Can colour bands become valued acquired body parts?

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Introduction

With this short note we present anecdotal behavioural observations on flag and colour band preening behaviour in waders in both Australia and the Netherlands. We propose that our observations suggest that waders can become very much at ease with their bands. We are also interested to learn whether any other wader watchers have seen this preening of flags behaviour?

Colour-banding and flagging are widely used marking methods in avian studies. For waders, various banding projects are currently active for as many as 44 species in Europe (IWSG Colour-marking Register, Mark Collier, pers. comm.). Marking schemes vary from a single (sometimes inscribed) colour band or flag to as many as six different bands and flags on any one individual. The reason for applying bands can be to mark cohorts or mark birds according to their origin or to create a unique individual identity. The major advantage of colour marks over metal bands is the option for multiple "recaptures" by way of resightings, often in places where there are few or no wader researchers. The possibility to encounter live individual birds several times over several years and collect data on their life histories is a remarkable boost to our understanding of the demography and biology of waders.

A search on ISI Web of Knowledge using colour/color ring & waders/shorebirds yielded 39 references covering most areas of wader biology, relevant examples of which are Baker *et al.* 2004, Bearhop *et al.* 2003, Burton 2000, Burton & Evans 1997, Butler *et al.* 1996, Dinsmore & Collazo 2003, Figuerola & Bertolero 1998, Gonzalez *et al.* 2004, Gudmundsson & Lindstrom 1992, Leyrer *et al.* 2006, Morse *et al.* 2006, O'Hara *et al.* 2005, Schamel *et al.* 2004, Summers 1994a, 1994b, Van den Hout *et al.* 2008, Verkuil *et al.* 2006, Warnock *et al.* 1997 and Yasue & Dearden 2008. It opens gateways to precise estimates of population sizes and of population vital rates, such as survival, reproduction, movement, and growth (for methods see Bearhop *et al.* 2003, Gillings *et al.* 2009, Sandercock 2003).

The validity of applying (colour) bands to free-living birds lies in the assumption that it does not significantly affect the birds. Permanent bands might adversely affect health and survival (GrattoTrevor 1994), or interfere with natural behaviour. There are very few studies looking into effects of colour banding. A famous example is the serendipitous observation that female Zebra Finch *Taeniopygia guttata* prefer males with red colour bands (Burley 1988), implying that colour-banding may affect mate choice or even reproduction. Cresswell *et al.* (2007) have tested whether bands can increase vulnerability to predators and concluded that aerial predators do not kill colour-marked Common Redshank *Tringa totanus* more often than unmarked Redshank, i.e. they found no so-called "oddity effect". Rogers *et al.* (2004) looked into resighting rates of waders that suffered from capture myopathy (leg cramp) and had to be rehabilitated. They did not find a difference in resighting rate between rehabilitated birds and initial released birds. Although these three studies suggest that effects on survival and reproduction might not be severe or can even be advantageous, birds still have to cope daily with their bands. This note reports anecdotal behavioural observations on banded shorebirds from two sides of our globe that might give some insight into how waders deal with wearing permanent artificial bands.

Observations

Australia

Great Knots *Canutus tenuirostris* ringed under the Global Flyway Network colour-marking project in Roebuck Bay, Broome, NW Australia wear one metal band, one plain yellow flag and four individual colour bands. CH was watching a Great Knot with colour-bands and a flag at a roost in Roebuck Bay on 28 Mar 2008. The bird was preening and during the preening it preened its leg flag. The observations were from close range in very good light with very good optics and it was very easy to discern the bird's bill open and gently preen the flag from near the leg away from the body to the tip of the flag. The bird did this a number of times. This was very different from a few random pecks at the flag that are occasionally seen soon after birds have had the bands and flags attached. The bird seemed totally at ease with its flag and treated it as another "body part".

The Netherlands

Since 2004, Ruff *Philomachus pugnax* have been studied by the University of Groningen as part of a Global Flyway Network colour-marking project to assess the demography and migration of inland waders (Piersma 2003, 2007). Ruffs are caught and banded during spring and autumn migration in the province of Fryslân in the NW Netherlands. Each Ruff is supplied with a metal ring, a colour flag and four colour bands. In the study area, YIV has often observed freshly banded ruffs pecking at their flags, which mostly involved individuals released hours to one or two days beforehand. Ruffs with colour ring combinations from earlier years seem to have become accustomed to the bands and were never observed pecking at them. However, on at least two occasions in April and May 2006 and 2007, YIV observed male Ruffs, delicately preening their bands and their flag, including the part of the flag extending from the leg. In all cases it involved resting birds going through a longer sequel of preening, which involved preening of the wings and chest feathers. The birds would slide their bills along the bands and the flag a few times in a movement resembling the preening of a feather.

Discussion

Our observations of the preening of flags and bands suggest that Great Knots and Ruffs can fully accept their colour rings and flags. Although the cleaning of a ring can serve to remove trapped dirt between the band and the leg, cleaning the extended part of the flag is certainly not "adaptive" and suggests that the bird has accepted the flag as just another body part that needs cleaning. Given the amount of time many wader watchers and other band readers spend watching flagged birds, it is surprising that we have seen this banding cleaning behaviour so rarely. We wonder whether this behaviour is actually an extremely rare phenomenon or more common but somehow overlooked or under-reported?

Our observations suggest that it would be worthwhile to study whether waders can take advantage from colour bands. Especially in the Ruff, with its highly variable male breeding plumage, one can expect a pre-existing female preference for novel phenotypes, so colour bands might be considered a newly-acquired, sexually-selected, trait that might actually attract females. We are also interested to learn whether any other wader watchers have seen this preening-of-flags behaviour? We would be interested to hear from you if you have.

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