Determinants of bird ring return : a questionnaire to duck hunters.

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***Running head**:* Guillemain: Hunters' motivation to return rings

Keywords: Questionnaire, Teal, *Anas crecca*, ring return rate, expectations, sociology

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ABSTRACT

Many ringing programmes rely heavily on rings returned by hunters, yet the motivation of hunters to participate in such schemes has not so far been examined. A questionnaire survey was launched while French hunters reported hunted Teal (*Anas crecca*) rings. The main aim was to quantify the proportion of rings returned by different means, to ask hunters about their previous knowledge of the ringing programme and about their motivation to report rings. Hunters reporting rings exhibited altruistic behaviour, sending their data with little knowledge of what they will be used for, and indicated their willingness to help research as their main motivation. They showed little interest in an internet-based ring return system or internet information, but relied mostly on a phone-reporting system when the phone number was indicated on nasal saddles (although the sole presence of a nasal saddle in addition to a metal ring also likely improved the reporting rate of such marked birds). Considering these sociological aspects in the advertisement of ringing programmes may help improve ring recovery rates of quarry species.

INTRODUCTION

Ring recovery rate, the probability that a ring fitted to a bird will subsequently be sent back to the ringing centre, is a crucial parameter of demographic models that is necessary to calculate harvest rates (e.g. Pollock et al. 2001, Williams et al. 2002). In North America, experiments using ‘reward bands’ have estimated return rates of standard metal rings to be around 30% in ducks (e.g. Nichols et al. 1991). Technical measures have then been taken there to improve such rates (i.e. toll-free phone number engraved on the rings, Royle & Garrettson 2005), since higher recovery rates translate into more precise estimates of demographic parameters (Robinson et al. 2009). As a consequence, the ring reporting rate has been observed to increase recently to over 80% (Royle & Garrettson 2005).

A dramatic decline in standard ring recovery rate has however been documented over the last 50 years, both in Europe and in North America (Crissey 1975, Henny & Burnham 1976, Dunn 2001, Robinson et al. 2009). The fact that this occurred for quarry as well as non-quarry species suggests that this pattern is not due (or at least not solely) to a decrease in hunting pressure, but is more likely to reflect a decreasing motivation of the general public to return rings. In an attempt to improve return rates of rings fitted to ducks as part of our research programmes (e.g. Guillemain et al. 2009), a questionnaire survey was launched while hunters reported hunted Teal (*Anas crecca*) rings. The main aim was to quantify the proportion of rings returned by different means (i.e. direct phone call / email to the researcher in charge of the programme, message to hunting NGOs, direct to the national ringing centre at the French National Museum of Natural History etc), to ask hunters about their previous knowledge of the ringing programme and about their motivation to report rings. One of the goals is to use these results to improve the advertisement of the ringing programme and ring return procedures, but the results also provide valuable sociological information about the way hunters consider ring return, which could be used by other ringing schemes.

METHODS

Hunters who reported Teal rings during the 2009/10 hunting season were interviewed using a questionnaire of 20 questions (both closed questions with yes/no answers and more open questions where people could freely detail their answer, Appendix 1). The only other duck species ringed in any number as part of the research programme was Mallard (*Anas playrhynchos*), but many of these were hand-reared birds released for hunting, and the motivation of hunters to report such rings may differ from that for birds they consider as genuinely wild (just as hunters have been observed to report rings to a lower extent when they were closer to ringing sites and less curious about rings; Crissey 1975, Henny & Burnham 1976). Approximately 1,000 Teal have been ringed throughout France (14 ringing sites) annually since 2002. All hunters reporting rings during the 2009/10 hunting season were directly contacted by the same person (MG) for interview, except when they sent rings back indirectly and explicitly expressed their will to remain anonymous. Only five rings were reported from foreign countries during this hunting season and up to April 2010 (one from Germany, two from the UK, one from Sweden and one from Russia). These were reported indirectly through the national ringing centres and these hunters were not contacted for interview. Hunters from foreign countries may have different attitudes towards ring reporting (which may translate into different ring reporting rates, Guillemain et al. in press). However, hunters mostly report birds that had been ringed in their own country, and hence the present study was restricted to French hunters. It is also acknowledged that the sample size was relatively small. However, the answers of this limited number of hunters showed clear patterns, and therefore it was assessed that a larger sample size would only affect the results little.

