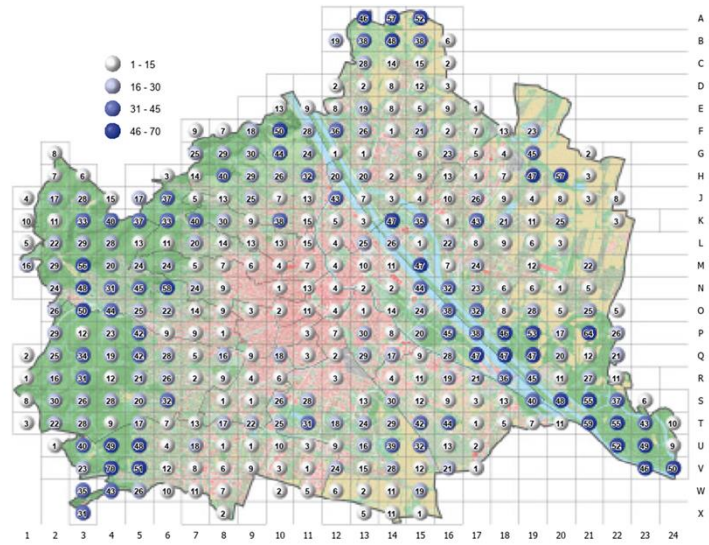
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Wiener Tagfalter haben einen vielfältigen Lebensraum  
Schutzgebiete,  
Natura 2000 Gebiete, Landschaftsschutzgebiete (LSG)

# Butterflies data: hot spots



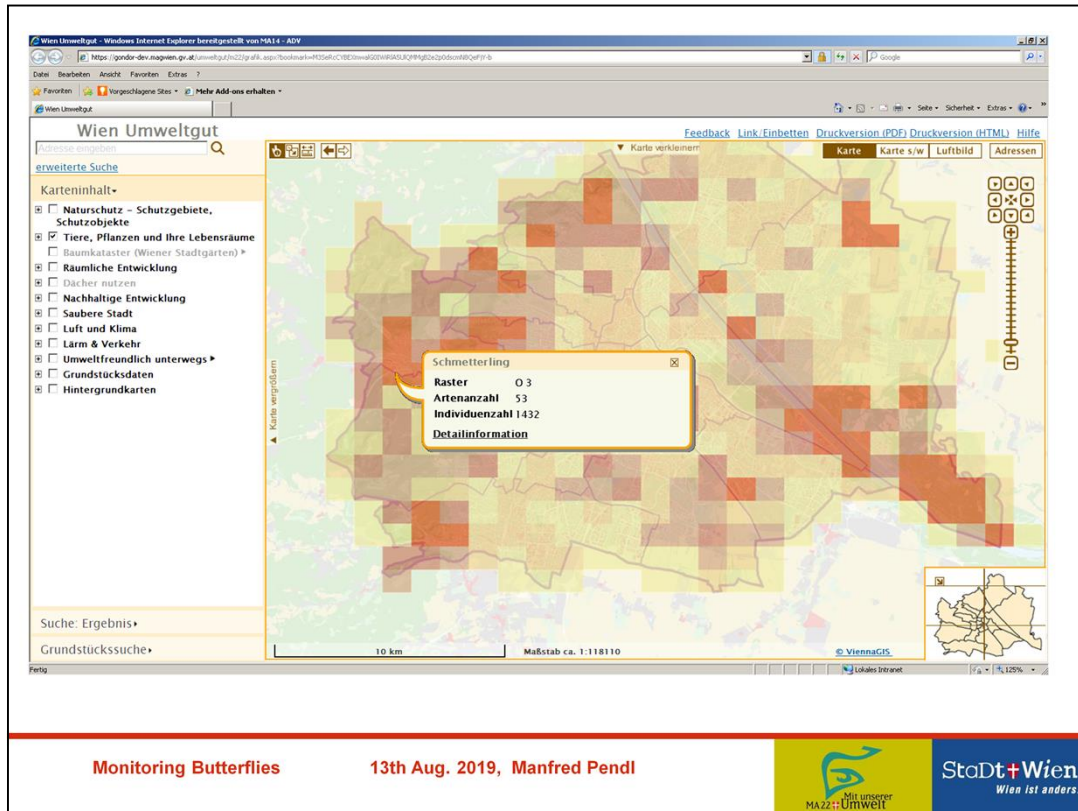
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Arten-Hotspots in Wien – Tagfalter

