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: *Emu* **97**; *Bird Conservation International* **7**; *Ibis* **138**; *ANZCCART, Gerfaut/Giervalk* **84**; *Auk* **113**; *Pacific Conservation Biology* **3**; *Wildlife Research* **24, 25**; *Australian Journal of Ecology* **20**; *Journal of Wildlife Management* **60**; *Marine Ecology Progress Series* **127**; *Behavioural Ecology and Sociobiology* **37, 40**; *Behavioural Ecology* **7.**

GENERAL INTEREST

A review of studies of the breeding biology of Australian birds from 1986–95: biases and consequences. Clarke, M. F. (1997) *Emu* **97:** 283–289. (Papers published in Corella and Emu from 1986 to 1995 that provide information on the breeding biology of birds in Australia are reviewed. Intensive studies were primarily carried out by professional rather than amateur ornithologists working at sites predominantly located in the coastal areas of the temperate regions of Australia. Species chosen for study were biased towards those that bred colonially or co-operatively, and that were sedentary, rather than migratory or nomadic. It is postulated that this bias reflects the comparative ease with which large, publishable data sets can be accumulated when studying sedentary and colonial species, and is in part due to the link between a researcher's professional advancement and their ability to publish papers in refereed scientific journals. Such biases are likely to severely limit our ability to responsibly manage and conserve highly mobile and non-colonial species, despite many of them being recognized as vulnerable. Such biases will also continue to inhibit the development of a comprehensive understanding of the life history attributes of Australian birds.)

Simplified polymerase chain reaction (PCR)-based sexing assists conservation of an endangered owl, the Norfolk Island Boobook *Ninox novaeseelandiae undulata.* Double, M. and Olsen, P. (1997) *Bird Conservation International* **7:** 283–286. (In 1986 a single Norfolk Island owl remained. As part of a re-establishment programme, 2 male New Zealand Moreporks *N.n.novaeseelandiae* were introduced, one of which survived to pair with the female in the wild and breed successfully. By 1995 the population numbered 12–13 individuals of which seven were second generation (F2). However, there were only two breeding pairs. as the 11 hybrids could not be sexed using morphometrics we developed a molecular method based on a recently described avian polymerase chain reaction (PCR)-based sexing technique. The population was found to contain six females and five males. A scarcity of mature males was established as the main factor slowing the recovery effort.)

AUSTRALIAN SPECIES

Breeding biology of Australian owlet-nightjars *Aegotheles cristatus* in eucalypt woodland. Brigham, R. M. and Geiser, F. (1997) *Emu* **97:** 316–321. (Based on 6 observed nesting attempts, data is reported on breeding season, clutch size, incubation and brooding behaviour, nestling grouth rates, fledging success, fledgling behaviour and roost site use for a population breeding near Armidale, NSW.)

TECHNIQUES AND ANALYSES

The contribution of artificial nest experiments to understanding avian reproductive success: a review of methods and conclusions. Major, R. E. and Kendal, C. E. (1996) *Ibis* **138:** 298–307. (Artificial nest experiments have been used in 80 recent studies to identify a wide range of factors influencing reproductive success of birds. Despite the same factors being examined in different studies, few consistent patterns have emerged. Reproductive success measured with use of artificial nests is frequently underestimated. Several studies suggest that different species of predators may be differentially attracted to the two types of nest. In general there is poor correspondence between the appearance of experimental setups and the natural systems they attempt to model. If future experiments with artificial nests are to contribute to theory, the quality of experiments must improve and the assumptions underlying the artificial approach must be tested.)

Animal experimentation: a student guide to balancing the issues. Monamy, V. (1996) ANZCCART: Glen Osmond, South Australia.

Mist-netting as a census method for determining species richness and abundances in an Andean cloud forest bird community. Poulsen, B. O. (1994) *Gerfaut/Giervalk.* **84:** 39–49. (The efficiency and deficiences of mist-netting were investigated in an Ecuadorean high altitude (2 675–2 825 m) cloud forest bird community. A species-encounter function showed that the majority of species captured in this study could have been obtained with considerably less effort than was invested. However, even extensive mist-netting captured less than half (45%) of the species that may potentially fly into nests and only 37% of the total number of species recorded in the netting zone. In conclusion, mist-netting in tall statured, tropical forests is useful for recording locally rare and crepuscular understory species, but less useful for determining abundances. Ideally, various census methods should be used to record all species present.)

BIRDS AND LANDSCAPE ECOLOGY

Dispersal of the Blue-breasted Fairy-wren in fragmented habitat in the wheatbelt of Western Australia. Brooker, M. and Brooker, L. (1997) *Pacific Conservation Biology* **3:** 295–300. (Dispersal of the Blue-breasted Fairy-wren *Malurus pulcherrimus* was studied in an agricultural landscape in which 93% of their preferred habitat has been cleared for farming and the remaining 7% is highly fragmented. In these conditions, the wrens were still capable of dispersing through non-breeding habitat for distances in excess of 10 km. Most long dispersals were by juvenile females moving between habitat patches, although shorter movements were made within habitat patches by breeding females and juvenile males. While it would seem that the population in this area is not entirely limited by the ability to disperse at the present time, persistence may depend more on the rigorous maintenance of existing habitat and inter-connecting corridors than on the revegetation of farmed land.)