The first part of the questionnaire aimed at collecting basic ring recovery information (ring number, recovery place and date etc), but this was also combined with return method and return date to assess how quickly rings were returned depending on the method of reporting. Approximately 60% of the ringed Teals were also fitted with a plastic nasal saddle to allow resightings from a distance (Guillemain et al. 2007). The office phone number of the researcher in charge of the programme was hand-written on the back of each of those saddles, while metal rings only had a return address written ('MUS. PARIS' for French rings). Earlier tests showed that saddled and non-saddled birds behaved similarly (Guillemain et al. 2007). Mortality rates still have to be compared between the two categories. For this reason only some of the birds received a nasal saddle in addition to a metal ring. The Teal ringing programme was also advertised and regular progress reports published in local and national hunting magazines, almost annually.

A number of questions then dealt with the previous knowledge people had of ring return procedures, and whether they had knowledge of the research programme or not.

The goal was then to assess hunters' motivation, and the answers to this open question were subsequently classified into one of the following: "I have to do it (by law)", "I want to know more about this individual bird" or "I want to receive a life history sheet for this bird, to show my friends" (i.e. personal motivation) and "I want to help a research programme" (i.e. altruistic motivation).

Hunters were also asked to estimate the proportion of other hunters reporting rings, as well as to provide an estimate for crippling loss (i.e. the proportion of birds killed by a gunshot but not retrieved by the hunter afterwards). The questionnaire ended with personal questions about sex, age and hunting practice.

Seven hunters reported more than one ring. Only one set of questionnaire answers was considered per hunter to avoid pseudo-replication, except for the time elapsed between recovery and return depending on the selected return method, for which n was the total number of rings sent back.

RESULTS

A total of 67 rings were reported by 59 different hunters of which only five preferred to remain anonymous and did not answer the questions. All respondents were men, aged between 15 and 71 (median: 47), with a median frequency of one hunt per week.

Of the 67 rings reported, 49 were from birds that had also been fitted with a nasal saddle on ringing. The ratio of saddled/unsaddled birds was therefore significantly higher than that in the general ringed population, where since the beginning of the ringing programme up to the end of the 2009/10 hunting season 3,888 birds had been fitted with nasal saddles and 2,581 were only metal ringed ($\chi^2 = 4.70$, df = 1, $P = 0.03$). Similarly, the recovery rate (i.e. proportion of marked birds that later got returned) for birds with nasal saddles from the Camargue, Southern France, was almost twice as large as that for metal ringed only Teal (13.2% and 6.6%, respectively, Guillemain et al. in press). One saddled bird was reported 1,824 days after recovery and was an outlier; when discarding this recovery, saddled birds were consistently reported more quickly than unsaddled ones (median number of days: 9.0, inter-quartile range: 26.5, n = 48 and median: 35.5 inter-quartile range: 41.0, n = 18, respectively; Mann-Whitney Z = -2.76, $P < 0.01$). Saddled birds were reported mostly by a direct phone call to the researcher in charge of the research programme (43% of cases) than via departmental hunting federations to which hunters have to register annually to get their licence (19%); or through the national wildfowlers' association (16%). Conversely, unsaddled Teal were mostly reported via the national wildfowlers' association (39%) or hunting federations (22%). Twenty of the 21 people reporting a saddled bird on the phone said that they had discovered the phone number on the reverse of the nasal saddle. Among the 54 different hunters reporting rings and answering the questions, opinions were strongly contrasting as to whether an online reporting system would be valuable; 30 were in favour of such a system while 24 were against it. There was no significant difference in median age between these two classes (median: 49.5 years, inter-quartile range: 21.0, n = 30 and median: 44.0 years, inter-quartile range: 24.5, n = 24, respectively; Z = -1.67, $P = 0.09$).

Interestingly, 54% of hunters did not know about the research programme when returning a ring. Of those who did know about it, 68% had heard about the programme via hunting magazines or television, while the others did so through discussion with fellow hunters, because they were ringers themselves or belonged to the National Hunting Office. No single hunter mentioned the webpages dedicated to the Teal research programme.

All hunters said they had always reported rings in the past, or that it was the first time that they had encountered one. Their main motivation to report rings fell into the category "I want to help a research programme" (33 of 54 cases), with answers like "ringers had a hard time catching and ringing birds, it is natural to support them by sending rings back". The second main motivation was to know more about the individual ringed bird (20 of 54 cases). Respondents estimated the proportion of hunters who reported rings as 60.0% (inter-quartile range: 30.0, n = 46 as 8 people had no opinion). Similarly, they estimated that 85.0% of the shot birds (inter-quartile range: 20.0, n = 51) which died immediately or quickly after being shot were retrieved.

DISCUSSION

The results of this survey suggest that hunters are more likely to report saddled than unsaddled birds and then to report them by phone.