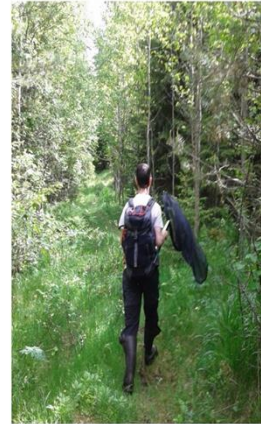


Umweltgut der Stadt Wien – Schmetterlings-Artenvorkommen in Quadranten:  
Daten sind frei zugänglich und jederzeit abrufbar (1 x 1,250 km)



# Butterfly Monitoring

- Monitoring: Systematic, regular, long term, coordinated monitoring schemes, using consistent methods.
  - Provides high quality data
  - Enables identification of trends
  - Underpins indicators
  - Can help evaluate policies
  - Can point to solutions
- ▶ Transects
  - Easy to do: few rules and conditions
  - Standardised method
  - Feasible training
  - Involves expert citizen science
  - Bring people closer to nature
  - Strong results: Annual indices of relative abundance



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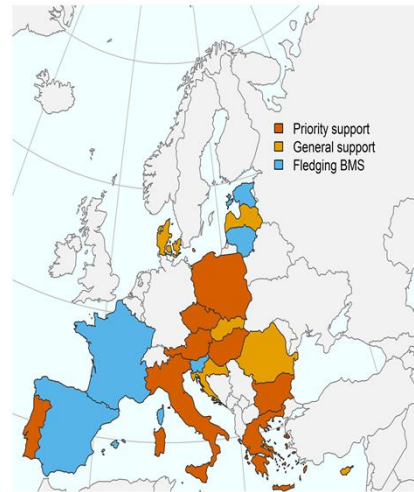
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Monitoring: Warum macht es Sinn eines zu machen.

Transekte: Einfache Regeln, die einzuhalten sind, standardisierte Methode, bringt die Menschen wieder zur Natur

## Butterfly Monitoring Network

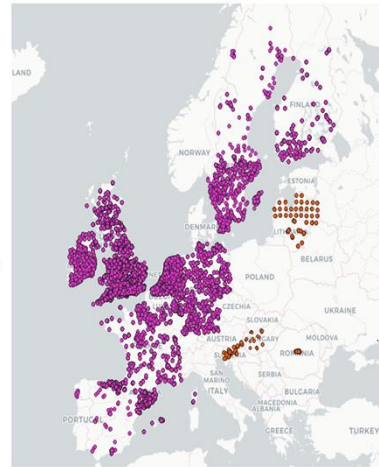
- ▶ *Fledgling schemes*: expand their networks and adopt new analysis methods. France, Spain, Slovenia, Estonia and Lithuania
- ▶ New schemes: support set up BMS
  - Other countries provided with support: Romania, Denmark, Latvia, Slovakia, Croatia, Malta and Cyprus
  - Priority Countries: **Austria**, Italy, Portugal, Poland, Hungary, Bulgaria, Greece and Czech Republic



Es gibt bereits ein europäisches Schmetterling-Monitoring-Netzwerk  
Österreich ist noch nicht dabei – wird aber 2020 offiziell beitreten

