

**A how-to guide for converting
and repurposing pillboxes for
re-use as bat hibernacula or
swallow nest sites: notes using
experience from fieldwork
along the River Trent.**

Repurposing and converting WW2 pillboxes for wildlife

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Converting Pillboxes for Wildlife: Lessons Learned and a How-To Guide

Introduction

Converting and repurposing WW2 pillboxes for wildlife use, especially for bat roosts or hibernacula, or for wild bird nesting sites, has been done in the past with varying degrees of success. When the Transforming the Trent Valley (TTTV) team got the opportunity to take on a similar project, we decided to learn from these previous sites, to take the best of what had gone before and adapt it to our requirements.

There are several factors to take into account; the cost of conversion versus the actual benefit to wildlife, keeping the integrity of these historic structures whilst making them suitable for their new purpose, ensuring the safety of our contractors and volunteers during the construction, and making sure that the work we do is secure. The following comments are all related to conversion of the Type 24 pillbox but could be applied to other types.

Safety First

These old bunkers are generally pretty robust, having been built with strength in mind. They are, however, susceptible to vandalism and damage of other kinds, including all forms of anti-social behaviour.

Other considerations are also necessary; some are occasionally used by rough sleepers, so making them inaccessible also forces changes on people that you may never meet.



Figure 1. A pillbox converted for bats to roost or hibernate along the River Trent. Note the gap under the door to allow flood water out.

Be aware that a careful examination of the interior **must** be made prior to entering with the gear and equipment to begin work. These buildings may contain all sorts of hazards, from broken glass, to human excrement, to used syringes and other drug-related paraphernalia, we've even come across live shotgun cartridges.

In many cases in our Trent Valley project area the pillboxes have been flooded when the river burst its banks, and all sorts of rubbish washes in and cannot get back out. One pillbox even had a set of four chairs for the comfort of the users. Due to river flooding, the pillboxes may also have silted up or sunk into the ground somewhat and height may be restricted, so mind your head! Please take care when entering for the first time and every time afterwards.



*Figure 2. Rubbish and chairs inside a pillbox near Doveridge.
The contents of pillboxes vary from the hazardous to the peculiar.*

Lessons Learned

The Environment Agency (EA) had previously converted a small number of pillboxes in the project area in 2010 and these, along with information from the internet on conversions elsewhere in the country, informed our process.

We knew, for example, that stable temperatures are best, with an element of dampness or moisture preferable to prevent desiccation during hibernation. If we were in an area free from regular annual river flooding events we might have made a snug-fitting door to prevent access by rats or other carnivorous animals; but we needed to ensure that any flood water could escape whilst attempting to prevent ingress by water-borne rubbish.



Figure 3. This pillbox on the Burton Washlands has been vandalised, the wrought-iron gate torn from its hinges and thrown aside.

We fitted doors that were snug at the top, but with a 25-50mm gap at the bottom. This would not prevent access by rats, mink, or weasels, so we fitted the internal roost covers at a height difficult for them to get to, as internal dimensions allowed. As the floor height varies due to accumulation of soil and rubbish, this will be different for each site so an actual dimension is difficult to give with any accuracy, but we fit the roost covers at least 500mm from the base of the pillbox.

Some conversions have a barred steel gate rather than a solid door, others still block up the top half or bottom half of the entrance with blockwork.



Figure 4. This pillbox conversion near Uttoxeter has the top portion of the entrance blocked up.



Figure 5. This pillbox conversion on the Burton Washlands has the bottom section of the entrance blocked up. The gate has been torn off by vandals.

A half-blocked entrance, whether top or bottom does not prevent access, and we chose to prevent ingress by people and hopefully reduce vandalism. We also opted for solid doors to help control temperature; a barred door allows a steady breeze to blow through, whereas a solid door with a gap at the bottom allows a passage of air but helps maintain a steady temperature.

One of the EA conversions along the River Dove had a steel door but with an exposed padlock. This meant that intruders were able to prise the padlock open or break it with a hammer to access the pillbox itself.

Once inside, the roost panels were damaged and the hessian sacking that had been hung up had been set on fire. If any bats had been present, they would have been burnt. To prevent similar happening to our conversions, we fitted 25mm pressure-treated hard-faced marine ply timber doors faced entirely with a 0.5mm steel plate, with a bolt secured by a padlock, fitted with a boxed-in padlock cover. The timber and steel were each painted with black waterproof tanking paint prior to assembly for maximum protection against water and to make them less visibly intrusive.



