

Nesting instinct: Alumni innovation protecting our native species

Around 300 Australian native species rely on tree hollows for breeding or shelter. It takes an average of 100 years for hollows to form naturally, and with many older trees lost to land clearing and bushfire, timber nesting boxes have long been the go-to though imperfect solution.

Charles Sturt graduate Mick Callan knew there had to be a better way. “Many nesting boxes aren’t grounded in a solid ecological understanding of the target species, and timber boxes typically last just eight to ten years,” Mick explains. “But the biggest issue is micro-climate; they get much hotter than ambient temperatures in summer, reaching levels often lethal to their occupants. They’re also colder than ambient temperatures on cold nights.”

While completing his Graduate Certificate in Ornithology at Charles Sturt, Mick met leading ecologist Professor David Watson. Determined to solve the problem and make a genuine difference in regional Australia and beyond, Mick persuaded him to supervise his honours work in the Bachelor of Science program. He started from scratch, examining the issues with timber boxes and building a better solution from the ground up.

“Using 3D printing technology, we developed several prototypes featuring a plastic outer casing for greater longevity and double-walled insulation, which we eventually tweaked to include an internal timber wall,” he says.

Mick co-founded *Habitat Innovation and Management* with fellow ecologist Carl Tippler in 2020 to commercialise the innovative design. Seeking a more durable and cost-effective alternative to 3D printing, the pair’s steep manufacturing learning curve led them to *Allmould Plastics*, a custom injection moulding factory in Orange.



“It would have been much more cost-effective to manufacture offshore, but we were adamant from the start that we wanted to manufacture in Australia, ideally regionally,” says Mick. “Working with Allmould and its industrial designers and engineers has truly enabled us to bring our vision to life.”

Combining significant investment in research and development with deep ecological knowledge, Habitat is the first company to deliver science-backed artificial habitat at scale, fully designed and manufactured in regional Australia.

Unlike traditional timber nesting boxes, Habitat’s solution uses organic shapes, textures and structures that closely mimic the physical and thermal properties of natural hollows. The modular system is customisable to various species, and features a unique mounting system that bonds to the host tree as it grows.

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Michael Callan
Graduate Certificate in Ornithology, 2018.

Constructed from fully recyclable, UV-stabilised polypropylene, the boxes have an expected minimum lifespan of around 50 years and maintain humidity levels of approximately 80 per cent—essential for egg development and preventing life-threatening dehydration in vulnerable newborns.

The original range caters to a diverse array of hollow-dependent fauna, from small critters to large parrots. Habitat has since expanded its range to include larger nesting boxes for owls and black



Habitat Innovation and Management co-founders, Carl Tipper (right), and Mick Callan, (left) pictured after installing the first Habitat modular nest box.



Above: Ecologist at Habitat Innovation and Management, Mikayla Green with Mick installing a new Habitat modular owl nest box.



Above: Australian Owlet-nightjar using a Habitat modular nest box.



Above: Mick with Carl Tipper conducting a bird survey.

Below: Krefft's Gliders in Habitat modular nest box.



cockatoos, as well as fire and flame-retardant marsupial dens. Initially developed for northern quolls for a project with Fortescue, the dens have been adopted by a surprising variety of species.

"We've documented around 70 unique species using them—everything from target species like quolls and other small marsupials to echidnas, reptiles and even birds," Mick notes.

Alongside its growing portfolio of artificial habitat solutions, Habitat—based in Bathurst and Wagga Wagga—provides nature-positive ecological consulting services to the government, nonprofit and private sectors. Among its high-impact projects is the holistic landscape rehabilitation of the *Two Thumbs Wildlife Sanctuary* near Cooma, devastated by the Black Summer bushfires, in partnership with the *International Fund for Animal Welfare (IFAW)*.

Mick—who was recently appointed Adjunct Research Fellow at Charles

Sturt's Gulbali Institute, formalising the ongoing research collaboration, and the Habitat team are constantly innovating. Among its latest developments is a bushfire recovery kit providing short-term refuge for native fauna in the critical post-fire phase. The artificial habitats will also be infused with beneficial microbes and fungi to replenish soil organic activity and kick-start plant regeneration.

"Our vision as a business is to be the leader in artificial habitat, and we're constantly driving towards that," Mick explains. "We're always looking at new projects and products; that's our passion. We aim to bring more solutions to the marketplace to support our precious biodiversity to thrive."

Visit www.habitatinnovation.com.au to learn more about how these unique artificial habitat solutions are restoring Australia's biodiversity, from backyard gardens to major ecological projects.