## Butterfly Monitoring Scheme: BMS

- Butterflies Monitoring Scheme since 1976 UK
- BMS growing in Europe: 15 Schemes, 7,227 transects
- New schemes will be incorporated
- Excellent collaboration between existing schemes (within the eBMS partnership) through BCE
- A large body of existing butterfly monitoring data, mainly in N&W Europe



eBMS data updated 2019

Purple dots eBMS partners  
Red dots, proposed new eBMS partners

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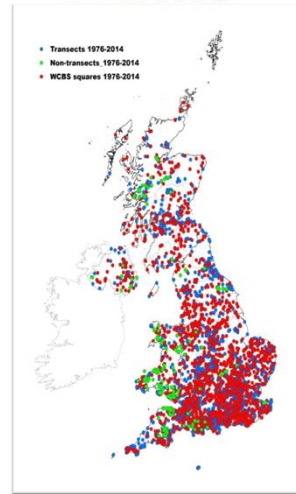


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Exkurs zum Schmetterlingsmonitoring in England

## BMS in Europe – Examples

- United Kingdom
  - 1976 (43 years), > 1174 transects, volunteers
- the Netherlands
  - 1990 (29 years), ~ 1000 transects (single sp + eggs), volunteers
- Germany
  - 2005 (14 years), 450 transects, volunteers



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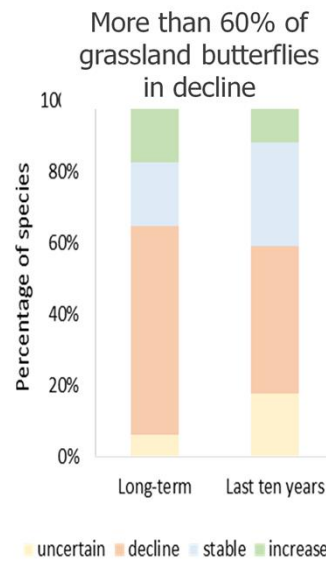
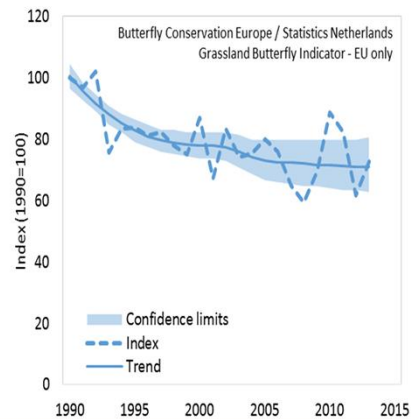


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Status quo der Beteiligung in drei Ländern

## BMS in Europe – Results

- **European Butterfly Grassland Indicator:** We have the analytical tools to measure trends and produce indicators



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Wichtigster Output des bisherigen international gleichgeschalteten Monitorings:  
der Europäische Grassland Indikator

# BMS in Europe – Results

## Results: Dutch BMS

Monitoring  
data  
+  
Modeling

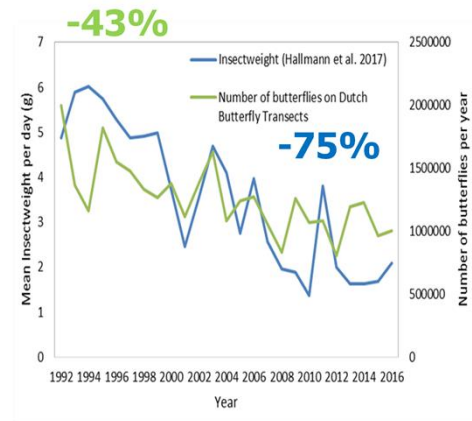


 **Biological Conservation**  
Volume 234, June 2019, Pages 116–122

Over a century of data reveal more than 80% decline in butterflies in the Netherlands

Arco J. van Strien <sup>1, R. Di. Chris A.M. van Susteren <sup>2</sup>, Willy T.S.M. van Solen-van Liempst <sup>3</sup>, Martin J.M. Poos <sup>4</sup>, Michiel F. Walz <sup>5</sup>, D. Vries <sup>6</sup>, K. F.</sup>

<https://doi.org/10.1016/j.biocon.2019.03.023> Get rights and content



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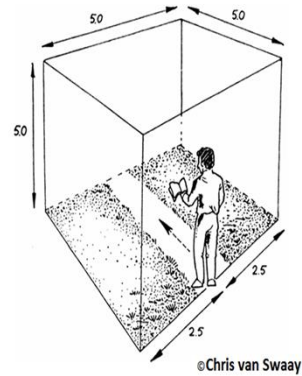


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Dieser Indikator deckt sich im Wesentlichen mit der Veröffentlichung der Hallmann-Studie von 2017, die ein massives Insektensterben in Schutzgebieten zum Inhalt hatte.