The sample was biased because interviews were carried out while hunters were sending rings back, so that the answers of hunters reluctant to report rings may have been different (all interviewed hunters said they always reported rings or it was the first ringed Teal that they encountered, while at the same time they assessed that only 60% of the hunters returned rings). However, such a sampling procedure was selected because our main aim was to assess the motivation of hunters to send rings back, not that of others to not report rings.

That hunters are more likely to send back colour-marked than metal ringed only birds has already been documented (Atwood & Geis 1960), and may have two distinct origins: on the one hand, hunters may be more curious because saddles are more unusual than simple metal rings, which have been used for decades. Similarly, birds wearing a radio or satellite transmitter have been observed to be reported more often than ringed individuals (e.g. Reinecke et al. 1992). It may also be that the information as to what to do with the saddle (the phone number on the reverse of the saddle) played an important role: indeed, most people calling to report the ring said they discovered the phone number on the reverse of the saddle, and most hunters had a poor knowledge about what to do with data when they encountered an unsaddled, ringed bird.

The majority of hunters demonstrated very altruistic behaviour, with their willingness to help research programmes being their main motivation to report rings, despite not knowing what the data would be used for. This is consistent with the current success of citizen science (i.e. scientific work in which volunteers without specific scientific training contribute to research through the provision of their observations; e.g. Devictor et al. 2010). This also highlights the fact that more advertising of research programmes, and of ringing schemes and ring reporting procedures more generally, is necessary among the hunting community. Most of the prior knowledge hunters had concerning the duck ringing programme came from specialized wildfowling and hunting magazines, rather than a website that has been available for seven years and information that has been published in a technical wildlife magazine (in French) and other publications dedicated to the general public. The limited impact of internet information was consistent with the fact that half of the hunters were not interested in an online reporting system for rings (which already exists through the EURING pages at www.ring.ac; unknown to the respondents). This suggests that it is necessary to use the hunters' own media if researchers want to inform them about research schemes. A communication solely or mostly based on an internet-based system may exclude some volunteers to participate to the programme.

In terms of ring recovery rate, it seems that a phone number engraved on the ring (or on a second ring) may be the best option to promote greater return rates, as most hunters selected this method when it was available to them, even when they had never heard about the ringing programme before. A toll-free phone number similarly provided very satisfactory results in North America (Royle & Garrettson 2005), and there seems, from this study, little evidence that using a web address on the rings, as currently trialed by EURING in several countries, including the UK (Robinson et al. 2009), may be the most valuable option within the hunter community (although it may be the case in other socio-economic groups for non-quarry species). Hunters themselves estimate that a large proportion (40%) of rings are not currently being reported, which may be an underestimate (Nichols et al. 1991). While the above technical measures may allow us to improve this rate, it is also absolutely necessary to measure ring reporting rate so as to be able to estimate duck harvest rate. The best option seems to be through reward rings fitted to some of the captured birds, which will allow computation of harvest rate of birds with standard rings when reporting rate of rewards is close to unity (e.g. Pollock et al. 2001). Such a scheme is considered in France, and may in the future provide new insights into European duck population dynamics.

ACKNOWLEDGEMENTS

I am most grateful to the hunters who kindly accepted to answer my questions, to Raphaël Mathevet, Coralie Beltrame, Philippe Aubry and Jim Nichols for useful discussions and advice, and to Mark Grantham, Vincent Schricke and Olivier Dehorter for valuable comments on an earlier version of the manuscript.

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Appendix 1. Questionnaire submitted to hunters reporting French Teal rings during the 2009-2010 and 2010-2011 hunting seasons.

1. Ring number:
2. Nasal saddle present (Y/N):
3. Duck Species / Sex:
4. Recovery date and place:
5. Do you want to remain anonymous (if not: give coordinates of address in order to receive the life history sheet of the bird)
6. Date ring sent back:
7. Media used by hunter to send ring back:
8. How did you know where to send this ring back ?
9. Do you know other means of sending rings backs (if yes, which ones) ?
10. If yes, why did you select the present mean ?
11. Would you find easier to report rings on the internet (Y/N/Does not know)
12. Do you have a previous knowledge of our research program (why we ringed this individual bird)?
13. If yes, how did you hear about the programme ?
14. Did you kill the bird yourself or do you report the ring for someone else ?
15. Have you always sent rings back in the past, or is it the first one you get ?
16. If yes or first one: why do you send the present ring back ? What do you expect from doing so ?
17. If not, why do you report this one ?
18. What proportion of hunters do you believe report rings ?

19. Among shot birds which die immediately or briefly after, what proportion do you believe hunters manage to find (NB: estimation of crippling loss) ?
20. Sex of the hunter:
21. Birth year:
22. Where do you hunt ?
23. How frequently do you hunt per week on average during the season ? (<once, once, 2-3 times, 3-5 times, > 5 times) ?