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Introduction

Woodland habitats in Europe have undergone major changes during the last century mainly by abandonment of traditional management practices. Chestnut orchards (Fig. 1) used to be very abundant until the middle of last century in Southern Switzerland and Northern Italy. Nowadays only few orchards are being managed traditionally.



Fig 1. Traditionally managed chestnut orchard in Ticino, southern Switzerland

A previous study (Zambelli, 2004) showed that the endangered migratory bat species *Nyctalus leisleri* is found to be more abundant from autumn to late spring in managed chestnut orchards compared to unmanaged ones (Fig. 2).

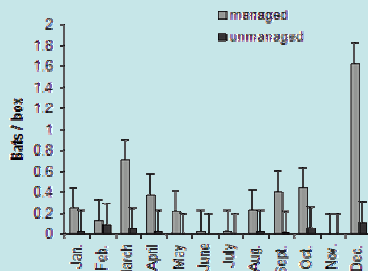


Fig. 2. Number of individuals of Leisler's bat (mean + SE) observed per box and inspection in managed and unmanaged chestnut orchards. Inspections at 200 bat boxes, no inspections in November and December (data from Zambelli, 2004).

We tested if A) habitat selection or B) roost microclimate can explain this pattern.

Questions

- A) Do managed orchards represent optimal foraging sites for *Nyctalus leisleri*?
 B) Do bat boxes in managed orchards offer more favorable microclimatic conditions?

Methods

We radio-tracked 12 individuals (7 males / 5 females) during a total of 109 nights to investigate foraging and roosting patterns.

Roost temperature was measured using 56 temperature loggers in 4 different roost types.

We analysed habitat selection by compositional analysis with data extracted by GIS ArcView 3.3.

Results

- Leisler's bats use extensive home ranges up to 67 km².
- We found a significant selection of deciduous woodlands over coniferous woodlands, pastures and settlements.
- Chestnut woodlands were frequently used habitats but there was no significant selection of managed orchards within woodlands as foraging areas.
- There was no temperature difference between roosts in differently managed orchards.
- Contrary to our prediction *Nyctalus leisleri* preferred cooler roosts.

Conclusion and implications for conservation

- Neither foraging nor roost temperatures explain the pattern of abundance of Leisler's bat in differently managed orchards.
- Leisler's bat seem to prefer roosts situated in open and semi-open orchards which facilitate the social flight behaviour of their lek mating system.
- Management of abandoned chestnut orchards should be resumed again in order to assure suitable roosting habitat.
- Suitable stop-over habitats are crucial for this migratory bat. By accumulating highly accessible roosts within the semi-open vegetation structure in managed chestnut orchards an optimal arena for the lek mating system of Leisler's bat can be assured.
- Canopy cover around roosts in managed orchards should be kept high in order to offer cooler roosts selected by this species outside the breeding season.

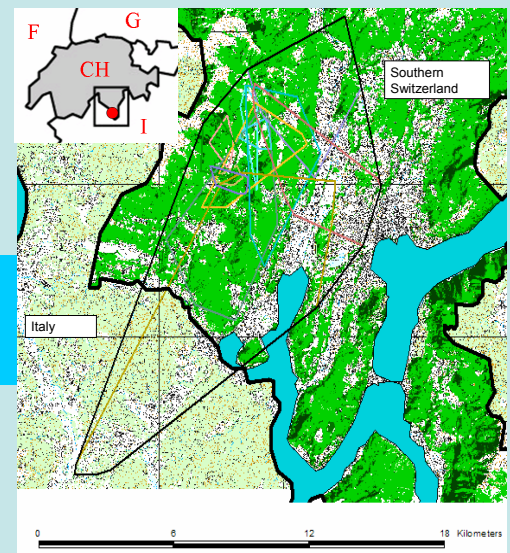
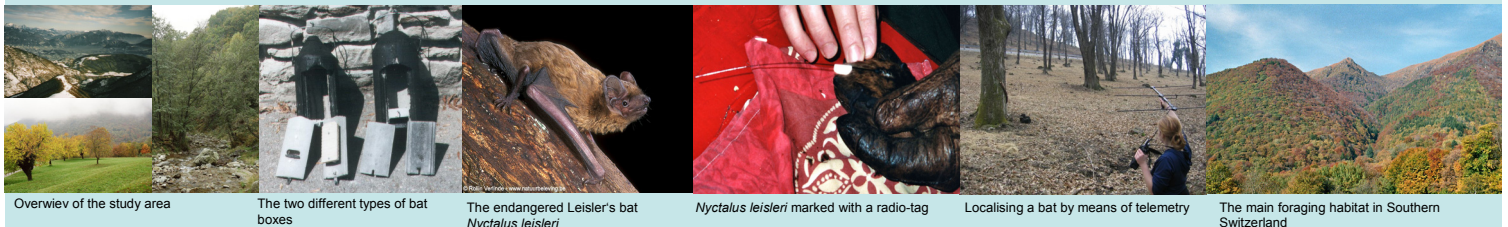


Fig 3. Study area (12'137 ha) showing the individual home-ranges. Mean used area: 1501 ha. Dark green areas show woollands, white-black areas representing settlements, blue areas show the lake Lugano (fat black line-boarder to Italy).



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