LITERATURE REVIEW

Compiled by B. Baker

This section is compiled from journals which are often not available to non-professional ornithologists in Australia. The following criteria are used to select papers for review:

- They relate to species which occur in Australia and its Territories;
- They provide details of techniques and equipment that may be of use in Australia;
- They provide details of studies that may be of general interest to Australian ornithologists.

Journals perused: *Auk* **114, 115;** *Biological Conservation* **73, 79;** *Behav. Ecol. Sociobiol.* **40;** *Emu* **97, 98;** *Ibis* **139;** *Journal of Animal Ecology* **67;** *Marine Ecology Progress Series* **153;** *Pacific Conservation Biology* **3;** *Wildlife Research* **25.**

TECHNIQUES AND ANALYSES

Can PVA models using computer packages offer useful conservation advice? Sooty Shearwaters *Puffinus griseus* in New Zealand as a case study. Hamilton, S. and Moller, H. (1995) *Biological Conservation* **73:** 107–117. (Population viability analysis (PVA) can guide conservation management and research by identifying the cheapest and most effective actions required to conserve population and by prioritizing research. The usefulness of PVA is illustrated for managing New Zealand mainland colonies of *Puffinus griseus*, a long-lived seabird that is preyed on by small carnivores and harvested by Maori for food. Preliminary PVA models can assist by formalizing how uncertain our current understanding is, but should not be expected to work a miracle of divining certainty from a lack of field information that still may take decades to collect.)

Software for population analysis. Cooch, E. (1997) http://mendel.mbb.sfu.ca.cmr (A useful website reference for information on computer software for capture-recapture analysis.)

The 'Burrowscope': modifications to burrow viewing equipment. Dyer, P. K. and Aldworth, K. (1998) *Emu* **98:** 143–146. (Describes modifications to equipment designed to examine the contents of shearwater breeding burrows.)

BIRDS AND LANDSCAPE ECOLOGY

Bushland modification and styles of urban development: their effects on birds in south-east Queensland. Sewell, S. R. and Catterall, C. P. (1998) *Wildlife Research* **25:** 41–63. (Variation in bird assemblages associated with forest clearing and urbanization in the greater Brisbane area was assessed by counting birds in sites within six habitat categories: large remnants, small remnants, no understorey remnants, canopy suburbs (original trees present), planted suburbs, and bare suburbs. Total birds abundance and species richness were generallly highest in canopy suburbs. Individual species showed many significant abundance differences among the habitat types, and were classified into three major response categories: bushland species (3 in summer, 13 in winter), tolerant species (13 in summer, 13 in winter), and suburban species (12 in summer, 11 in winter). The commonly proposed notion that urbanization results in lowered bird species richness and increases in introduced species is broadly consistent with the observed differences between bare suburbs and large remnants. However, it does not adequately describe the situation in the planted and canopy suburbs, where there was high species richness and extremely high abundance of some native species (including noisy miners, lorikeets, friarbirds, and butcherbirds) but low abundance of a majority of the species common in the original habitats (including fantails, wrens, whistlers, and other small insectivores). Retained forest remnants are essential for the latter group. Urban plantings of prolifically flowering native species do not reverse the effects of deforestation, but promote a distinctive group of common native suburban bird species. Origins of the urban bird assemblage are discussed.)

Fire and its impact on avian population dynamics. Baker, G. B., Dettmann, E. B. and Wilson, S. J. (1997) *Pacific Conservation Biology* **3:** 206–212. (Survival rate, population size, recruitment and probability of capture, derived from a long-term study of 20 passerine species in wet sclerophyll forest near Canberra, were used to measure the impact of a high intensity wildfire which burnt 70 per cent of the study site. The wildfire significantly affected the population size of 13 species for a period of up to six years following the fire. Survival and recruitment were the least sensitive measures of impact and indicated a significant response to fire for only two and 10 species respectively. We detected measurable effects of the fire for 17 of the 20 species studied. Many of these species had returned to prefire levels within three years, but for nine species the effects were still apparent six years later. Mark-recapture methodology provides an effective way of measuring the impact of fire regimes in forest environments. Long-term monitoring programmes should be established in fire-prone forest environments to contribute toward an understanding of fire, and its effect on avian populations. Such programmes have resource implications and researchers are urged to encourage the participation of the amateur bird banding community to contribute to such projects.)

