

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.



Fig.1. In workshops, volunteers and Regional Bat Experts were taught how to discriminate *P. pygmaeus* and *P. pipistrellus* with their heterodyne bat detector

Aims

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

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 kHz for *P. pipistrellus* and 55 kHz for *P. pygmaeus*).
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 ultrasound call analysis with sonograms (records with Pettersson D980 & ULTRA-SOUNDGate/Avisoft, sonograms with Software Raven, Cornell Lab).
4. Additionally, 4 bat researchers checked high potential areas recording echolocation calls on transects and analysing 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.

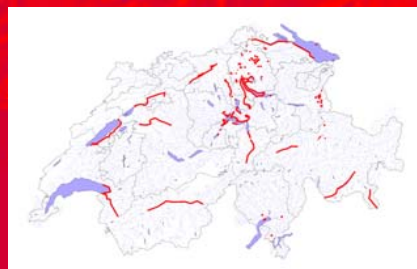


Fig. 2. Points and transects that were checked for *P. pygmaeus* in 2003 with echolocation call analysis (in red).

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

Roost type	2000 - 2002	2003 ^a	Total	Remarks
Maternity roost	6	3	9	All in crevices of buildings (mostly roof tops)
Day roost	3	6	9	Roosts in bat box (7), parasol (1), chimney (1)
Winter roost	2 ^b	2	3	In tree hollow, bat box, shutter box and crevice of a building (1 each)
Total	10	11	21	

^a Only previously unknown roosts ^b One winter roost served also as a day roost, in totals counted as day roost

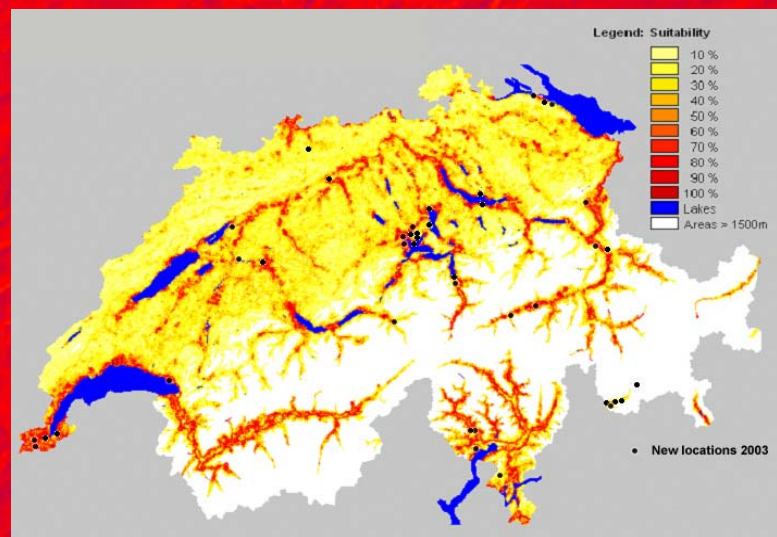


Fig. 3. Locations of *P. pygmaeus* observations 2003 (black points). The colours of the map are indicating habitat suitability calculated with the ENFA on observations until 2002 (Sattler et al. in prep b.)

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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 focally 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 then 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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