REFERENCES

Barrett, G. W., Ford, H. A. and Recher, H. F. (1994). Conservation of woodland birds in a fragmented rural landscape. *Pac. Cons. Biol.* **1:** 245–256.

Bell, H. L. and Ford, H. A. (1986). A comparison of the social organization of three syntopic species of Australian thornbill, *Acanthiza. Behav. Ecol. Sociobiol.* **19:** 381–392.

Bell, H. L. and Ford, H. A. (1990). The influence of food shortage on interspecific niche overlap and foraging behavior of three species of Australian warblers (Acanthizidae). *Stud. Avian Biol.* **13:** 381–388.

Blakers, M., Davies, S. J. J. F., and Reilly, P. N. (1984). 'The Atlas of Australian Birds'. (RAOU and Melb. Univ. Press: Carlton.)

Diamond, J. M. (1975). Assembly of species communities. In 'Ecology and Evolution of Communities.' (Eds M. L. Cody and J. M. Diamond). Pp. 342–444. (Belknap Press: Harvard.)

Dow, D. D. (1977). Indiscriminate interspecific aggression leading to almost sole occupancy by a single species of bird. *Emu* **77:** 115–121.

Fitri, L. L. (1993). 'Ecology and behaviour of Hooded Robins (*Melanodryas cucullata*) in the Northern Tablelands of New South Wales'. (M.Sc. Thesis, University of New England, Armidale).

Fitri, L. L. and Ford, H. A. (1997). Status, habitat preferences and social organisation of the Hooded Robin *Melanodryas cucullata* in the Northern Tablelands of New South Wales. *Aust. Bird Watcher.* **17:** 142–155.

Fleming, P. (1980). 'A comparative ecology of four sympatric Robins'. (B.Sc. Hons. Thesis, University of New England, Armidale.)

Ford, H. A. (1985). The bird community in eucalypt woodland and eucalypt dieback in the Northern Tablelands of New South Wales. In: 'Birds of Eucalypt Forests and Woodlands: Ecology, Conservation, Management.' (Eds A. Keast, H. F. Recher, H. Ford and D. Saunders.) Pp. 333–340. (Surrey Beatty & Sons: Chipping Norton).

Ford, H. A. and Debus, S. (1994). Aggressive behaviour of Red Wattlebirds *Anthochaera carunculata* and Noisy Friarbirds *Philemon corniculatus. Corella* **15:** 141–147.

Ford, H. A., Noske, S. and Bridges, L. (1986). Foraging of birds in eucalypt woodland in north-eastern New South Wales. *Emu* **86:** 168–179.

Grey, M. J., Clarke, M. F. and Loyn, R. H. (1997). Initial changes in the avian communities of remnant eucalypt woodlands following a reduction in the abundance of Noisy Miners *Manorina melanocephala. Wildlife Research* **24:** 63–64.

Huddy, L. (1979). 'Social behaviour and feeding ecology of Scarlet Robins (*Petroica multicolor*)'. (B.Sc. Hons. Thesis, University of New England, Armidale, NSW.)

Marchant, S. (1985). Breeding of the Eastern Yellow Robin *Eopsaltria australis.* In 'Birds of Eucalypt Forests and Woodlands: Ecology, Conservation, Management.' (Eds A. Keast, H. F. Recher, H. Ford and D. Saunders.) Pp. 231–240. (Surrey Beatty & Sons: Chipping Norton).

Marchant, S. (1987). Territorialism and co-operative breeding of the Eastern Yellow Robin *Eopsaltria australis. Corella* **11:** 1–64.

Perrins, C. M. and Birkhead, T. R. (1983). 'Avian Ecology'. (Blackie: Glasgow.)

Pyke, G. H. (1985). Seasonal patterns of abundance of insectivorous birds and flying insects. *Emu* **85:** 34–39.

Recher, H. F. and Lim, L. (1990). A review of current ideas of the extinction, conservation and management of Australia's terrestrial vertebrate fauna. *Proc. Ecol. Soc. Aus.* **16:** 287–301.

Robinson, D. (1989a). Interspecific aggression and territorial behaviour between Scarlet Robin *Petroica multicolor* and Flame Robin *P. phoenicea. Emu* **89:** 93–101.