EFFECTS OF MARKING AND RESEARCH TECHNIQUES

The adrenocortical response to stress in incubating Magellanic Penguins *Spheniscus magellanicus*. Hood, L. C., Boersma, P. D. and Wingfield, J. C. (1998) *Auk* **115:** 76–85. (Circulating levels of glucocorticoids increase rapidly in response to capture and handling in many vertebrates, which is indicative of the sensitivity of the hypothalamo-pituitary-adrenal axis to a variety of acutely stressful events. The authors measured circulating levels of corticosterone at capture and after 25 min. of handling and restraint in free living penguins starting their first two long incubation turns. Initial levels were higher for males than females; however levels after 25 min. of handling and restraint increased throughout incubation and were higher for females than for males. These 25 min. handling levels were negatively correlated with body mass and body condition. Initial levels were not associated with body mass. Magellanic penguins appear to be more responsive to stress as fasting proceeds, suggesting that disturbances should be minimized when penguins have depleted fat stores.)

SEABIRDS

Natal philopatry and close inbreeding in Cory's Shearwater *Calonectris diomedea*. Rabouam, C., Thibault, J-C. and Bretagnolle, V. (1998) *Auk* **115:** 483–486. (Consistent sexual differences were observed in natal dispersal. Firstly, markedly fewer females returned and were recruited as breeders at their natal colony. Twenty one per cent of fledglings returned to the nesting colony. Of these, 67 per cent were males, 26 per cent were females and the rest were unsexed. Only 49 per cent of these birds subsequently bred, and most of them were males (82.4%). The male bias in natal philopatry was higher than the sex ratio of fleglings. Second, the pattern of dispersal differed significantly according to sex in breeders and non breeders — females were founded further from their natal burrows than males. Overall both sexes exhibited very high philopatry, with more than 95 per cent and 46 per cent of male and female recruits respectively establishing within 200 m of their natal burrows. Two males were found paired with their mothers, the first evidence of close inbreeding in Cory's shearwater. No evidence was found of daughters mating with their fathers. The lack of father/daughter pairings could have resulted from the reduced rate of female recruitment to the natal colony and their higher level of dispersal. Although Cory's shearwater show strong philopatry that results in high genetic similarity between mates, their sex-biased dispersal and mating strategies apparently ensure an optimal balance between inbreeding and outbreeding, which could serve to avoid the disruption of coadapted gene complexes and the loss of local adaptations.)

The breeding distribution and status of Abbott's Booby *Sulidae: Papasula abbotti* on Christmas Island, Indian Ocean. Yorkston, H. D. and Green, P. T. (1997) *Biological Conservation* **79:** 293–301. (Breeding distribution and population status was assessed in 1991. A total of 1 833 breeding sites were located and it is estimated that the

total breeding population is around 2 500 pairs, 600 pairs more than the most recent estimate of 1 900 pairs in 1983. This was not interpreted as a genuine increase in the breeding population, but to the discovery of areas on the island where birds have probably always nested but have never been recorded.)

Boondelbah Island confirmed as a second breeding locality for Gould's Petrel *Pterodroma leucoptera leucoptera*. Priddel, D. and Carlile, N. (1997) *Emu* **97**: 245–248. (Reports the finding of a small colony of Gould's petrel on Boondelbah Island in 1997.)

