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USE OF REFLECTIVE GLASS BALLS TO DETER PREDATORY BIRDS

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As more species have become endangered, interest in captive breeding has increased, either for preservation in zoos or for the subsequent release of captive progeny back into the wild. With the establishment of captive colonies comes the need to protect captive stock from predation. Ground-dwelling predators, such as Foxes *Vulpes vulpes* and Cats *Felis catus* can be excluded by mesh or electric fences of appropriate design. Enclosing the top of the enclosure will also exclude predatory birds, but as some captive species require large areas for successful breeding, this can be difficult and expensive.

As part of a programme aimed at the conservation of the Malleefowl *Leipoa ocellata* in New South Wales, chicks and adults are held in 1 hectare enclosures of natural mallee on Yathong Nature Reserve (32°40'S., 145°30'E.). Despite the density of mallee within the enclosures predation of chicks by Spotted Harriers *Circus assimilis*, Swamp Harriers *C. aeruginosus* and Brown Falcons *Falco berigora* was common, although most kills occurred along the narrow cleared areas next to fences. Losses of chicks highlighted the need for protection, however fully enclosing the eight enclosures with mesh was too costly.

Several decades ago in Germany it was discovered that wine or brandy bottles mounted atop wooden poles kept predatory birds away. The bottles have since been replaced by large hollow glass balls silvered on the inside; the most effective being 250 to 350 mm diameter, positioned 100 m apart at a height of about 4 m (Keil 1962). Reflective glass balls have successfully protected chickens, pheasants and other game birds from goshawks, sparrowhawks and kestrels (Mansfeld 1954, Pfeiffer and Keil 1963). This technique was tried as a means of protecting Malleefowl on Yathong.

METHODS

Glass balls of sufficient size were not obtainable at less than \$100 each. Since only the upper half of the glass balls used successfully by Pfeiffer and Kiel (1963) were silvered (this being the only part visible from above), inexpensive inverted hemispherical glass bowls (250 mm diameter) were used instead.

The eight enclosures on Yathong had been constructed in a 4×2 configuration. A silvered hemisphere was mounted at a height of 3 m atop each of the 15 corner fence posts, such that they were spaced 100 m apart in a 5×3 grid, each square within the grid being a 1 hectare fenced enclosure.

RESULTS AND DISCUSSION

The reflective hemispheres proved to be completely ineffective. Predatory-bird strikes, particularly from harriers and falcons, continued without abatement. By perching on the hemi-

spheres, albeit somewhat precariously on the convex surface, a Brown Falcon used them as vantage points from which to survey the enclosures. Such a blatant lack of response deterred us from experimenting further, particularly as experiences in Europe had found that even the most primitive deterrent, a bottle on a pole, worked to some extent.

With modification the technique may be effective against some species of Australian predatory birds, but in our view it seems unlikely that any modification would improve their effectiveness significantly. The contrast between the success of the technique in Europe and its ineffectiveness in Australia may not necessarily be due simply to geographic or species differences. Rather, it may indicate that whilst reflective glass balls can protect some species in an artificial environment, they will not deter predatory birds from their natural prey in their natural environment.

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