Artificial hollows

for Carnaby's cockatoo

How to design a hollow

Department of
Environment and Conservation

Birds Australia
CONSERVATION THROUGH KNOWLEDGE

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Information sheet

How to design and place artificial hollows for Carnaby's cockatoo

Artificial hollows can be used to help conserve the threatened Carnaby's cockatoo by enabling the cockatoos to breed in areas where natural hollows are limited.

A wide variety of artificial hollow designs have been used with mixed success. Evidence suggests that, while the hollow must meet some basic requirements, other factors such as proximity to existing breeding areas may be more important when determining the success of artificial hollows.

This information sheet contains broad guidelines for the design and placement of artificial hollows for Carnaby's cockatoo. (Also see information sheet, *When to use artificial hollows for Carnaby's cockatoo*.)

Walls

The walls of the artificial hollow need to be constructed from a material that is:

- durable enough to withstand exposure to elements for an extended period of time (that is, 20+ years)
- able to simulate the thermal properties of a natural tree hollow not less than 300 millimetres in internal diameter
- between 0.5 and 2.5 metres long.

Successful artificial hollows have been constructed from sections of salvaged natural hollow, black industrial pipe recycled from the mining industry and, in captivity, white PVC pipe. When using non-natural materials care must be taken to ensure there are no toxic residues and that the materials are safe to ingest.

Base

The base of the artificial hollow must be:

- able to support the bird and chicks
- durable enough to last the life of the nest
- free draining
- at least 300 millimetres in diameter
- covered with 100–150 millimetres of dry, free draining material such as charcoal, hardwood woodchips or wood debris (do not use saw dust or fibre products that will retain moisture).

Example materials that could be used for artificial hollow bases include heavy duty stainless steel, galvanised or treated metal (for example Zincalume ®), thick hardwood timber slab or marine ply (not chipboard or MDF). The base material must be cut to fit internally, with sharp or rough edges ground away or curled inwards and fixed securely to the walls.

Carnaby's cockatoo chicks in artificial hollow. Photo by Christine Groom

Entrance

The entrance of the artificial hollow:

- must have a diameter of at least 100 millimetres (preferably 200–300 millimetres)
- should preferably be top-entry to minimise use by non-target species.

A lid or cap would partly weatherproof the hollow, but is not necessary. Top-entry hollows are unattractive to nest competitors such as feral bees, galahs and corellas. Side-entry hollows have been successful in areas where feral bees are not a problem and where galahs and corellas are deterred.

Ladder

For artificial hollows made of non-natural materials, or of processed boards, it is necessary to provide a ladder to enable the birds to easily climb in and out of the hollow.

Bottom of artificial hollow showing ladder fixed to wall and chewed sacrificial posts. Photo by Christine Groom

The ladder must:

- be securely mounted to the inside of the hollow
- be made from an open heavy wire mesh such as WeldMesh™ with mesh size of 30–50 millimetres, or heavy chain
- not be made of a material that the birds can chew
- not be galvanised because the birds may grip or chew the ladder and ingest harmful compounds.

If using mesh for the ladder, the width will depend on the curvature of the nest walls. A minimum width of about 60–100 millimetres is recommended.

Sacrificial chewing posts

For artificial hollows made of non-natural materials, or of processed boards, it is necessary to provide sacrificial chewing posts. The birds chew material to prepare a dry base on which to lay their egg(s). Without this material, the artificial hollow is unlikely to be used by a cockatoo.

The sacrificial chewing posts must:

- be made of untreated hardwood such as jarrah, marri or wandoo
- be thick enough to satisfy the birds needs between maintenance visits
- extend beyond the top of the hollow as an aid to see whether the nest is being used
- be placed on the inside of the hollow
- be attached in such a way that they are easy to replace (for example, can hook over the top of hollow or can slide in/out of a pair of U bolts fitted to the side of the hollow).

It is recommended that at least two posts are provided. Posts 70 by 50 millimetres have been used but require replacing at least every second breeding season when the nest is active. Birds do vary in their chewing habits and therefore the frequency at which the chewing posts require replacement will also vary.

Mountings

The artificial hollow must be mounted such that:

- the fixings used will last the duration of the nest, for example galvanised bracket or chain fixed with galvanised coach screws
- it is secured by more than one anchor for security and stability
- it is positioned vertically or near vertically.

Placement

Sites should be chosen within current breeding areas and where they can be monitored, but are preferably not conspicuous to the general public. It is important that artificial hollows are placed where they will be accessible for future monitoring and maintenance. For more detail refer to the separate information sheet, *When to use artificial hollows for Carnaby's cockatoo*.

The height at which artificial hollows should be placed is variable. The average height of natural hollows in dominant tree species in the area is a good guide. Natural hollows used by Carnaby's have been recorded as low as two metres above the ground. If located on private property, the hollows can be placed lower to the ground so they are accessible by ladder or a rope and pulley system can be used. Where public access is possible artificial hollows should be placed at least seven metres high (that is, higher than most ladders) and on the side of the tree away from public view to reduce the chance of interference or poaching.

Carnaby's cockatoos show no preference for aspect of natural hollows. However, it may still be beneficial to place artificial hollows facing away from prevailing weather.

Artificial hollows to be placed in trees require:

- accessibility of the tree for a vehicle, elevated work platform or cherry picker
- a section of trunk two-to-three metres long suitable for attaching the hollow.

Artificial hollows to be placed on poles require:

- a hinge at the bottom of the pole that can be secured when the pole is in the upright position
- access for a vehicle to assist raising the pole.

Example fixing for artificial hollow. Photo by Christine Groom

Maintenance and monitoring

Once artificial hollows have been placed they require monitoring and maintenance to ensure they continue to be useful for nesting by Carnaby's cockatoos. It is important to monitor artificial hollows to determine use by the cockatoos, other native species and pest species. By undertaking monitoring, the success of the design and placement of artificial hollows can be determined and areas for improvement identified for future placement of artificial hollows.

Monitoring can also assess whether any maintenance is required. Without regular maintenance artificial hollows are unlikely to achieve their objective (that is, they will fail to provide nesting opportunities for threatened cockatoos). Therefore, it is important to continue a regime of regular maintenance while the artificial hollow is required. It may be several (too many) decades until a natural replacement hollow is available.

Carnaby's cockatoo chicks. Photo by Christine Groom

For further advice on monitoring and maintenance of artificial hollows please refer to the separate information sheet *How to monitor and maintain artificial hollows for Carnaby's cockatoo*.

Safety

Take care when placing artificial hollows. Artificial hollows are heavy and require lifting and manoeuvering into position several metres above the ground. Consider your safety at all times.

Examples of successful artificial hollows. Note signs of fresh chewing on hollow entrance (right) and chewing posts (left). Photos by Christine Groom

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