Size-dependent variation in reproductive success of a long-lived seabird, the Antarctic Petrel *Thalassoica antarctica*. Saether, B-E., Lorentsen, S-H., Tveraa, T., Andersen, R. and Pedersen, H. C. (1997) *Auk* **114**: 333–340. (Examines how variation in parental quality influences the reproductive success of a long-lived seabird, the Antarctic petrel. In particular, the study focused on how parental quality can interact with and influence the effects of stochastic variation in the environment due to varying climatic conditions. The Antarctic petrel is influenced by stochastic variation in the environment, probably related to climatic conditions. Effects of this stochastic variation may depend on body mass and/or body condition of the parents.)

Laying dates, breeding success and annual breeding of Southern Royal Albatrosses *Diomedia epomophora epomophora* at Campbell Island during 1964–69. Waugh, S. M., Sagar, P. M. and Paull, D. (1997) *Emu* **97**: 194–199. (Aspects of the breeding biology of the southern royal albatrosses were studied at Campbell Island during four breeding seasons, 1964–1969. Laying and hatching dates for *D.e.epomophora* on Campbell Island were 17–22 days later than those reported for northern royal albatrosses *D.e.sanfordi* at Taiaroa Head. Although recapture rates were low, most birds followed a biennial breeding pattern typical of the great albatrosses. Notable exceptions were two pairs which bred in consecutive years after raising chicks to fledging in the first year. Breeding success approximated long-term averages found for wandering albatrosses *D. exulans*. *D.e.epomophora* differed from *D. exulans* in having higher rates of chick failure when overall breeding success was low. Incubation period was approximately similar to that reported for *D.e.sanfordi* and mate fidelity was high, as with most petrel species.)

Weather systems determine the non-breeding distribution of Wandering Albatrosses over southern oceans. Nicholls, D. G., Murray, M. D., Butcher, E. and Moors, P. (1997) *Emu* **97**: 240–244. (The tracked flights of 14 non-breeding wandering albatrosses captured in Australia and New Zealand provided 3 946 locations in the Tasman Sea, around southern Australia, and across the Indian and Pacific Oceans. Nearly all the locations were between 30°S and 50°S, a zone where circumpolar weather systems enable albatrosses to fly in any direction and thus exploit fully this southern environment. It is a zone where currently only the limited EEZ's offer a potential for enforceable legislative protection of this endangered species from the hazards of international longline fisheries.)

By-catch of albatrosses and other seabirds by Japanese longline fishing vessels in the Australian Fishing Zone from April 1992 to March 1995. Klaer, N. and Polacheck, T. (1997) *Emu* **97**: 150–167. (For the years examined 78% of the seabirds caught on tuna longlines were albatrosses with black-browed and shy albatross caught in the greatest numbers. Catches of yellow-nosed albatross, wandering albatross and grey-headed albatross were also significant.)

Diving behaviour of the Shy Albatross *Diomedea cauta* in Tasmania: initial findings and dive recorder assessment. Hedd, A., Gales, R., Brothers, N., and Robertson, G. (1997) *Ibis* **139**: 452–460. (Fifty-two dives were recorded during 20 foraging trips of 15 individuals. The majority of dives were within the upper 3 metres of the water column and lasted for less than 6 s. However, dives to 7.4 m and others lasting 19 s were recorded. Birds dived between 07.00 and 22.00 hours, with peaks in their diving activity near midday and twilight. The characteristics of shy albatross plunge dives were similar to those of gannets Morus spp., which are known to be proficient plunge divers. Swimming dives suggest that shy albatrosses actively pursue prey underwater.)

Foraging zones of royal penguins during breeding season, and their association with oceanographic features. Hull, C. L., Hindell, M. A. and Michael, K. (1997) *Marine Ecology Progress Series* **153**: 217–228. (Foraging behaviour of royal penguins is closely linked to the polar frontal zone, their prey, and the constraints of the breeding season.)

