Breeding Season Survey of Water Rails in Poole Harbour Reedbeds, 2004

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A report to Poole Harbour Study Group

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SUMMARY
Thirteen reedbeds (174.55ha) in Poole Harbour were surveyed for water rails between March 27th and April 20th 2004. Methods were based on the recommended published method (playing taped calls to elicit responses). Modifications to the method, adopted in the light of water rail responses, were described in detail.

Two hundred and one pairs of water rail and 63 'single' birds were located in the 13 reedbeds. A further 10 pairs and eight singles were located in areas of reedbed in the vicinity of the main survey sites.

The population estimate of 211 pairs is considered to be a minimum. It is thought likely that a significant proportion of 'single' birds were actually breeders; and that the need to continue survey after 1000hrs, when water rails were less responsive, resulted in some pairs being overlooked.

Recent surveys using the method used in this survey have shown that water rails are more numerous than previously suspected, such that the existing British population estimate is essentially obsolete. The overall density of water rails in Poole Harbour's reedbeds is slightly higher than the highest density recorded on a number of other large wetlands for which data have been obtained. It is suggested that the Poole Harbour should be considered nationally important for water rails.

The distribution of water rails in relation to habitats is discussed briefly. Unexpectedly, populations were high in tidal reedbeds as well as in fresh water ones. There is anecdotal evidence that water rails benefit from the tracks of sika deer, which, it is suggested, increase habitat diversity within reedbeds.

[1 INTRODUCTION – John Day

Most of the reedbeds of Poole Harbour were surveyed in detail by Cook (2001). Thirteen reedbeds were mapped (see Figure 1), with a total extent of 174.55ha. The recommendations arising from this survey included surveys of bird populations in the reedbeds.

Water Rails were known to breed in some of the reedbeds, but there were no reliable counts of the breeding population. The species is very inconspicuous in the breeding season, such that an effective survey method has only recently been devised (see below).

The objective of this survey was to estimate the breeding season population of water rails in the 13 reedbeds mapped by Cook (2001).]

2 METHODS

The method followed that described by Gilbert *et al* (1998), using a tape of water rail calls to elicit a response. The method is described in detail here, including departures from Gilbert *et al* (1998).

2.1 Dates and timing of survey

Survey was carried out on 13 mornings between March 27th and April 20th. Gilbert *et al* (1998) recommended surveying in late March in southern England. It had been hoped to complete survey by the end of the first week of April, but the survey took longer than anticipated, because many sites were difficult to walk through, and because of the large numbers of water rails found. The implications of the extended survey period for the interpretation of the results are discussed in section 4.

Survey commenced between 0630 and 0715 BST, usually within 30 minutes of sunrise, and often continued until midday, rarely to 1330hrs. Therefore, fieldwork continued much later than the 'early morning, after sunrise' recommended by Gilbert *et al* (1998). This was necessary to complete the survey as close as possible to the recommended late March survey date, but has significant implications for the interpretation of the results, discussed in section 4. Total survey time was 63 hours.

The dates on which sites were surveyed are shown in Table 1, and the times of survey at each site are show in Appendix 1.

2.2 Weather conditions

Fieldwork was conducted in dry weather with light winds. On five dates (March 31st, April 1st, 2nd, 7th and 13th), winds increased to force 4 by mid-morning, whereas Gilbert *et al* (1998) recommended surveying in winds of force 3 or less. On one occasion (The Moors, April 1st), the increased wind strength coincided with a very pronounced reduction in water rail responses, so that survey was curtailed. Weather conditions on each survey date are shown in Appendix 1.

2.3 Number of observers

Survey was conducted by a single observer on nine mornings, and two observers working together on four mornings on some of the larger sites. Gilbert *et al* (1998) recommended the use of two observers. The presence of the second observer 10m or

so from the first enabled more accurate location of responding rails, and a second opinion on whether more distant responses involved pairs or single birds. However, the absence of a second observer is not thought to have significantly reduced survey efficiency.