Robinson, D. (1989b). Ecology and Behaviour of the Scarlet Robin *Petroica multicolor* and Flame Robin *P. phoenicea* in southeastern Australia. (Ph.D. Thesis, Monash University, Clayton.)

Robinson, D. (1992). Habitat use and foraging behaviour of the Scarlet Robin and the Flame Robin at a site of breeding-season sympatry. *Wildlife Research* **19:** 377–395.

Robinson, D. (1993). Interspecific aggressive behaviour between robins and other birds in eucalypt forest. *Corella* **17(4):** 107–110.

Savard, J. P. L. and Smith, J. N. M. (1987). Interspecific aggression by Barrow's Goldeneye: a descriptive and functional analysis. *Behaviour* **102:** 168–184.

Sullivan, D. (1993). The breeding and non-breeding behaviour of the Hooded Robin *Melanodryas cucullata* in Canberra, 1990–1991. *Aust. Bird. Watcher* **15:** 99–107.

Woinarski, J. C. Z. and Cullen, J. M. (1984). Distribution of invertebrates on foliage in forests of south-eastern Australia. *Aust. J. Ecol.* **9:** 207–232.

Corella, 1998, 22(1): 29–31

WEAR RATES OF ALUMINIUM AND STAINLESS STEEL LEG BANDS ON SILVER GULLS

R. D. WOOLLER and S. J. WOOLLER

Biological Sciences, Murdoch University, Western Australia 6150

Received: 1 May, 1997

More Silver Gulls *Larus novaehollandiae* have been banded in Australia than any other non-passerine species (Baker *et al.* 1995). The 6 per cent recovery rate has resulted in over 9 000 recoveries and a longevity record of more than 28 years for one individual. However, the interpretation of these recoveries requires some understanding of the durability and readability of bands, especially for seabirds and other long-lived species. One major study of Silver Gulls used aluminium, numbered bands that were readable on free-living birds, combining them with visible colour bands (Ottaway *et al.* 1984). This resulted in recovery rates much greater than in most large-scale gull-banding programmes worldwide, many of which no longer use aluminium bands on gulls because of concerns about their rapid wear (Coulson 1976). More recently, stainless steel bands have also been used on Silver Gulls in Australia. This note compares the wear rates of some conventional butt-ended aluminium and stainless steel bands used on Silver Gulls.

The returned bands, kindly provided by the Australian Bird Banding Scheme, were weighed to

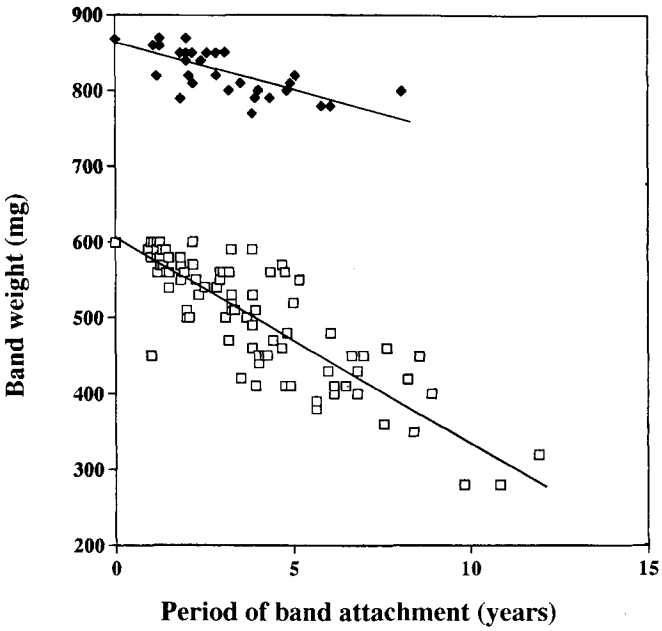

Figure 1. The weights of aluminium (□) and stainless steel (◆) bands in relation to the period they had been attached to Silver Gulls.

±0.001 g, as were batches of 10–15 unused bands from the same series as those analysed. Due to concerns about possible differences between bands manufactured on different occasions, we restricted the comparison to one batch of 94 aluminium bands which were carried by Silver Gulls for up to 12 years and one batch of 33 stainless steel bands carried for up to 8 years; recoveries from other batches were too few for analysis. The average unused stainless steel band weighed 868 mg (range 861–872 mg), substantially more than the 599 mg (range 593–607 mg) of the aluminium bands.