## Transects Methodology

- ▶ **Pollard Walks:** fixed routes visited frequently in order to record butterflies for a number of years.
  - Walk your transect at a slow, constant pace.
  - Count all butterflies by individual species in an **imaginary box**, 2.5m to each side and 5m in front and above you
  - You may stop (e.g. to identify a butterfly), but do not count when you are stationary, or when looking behind.



Erklärung der Methode, wie Schmetterlinge gezählt werden sollen. Man bewegt sich in einem gedanklichen Würfel und zählt links und rechts (je 2,5 m und bis 5 Meter über den Boden) alle Schmetterlinge. Jene die nicht in dem Würfel fliegen werden extra gezählt.

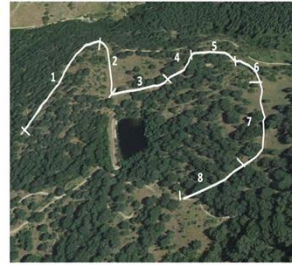
# Transects Methodology

## *Where to choose the transect?*

- ▶ Different methods: random, grid or by the volunteer. Recommended **closed their house or work**
- ▶ Coordinators supervised the election with the volunteer

## *Conditions for the transect:*

- ▶ Divided in sections: based on dif. habitats (not fixed sections)
- ▶ Section: min. 50 m length
- ▶ Find landmarks for the section division
- ▶ Not longer 1km;
- ▶ Trying to include areas with difference in abundances (best areas vs missing data)



Wie legt man einen Transekt an? Zufällig oder in der Nähe des Wohnsitzes, des Zählers; Koordinator unterstützt bei der Auswahl;

Besteht aus mehreren Abschnitten – jeder Abschnitt ist nur einem Habitattyp zuordenbar; der Transekt ist nie länger als 1 km; Abschnitt sind min. 50 m lang



# Transects Methodology

Weather Conditions before starting:

- Time: between 10h – 16h (in summer can vary)
  - Temperature: >13°C, no more than 35°C
  - Wind: Beaufort Scale not > 5
  - Cloud Cover: % of clouds in the sky
- any % with good temperature



Beaufort Scale

| Beaufort number | Wind Speed (mph) | Seaman's term   | Icon | Effects on Land   |
|-----------------|------------------|-----------------|------|---|
| 0               | Under 1          | Calm            |      | Smoke rises vertically.   |
| 1               | 1-3              | Light Air       |      | Smoke drift indicates wind direction; trees do not move.            |
| 2               | 4-7              | Light Breeze    |      | Wind felt on face; leaves rustle; trees begin to move.              |
| 3               | 8-12             | Gentle Breeze   |      | Waves, small flags in constant motion; light flags extended.        |
| 4               | 13-18            | Moderate Breeze |      | Leaves and loose paper raised up; all branches move.                |
| 5               | 19-24            | Fresh Breeze    |      | All trees begin to sway.  |
| 6               | 25-31            | Strong Breeze   |      | Top branches of trees in motion; whistling heard in wires.          |
| 7               | 32-38            | Moderate Gale   |      | Whole trees in motion; resistance felt in walking against the wind. |
| 8               | 39-46            | Fresh Gale      |      | Tops and small branches broken off trees.                           |
| 9               | 47-54            | Strong Gale     |      | Slight structural damage occurs; slate blown from roofs.            |
| 10              | 55-63            | Whole Gale      |      | Seldom experienced on land; trees broken; structural damage occurs. |
| 11              | 64-72            | Storm           |      | Very rarely experienced on land; usually with widespread damage.    |
| 12              | 73 or higher     | Hurricane Force |      | Violence and destruction.   |

In general, have a good weather



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Wetterkonditionen für ein Monitoring

