Status and trends of the dragonflies of the Habitats Directive in Flanders

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Introduction

European Habitats and Bird Directive
- protection (maintain and restore) of habitats and species in Europe
- network of protected sites = Natura 2000 network
- list of protected species under HD and BD = Natura 2000 species

EU member states have to report every 6 years on the conservation status of Natura 2000 species
- Range -> opportunistic data via citizen science
- Population size -> monitoring network
- habitat of the species
- future prospects
- Global assessment + trend over last 12 years
Assessing conservation status

- **Range**
  - trend is stable or increasing
  - not lower than favourable reference range (FRR)
    - situation 1994
    - regional and local conservation objectives (G-IHD, LSVI)

- **Population**
  - population is unfavourable if negative trend of 1% per year (or 24% in 24 year)
  - not lower than favourable reference population (FRP)
    - situation 1994
    - regional and local conservation objectives (G-IHD, LSVI)
    - including demographic and genetic viability

- **Habitat for the species**
  - sufficiency of area and quality of occupied habitat, if NO, of unoccupied habitat

- **Distance to reference values**
  - < 10 % to favourable ref. range (FRR) - **U1 inadequate**; > 10 % - **U2 bad**
  - < 25 % to population (FRP) - **U1 inadequate**; > 25 % - **U2 bad**
Assessing conservation status

- Assessment for range, population, habitat of the species and future perspectives
  
  \[ FV = \text{favourable} \]
  \[ U1 = \text{unfavourable} - \text{inadequate} \]
  \[ U2 = \text{unfavourable} - \text{bad} \]
  \[ XX = \text{unknown} \]

- Strict rules from the EC
- Evaluation matrix

| All 'green' OR three 'green' and one 'unknown' | One or more 'amber' but no 'red' | One or more 'red' | Two or more 'unknown' combined with green or all "unknown" |
Assessment of range

- Outer limits of the overall area ~ extent of occurrence (Red Listing)
- Point localities
- 10 x 10 km grids (EC grid)
- Range tool (envelope around distribution + gap distance)
- *Leucorrhinia pectoralis*
  - gap distance 40 km, range 13500 km = FRR -> FV
Leucorrhinia pectoralis
Distribution in Flanders & Belgium

• populations present since 19th century
• 20th century decline
• no observations from 1990-1999!
• Since 2000 slow re-colonisation
• 25 populations in Flanders
• In 2018 found at 62 new grids 1 x1 km –> populations
Leucorrhinia pectoralis

- monitoring since 2016 by volunteers
- 2 counts of imago’s during 1h in peak flight season
- all population sites (n = 25)
- very low numbers counted per day per location
**Leucorrhinia pectoralis**

- 2017: very wet, bad weather during monitoring -> very low numbers
- 2018: very dry and warm + influx

Mean counted exuviae per year/transect

Mean counted exuviae per year, 95% confidence interval in red
Leucorrhinia pectoralis

Distribution *Leucorrhinia pectoralis* in Flanders: 2013-2018
**Blue**: populations and records 2013-2017
**Red**: only observation from 2018
**Leucorrhinia caudalis**

**Distribution in Flanders & Belgium**
- populations present in 19\textsuperscript{th} century
- disappeared from Belgium during first decades of 20\textsuperscript{th} century
- declined and disappeared in large parts of Europe
- 2011 population discovered in Wallonia
- 2013 population in Flanders
- 2018 new records at 5 other locations -> populations?

**Population numbers**
- 1 small population
- max 10 ind. count/day
- 5 new locations in 2018

**Habitat**
- many suitable habitats present

Daemen et al. 2016 Brachytron
Leucorrhinia caudalis
**Gomphus flavipes**

**Distribution in Flanders & Belgium**
- first observed in 2010 along river Meuse
- small population present along riv. Meuse
- in 2012: found along Albert Canal
- not present in Wallonia
**Gomphus flavipes**

- monitoring exuviae since 2016
- 12 randomly selected transects of 500 m
- 6 counts during emergence period
- emergence starts beginning of June
Gomphus flavipes

- numbers seems to increase
- max. 109 exuviae on 500 m at 1 day
- 2018: 1399 exuviae on 6 km
- length Albert Canal (both sides) 250 km