Figure 1 shows the weights of bands in both batches in relation to their time on a gull. The lines through these points were fitted using least squares regression. Both types of bands lost weight at a constant rate with the time worn, but the aluminium bands wore faster. On average, a stainless steel band lost 12.3 mg per year or 1.4 per cent of its initial weight, whereas the lighter aluminium band lost twice this amount or 4.1 per cent of its initial weight each year. If a band that has become reduced to half its original weight is more liable to be lost (Ottaway *et al.* 1984; Hatch and Nisbet 1983a), an aluminium band would reach this state after about 12 years but a stainless steel band not for 35 years.

The series of aluminium bands weighed has been used on Silver Gulls for up to 30 years and the oldest recovery was of a band carried for more than 26 years. However, 390 recoveries of birds carrying these bands showed that one third were recovered within one year, over half were recovered within the next five years and only about 1 per cent were recovered after ten years on a gull. It is unclear whether this represents an accurate reflection of mortality or dispersal rates in this species, or is the outcome of band loss. At the time of analysis, stainless steel bands had not yet been in use for long enough to resolve this question.

A small sample of 16 bands from a different series of lighter (280 mg initial weight) aluminium bands carried for up to 4 years wore at an even faster rate (6 per cent per annum). Interestingly, Ottaway *et al.* (1984) found that 196 readable number bands on Silver Gulls had an initial weight of 956 mg and lost weight at 41 mg per year. The wear rate of these aluminium alloy bands (4.3 per cent per annum) was therefore almost identical to the 4.1 per cent we recorded, despite being heavier bands with a coating on the outer surface. However, bands are affected more by abrasion than corrosion (Ludwig 1981) and wear is greatest on the inner surface, even in seabirds that scrape their tarsi over rocks (Anderson 1980). Usually, most wear is concentrated on the top and bottom edges from the inside (Ottaway *et al.* 1984; Coulson 1976; Rowley 1966; Wooller *et al.* 1985), causing notches and thinning that can eventually result in a band falling off.

In common with other studies (Coulson 1976; Wooller *et al.* 1985), inspection of the raw data revealed no marked differences in the rates of wear of bands on birds first banded as adults or as young. Some studies have found that wear on bands carried by female gulls is greater than on males (Coulson 1976; Mills 1972) but this may be attributable to the slightly smaller average size of females and looser bands wearing faster (Rowley 1966; Ludwig 1981; Mills 1972). The sexes of individuals carrying the bands we analysed were unknown.

Wear rates vary greatly between species and with the metal used (Ludwig 1981). In three species of tern that nested together, two coastal species had higher wear rates of aluminium-magnesium alloy bands (4.1 per cent and 6.3 per cent per annum of their initial weights) than a more pelagic species (0.9 per cent) (Hatch and Nisbet 1983a, 1983b; Nisbet and Hatch 1983). Coulson (1976) found that bands of monel (a nickel-copper alloy) wore at a constant 2.2 per cent and 3.8 per cent of their initial weights on two large gull species living together. On shearwaters, monel bands lost only 1.2 per cent of their initial weight each year (Wooller *et al.* 1985). However, although monel bands normally outlast aluminium bands, corrosion under highly saline/alkaline situations can reverse this situation (Coulson 1976; Ludwig 1981). If differential band wear leads to differential band loss, interpretation of recoveries of individuals carrying bands that will not outlast them may be problematical. Differential band loss may also make comparisons between apparently similar projects difficult. The retention of bands at the end of their period of attachment to a bird, and their subsequent analysis, would help address this problem.

ACKNOWLEDGMENTS

We thank those many banders who returned bands to the Australian Bird Banding Scheme, which kindly made them available, Bernadette Gunn, who weighed them all, and Belinda Dettman for her comments on the manuscript.

REFERENCES

Anderson, A. (1980). Band wear in the fulmar. *J. Field Ornithol.* **51:** 101–109.

Baker, G. B., Dettman, E. B., Scotney, B. T., Hardy, L. J. and Drynan, D. A. D. (1995). 'Report on the Australian Bird and Bat Banding Scheme, 1984–1995'. (Australian Nature Conservation Agency, Canberra.)

