

SHORT COMMUNICATIONS

A METHOD FOR REDUCING ILLEGAL REMOVAL OF EGGS FROM RAPTOR NESTS

Ratcliffe (1980) has described the contribution made to the knowledge of the breeding habits and distribution of Peregrine Falcons *Falco peregrinus* in Britain by egg collectors. They have also contributed much to the study of Peregrine Falcons in Australia, e.g. Olsen & Olsen (1979). However, the birds do not always re-lay, as many collectors believe, so considerable harm can be done both to the birds and to scientific studies by egg-collecting. Ratcliffe (1980) believes that the estimated 500 active egg collectors in Britain must be prevented, through persistent vigilance at eyries, from causing excessive nesting failure. He states "Above all egg collecting is an essentially selfish activity which spoils many other people's enjoyment and can be a complete nuisance to those engaged in serious study of breeding biology of an uncommon or local species" (p351). In Australia it is seldom practical to guard vulnerable eyries as is done in the United States and Britain. Egg marking schemes using secret markings or dye visible only under ultraviolet light have been used in Britain to apprehend licensed falconers who have eggs allegedly laid by their captive falcons. However, there are no licensed falconers in Australia. This method should also deter licensed egg collectors, but very few are licensed in Australia so eggs are most often removed by unlicensed individuals. Obviously, authorities cannot check the eggs of collectors unknown to them. Furthermore, a researcher trying to determine incubation, fledging times, etc. will have this work disrupted when secretly marked eggs are removed.

We have generally been free from the effects of egg collectors or falconers in our study areas. However, in 1979 we noted some declines in productivity of Peregrines and Wedge-tailed Eagles *Aquila audax* in the Flinders Ranges of South Australia which we attributed to the disappearance of eggs. On the assumption that egg collectors may have removed these eggs, we did two things in 1980:

1. We asked a local licensed egg collector not to collect in the study area and the agreed to co-operate.
2. In one Wedge-tailed Eagle eyrie and five Peregrine eyries we put a single line around the circumference of each egg with a standard, black, waterproof marking pen (Golden Axe marker, Mitsubishi Pencil Co. and Pilot Super Colour Marker).

Our objective in marking eggs was to make them unappealing to collectors. The outer non-fast layer of pigment on a Peregrine's egg rubs off when wet so, we hoped, collectors would realize that the egg would be further disfigured if they tried to remove the mark. We thought bold, visible marking would act as an immediate deterrent to the collector and eggs would be more likely to remain with the birds. Collectors we spoke to believed this method would be effective, and that most other collectors would not remove eggs so that a second clutch could be collected later. Many eyries are in remote areas so it is unlikely that a return trip would be made for a relatively common species like the Peregrine.

The marking programme did not appear to have any adverse effects. Twice as many young were produced from a similar number of eggs in 1980, when the eggs were marked, compared to the previous year, when they were unmarked (Peregrine: 1979, six young from fifteen eggs; 1980, twelve from sixteen $\chi^2_{(1)} = 3.89, p < 0.05$; Wedge-tailed Eagle: 1979, no young from two eggs; 1980, one from two), although many factors could have contributed to this difference.

Marking pens should be used with discretion until possible embryotoxic effects are tested. We have used them to number eggs for the determination of incubation times in wild and captive Australian Kestrels *Falco cenchroides*, Brown Falcons *Falco berigora*, Brown Goshawks *Accipiter fasciatus* and in wild Welcome Swallows *Hirundo neoxena* with no harmful effects. In future years we plan to label eggs with the initials of a government wildlife organization which may act as a further deterrent.

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