

may be unable to stand very soon after capture and some may die although there are no obvious injuries. In view of van Heerden's paper they may well be suffering from stress myopathy caused by the birds straining their leg muscles by pushing against the net in which they are captured: a leg motion entirely different from their usual movements. This once again lends emphasis to the view that captured Curlews must be dealt with quickly and released again as soon as possible after capture. Whenever possible they should be taken from mist nets immediately they are caught.

Van Heerden also mentions leg paralysis and death in long legged Flamingos *Phoenicopterus ruber*, *P. roseus* and *P. minor* which had been chased, were exhausted on capture and then transported with their legs in a folded position. Histological lesions were found in the leg muscles which suggested that their blood supply had been impaired when the legs were 'folded' thus leading to muscle death and leg paralysis. It seems likely that waders which are unable to stand after being confined in a low roofed keeping cage may be suffering from a similar condition. It is always noticeable that small waders run about in keeping cages which are 30–35 cm high whereas taller species are quiescent and crouch on folded legs. They may be unable to walk after quite short periods in this position although not all individuals are affected. To alleviate this problem Bainbridge (*Bulletin* 16:

6–8) described a tall hessian cage about 90 cm high which reduced the incidence of leg cramp in captured Curlews. It can be concluded that if capture of Curlews is expected his advice should be followed; if capture is unexpected the birds should be released again as rapidly as possible and this may require special efforts on the part of the ringer.

Birds with leg paralysis may recover. In the short term wader ringers could try suspending the birds in a sling so that the feet are on the ground in a normal position – the suspended bird being kept in a tall, darkened and undisturbed place. It is better to try this than do nothing. In the long term specialist treatment may be required – vitamin injections, forced feeding, quiet and solitude for perhaps ten days and minimal handling. This requires the co-operation of people used to keeping birds in captivity and probably a vet. This may be beyond the resources of most ringers who must therefore aim at prevention by working rapidly and the use of tall cages.

Finally a personal observation – captured waders occasionally suffer from wing strain, or wing droop and cannot fly when they are released. Providing they have no obvious injuries such birds should be left in peace on undisturbed coast where they can feed. They will probably recover. Once released they should not be chased or harassed in any way.

If anyone has any further observations on these matters we should be pleased to hear from them.

The “cramp, stress myopathy, over-straining” syndrome in captured large waders

Recent developments and rising interest in catching Curlews Numenius arquata in Britain has once again high-lighted this problem. In the following note Derek Stanyard reports on recent experiences. Discussion at the WSG autumn [1978] meeting added further information – including the observation that not everyone read all of Bulletin 24 where a review of a paper from South Africa (van Heerden 1977) contained many of the comments which were later put forward as unique observations at the meeting! We suggest that inter-

ested readers and prospective Curlew catchers refer back to that note (Green 1978) before reading on.

Undoubtedly Curlew trapping presents special problems and every would-be catcher must be prepared to make special arrangements when their capture is planned. A design for a suitable keeping cage is given after Derek Stanyard's note followed by guidelines which we hope will be helpful to Curlew catchers.

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Further notes on Curlew cramp and keeping cages

D.J. STANYARD

Court Farm, Groeslon, Caernarfon, Gwynedd LL54 7UE, UK

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Introduction

The recent increase in catching large waders, particularly Curlew *Numenius arquata*, has high-lighted the problem referred to by British ringers as 'the cramp condition'. Various people have theorised on its possible causes but so

far there are no definite conclusions apart from van Heerden's (1977) report. With one Curlew study in progress and further ones planned by west coast groups it is appropriate for the Wader Study Group to discuss the problem and draw on past experiences to set out guidelines for future activities.



Report on two catches of Curlew made by SCAN in autumn 1979 at Aber, Gwynedd, Wales

During August and September this year SCAN (a wader ringing group active in North Wales) made two catches of Curlew – one of 50, the other of 60 birds. On both occasions we operated with a team of eleven persons and expertise varied from six experienced cannon netters in August to ten in September. Both catches were made under similar circumstances. Four nets were set in clap net pattern (i.e. in adjacent opposing pairs) on a field which had been cut for silage. It was situated near the coast. On both occasions the weather was sunny and warm. Being aware of past problems of Curlew cramp we constructed a high keeping cage (1 m) in which the birds could stand with headroom (details follow later). On both dates we fired over approximately 100 birds. Some escaped because the nets did not extend completely. All the trapped birds were extracted from the nets within 20 minutes of firing and put in the specially constructed cage. When ringing/processing started about 20% of the birds were found to be sitting down in the cage and these were dealt with first. The majority of these were 'bad-goers' when released. They stumbled and flapped alternately and did not immediately fly off. The problem appeared to be leg cramp. However, with one exception in the first catch and two in the second, all the birds eventually flew off. The recovery time varied from 5 minutes to 1½ hours. The remainder of the birds (80% of the catch) stood up and walked about all the time they were in cage and flew well when released after ringing and processing.