Figure 6. Pillbox converted to bat roost/ hibernacula opposite Walton south. Note the padlock cover to protect the padlock against vandals.

Converting pillboxes: wild bird nest sites and bat roosts

The simplest of the two conversions discussed here is the swallow or wild bird nest site. The door type remains the same for both conversions, as described above, but the internal conversion is different.

We simply fitted a shelf on each side of the long wall of the internal Y-shaped blast wall at approximately chest height. This meant that the shelf could be used by all sorts of bird species to nest on, or by martins, swallows and swifts to nest under. Encouragingly, one pillbox we converted had already been used as a nest site, with an old house martin nest attached to the concrete, much like under the eaves of a house. We also hung hessian inside, just in case bats chose to use the swallow conversion sites too.



Figure 7. A plywood nesting shelf fitted to either side of the internal blast wall.

The bat roost or hibernacula conversion is slightly more complicated. The lockable door is fitted but inside a sheet of plywood is fixed to each side of the long wall of the Y shaped blast wall.



Figure 8. A plywood cover fitted to either side of the internal blast wall raised on 20mm deep batons at each side, allowing a narrow crawling space for the bats to roost or hibernate behind.

This is then raised from the surface on 20mm wooden batons to allow bat access between the wall and the plywood. Stout steel hooks are fixed high on the wall and hessian is gathered at the top and hung from these.

Again, it is important to leave as large a gap as possible between the floor and the bottom of the hessian and the floor and the plywood sheet. Then each loophole is blocked up. Following the EA conversions, we chose to use blue bricks as they seemed to detract less from the original building.



Figure 9. Hanging hessian for bat use. Note also the ~30mm 'letterbox' gap in the loophole for bat ingress and egress.

Obviously, if converting a red-brick built pillbox, then the loopholes would be blocked with matching bricks. One of the bricks at the top of the loophole was left out, creating a 'letterbox', on which we laid a skim of mortar to close the gap a little more.

This left a gap of around 30mm, more than required for a bat to squeeze through but for good reason. The EA conversions had a very narrow letterbox entrance for the bats, a good size for them to squeeze through and prevent rat, weasel or mink access but the perfect size for snails to get caught in. In fact, all of the early conversions we checked were blocked by dead snails. Whether they get trapped there or choose that gap as their final resting place is not known. For this reason, we chose to increase the letterbox size and hope that the bats were inaccessible to predators once in place in their roost.



Figure 10. We installed trail cameras to capture any use of the pillboxes by bats, swallows, or other wildlife.

Extras.

Finally, we were given several trail cameras by our colleagues at Derbyshire Wildlife Trust, and the SmartWater Group Ltd, which we installed in each pillbox. Quite quickly it became apparent that birds and bats were using the pillboxes. Bats hunt inside them but as yet there is no evidence that they have moved in.



Figure 11. A hunting Daubenton's bat appears as a blur above the fabric hanging inside the pillbox. Image taken from trail camera video footage. Photo credit TTTV 2022

A pair of wrens did move in to one pillbox and reused an old swallow nest in which to build their nest. The male wren builds several globe-shaped nests in trees, banks, or in our case an old swallow's nest in a pillbox and the female chooses whichever one she prefers.



Figure 12. One of the adult wrens is perched on the nesting shelf. Their nest is in an old swallow nest in the shadowed area at the top left of the image; trail camera footage shows both parents feeding the young birds. Photo credit: TTTV 2022.

Luckily for us, she chose the nest in the safety of one of our pillboxes to lay her eggs. Camera footage shows both birds feeding young.

In another pillbox conversion, we captured several images of a tawny owl. It seems interested in the camera at one point.



Figure 13. A visiting tawny owl using the pillbox loophole as a vantage point from which to watch the sunrise, and also to have a look at our camera.

Photo credit: TTTV 2022

Wild birds are protected by law, as are their nests and eggs, and it is an offence to disturb a wild bird nest site. See the RSPB website here for more information:

<https://www.rspb.org.uk/birds-and-wildlife/advice/wildlife-and-the-law/wildlife-and-countryside-act/>

Once bats have settled in the pillbox then it becomes a criminal offence to knowingly disturb them and a licence is required to enter a known bat roost. For more information on this and bats in general please visit the Bat Conservation Trust website:

<https://www.bats.org.uk/>

<https://www.bats.org.uk/advice/bats-and-the-law>

Photographs by Mark Knight 2022 unless otherwise stated.