2.4 Survey route

The observer(s) walked around the margins of narrow reedbeds, and entered larger reedbeds. Areas dominated by rush *Juncus* within the mapped reedbeds (as on the north sides of both Slepe and Salterns reedbeds) were surveyed. Where areas of reedbed were found outside the mapped reedbeds, these were also surveyed. Most areas were approached to within 100m. Exceptions were the centres of Slepe and Salterns reedbeds, the north west end of Middlebere, the south-east end of Swineham and the south end of Buck's Cove. Some water rails may have been missed in these areas. Gilbert *et al* (1998) recommended approaching areas to within 200m, but this was found to be insufficient, both in terms of eliciting responses, and in distinguishing between pairs and single birds.

Survey routes were marked on field-maps, copies of which are held by Poole Harbour Study Group.

2.5 Playing the tape

The observer(s) stopped frequently (at intervals of 50 to 100m) to play a loop tape of a pair of water rails 'sharming'. The tape was played for about 30 seconds, followed by a period of 30 to 60 seconds listening. This cycle was repeated twice more. However, in late morning/early afternoon, when the birds responded less readily (see section 4.1), the tape was sometimes played up to five times. The regime of tape-playing therefore differed slightly from the recommended method, which consists of just two spells of tape (first one minute, then 30 seconds, with equal listening intervals). Again, this is discussed in section 4.

2.6 Mapping

All calling water rails were plotted on field-maps (scale 1:6000 to 1:8000), using CBC-notation to indicate where birds were known to be different, or where different registrations were thought to relate the same birds. Only pairs responding to the tape are included in the population estimate (Gilbert *et al* 1998). In some cases where birds were relatively distant, it proved impossible to differentiate between pairs and singles. In these cases, they were treated as singles. In many cases, adjacent pairs were heard simultaneously, but this was not always the case, such that it was necessary to make value judgements as to whether proximate non-simultaneous registrations related to the same birds. This was done with considerable care, particularly in view of the implication that water rails may follow the tape (Gilbert *et al* 1998). This is discussed in section 4.1.

3 RESULTS

A total of 201 pairs of water rail and 63 single birds were located in the 13 reedbeds mapped by Cook (2001), and a further 10 pairs and eight singles in areas of reedbed in the vicinity of the these areas. Table 1 shows the number of water rail pairs and single birds in each area. The distribution of water rails in each reedbed is shown in Figures 2 to 13.

Table 1. Counts of water rail pairs and single birds in Poole Harbour reedbeds.

Site number and name (after Cook 2001)		Area (ha)	Date of survey	Pairs	Pairs /ha	Singles	Sites (pairs & singles)	Sites /ha
1	Lytchett Bay	16.62	13-Apr & 20-Apr	24	1.44	11	35	2.11
2	East Holton (Holton Lees)	35.26	12-Apr & 14-Apr	40	1.13	20	60	1.70
3	Holton Heath	17.31	8-Apr & 9-Apr	31	1.79	6	37	2.14
4	Keysworth reedbeds	25.5	31-Mar & 8-Apr	31	1.22	4	35	1.37
5	Swineham Point	9.01	02-Apr	12	1.33	4	16	1.78
6	The Moors	22.53	1-Apr & 7-Apr	24	1.07	7	31	1.38
7	Slepe	12.77	28-Mar	8	0.63	3	11	0.86
8	Salterns	10.77	28-Mar	7	0.65	2	9	0.84
9	Middlebere	7.1	27-Mar	7	0.99	0	7	0.99
10	M'bere - Wych Lake west	0.61	27-Mar	0	0.00	1	1	1.64
11	South Middlebere	9.87	27-Mar	7	0.71	1	8	0.81
12	Wych Lake east	1.57	27-Mar	3	1.91	1	4	2.55
13	Brownsea Island	5.63	15-Apr	7	1.24	3	10	1.78
Totals and densities		**174.55**		**201**	**1.15**	**63**	**264**	**1.51**
Water rails in the vicinity of, but outside the boundaries of reedbeds mapped by Cook (2001). See Figs 2 to 13.								
Lytchett Bay/Turlin Moor		?	13-Apr & 20-Apr	3		1	4	
East Holton (Holton Lees)		?	12-Apr & 14-Apr	1		0	1	
Holton Heath		?	8-Apr & 9-Apr	1		0	1	
Swineham		?	02-Apr	0		2	2	
The Moors		?	1-Apr & 7-Apr	1		1	2	
Slepe		?	28-Mar	1		1	2	
Middlebere		?	27-Mar	0		1	1	
Wych Lake west		?	27-Mar	1		1	3	
Wych Lake east		?	27-Mar	2		0	2	
Brownsea Island		?	15-Apr	0		1	1	
Total in the vicinity of, but outside sites 1 to 13				10		8	18	
Grand totals				**211**		**71**	**282**	

