From scientific results to a conservation strategy:
The case of the Soprano Pipistrelle Bat (Pipistrellus pygmaeus) in Switzerland

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Introduction
Up to now the conservation of the common Pipistrellus pipistrellus had only low priority in Switzerland. The recent recognition of its cryptic sibling species Pipistrellus pygmaeus (Barrat et al. 1997), lead to a closer look at their respective status: in 2002, bioacoustic analysis of echolocation calls from representative transects revealed that the new species is very rare in Switzerland. Surprisingly, the species seemed to be missing in wide parts of the Swiss plains. The Ecological Niche Factor Analysis (ENFA; Hirzel et al. 2002) enabled description of preferred habitats and projection of a habitat suitability model (Sattler et al. in prep. a). The model showed that P. pygmaeus prefers structured landscapes in the vicinity of wide rivers of the lowlands of Switzerland. Besides securing these hunting habitats, an accurate protection of maternity roosts is crucial for their conservation.

But until the end of 2002, only 6 nursery colonies and 3 day roosts had been found in whole Switzerland. P. pygmaeus is expected to occur in more high potential areas within Switzerland. In these regions, more maternity roosts of P. pygmaeus need to be distinguished from its nearest relatives in order to protect the species accurately. As a consequence, a conservation project was started in 2003.

1. Finding the species in the Swiss Plain
2. Finding new roosts, especially nursery colonies

Aims

Methods
1. In workshops, about 100 volunteers were taught how to discriminate P. pygmaeus and P. pipistrellus with their heterodyne bat detector (Fig. 1). Even though morphological determination remains difficult, the species are readily distinguished by the different end frequency of their calls (45-55 kHz for P. pygmaeus and 55-65 kHz for P. pipistrellus).

2. Thereon, the volunteers were asked a) to look for flying P. pygmaeus in high potential areas (red in Fig. 3) in their neighbourhoods and b) to check known maternity roosts of the genus Pipistrellus with their heterodyne bat detector. App. 67 locations were visited (Fig. 2).

3. Once a location with P. pygmaeus was identified, bat researchers verified the taxa by ultrasonic call analysis with sonograms (records with Pettersson D980 & ULTRASONID/Steiner, sonograms with Software Room, Cornell Lab).

4. Additionally, 4 bat researchers checked high potential areas recording echolocation calls on transects and analyzing them with Sonograms. A special emphasis was given to the plains. Overall, a distance of 1285 km was covered (Fig. 2).

5. At locations where P. pygmaeus was identified, it was tried to find their respective roost. A special concern was the identification of maternity roosts in June/July.

Results
1. 63 observations of P. pygmaeus in 2003.
2. They originate from 42 locations, where the species had not been reported previously (Fig. 3; Sattler et al. in prep b.).
3. 26 stemming from regions where the species is known to occur in a radius of 10 km. The remaining 16 locations are distributed in the Alps (3), Prealps (2), Southern Switzerland (1), the Plains (for the first time in the central Plains: 4; Eastern Plains 4; Western Plains 1) and in the Jura mountains (1).
4. Overall, 11 previously unknown roosts were found (3 maternity roosts; Tab).

Tab. Number of different roost types found in 2000-2002 and 2003

<table>
<thead>
<tr>
<th>Roost type</th>
<th>2000 - 2002</th>
<th>2003</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternity roost</td>
<td>6</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Day roost</td>
<td>3</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Winter roost</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Total: 10 (2000-2002) and 11 (2003) roosts were found.

Conclusions
1. Most of the new locations originate from areas designated with high suitability in our model. Hypotheses: P. pygmaeus still occurs at more places yet unknown. As P. pygmaeus occurs only rarely and in low densities, it is overlooked easily.

2. This fact is supported by the results of the roost search: The global amount of known maternity roosts remains small.

3. Although P. pygmaeus is not in acute danger, a regular monitoring is highly recommended. In this way changes in population sizes can be detected at an early stage. Consequently more maternity roosts need to be found.

4. Therefore, the PYGMAEUS Project will continue in 2004 and should be incorporated into the regular work of the Regional Bat Experts.

5. It is suggested to include P. pygmaeus into the Red List of Switzerland, due to its small population size into the category 4a (potentially threatened; species with a small population size but no apparent threat).

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