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Monitoring Methods For Non-Breeding Snipe

Author

Sarah F Jackson

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The National Centre for Ornithology, The Nunnery, Thetford, Norfolk IP24 2PU
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CONTENTS

EXECUTIVE SUMMARY

1. Accepting the requirement for accurate information regarding the status of Common and Jack Snipe populations in Great Britain, and the problems associated with conventional survey methods for secretive, largely nocturnal or crepuscular, rarely aggregating species with a preference for little observed habitat, this report presents and discusses a range of alternative survey methodologies taken from the literature.

2. Survey methods discussed are: simple transects, nets and ringing, nocturnal surveys, calls and playback. Each alternative approach is discussed in relation to likely effectiveness and feasibility in relation to: time constraints, habitat characteristics, locating the birds and welfare issues.

3. From the literature and after consideration of the possible problems of alternative survey methods, the most appropriate and indeed practical method for the surveying of snipe during the winter period in Great Britain involves the use of a 25 m rope dragged along the ground between two observers. Chosen areas should be surveyed using adjacent transects of a known length to cover as much of the whole area as possible, whilst ensuring representative coverage of different habitat types.

4. To minimise counter effort only the habitats where Common and Jack Snipe are known to occur should be sampled. The identification of such habitats can be achieved through Common and Jack Snipe records obtained from existing surveys, snipe experts or detailed studies of snipe habitat use. The CEH Landcover Map of Great Britain can then be used to help establish a stratified randomised sampling protocol based solely on the habitats known to be used by the snipe.

5. Given the time needed for each survey it would be sensible to concentrate on three winter months (December, January, February), although total coverage over all winter months should not be discouraged. In addition, surveys should be conducted during the day, ideally between 9am and 4pm, (Rehfisch & Holloway, 1998) to help ensure good visibility.

1. INTRODUCTION

The provision of suitable and appropriate legislation and management of species' populations requires knowledge of their status at the national and international level. Nonetheless, for those species whose habitat preferences and / or behavioural characteristics preclude the use of conventional survey methods, such information is rarely available or potentially inaccurate. In this respect, both Common Snipe (*Gallinago gallinago*) and Jack Snipe (*Lymnocryptes minimus*) are secretive, largely nocturnal or crepuscular, tend not to aggregate and prefer a wet, diffuse and little observed habitat (Lack 1986; Deplanque 2003). Such characteristics mean that encounters with both species can be unpredictable; Jack Snipe in particular, are very difficult to detect as they tend to lie prone virtually until trodden on (or in some instances, including when they have been trodden on!). In consequence, existing monitoring schemes, including the Wetland Bird Survey (WeBS) and the Breeding Bird Survey (BBS) in the UK, record only a small proportion of the total numbers of these birds. Such inaccurate monitoring has led to a wide discrepancy between the various alternative national and international population estimates currently available (Scott 2002). For example, the reported non-breeding European population of Jack Snipe varies from 20-30 million (Beintema & Muskens 1983), to 5.4-33 million (BirdLife International 2000) to just 2.5-4 million (Stroud *et al*. 2002). Similarly, the most recent estimate of the numbers of Jack Snipe overwintering in Great Britain is within the range of 10,000-100,000, and at least >100,000-300,000 for Common Snipe (Stone *et al*. 1997; Hoodless *et al*. 2000).

In an attempt to improve the coverage of non-aggregating species in Great Britain and knowledge of their population status and trends, the Dispersed Waterbird Survey (DWS) was set up to monitor those species for which existing surveys do not provide an accurate measure of population size. Nonetheless, despite a better coverage of suitable sites for these species through the random selection of inland areas across the UK, the DWS is based on a 'look-see' methodology (as is the case for the WeBS Core and Low Tide counts) and is therefore also hampered for the purposes of monitoring secretive species such as Common Snipe and Jack Snipe (Rehfisch *et al*. 2003).

