Cramp in captured waders: suggestions for new operating procedures in hot conditions and a possible field treatment

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Cramp (capture myopathy) has been observed in a wide variety of waders, but appears to be a particular problem in long-legged species (Green 1978). This has led to much discussion about how the problem can be alleviated (Bainbridge 1975, Green 1978, 1980, Stanyard, 1979, Minton 1980, Purchase & Minton 1982, Melville 1982, Piersma *et al.* 1991, Evans 1993, Clark & Ireland 2001). Ringers now take extreme care when catching long-legged birds and have found that even Eurasian Curlew *Numenius arquata*, which appears to be one of the most susceptible species, can be caught safely if precautions are taken (Evans 1993, Clark & Ireland 2001).

Leg cramp does not, however, only occur when birds are caught. In 1991, while on Eighty Mile Beach, NW Australia, we observed a Brahminy Kite *Milvus indus* take a Red Knot *Calidris canutus* from a scattered flock of waders at the tide edge. As soon as the Kite had flown off, we noticed that two of the three birds that had been within a couple of metres of the Red Knot when it was taken (a Red Knot and a Great Knot *Calidris tenuirostris*) were showing symptoms of leg cramp (standing on the tips of their toes and falling over when trying to walk). We did not disturb the birds but observed them for the next hour. During this time, their symptoms became progressively worse and, by the time we left, they were unable to stand. The cramped birds were unringed so they were not birds that had been part of a cannon-net catch made 5 km away the previous day. This demonstrates that, under some circumstances, cramp may result from naturally occurring stress and does not just arise from the physical processes of being captured, held in a keeping cage and handled in the course of ringing.

Despite precautions to minimise stress to captured waders, leg or wing cramp may still occur, particularly when birds are caught in poor condition or in high temperatures (pers obs). The problem in high temperatures may arise because of high water loss through evaporation. Piersma *et al* (1991) found that valium (diazepam) is effective in the treatment of cramp, but this requires birds to be kept safely in temporary captivity for several hours. The effects of heat may be minimised by shading the keeping cages. In extreme heat, it may also be necessary to shade the birds in the net both before and while they are being extracted. In addition, keeping cages should be placed on damp sand, as heat from dry sand considerably increases the temperature in the cages. If only dry sand is available, the hot top layer should be scraped away before the keeping cages are erected. Experience of catching waders in relatively high temperatures in Delaware Bay, USA, has suggested a further precaution and a possible treatment for incipient leg cramp.

It is the practice of many ringers to ring all birds from one compartment of a keeping cage and then to move on to the next. We have found that, in hot conditions, it is advantageous to begin by ringing a proportion of birds (25–50%) from each compartment, thereby reducing their density. Any birds that are sitting down are ringed and released first. This approach both reduces the temperature in all compartments more rapidly and ensures that any birds that are sitting, and may therefore be likely to become cramped (pers obs), are dealt with and released first. On large catches, processing birds in this way has meant even the last birds to be released, after more than two hours in captivity in high temperatures, showed no signs of cramp.

We have also found that it seems possible to treat incipient cramp by bathing the birds' legs in water. We noticed that Red Knots, released after a catch with signs of slight cramp, went direct to the water's edge and stood in the water. After a short time they moved away, having apparently lost their symptoms or shown great improvement. Following these observations, birds with incipient cramp were taken immediately to the tide edge and their legs were bathed before release. This treatment seemed to be effective, with all birds on which it was tried recovering. It is likely to operate by rapidly reducing the bird's temperature. All birds held in temporary captivity were checked regularly for signs of cramp and any birds suspected of developing cramp were ringed and released immediately. Therefore this technique was only tried on birds in the very early stages of cramp and may not be effective if the condition is allowed to develop. In addition, we found that releasing birds close to feeding flocks of waders seemed to hasten their recovery. This was relatively easy in Delaware Bay where flocks would often feed within 30 metres of the ringing team.

Bathing the legs of birds with incipient cramp in water may also be an effective treatment in cold weather. We have found that in these circumstances bathing in warm water can alleviate cramp symptoms, allowing birds to be released quickly.

All wader ringers are very aware of the potential problems of cramp and take care to avoid it. We hope that these suggestions will prove useful. We will also be pleased to hear if other ringers find success in applying the technique of bathing waders' legs in water.

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