4 DISCUSSION AND CONCLUSIONS

4.1 Interpretation of the results

In the UK, water rails lay their clutches from late March onwards (Cramp and Simmons 1979). It is known that only one member of a breeding pair responds in at least some cases where incubation has started (John Wilson pers.comm.). It is likely that this situation applied to a proportion of sites where only single birds were recorded during this survey, perhaps especially in the reedbeds covered after early April.

Some wintering and passage water rails are likely to remain in reedbeds in southern England in the recommended survey period of late March, and perhaps into April; such birds probably account for a proportion of the single birds recorded. Note that there is an assumption inherent in the method, that rails responding as pairs are breeders rather than lingering winter or passage birds.

The overall rate of survey was around 3ha/hour, much slower than the rate implied by Gilbert *et al* (1998), who suggest that up to 40ha is manageable in an 'early morning' visit. This was the result of the relatively high density survey route, the longer duration of playing and listening at each stop, and to some extent the observers' unfamiliarity with the survey areas.

There was considerable variation in response behaviour, with regard to distance from the tape, the delay before response, and the duration of responses. As indicated in the Methods, water rails were often found to respond poorly at ranges beyond 100m, and it was for this reason that areas were approached to within 100m where possible. This modification to the method was also found to be helpful at Leighton Moss (Wilson and Horner, in prep.). Similarly, two plays of the tape were quite frequently found to be insufficient to elicit a response (while some other birds responded immediately, but then became subdued). Again, this has also been found at Leighton Moss (Wilson and Horner, in prep.). Therefore, the tape was played three times as standard, and up to five times when birds became unresponsive in late morning and early afternoon (see below), or occasionally to try and resolve the number of pairs and single birds in confusing situations. The tape was never played for one minute continuously (*contra* Gilbert *et al* 1998), because it was found that birds sometimes responded quickly, while the tape was still playing, so that they could not be heard properly.

Gilbert *et al* (1998) noted the need to move quickly between each tape-playing site, to prevent water rails following the tape, and thus reduce the risk of double-counting. By implication, the much slower progress made during the current survey could have resulted in a significant risk of double-counting. However, it is stressed that in most cases, adjacent pairs were heard simultaneously, and that a cautious approach was adopted in the case of proximate non-simultaneous registrations, such that many were assumed to relate to the same pair. As a result, the observers' impression is that double-counting will have been minimal. Instead, there was frequent corroboration in the field that the high density survey route and more persistent tape-playing and listening resulted in a more accurate survey, locating pairs that would otherwise have been overlooked.

A decline in the responsiveness of water rails after 0900hrs was evident during survey (personal observation), becoming more marked by late morning. Under-recording as a result of this pattern was partly offset by the increased tape-and-listen effort from mid-morning onwards (see above). However, a rough assessment of the numbers recorded before and after 1000hrs suggest that the frequency with which pairs were located was almost halved after 1000hrs (falling from around four pairs/hour to just over two pairs/hour). Slower survey time (through more persistent tape-playing) could have contributed to this pattern, but there is no doubt that the change largely reflected a genuine reduction in water rail responsiveness. As a result, some pairs will have been overlooked in the areas covered after 1000hrs.