# Transects Methodology

- Filling the Field sheet

weather conditions (start and end)

Species per sections

Notes: sp outside of transect, other animals, dif. managements

BUTTERFLY MONITORING SCHEME  
FIELD SHEET

TRANSECT NAME: \_\_\_\_\_ OBSERVER: \_\_\_\_\_

DATE: \_\_\_\_\_ SEMANA: \_\_\_\_\_ START TIME: \_\_\_\_\_ END TIME: \_\_\_\_\_

START/ END TEMPERATURE: \_\_\_\_\_ / \_\_\_\_\_ START/ END WIND SPEED: \_\_\_\_\_ / \_\_\_\_\_  
(°C) (Beaufort scale)

AVERAGE TEMP: \_\_\_\_\_ AVERAGE WIND SPEED: \_\_\_\_\_  
(°C) (Beaufort scale)

ESCALA DE BEAUFORT: 0 - Calm, smoke rises vertically; 1 - Smoke drift indicates wind direction, stiff and sparse; 2 - Wind felt on face, leaves rustle, waves begin to move; 3 - Leaves and small twigs constantly moving, light flags extended; 4 - Dust, leaves, and loose paper lifted, small tree branches move; 5 - Small trees in leaf begin to sway

| SPECIES | SECTIONS |   |   |   |   |   |   |   |   |    | TOTAL |  |
|---------|----------|---|---|---|---|---|---|---|---|----|-------|--|
|         | 1        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |       |  |
|         |          |   |   |   |   |   |   |   |   |    |       |  |
|         |          |   |   |   |   |   |   |   |   |    |       |  |
|         |          |   |   |   |   |   |   |   |   |    |       |  |
|         |          |   |   |   |   |   |   |   |   |    |       |  |
|         |          |   |   |   |   |   |   |   |   |    |       |  |
|         |          |   |   |   |   |   |   |   |   |    |       |  |
|         |          |   |   |   |   |   |   |   |   |    |       |  |
|         |          |   |   |   |   |   |   |   |   |    |       |  |
| TOTAL   |          |   |   |   |   |   |   |   |   |    |       |  |

CLOUD COVER: \_\_\_\_\_ Average cloud cover: \_\_\_\_\_

NOTES: \_\_\_\_\_

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Mit unserer MAZZ-UMWELT

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Datenaufnahme



## 13. Monitoring „Salzwiese“ – Transect



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Abschnitte des Transektes Salzwiese

Alle Transekte werden in der Dokumentaiton mit GPS Punkten markiert und ins Geo Informations Netz abgebildet, bzw. gespeichert.

