

Barn Owls and bio-control

The Barn Owl *Tyto alba* is familiar to many people as a rather spooky denizen of eaves, barns and abandoned buildings. It is admired for its silent flight and its angelic, heart-shaped face, and notorious for its ghostly appearance on the wing at night, and its spine-chilling, screeching call. But perhaps the most unique feature of the Barn Owl is the intimacy of its relationship with its rodent prey. Virtually every detail of its make-up, from shape and appearance, to behaviour and even breeding biology, is designed to improve its ability to locate and catch nocturnal rats and mice, and to profit from this habit. Given this degree of specialization, and an almost global distribution, the Barn Owl is arguably the most effective rodent predator on earth.



In essence, it involves the manipulation of the owl population (which is locally indigenous) by the supplementation of an otherwise limiting resource – nesting sites. Barn Owls are cavity-nesting birds which under natural conditions breed in cracks in rock faces and holes in trees. They have adapted well to using recesses in buildings, particularly in rodent-rich environments. In farming areas with pest rodent problems, Barn Owl numbers can be increased by providing suitable nest boxes, spread evenly across the farmland, for occupation and use by breeding owls. Once in residence, the owls will hugely increase the levels of predation pressure on the nocturnal rodent population, and reduce the rodent pest factor in the area both by killing and eating large numbers of rats and mice, and by limiting the extent to which the remaining rodents are prepared to venture away from protective cover. Rodent populations are as prone to crashing in poor years as they are capable of erupting in good ones. Barn Owls are evidently so locked on to the cyclical nature of their prey populations that, unlike most other predatory birds, they boom and bust with their prey, and there is no danger of an artificially inflated Barn Owl population switching to other, non-target prey when pest rodent numbers are down. Instead, owl numbers in the area will drop, presumably as birds leave the area for 'greener pastures', and rise again coincident with the next rodent plague.

With these credentials, it's not surprising that Barn Owls are increasingly called on by farmers to help control rodent plagues when these threaten to decimate their cash-crops. In areas of high intensity agriculture around the world, particularly in cereal croplands, but also in rice paddies and fruit orchards, there is a growing trend away from the use of expensive and damaging toxic chemicals to eradicate rodents, and towards a much cheaper, more sustainable and, crucially, more efficient 'bio-control' agent – the Barn Owl.

What is bio-control?

Bio-control is the managed use of one organism to limit the numbers or spread of another. In concept, it is a better way of controlling pests or weeds because it pits predators or parasites against prey or hosts, and relies on the natural impact of one on the other to reduce the scale of an undesired imbalance. Often, bio-control programs involve the importation of alien predators to control invasive pests. Ideally, such interventions conclude with the pests being driven to local extinction, rapidly followed by their starving control agent. However, there is always the risk of imported predators switching their attentions from target species to other, indigenous taxa, and becoming pests themselves.

The Barn Owl bio-control concept is a much simpler and less risky approach to pest management.

A local test case

In the grain-growing areas of the Western Cape Province, Cape Gerbil *Tatera afra* numbers increase exponentially in good rain years, and this nocturnal pest can cause considerable damage to farmland and crops in the area. A quantitative study of owls as bio-control agents was recently conducted on a West Coast wheat farm with a network of over 80 Barn Owl nest boxes. The size of the owl population resident on this property varied from year to year, from about 15-40 pairs. Cape Gerbils made up about 90% of the diet of breeding owls and, collectively, the owls 'harvested' about 35 000 gerbils per year. Overall, using owls to control gerbil damage was twice as effective as using poison, and much less expensive in the long-term. An optimal array of owl nest boxes in



this area requires about one nest box per 25 ha of cropland, with each box spaced at least 500m from its nearest neighbour. While the capital outlay required to set up such an array of boxes can be more or less the same as the cost of poison needed to control gerbils on an average farm in an average year (depending on the building materials used), maintenance costs for an existing nest box scheme are probably less than 5% of the cost of another application of poison. Perhaps most importantly, the Barn Owl and nest box approach avoids the severe and systemic environmental costs of repeated doses of toxins: other rodent predators are unaffected, properties remain ecologically functional, and farmland is left healthy and productive.

Further reading

<http://www.ewt.org.za/images/uploaded/workgroups/7Owl%20nest%20boxes.pdf>

Potter, L. 2004. Raptors for rodent control: Is the Barn Owl a viable control agent for pest rodents on South African farmlands? Unpublished MSc Thesis. University of Cape Town, Cape Town.

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