On the balance of the factors discussed above, and the fact that a small proportion of reedbeds in Poole Harbour were not covered (eg. the area between Sandford Bridge and the main Keysworth reedbed), it is suggested that the population estimate of 211 pairs should probably be regarded as a minimum.

4.2 Importance of Poole Harbour water rail population

The British water rail population has been estimated at 450 to 900 pairs, a figure derived by applying assumed very low densities to the range identified by the Atlas (Gibbons *et al* 1993). However, recent use of the tape-playing method used in this survey has demonstrated that water rails occur at much higher densities than was previously thought. Sites which have been surveyed using this method provide the best context in which to view the Poole Harbour results.

Inner Tay Estuary (Tayside) Surveys of partly tidal reedbeds located 126 pairs of water rail in a survey area of 410ha (0.31 pairs/ha). Few single birds were recorded. The population reported prior to survey using tapes was four or five pairs (Derek Robertson pers. comm.).

Leighton Moss RSPB (Lancashire) Annual surveys recently have revealed a population of 73 to 104 pairs in an area of 106ha (0.69 to 0.98 pairs/ha) (Wilson and Horner in prep.). Tape survey resulted in a doubling of the estimated population.

Stodmarsh NNR (Kent) Forty-three pairs were found in 2003, but also about 100 singles (David Feast pers. comm.). About 80% of the site's 149ha of reedbed was surveyed, suggesting an overall density of 0.36 pairs/ha (but a density of 1.55 birds/ha including singles). Prior to survey using tape, the population was estimated at about 10 pairs.

Dungeness RSPB (Kent) Survey in areas totalling 23ha (but including open water) in 2003 located a population of 12 pairs (0.52/ha) and 22 singles. Before this survey, the population was estimated at three to four pairs on the basis of casual observations (Pete Akers pers. comm.).

Avalon Marshes (Somerset) Chown (2003) found 122 pairs and 80 singles in varied wetlands in restored, active and derelict peat diggings. A significant proportion of the large number of sites where singles were recorded were thought likely to refer to breeding pairs, and some areas of suitable habitat were surveyed from considerable distance, leading to probable under-recording. The total extent of wetland in the Avalon Marshes is about 670ha, but approximately half of this consists of open water, unsuitable for water rails, suggesting a minimum density of 0.36 pairs/ha. There were no estimates of the water rail population in this area before survey with tapes.

It is clear from the results above that the British population estimate is likely to be revised upwards very substantially, either on the basis of a national survey (which has been proposed, but is currently considered of insufficient priority to warrant funding; Gillian Gilbert pers.comm.), or by extrapolation from the results of surveys such as these. However, the Poole Harbour population will almost certainly exceed 1% of any revised estimate, and is likely to be one of the largest water rail populations in Britain. The overall density of water rails (pairs) in the areas covered by this survey was slightly higher than the highest recorded in other major British wetlands for which data have been obtained and presented above. Poole Harbour's reedbeds should be considered nationally important for this species.

The largest water rail populations were found at East Holton, Holton Heath, Keysworth, Lytchett Bay and The Moors. Densities were particularly high at Holton

Heath (1.85 pairs/ha) and Lytchett Bay (1.5 pairs/ha), as well as in the small Wych Lake east reedbed (Table 1). With the exception of the tiny Wych Lake west reedbed, densities were consistently relatively high in all reedbeds (0.65 pairs/ha and above) compared with other sites. The densities are all within the range given for central Europe (0.3 to 2 pairs/ha) by Cramp and Simmons (1979).

4.3 Other issues

It is beyond the scope of this brief report to consider water rail habitat preferences in the Poole Harbour reedbeds. Nevertheless, a few observations can be made.

Dry reedbed is usually occupied at low densities if at all (personal observation; Wilson and Horner in prep.). However, in Poole Harbour, some water rails were found in reedbeds which lacked extensive permanent standing fresh or brackish water, but which would have been prone to inundation on at least spring high tides. It is thought that nearby saltmarsh pools and creeks may also be used for feeding.