Discussion

It appears that the cramp condition is caused *before* the birds are placed in keeping cages and may be largely dependent on the length of time the birds are under the net. However, the condition could be brought on later if the birds are placed in low keeping cages, like those usually used for small waders, where they would be unable to stand. Other possible contributory factors have been described (*Bulletin* 24: 24).

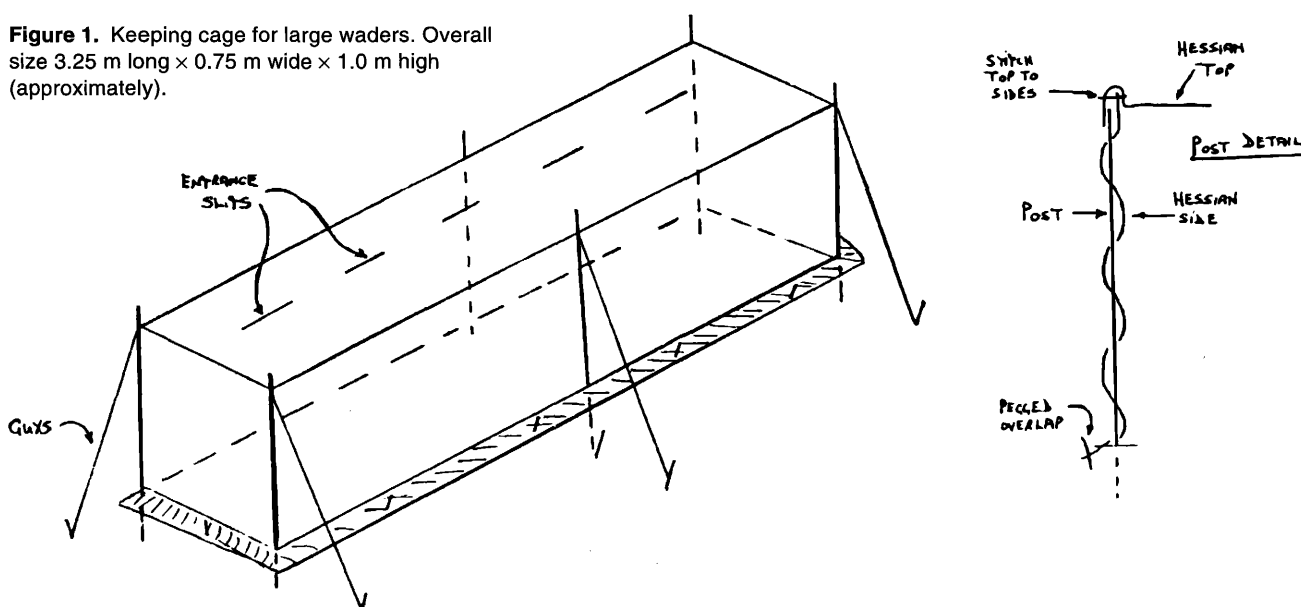
It is interesting to note that the casualty in the first catch had a considerably lower moult score than average for the catch. In the second catch the two casualties were the least advanced in wing moult having primary scores of 23 and 32 compared with the catch average of 44. The fact that these birds were less advanced in moult might indicate poorer condition or merely reflect a late start perhaps following late breeding. That they were casualties may be purely coincidental. Perhaps other ringers have noticed a similar relationship?