Given the current lack of adequate monitoring for Common and Jack Snipe, a recognised alternative data source to establish population sizes for these species is the use of records compiled by hunters (bag statistics). Snipe are, however, reportedly one of the most difficult game species (http//:www.huntsflorida.com.AboutSnipe.htm). Indeed, the American dictionary of slang defines the snipe as 'a non-existent animal' and to send someone on a snipe hunt is sending them on a wild goose chase (Wentworth & Flexner 1975). Nonetheless, for many countries bag statistics are the most reliable data available (Kanstrup 2003) and are used for two main purposes at both a national and international level (*i.e*. Wetlands International's Waterbird Population Estimates, Delany & Scott 2002). First, assuming a constant hunting rate (a somewhat questionable assumption in itself), the overall trend in the numbers of birds shot will reflect the trend in the actual population (Kanstrup 2003). The implication is that should hunting statistics show an overall decline in the numbers of snipe shot, a decline can then be assumed for the population as a whole. These data can then be used to assess conservation priority, possible requirements for conservation programmes and to address potential management options. Second, establishing the ratio between the numbers of shot Jack Snipe *vs* Common Snipe can be used to extrapolate numbers of the more elusive Jack Snipe from numbers of the more easily recorded Common Snipe in a given population. Kalchreuter (2002) put forward the suggestion of a constant one Jack Snipe to five Common Snipe ratio using records of the numbers of each species shot across various countries in the south of the European Union and in North Africa and ringing recoveries. However, on closer inspection the results provided indicate a one Jack Snipe to 7.3 Common Snipe ratio and not 1:5 as suggested. In this respect, the Winter Atlas in Great Britain used a 1:8 ratio to calculate a Jack Snipe population estimate (reported as 100,000 birds; Lack 1986). Additionally, Clausager (2003), looking at snipe shot in Denmark, reported a one Jack Snipe to nine Common Snipe ratio. There is, therefore, some doubt as to the validity of a constant ratio for the estimation of Jack Snipe populations. More generally however, various confounding factors invariably limit the practical application of hunting bag statistics, not least that Common Snipe are far more likely to be flushed, fly further, higher and call more obviously than Jack Snipe and are,

therefore, more likely to be shot. A further complication is that reporting for many countries, including the UK, is voluntary rather than obligatory, which raises considerable doubt as to the fraction of birds shot that are accurately reported. Two organisations operate voluntary schemes in the UK, the British Association for Shooting and Conservation (BASC; member bags only) and the Game Conservancy Trust (mainly estates). By contrast, some countries such as France have a long history of detailed records of harvest rates and the age and sex compositions (a particularly difficult task with live birds in the hand) of hunting bags (Kanstrup 2003). Aside from such variation in the accuracy and periodicity of reporting, any estimates of population size calculated from bag statistics are inevitably correlated with shooting effort (the time spent by individual hunters), hunter preference (*i.e.* for individual species or particular methods and habitats) and the type of ammunition and / or gun used and their effectiveness (Lecocq 2003; Y. Ferrand pers. comm.).

Given the threats posed to both farmland and wetland habitats through progressive fragmentation, modification and development (Green 1988, Moore *et al.* 1989, Lindegarth & Chapman 2001), coupled with the inaccuracies of hunting bag statistics and inappropriate / inadequate current survey techniques for Snipe and Jack Snipe, the development of suitable monitoring strategies for these species is a priority. Indeed, Snipe populations are thought to be declining throughout much of Europe, most likely through loss of breeding and moulting habitat, due to the combined effects of agricultural development and drainage (Beintema & Müskens 1983, Hötker 1991, Hagemeijer & Blair 1997). Additionally, a study in south-west Finland shows a highly significant decrease in the density of breeding birds probably as a result of habitat loss through the cessation of cattle-grazing on shore meadows, allowing the encroachment of reeds and shrubs (Hagemeijer & Blair 1997). Recent decreases in breeding range have also been reported in Britain, Ireland, France, Switzerland and Ukraine (Stroud *et al*. 2001). In Britain, farmland drainage and agricultural intensification have been implicated in the declining numbers of breeding Common Snipe and Jack Snipe (Gibbons *et al.* 1993, Siriwardena *et al*. 2000). In this respect, the remainder of this review will consider various alternative methodologies (proposed and / or tested) and discuss their relative merits in the context of developing a survey protocol for Jack Snipe and Common Snipe in the UK.