Coulson, J. C. (1976). An evaluation of the reliability of rings used on Herring and Lesser Black-backed Gulls. *Bird Study* **23:** 21–26.

Hatch, J. J. and Nisbet, I. C. T. (1983a). Band wear and band loss in Common Terns. *J. Field Ornithol.* **54:** 1–16.

Hatch, J. J. and Nisbet, I. C. T. (1983b). Band wear and band loss in Arctic Terns. *J. Field Ornithol.* **54:** 91.

Ludwig, J. P. (1981). Band wear and band loss in the Great Lakes Caspian Tern population and a generalized model of band loss. *Colonial Waterbirds* **4:** 174–186.

Mills, J. A. (1972). A difference in band loss from male and female Red-billed Gulls *Larus novaehollandiae scopulinus*. *Ibis* **114:** 252–255.

Nisbet, I. C. T. and Hatch, J. J. (1983). Band wear and band loss in Roseate Terns. *J. Field Ornithol.* **54:** 90.

Ottaway, J. R., Carrick, R. and Murray, M. D. (1984). Evaluation of leg bands for visual identification of free-living Silver Gulls. *J. Field Ornithol.* **55:** 287–308.

Rowley, I. (1966). Rapid band wear on Australian Ravens. *The Australian Bird Bander* **4:** 47–49.

Wooller, R. D., Skira, I. J. and Serventy, D. L. (1985). Band wear on Short-tailed Shearwaters *Puffinus tenuirostris*. *Corella* **9:** 121–122.

ORDER OF AUSTRALIA — MR STEPHEN JAMES WILSON

Steve Wilson, a long-standing member of the ABSA, was recently awarded the Medal of the Order of Australia (OAM) in the 1997 Queen's Birthday honours for services to ornithological research, bird-banding and the community.

Steve first developed an interest in birds in the 1960s when he moved to Canberra from Melbourne. Two of his school age sons, Brendan and Dennis, were particularly keen to become involved in bird banding but as they were not old enough to be issued with a Bird Banding Authority, Steve applied for, and was issued with, an Authority by CSIRO, who administered the Australian Bird and Bat Banding Scheme at that time.

Bird banding was a relatively new technique in Australian field ornithology then and Steve quickly became proficient in its use. He established a number of banding stations throughout the Australian Capital Territory, including a site in the Brindabella Ranges, New Chums Road, which was visited every month for nearly 20 years. His interest in bird research soon outstripped that of his sons, and he recruited a number of interested school boys to assist in the banding projects he had undertaken. Under his tutelage, many of these boys developed their interest to a degree where they decided to make science their career. At least seven of them (and I am one) are now employed throughout Australia and the South Pacific in positions relating to nature conservation and ornithology.

Steve has made a huge contribution to ornithology in the Canberra region in particular, and at 86 years of age continues to do so. He has authored over forty papers, five of which were written or co-authored within the last three years, and is still analysing data from the New Chums Road project. He has also contributed to books on the birds of the Australian Capital Territory, writing many of the species treatises for the *Birds of the Australian High Country* and the *Readers Digest Book of Australian Birds.*

Steve was a foundation member of the ABSA and served as President from 1964 to 1966. In 1962 he started the Mist Net Service, which he ran for a period of 14 years. Initially started with a loan of 100 pounds ($200.00), he quickly repaid this amount from profits and placed the Mist Net Service in a position where it was self funding, running from profits generated from sales. The Service has been used continuously since its establishment to fund publishing and other activities of the ABSA.

His contribution in fields other than ornithology should also be mentioned. A tireless worker for his local church parish, Steve, and his wife Noni, have run what is loosely called the 'garden stall' which raised over $115 000 during the last 12 years. Although they have now handed over the reigns for selling plants, which they used to do all year round from their backyard as well as at church fetes, they still propagate the plants, which are sold at the parish stall every weekend.

Steve is like many other amateur ornithologists who devote much of their own time and resources to studying birds and furthering their conservation. The ABSA is proud that one of its most active supporters has received recognition for his efforts and extends congratulations to Steve for this prestigious honour.

Barry Baker,
P.O. Box 249, Mawson,
Australian Capital Territory 2607.