Notes on the construction of a SCAN-type keeping cage

In anticipation of a sizeable catch of Curlew and in accordance with WSG recommendations, SCAN made a suitable keeping cage. We later found this to be similar to the one described by Bainbridge in *Bulletin* 16: 6–8 but larger. The cage was made from three of the hop-sack familiar to many British cannon-netters as material for covering a catch (each sack when opened out is a strip of hessian approximately 1 × 4 m). Two strips were sewn together end-to-end to form a continuous band of material. This was stretched round four 1 m-high corner posts (12 mm steel or alloy) to form a rectangle 3.25 × 0.7 m standing about 1 m high. A series of slits were cut in the corners and mid parts of the sides, posts pushed through (see Figure 1) and sewn in position. About 10 cm of hessian was left at the top of the sides as attachment for sewing on a roof. Similarly a 10 cm flap was left as the base for pegging to the ground. The third piece of sacking was sewn in to form a roof. A number of slits cut in the top formed entrances through which the birds are put. When erecting the cage the hessian is kept as taut as possible and guys attached between the poles and pegs in the ground to give extra rigidity. The bottom flap is pegged to the ground or covered with soil, sand, etc. to reduce the risk of the birds escaping. Two or three people can erect the cage in about 5 minutes and it can house about 75 Curlews or similar sized birds.

(Note: Partitions may help to prevent birds trampling on each other? – Eds.).

Figure 1. Keeping cage for large waders. Overall size 3.25 m long × 0.75 m wide × 1.0 m high (approximately).



Guidelines and recommendations when catching Curlews

- 1. Speed of operation.** Special efforts should be made to remove captured Curlew from either cannon or mist nets as quickly as possible after capture. They should be 'processed' and released as soon as possible.
- 2. Numbers caught.** The speed and efficiency of extracting trapped birds from cannon nets does not necessarily increase proportionately to the number of extractors although obviously an adequate number is essential. Such things as the density of the birds under the net and the number of nets fired determines the number of people who can work efficiently at the same time. We suggest that catches should be limited to about 100. Mist netting many Curlews simultaneously, especially over water, is hazardous because the birds are very heavy. Individual birds drag and tighten the net round other Curlew or smaller waders and may injure them. Even tightly stretched nets may droop into water under the weight of a few birds. Hence if a large catch is a possibility only a few nets should be used and the birds removed immediately after capture. Curlew in wing-moult (especially the outer primaries) tend to become more entangled than birds not in moult and take longer to extract. Extra care is needed to avoid damage to the growing feathers. This should be remembered and taken into account when assessing catch size. Birds caught on short grass become more entangled than on stubble which supports the net above crouching birds.
- 3. Organisation.** In all cases sufficient experienced extractors should be available to take birds from the net rapidly. They should be aware of the dangers of working too close together when excessive pulling on the net by people crowding together may well slow down the operation and injure the birds. All personnel should be aware of the Curlew cramp problem. When cannon netting some people should be allocated the task of erecting the cage

by the net immediately after firing while the others are covering the catch with light-weight material to stop the birds flapping and struggling under the net. The simultaneous activities followed by rapid extraction save time and reduce the period for which the birds are in the net. Heavy covering material which may force or encourage the birds to crouch or to push upwards should be avoided. Those Curlew which are found sitting down in the keeping cage should be ringed, processed and released first.

- 4. Treating the cramp condition.** When cramped birds are released they should be given time to recover without harassment or chasing them. If they fail to recover various treatments can be tried.
- 5. Slings.** Try suspending the bird in a sling made of cloth and suspended with a string so that the bird's feet just touch the ground. The bird should be placed in a quiet place with subdued light to discourage struggling. If recovery proceeds the string is lengthened to gradually place more of the bird's weight on its legs. This process may take hours or even days. In the latter case the bird has to be fed. Suitable foods are chopped boiled eggs and tinned catfood preferably laced with meal-worms whose movement encourages the bird to peck. As the bird recovers take care not to panic it again – a bird which had recovered flapped, kicked and struggled and became cramped again necessitating further treatment.
- 6. Warmth.** Some success has followed immersing the bird's legs in warm water and massaging them gently for a period of up to 30 minutes. This presumably encourages blood flow.

References

- Bainbridge, I.P. 1975. Curlew, cramp and keeping cages. *Wader Study Group Bull.* 16: 6–8.
 Green, G.H. 1978. Leg paralysis in captured waders. *Wader Study Group Bull.* 24: 24.
 Heerden, J. van. 1977. Leg paralysis in birds. *Ostrich* 48: 119–119.

(Although the whole of this paper has been attributed to Derek Stanyard the guidelines and recommendations section takes into account observation and comments from many people. The following points were made in discussion and omitted in error from the above. During capture and handling of Curlews and other long-legged waders precautions should be taken to avoid folding the legs to the body. Such birds should not be carried in sacks or bags, but if this is unavoidable they should remain therein for a minimal time (less than 5 minutes). When handling the birds the legs should be allowed to dangle and not be folded to the body. These precautions appear to help prevent cramp – Eds.)