Water rails have been considered primarily birds of fresh water reedbeds and swamps (eg. Cramp and Simmons 1979). It is therefore both interesting and surprising that in Poole Harbour, the reedbeds with the highest densities were mainly those categorised by Cook (2001) as largely or wholly tidal. The highest densities of water rails in reedbeds categorised as tidal were often close to the landward edge (eg. at Holton Heath, and on the southern margin of East Holton), where any freshwater influence would be greatest, and where tidal flooding would be infrequent at most. Nevertheless, it appears that food for water rails (mainly invertebrates; Cramp and Simmons 1979) is available in tidal reedbeds. The food of young water rails is reported to be mainly insects and spiders (Cramp and Simmons 1979), which would probably be scarce at best in tidal areas; however, there may simply be a lack of information on diet in tidal reedbeds. In the Tay reedbeds, Moyes *et al* (1997) found that breeding water rails were as numerous in brackish areas as freshwater ones. However, water rails avoided establishing territories in areas which experienced daily tidal flooding.

Spring tide inundations might be expected to prevent successful breeding, but observations at Lytchett Bay show that this is not the case at this site at least (see below). Swineham reedbed appears to be particularly susceptible to tidal flooding, experiencing ‘regular’ total inundation (Cook 2001), yet it holds a good population of water rails (Table 1). Observations on breeding success at this site would be of interest.

Habitat diversity is preferred to large uniform areas (Cramp and Simmons 1979). This is reflected in observations at Leighton Moss, where the highest densities were found where the reedbed was wet, but where waters edge was also present (Wilson and Horner in prep.); and in the Avalon Marshes, where the presence of willow scrub (creating bare areas underneath) is sometimes favoured (personal observation).

Concentrations of pairs were located where willow scrub was present in some Poole Harbour reedbeds (almost invariably on the inland edge of sites), for example at Holton Heath. However, a more important source of habitat diversity in Poole Harbour reedbeds arises from the presence of sika deer, which make heavy use of some sites. Their most obvious impact is in creating tracks through the reedbeds,

essentially linear strips of standing water and bare mud, converging in places to form patches of bare ground, or open water when water levels are high.

The observer gained the impression that water rails were often particularly numerous in areas where deer tracks were frequent (for example, the whole of the East Holton and Holton Heath reedbeds). By increasing the extent of standing water and bare mud in reedbeds, deer tracks probably provide improved foraging conditions for the rails. Droppings, believed to be those of water rails, were found on the tracks very frequently. Furthermore, water rails appear to use the tracks to move around their territories (personal observation).

The impact of sika deer can be detrimental to reedbeds, with trampling and grazing causing a transition to saltmarsh or grazing marsh in heavily used areas (Cook 2001), and the presence of the deer themselves a potential source of disturbance to some key reedbed species (John Day pers. comm.). However, in the case of water rails, it is suggested that the impact of sika deer is beneficial, though clearly not at the level where reedbed is replaced by saltmarsh. It should also be noted that deer tracks would permit easier access to reedbeds for mammalian predators, though these do not appear to use the reedbeds to any great extent at present.

Counts of juvenile water rails at Lytchett Bay in summer indicate a level of successful breeding at this site at least (Cook 2001). The records include a minimum of 28 young fledging in 1996, and a count of 14 juveniles on August 13th 1999. Bearing in mind the secretive habits of the species and the size of the Lytchett Bay reedbed, it is highly unlikely that these counts are complete.

5 RECOMMENDATIONS

Ideally, the important water rail population in Poole Harbour should be monitored at regular intervals. Future surveys would benefit from a larger team of fieldworkers, so that two teams or individuals could work simultaneously on different sites. This would enable survey to be completed as close as possible to the recommended survey period, taking full advantage of appropriate weather conditions, and avoiding the need to work beyond 1000hrs, when survey becomes less effective. Observations at Leighton Moss have found evenings to be as productive as early mornings (John Wilson pers.comm.); it may be possible to take advantage of this to further enable the completion of survey during optimum times and conditions.

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