Mean counted exuviae per year/transect

Mean counted exuviae per year, 95% confidence interval in red
**Ophiogomphus cecilia**

- in 2015 - new for the Belgian fauna
- no population yet found
**Ophiogomphus cecilia**

- migrants from the Netherlands
- population present in the Netherlands extending to Flanders
Assessing range, population & habitat

### Range

<table>
<thead>
<tr>
<th>Species name</th>
<th>km²</th>
<th>Trend</th>
<th>Ref</th>
<th>Assessment</th>
<th>Gap distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leucorrhina caudalis</td>
<td>1100</td>
<td>+</td>
<td>&gt;&gt;</td>
<td>U2</td>
<td>40</td>
</tr>
<tr>
<td>Leucorrhina pectoralis</td>
<td>13500</td>
<td>+</td>
<td>≈</td>
<td>FV</td>
<td>40</td>
</tr>
<tr>
<td>Ophiogomphus cecilia</td>
<td>300</td>
<td>+</td>
<td>&gt;&gt;</td>
<td>U2</td>
<td>40</td>
</tr>
<tr>
<td>Gomphus flavipes</td>
<td>2100</td>
<td>+</td>
<td>≈</td>
<td>FV</td>
<td>40</td>
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</tbody>
</table>

### Population

<table>
<thead>
<tr>
<th>Species name</th>
<th>best</th>
<th>unit</th>
<th>trend</th>
<th>Fav ref pop</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leucorrhina caudalis</td>
<td>8</td>
<td>1 x 1 km grid</td>
<td>?</td>
<td>&gt;&gt;</td>
<td>U2</td>
</tr>
<tr>
<td>Leucorrhina pectoralis</td>
<td>132</td>
<td>1 x 1 km grid</td>
<td>+</td>
<td>&gt;&gt;</td>
<td>U2</td>
</tr>
<tr>
<td>Ophiogomphus cecilia</td>
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<td>1 x 1 km grid</td>
<td>x</td>
<td>&gt;&gt;</td>
<td>U2</td>
</tr>
<tr>
<td>Gomphus flavipes</td>
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<td>1 x 1 km grid</td>
<td>+</td>
<td>≈</td>
<td>FV</td>
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</table>

### Habitat

<table>
<thead>
<tr>
<th>Species name</th>
<th>occupied</th>
<th>unoccupied</th>
<th>trend</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leucorrhina caudalis</td>
<td>no</td>
<td>yes</td>
<td>0</td>
<td>U1</td>
</tr>
<tr>
<td>Leucorrhina pectoralis</td>
<td>no</td>
<td>yes</td>
<td>0</td>
<td>U1</td>
</tr>
<tr>
<td>Ophiogomphus cecilia</td>
<td>no</td>
<td>no</td>
<td>?</td>
<td>U2</td>
</tr>
<tr>
<td>Stylurus flavipes</td>
<td>yes</td>
<td>-</td>
<td>0</td>
<td>FV</td>
</tr>
</tbody>
</table>
Overall assessment and trend in conservation status

<table>
<thead>
<tr>
<th>Species name</th>
<th>range</th>
<th>pop</th>
<th>hab</th>
<th>future</th>
<th>TOT</th>
<th>TRENDS</th>
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</thead>
<tbody>
<tr>
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<td>U2</td>
<td>U2</td>
<td>U1</td>
<td>U2</td>
<td>U2</td>
<td>=</td>
</tr>
<tr>
<td><em>Leucorrhinia pectoralis</em></td>
<td>FV</td>
<td>U2</td>
<td>U1</td>
<td>U1</td>
<td>U2</td>
<td>+</td>
</tr>
<tr>
<td><em>Ophiogomphus cecilia</em></td>
<td>U2</td>
<td>U2</td>
<td>U2</td>
<td>XX</td>
<td>U2</td>
<td>x</td>
</tr>
<tr>
<td><em>Stylurus flavipes</em></td>
<td>FV</td>
<td>FV</td>
<td>FV</td>
<td>FV</td>
<td>FV</td>
<td>+</td>
</tr>
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- **One or more 'red'**
- **Two or more 'unknown' combined with green or all 'unknown'**

Flanders State of the Art
Thanks

- all the volunteers for the monitoring
- Natuurpunt and Flemish Dragonfly Society
- for your attention