Reliability of morphometric measures for determining the sex of adult and fledgling Shy Albatrosses *Diomedea cauta cauta* in Australia. Hedd, A., Gales, R. and Brothers, N. (1998) *Wildlife Research* **25**: 69–79. (Sexual dimorphism was evident in all head, beak and leg measurements for adult and subadult birds, with males being significantly larger than females, while there was no sex differences in measures of the wings and tail. A stepwise discriminant function analysis of the seven head and beak measures indicated that 98 per cent of adult and subadult birds could be correctly sexed by measuring the upper bill depth and head width, whilst the sex of 89 per cent of fledglings could be discerned by measuring the head length and width and the minimum bill depth. Data from three experienced observers indicated significant differences in the morphometric measures taken from the same individual albatrosses. The extent of these differences varied greatly depending on the measuretaken (i.e. beak *v* wing measures), with head and beak measures showing the least inter-observer differences. Such differences resulted in a decrease in the success rate of the adult-subadult discriminant function analysis from 98 to 90 per cent. When working with breeding birds, sex-allocation errors can be reduced by measuring both members of a pair and allowing the relative size of the discriminant score to identify the individuals concerned.)

SOCIAL BEHAVIOUR

Magpies' tails: damage as an indicator of quality. Fitzpatrick, S. and Price, P. (1997) *Behav. Ecol. Sociobiol.* **40**: 209–212. (Quality-indicating sexually selected traits may have their honesty maintained by their costs or by an inherent 'revealing' nature. Long tails in birds are usually considered to be costly 'handicaps', but may have additional potential as revealing indicators through the incidence of breakage. Magpies *Pica pica* with unbroken and less abraded tails paired earlier, but did not nest or fledge young earlier than pairs with tails in poorer condition. Pairs mated assortatively by tail quality, and magpies with very broken tails remained unmated. Pairs in which both members had almost undamaged tails fledged more offspring than pairs with poorer tails. Tail quality did not correlate with the extent of any habitat type in the territory. Tail damage thus honestly indicated a magpie's reproductive potential, and the data are consistent with its having a role in mate choice, as a revealing element of tail morphology.)

'Wife-sharing' in the Tasmanian Native-Hen *Gallinula mortierii:* is it caused by a male-biased sex ratio? Goldizen, A. W., Goldizen, A. R., Putland, D. A., Lambert, D. M., Millar, C. D. and Buchan, J. C. (1998) *Auk* **115**: 528–532. (Abstract not available.)

Variable mating patterns in Tasmanian Native-hens *Gallinula mortierii:* correlates of reproductive success. Goldizen, A. W., Putland, D. A. and Goldizen, A. R. (1998) *Journal of Animal Ecology* **67**: 307–317. (Abstract not available.)

Offspring sex ratio bias in the Little Grassbird *Megalurus gramineus*. McIntosh, R. R. (1997) BSc. Honours Thesis, Zoology Department, Univ. of Melbourne, Victoria. (Few sex ratio studies have examined monomorphic bird species with respect to offspring sex ratio bias due to past difficulty of sexing monomorphic nestlings. This study found no overall primary sex ratio bias in the Little Grassbird *Megalurus gramineus* offspring, however the primary sex ratio did display variation that was explained by a seasonal bias. Early in the breeding season, the Little Grassbird parents reared female biased clutches, and later in the breeding season, they reared male biased clutches. There were no growth differences between males and females, there were no maternal effects on the sex ratio and there was no co-operative breeding. These factors and the male biased population structure suggest that females are dispersing earlier than males. Therefore, the most plausible model that explains this sex ratio bias is a difference in dispersal between the sexes. This difference in dispersal times may be driven by faster maturation of females. The seasonal sex ratio bias found in grassbird clutches is a primary sex ratio bias, occurring before the clutch has been laid and is therefore an adaptive sex ratio bias. As the sex ratio is allocated before laying,there must be environmental and physiological mechanisms which act on the female to determine the sex of the offspring, though the mechanisms of such sex allocation are unknown.)