

Creating a bat hibernaculum at Kingfishers Bridge, Cambridgeshire, England

Gulickx M.M.C.¹, Beecroft R.C.² & Green A.C.³

¹ Conservation Science Group, Department of Zoology, University of Cambridge, Cambridge, CB2 3EJ, UK

² Wildlife and Countryside Services, Fen Cottage, Creting St. Mary, Ipswich, IP6 8QE, UK

³ Kingfishers Bridge Wetland Creation Trust, Kingfishers Bridge, Wicken, Ely, CB7 5XL, UK

SUMMARY

To provide a winter hibernation site for bats, an artificial cave was constructed at a nature reserve in eastern England. Subsequent to its completion, in the winter of 2005/06, two brown long-eared bats *Plecotus auritus* hibernated in the cave and in the subsequent winter one hibernated within it. It is considered likely that bat numbers will build up in future years.

BACKGROUND

Since 1995, the Kingfishers Bridge Project has transformed 61 ha of arable farmland into a mosaic of wetland wildlife habitats. This site harbours numerous flying insects and thus provides highly suitable foraging areas for bats. Hence, the area of Kingfishers Bridge was considered to be an appropriate location to create roost habitat for bats, especially a hibernaculum in which to over-winter as there were few suitable existing sites in the area. Bats need safe roost sites all year round, with the requirements in winter differing from summer breeding sites. The temperature of the hibernaculum is extremely important to the survival of the bats. The winter requirements to



Figure 1. The hibernaculum was created by digging a trench out of limestone and by putting pre-cast concrete roof sections over the trench.



Figure 2. Bat brick, containing six gaps, each gap has room for 2 - 3 bats to hibernate within.

hibernate safely are dark crevices inaccessible to predators, low constant temperatures and high humidity.

At Kingfishers Bridge a carefully designed cave was constructed as a bat hibernation site.

ACTION

Bat cave: In 2004, a bat hibernaculum (bat cave) was created at Kingfishers Bridge, Cambridgeshire, eastern England. The cave (2 m wide, 2 m high by 30 m long) comprised a trench dug into the underlying Corallian limestone and has pre-cast concrete roof sections (Fig. 1).

Within this structure, the roof contains numerous bat bricks (Fig. 2) that are specially made by the Norfolk Bat Group. Each elongated brick contains six gaps and each gap has room for two to three bats to hibernate within.

A door made of steel, oak boards, and wire mesh (Fig. 3), restricts access for predators (e.g. brown rat *Rattus norvegicus*, stoat *Mustela erminea* and weasel *M.nivalis*), and also humans. Two slots at the top of the door allow the bats to enter the hibernaculum. The bottom section is made of fine wire mesh. The slots at the top and the mesh at the bottom result in an important circulation of air through the cave. Cold air will run down over the floor and warm air will rise up and move slowly out of the cave at the top.



Figure 3. Cave door made of steel and oak boards. The top has two slots for the bats to enter and exit the cave. The bottom is made of wire mesh to enhance ventilation.

CONSEQUENCES

Hibernating bats: Bats are quite loyal to their hibernation sites, returning to the same ones year after year. Therefore, occupation of new hibernation sites occurs gradually. In general, after the creation of a bat cave it takes often a few years before the first bat hibernates in the artificial hibernaculum. At Kingfishers Bridge bats hibernated in the cave the first year after its creation.

In 2005, two brown long-eared bats *Plecotus auritus* hibernated in the hibernaculum. Subsequently in 2006, one brown long-eared bat hibernated within it. The hibernating bats used the space in between the concrete roof sections, rather than the bat bricks attached to the cave roof.

Other hibernating species: Besides bats, the cave is used for hibernation by a number of lepidopteran species including herald moths *Scoliopteryx libatrix*, and peacock *Inachis io*, and small tortoiseshell *Aglais urticae* butterflies.

Conclusions: Since construction of the bat cave has been used by bats in the two successive years subsequent to its completion, but up to now only 1-2 bats have hibernated in the cave each winter. However, as the cave has been only available for two years it is expected that bat numbers will increase in the forthcoming years, and hopefully other bat species, such as Daubenton's bats *Myotis daubentonii*, will be attracted as well.