Reproductive behaviour and success of Red-footed Falcon *Falco vespertinus* in North Italy

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From literature it appears that research on Red-footed Falcon *Falco vespertinus* has been centred, above all, on monitoring the species and on its ecological demands (Glutz *et al.* 1971, Cramp & Simmons 1980, Hagemeijer & Blair 1997). The behavioural approach has been examined less in detail. Particularly scant is the analysis of breeding behaviour. With this study we want to focus better these aspects through the quantification of two behavioural parameters expressed during reproduction: the presence on nest and the presence on nest tree.

Study area and methods - Study area was an agricultural zone located near Parma. Observations have been carried out, in 1997 and 1998, over three alternate days per week, from 15 April to 15 August. We recorded duration of the presence on nest and on nest tree. We have distinguished pairs with successful fledging (Pairs YES, in total 5) from pairs without success (Pairs NO, in total 5).

Results - Females YES have longer durations of presence on nest than males both in Incubation (N=60, U=282.5, P<0.05) and in Chick Rearing (N=60, U=235, P<0.01) phase. In pairs NO there are no differences. Comparing the categories, we find a similar investment by males in Pre-Incubation and in Incubation phase. Instead females YES invest greater time in the first phase (N=43, U=86.5, P<0.05). This difference is kept only in the first 8 days of incubation (N=22, U=25, P<0.05). Pairs YES brood more in the initial period (N=24, U=25, P<0.01) and in the final one (N=24, U=30, P<0.05). Pairs NO, instead, present a constant trend.
Females NO compared to males have longer durations of presence on nest tree in Pre-Incubation phase (N=86, U=545.5, P<0.01). In the first 8 days of incubation females NO show a presence level greater (N=22, U=28, P<0.05) than those with success. Temporal trends almost overlap in pairs YES and NO. In pairs YES, parents alternate themselves in a specular way as to the previous parameter; males, in fact, contribute more in the first period (N=22, U=24, P<0.05). In pairs NO there are no trend differences.

Conclusions - Our data highlight strong discrepancies between pairs YES and NO in the expression of reproductive behaviour. We feel confident to put forth two possible explanations of reproductive failure. Considering the results of Incubation phase, we point out the possibility that two different reproductive strategies can be present in Red-footed Falcon biology. The first is identifiable in pairs NO with a greater overlap of roles between parents. The second is shown by pairs YES in which the marked separation of roles takes females to a higher investment in the guard of site and in the incubation of eggs. The ecological and available food conditions can have been determinants in supporting the second strategy. The other hypothesis, more centred on the results of Pre-Incubation phase, is instead linked with the physiological condition of the various individuals. It is possible that some females have not reached a condition suitable to reproduction. The low physiological level would not have consented females to increase incubation durations in the first period which is the moment, as we can see in pairs YES, with the highest level of energetic investment.

References - Cramp S., Simmons K.E.L. 1980. The Birds of the Western Palearctic, Vol. 2. Oxford University Press, Oxford. ● Glutz von Blotzheim U.N., Bauer K.M. & Bezzel E. 1971. Handbuch der Vögel Mitteleuropas, Vol. 4. Akademische Verlagsgesellschaft AULA-Verlag, Wiesbaden. ● Hagemeijer E.J.M. & Blair M.J. 1997. EBCC Atlas of European Breeding Birds: their Distribution and Abundance. T & A D Poyser, London.