2. ALTERNATIVE METHODOLOGIES

2.1 Transects

The basic transect method was originally adopted by Smith (1983) for the estimation of breeding Common Snipe populations in Cambridgeshire. Specifically, an attempt to count all breeding individuals in a given area required a group of six observers to walk the chosen sites to flush out nesting birds and to locate individual nests. Nonetheless, using this approach, the nest detection rate was thought to be only around 40% of the total for the area (Green 1985), resulting in an underestimation of the total numbers of breeding birds. To improve the accuracy of this method, Green (1985) suggested that a 70 m long polypropylene rope 1 cm in diameter stretched between two people and dragged along the ground would improve both the detection of nests and the success rate for flushing individual birds. For this study, individual survey plots in Cambridgeshire and Somerset consisted of a number of fields, each between 1 and 9 ha in size. Counts for each plot were taken within 3 hrs of dawn or dusk on 2-15 occasions per plot. If nothing was found the area was marked and revisited at least half an hour later. The results obtained using this technique were consistent with estimates obtained using the numbers of drumming individuals earlier in the season (Green 1985). This study concluded that using a rope provided a more accurate means of counting the numbers of snipe at a site as compared with the more straightforward walked transect method adopted by Smith (1983).

In an attempt to provide a standardised survey method for these species, the transect method has since been modified further by Rehfisch & Holloway (1998). They suggest that surveys be carried out once in each of the winter months (October to March) between 9am and 4pm at sites deemed suitable for Common and Jack Snipe using local knowledge and distribution maps. Estimates of the numbers of Common or Jack Snipe derived from this procedure then incorporate a correction factor to account for the area surveyed in relation to the total habitat area. Specifically, linear habitats such as streams and rivers are sampled (either the whole area or randomly selected transects) and the sample habitat length multiplied by the total available area of the habitat (Equation 1).

Equation 1:

$$\text{Estimated number of snipe} = \frac{\text{Number of snipe counted} * \text{Total habitat length (ha)}}{\text{Transect length}}$$

To avoid double counting, the movements of flushed individuals should be followed closely. Specifically, any birds flushed that subsequently fly ahead to settle within the transect area should be omitted, as it will be picked up again; but a flushed bird that flies up and back over the surveyors heads to land behind them should be counted; also a bird flushed forwards that lands outside the survey area should be counted. Open habitats such as marshes and water meadows are sampled by walking parallel transects of a known length dragging a 25 m long piece of rope between two people (as described above). The number of birds detected is then multiplied by the available area (Equation 2), where the area sampled is 25*total transect length (m).

Equation 2:

$$\text{Estimated number of snipe} = \frac{\text{Number of snipe counted} * \text{Total habitat area } (m^2)}{\text{Area sampled } (m^2)}$$

This approach has been used and modified on a number of occasions, although mainly for breeding populations. Specifically, in Iceland a systematic method has been used to count the numbers of breeding Common Snipe since 2000 (A. Petersen pers. comm.). To aid in the flushing of individuals,

tin cans with inserted objects were attached to the rope to make a loud rattling noise as it was dragged across the study site. Several observers followed behind the rope to record flushed birds and disturbed nests.

The Greater Manchester Bird Ringing Group has also adopted this method for the surveying of wintering Common and Jack Snipe. In this instance, in addition to dragging a rope along the ground, dogs were used to ensure all birds were flushed at three sites within Chat Moss, Greater Manchester (Croxtons peat works, Barton Moss and Astley Moss; J. Smith pers. comm.). Each of these sites was surveyed completely given their relatively small total area. Dogs have also been used in conjunction with people stamping and beating the ground with sticks to flush out birds during snipe surveys in Australia (F. Crome pers. comm.).

