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Poster

**RESPONSE OF BATS TO CHESTNUT ORCHARD RESTORATION
IN SOUTHERN SWITZERLAND**
Biotope conservation and species conservation

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Abstract:

Twenty-five of the 36 European bat species may use tree cavities as roosts and they need well structured habitats as foraging area. As potential foraging and roosting habitats woodlands have undergone major changes during the last century by abandonment of traditional management practices and increase in intensively cultivated plantations. In Southern Europe traditionally managed chestnut (*Castanea sativa*) orchards are open old forests with large and very old trees and they form landscape elements of high cultural and ecological value. Created and maintained by man, they became increasingly abandoned and overgrown in the past century. However, since the early 1990's about 200 ha of chestnut area has been restored in Switzerland.

The aim of this contribution is to assess the effect of these restorations on bat species richness and foraging activity and to find practical recommendations to improve restoration and long term management.

We compared by acoustic surveys bat species richness and foraging activities between traditionally managed and unmanaged chestnut orchards. The study took place in 32 pairs of managed and unmanaged chestnut orchards (64 sites in total) on the Southern slope of the Swiss Alps. We determined presence of foraging bats by digital ultrasound recordings during 32 nights with two recording sets with each 4 microphones running simultaneously in a pair of managed and unmanaged orchards in close proximity. Echolocation calls were offline identified automatically to bat species. Forest structure was characterized in two quadrates (20 m x 20 m) that coincide with the places where microphones were installed. During recording of bat activities, food availability (aerial insects) was assessed using an omni-directional light trap.

We found twice the number of bat species (12 species) and four times higher foraging activities (530 ultrasound sequences) in the managed chestnut orchards compared to the unmanaged ones (6 species, and 132 sequences). Within the managed habitat, bats visited the most open and undergrowth free orchards. The stand structure in the managed orchards was significantly different from that in unmanaged ones the latter being denser and closer than the former. Management, however, did not affect food availability (i.e. aerial insect number and biomass).

Our study clearly demonstrated that the abandonment of chestnut orchards leads to a decline in bat species richness and foraging activities. Restoring and maintaining chestnut orchards open appears thus crucial to conserve endangered bat species. Forest managers should therefore aim undergrowth-free, open stands with maximal 80-100 trees per hectare when restoring chestnut orchards.