## e.g. record of data

|    |   |      |   |   |                            |                   |                           |
|----|---|------|---|---|----------------------------|-------------------|---------------------------|
| 11 | 7 | 2019 | 2 | 1 | Leptidea sinapis/juvernica | Penzing Salzwiese | Transect/Abschnitt 1      |
| 11 | 7 | 2019 | 1 | 1 | Polygonia c-album          | Penzing Salzwiese | Transect/Abschnitt 1      |
| 11 | 7 | 2019 | 2 | 1 | Maniola jurtina            | Penzing Salzwiese | Transect/Abschnitt 1      |
| 11 | 7 | 2019 | 1 | 1 | Iphiclides podalirius      | Penzing Salzwiese | Transect/Abschnitt 1      |
| 11 | 7 | 2019 | 1 | 1 | Pieris napi                | Penzing Salzwiese | Transect/Abschnitt 1      |
| 11 | 7 | 2019 | 2 | 1 | Aphantopus hyperantus      | Penzing Salzwiese | Transect/Abschnitt 1      |
| 11 | 7 | 2019 | 7 | 1 | Argynnis paphia            | Penzing Salzwiese | Abseits Trans/Abschnitt 1 |
| 11 | 7 | 2019 | 4 | 1 | Aphantopus hyperantus      | Penzing Salzwiese | Abseits Trans/Abschnitt 1 |
| 11 | 7 | 2019 | 1 | 1 | Coenonympha arcania        | Penzing Salzwiese | Abseits Trans/Abschnitt 1 |
| 11 | 7 | 2019 | 1 | 1 | Neptis rivularis           | Penzing Salzwiese | Abseits Trans/Abschnitt 1 |
| 11 | 7 | 2019 | 1 | 1 | Maniola jurtina            | Penzing Salzwiese | Abseits Trans/Abschnitt 1 |
| 11 | 7 | 2019 | 1 | 2 | Amata phegea               | Penzing Salzwiese | Abseits Trans/Abschnitt 1 |
| 11 | 7 | 2019 | 3 | 1 | Pieris rapae               | Penzing Salzwiese | Transect/Abschnitt 2      |
| 11 | 7 | 2019 | 2 | 1 | Iphiclides podalirius      | Penzing Salzwiese | Transect/Abschnitt 2      |
| 11 | 7 | 2019 | 4 | 1 | Aphantopus hyperantus      | Penzing Salzwiese | Transect/Abschnitt 2      |
| 11 | 7 | 2019 | 1 | 1 | Neptis rivularis           | Penzing Salzwiese | Transect/Abschnitt 2      |
| 11 | 7 | 2019 | 5 | 1 | Ochlodes venatus           | Penzing Salzwiese | Transect/Abschnitt 2      |
| 11 | 7 | 2019 | 1 | 1 | Leptidea sinapis/juvernica | Penzing Salzwiese | Transect/Abschnitt 2      |
| 11 | 7 | 2019 | 1 | 1 | Vanessa cardui             | Penzing Salzwiese | Transect/Abschnitt 2      |
| 11 | 7 | 2019 | 1 | 1 | Pieris napi                | Penzing Salzwiese | Transect/Abschnitt 2      |
| 11 | 7 | 2019 | 1 | 1 | Pyrgus malvae              | Penzing Salzwiese | Abseits Trans/Abschnitt 2 |
| 11 | 7 | 2019 | 1 | 1 | Erynnis tages              | Penzing Salzwiese | Abseits Trans/Abschnitt 2 |
| 11 | 7 | 2019 | 1 | 1 | Maniola jurtina            | Penzing Salzwiese | Abseits Trans/Abschnitt 2 |
| 11 | 7 | 2019 | 2 | 1 | Argynnis paphia            | Penzing Salzwiese | Abseits Trans/Abschnitt 2 |
| 11 | 7 | 2019 | 1 | 1 | Aphantopus hyperantus      | Penzing Salzwiese | Abseits Trans/Abschnitt 2 |
| 11 | 7 | 2019 | 1 | 1 | Cupido argades             | Penzing Salzwiese | Abseits Trans/Abschnitt 2 |
| 11 | 7 | 2019 | 1 | 1 | Polyommatus icarus         | Penzing Salzwiese | Abseits Trans/Abschnitt 2 |
| 11 | 7 | 2019 | 1 | 2 | Euclydia glyphica          | Penzing Salzwiese | Abseits Trans/Abschnitt 2 |

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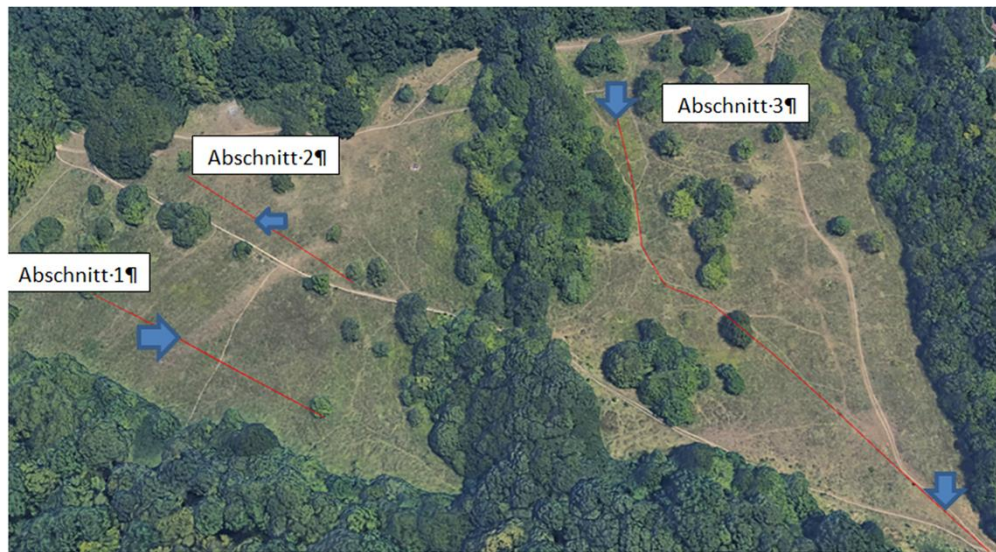
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Auszug aus einer Erhebung, Anfang JULI