2.2 Nets and ringing

In France, the Office Nationale de la Chase et de la Faune Sauvage (ONCFS) has tested and approved a specific method to monitor Jack Snipe populations. The aim of the survey is to increase the number of ringed birds across the migratory and wintering areas, to obtain new population size estimates and information pertaining to national trends. Nonetheless, those involved in the survey suggest only a 50% catch rate (M. Lepley pers. comm.). This method was presented to the Woodcock and Snipe Specialist Group in Nantes (24-27 November 2003) and involved pulling a 10 m by 10 m net horizontally above the ground in areas where snipe are known to occur (M. Lepley pers comm.). Four people were evenly distributed along the back of the net to flush the birds and to ring those caught.

2.3 Nocturnal surveys

The Chatham Island Snipe Research and Management trials (New Zealand) have adopted a nocturnal transect method specifically to improve the information currently available regarding Common Snipe populations in the area (Miskelly & Barlow 2001). The island was sub-divided into transects of approximately 1.5 km in length, each of which was walked at a slow pace starting at dusk. Both sides of the transect were searched using a hand-held 12 volt halogen spotlight. All snipe seen within 10 m of the track were recorded and their age class and social groupings (if any) noted. Each transect was counted twice separated by no less than a half hour interval. This method employed a correction factor for the individuals assumed to be obscured by either vegetation or topography. Nonetheless, it was estimated that only around half the transect area was sampled effectively due to the confounding effects of dense vegetation, rocks, logs and uneven ground.

Hoodless *et al.* (2000) also used spotlights to determine wintering densities of Common Snipe on 63 fields (300.5 ha) in southwest England during the late-1990s. All fields were searched on foot on three nights between 2100 h and 0100 h GMT in addition to three occasions during the day between 0930 hrs and 1630 h GMT. During the nocturnal survey period, the numbers of snipe were counted using a 300 000 CP spotlight.

Spotlights were also found to be a fairly effective means of counting the true numbers of wintering snipe at Hope Farm, Cambridgeshire (Buisson 2002).

2.4 Calls

In the USA Common Snipe are commonly monitored during the breeding and occasionally the wintering period at dusk by counting the numbers of individuals calling at a given location (McKibben & Hoffman 1981; Downs 1998; S. Andersson pers. comm.).

2.5 Playback

Numbers of Common Snipe are monitored as part of the Ontario Nocturnal Owl Survey (http://www.bsc.eoc.org/download/northernontarioowlprotocol2003.pdf). The aim of this survey is to

walk a given route, stop at fixed intervals (10-20 each 1.6 km apart) and record the numbers of individuals seen and heard using a play-back method (tape includes calls for all survey species). Surveys ideally begin half an hour after sunset and take approximately three hours to complete. Given however, that Common Snipe are an addition to this survey rather than its main target, the routes chosen are not likely to be in prime Common Snipe habitat. The survey protocol also accounts for variation in the type and quality of audio equipment to try and minimise any variation associated with sound quality affecting the numbers of birds responding to the calls.

3. PROBLEMS WITH SURVEY METHODS

3.1 Time

In general, each of the survey techniques detailed above is particularly demanding of the observers. For example, complete surveys in Iceland took four to five days (on average two hours per ha; A. Petersen pers. comm.). Similarly, work completed by Smith (1983) in Cambridgeshire took approximately 36 hours to cover an 83 ha site. Given that many of the volunteer counters in Great Britain are already committed to various winter surveys (*e.g.* WeBS Core and Low Tide Counts, DWS, winter farmland birds), an additional and rather time intensive survey could potentially encounter resistance from the counter network. If this were the case, the resulting small samples would lead to less precise statistical analysis and interpretation.

3.2 Habitat characteristics

The type of habitat to be surveyed will inevitably determine the effectiveness of methods employing a long rope. Indeed, the taller and denser the vegetation the more likely the rope will become tangled and the lower the accuracy of the method for flushing out individuals. In this respect, Green (1998) suggested that flushing methods worked best in long narrow strip habitats that could be easily covered by a few people. By contrast, in large continuous habitats flush counts did not accurately measure numbers because snipe were harder to flush. Thus, the utility of a rope method will depend on the types and characteristic of selected survey sites.