Weißbindiges Wiesenvögelchen

## 17. Monitoring „Schafberg-Wiese“ - Transect



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Abschnitte im Transekt Schafberg-Wiesen



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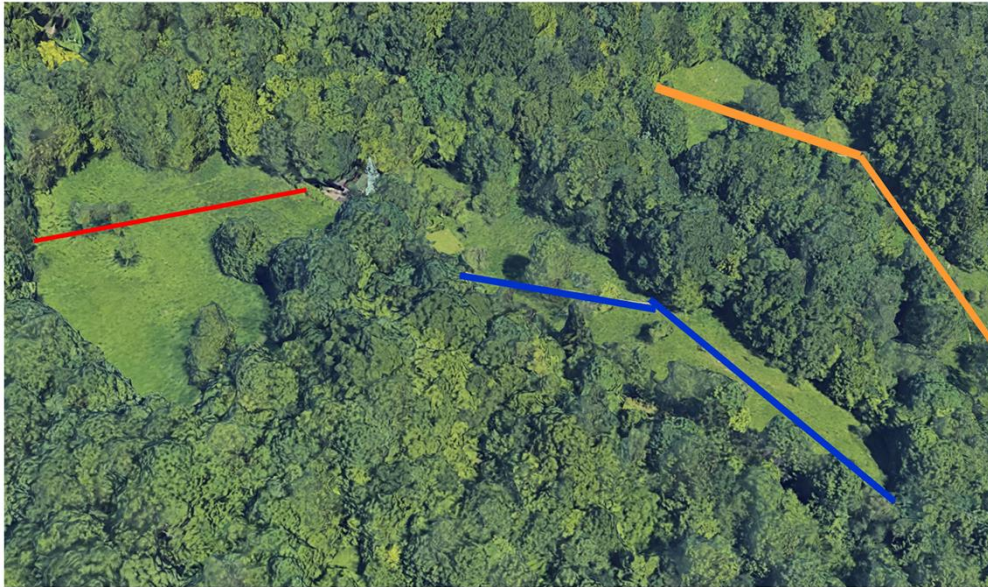


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Esperetten Widderchen



## 19. Monitoring „Eiserne Hand Wiese“ - Transect



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Abschnitte im Transekt Eiserne Hand



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Segelfalter

## 22. Monitoring „Asperner Terrasse“ - Transect



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Abschnitte im Transekt Asperner Terrasse



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Magerrasen - Perlutfalter

## CITY NATURE Monitoring steps:

- **Homepage – CITY NATURE**
- **Network Butterfly Monitoring: CITY NATURE, Uni Vienna, ....**
- **Public transect – Donauinsel (train the volunteers)**
- **Umweltgut MA 22 (update distribution map)**
- **Excursions & events & Citizen Science**

Aktivitäten im City NATURE betreffen Monitoring



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# Tools and data systems

Centralised data system to support butterfly indicators: **eBMS – European Butterfly Monitoring Scheme**

<http://butterfly-monitoring.net>



- Website to collect butterfly data in Europe
- Support tool for new schemes:
  - Website running
  - Further developments under way
  - Easy for volunteers
  - Coordinators control
- Verification System
- Online site **National BMS**
- Clear data policy: eBMS database



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