3.3 Locating the birds

Calling methods are unlikely to be particularly useful during the winter season, as the birds generally remain silent unless flushed. The methods based on calls and / or playback (i.e. Ontario Nocturnal Owl Survey) would, therefore, be considerable underestimates of the wintering population. Double counting is a real concern for these species as flushed individuals may be difficult to follow. This means that it will be necessary to closely observe each flushed individual (which would be impossible at night of course)

3.4 Welfare grounds

Deliberately flushing birds as a means to survey them is a departure from most other bird surveys and may need to be treated delicately. As a consequence of potential resistance on behalf of volunteer counters, such a survey may have a greater reliance on ‘professional’ staff. This may be of particular relevance during periods of especially cold weather.

4. SURVEY METHOD

From the literature and after consideration of the possible problems of alternative survey methods, the most appropriate and indeed practical method for the surveying of snipe during the winter period in Great Britain involves the use of a 25 m rope dragged along the ground between two observers. To ensure all birds are flushed, tin cans containing small objects should be attached to the rope and the surrounding vegetation can be beaten with sticks. Chosen areas should be surveyed using adjacent transects of a known length to cover as much of the whole area as possible, whilst ensuring representative coverage of different habitat types. Should this be impractical, a number of random transects should be completed. In all cases the area of habitat should be measured. Only flushed birds should be counted and where possible their movements tracked to eliminate double counting.

5. RECOMMENDATIONS AND MODIFICATIONS

After consideration of all available options the following can be usefully recommended.

5.1 Feasibility study

To establish the effectiveness of the rope method for sites in Great Britain, it will be necessary to conduct a feasibility study at a variety of habitats where Common Snipe / Jack Snipe are known to occur. In this respect, trials undertaken by the Greater Manchester Bird Group on three sites at Chat Moss appear to have been extremely effective. The habitats surveyed were a 28 ha area of *Molinia* dominated, flat peat workings (Croxdens Peat Works Nature Reserve; SJ712970), a 20 ha wet stubble field (Barton Moss; SJ737975) and a 15 ha area being re-flooded for sphagnum by Lancashire Wildlife Trust (Astley Moss SSSI; SJ697977). Using the rope method, 39 Jack Snipe were detected at the Croxtons Site, 19 at Astley Moss and 11 at Barton Moss in 2001 (J. Smith pers. comm.). Nonetheless, should this rope method appear to be less effective or indeed impractical for other habitats (e.g. reedbeds), then surveys should be undertaken using a line of observers, no more than 1 m apart (following Smith 1983), beating the ground with sticks to flush out the birds. Transects should be constructed in the same way detailed in section 4 and the area of habitat recorded.

5.2 Stratified sampling of habitats

The survey methodology is quite arduous. In order to minimise counter effort only the habitats where Common and Jack Snipe are known to occur should be sampled. The identification of such habitats can be achieved through Common and Jack Snipe records obtained from existing surveys, snipe experts or detailed studies of snipe habitat use, such as that carried out by Hoodless *et al.* (2000). Their study of wintering Common Snipe habitat use in southwest England identified that grass fields and in particular those with temporary pools of shallow, standing water supported the highest densities of Common Snipe both during the day and at night, as compared with set-aside and winter cereals, most likely as a consequence of the greater availability of soil invertebrates (Evans & Guild 1948; Edwards & Lofty 1977). Once suitable habitats have been identified. The CEH Landcover Map of Great Britain can be used to help establish a stratified randomised sampling protocol based solely on the habitats known to be used by the snipe. Although such protocols can be complex to establish they invariably help ensure that a survey is run efficiently and help minimise participant input into the actual surveying procedure. As is usual for such a sampling approach the results are extrapolated out by stratum to give a final population estimate and confidence intervals.

5.3 Timing

Given the time needed for each survey it would be sensible to concentrate on three winter months (December, January, February), although total coverage over all winter months should not be discouraged. In addition, surveys should be conducted during the day, ideally between 9am and 4pm, (Rehfisch & Holloway, 1998) to help ensure good visibility. The timing of surveys during any given day is not, however, critical given that analysis of radio-tracking data for snipe in southwest England suggested that birds hardly move during the day or the night (results from 35 diurnal records over 13 days and 20 nocturnal records over 10 days; Hoodless *et al.* 2000).

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