Initial changes in the avian communities of remnant eucalypt woodlands following a reduction in the abundance of noisy miners, *Manorina melanocephala.* Grey, M. J., Clarke, M. F. and Loyn, R. H. (1997) *Wildlife Research* **24:** 631–648. (It has been postulated that aggressive honeyeaters like the noisy miner may contribute to rural tree decline by excluding small insectivorous birds from remnant patches of woodland, thereby reducing the level of predation upon defoliating insects. Previous studies provide correlational evidence that avian diversity and abundance is lower in remnant patches of woodland occupied by noisy miners than in those without miners. Noisy miners were removed from three small remnant patches of woodland in NE Victoria. The removal of the majority of noisy miners from a site, or even the removal of only part of a noisy miner colony from a site, resulted in a major influx of honeyeaters and other insectivorous birds to these sites in the following three months. Such major invasions were not observed on matching control sites. At two of the three removal sites, this led to an increase in both the abundance and diversity of birds on the site. At the third site, there was an increase in the diversity, but not the abundance of birds. These experiments are the first to demonstrate that noisy miners affect avian diversity and abundance by aggressive exclusion of small birds. They also showed that if domination by noisy miners is reduced, small, degraded woodland remnants can support significant populatons of some small insectivorous birds and honeyeaters. Noisy miners did not reinvade the experimental sites during the following 16 months and avian diversity and abundance remained higher at the experimental sites than at the paired control sites. Long-term monitoring is needed to determine whether the small invading bird species have a lasting effect upon insect populations and tree health.)

EFFECTS OF MARKING AND RESEARCH TECHNIQUES

The effects of flipper bands on adult survival rate and reproduction in the royal penguin, *Eudyptes schlegeli.* Hindell, M. A., Lea, M. and Hull, C. L. (1996) *Ibis* **138:** 557–560. (No adverse effects due to wearing a flipper band were detected. Banded birds showed survival rates and reproductive success similar to those of unbanded birds. The chicks of banded birds exhibited growth rates similar to those of unbanded parents.)

Survival of radiomarked canvasback ducklings in northwestern Minnesota. Korschgen, C. E., Kenow, K. P., Green, W. L., Johnson, D. H., Samuel, M. D. and Sileo, L. (1996) *Journal of Wildlife Management* **60**(1): 120–132. (The magnitude, timing, and causes of mortality of canvasback *Aythya valisineria* ducklings from hatch to fledging were investigated at the Agassiz National Wildlife Refuge (NWR) in NW Minnesota during 1987–90. During the four years, 217 day old ducklings were radiomarked and released in 52 broods. Another 141 ducklings were radiomarked at = or > 4 weeks of age. Survival was estimated with the Kaplan-Meier nonparametric estimator and the Weibull parametric model. Most mortalities occurred within 10 days after hatch. Total brood loss occurred in 18 (35%) of 52 broods released. The primary sources of mortality were predation, principally by mink *Mustela vison* and exposure to precipitation and cold temperature. For combined years, females had lower survival than males.)

The comparative foraging ecology of royal *Eudyptes schlegeli* and rockhopper *E. chrysocome* penguins. Hull, C. L. (1997) Ph.D. thesis, Zoology Dept., University of Tasmania. (Experiments assessing the impact of investigators on breeding success found no significant effects, provided care was taken when working in the colony. The deployment of external devices (transmitters and Time Depth Recorders, TDRs) was integral to the study and their impact on royal penguins was assessed. No effects were found in birds carrying small, streamlined VHF transmitters, but the attachment of larger, unstreamlined TDRs decreased the likelihood that penguins would return from a foraging trip, increased foraging trip duration, increased water influx rates, and decreased accumulated fat levels. The different impacts of the devices was related to their size and streamlining most likely affecting drag.)

SEABIRDS

The importance of trawl discards in the diets of tropical seabirds of the northern Great Barrier Reef, Australia. Blaber, S. J. M., Milton, D. A., Smith, G. C. and Farmer, M. J. (1995) *Marine Ecology Progress Series* **127:** 1–13. (Describes important seabird interactions with trawl fisheries.)

At-sea distribution of shy albatrosses *Diomedea cauta cauta* derived from records of band recoveries and colour-marked birds. Brothers, N. P., Reid, T. A. and Gales, R. P. (1997) *Emu* **97:** 231–239. (The distribution of shy albatrosses *Thallasarche cauta* from Australian colonies was studied using band recoveries and colour-marked birds. Adults from the colonies on Albatross Island and the Mewstone were found to be relatively sedentary. Birds were found to travel much more widely in their first five years, with birds from Albatross Island recovered from Western Australia, and birds from the Mewstone recovered from South Africa. The difference in dispersal between birds from two close colonies and the overlap of shy albatrosses at-sea with areas of longline fishing has important differential implications for the conservation of this population.)

SOCIAL BEHAVIOUR

A study of resource partitioning within the helmeted honeyeater *Lichenostomus melanopscassidix* during the non-breeding season. Moysey, E. D. (1997) *Emu* **97:** 207–219. (Home ranges of males and females within a breeding pair were highly overlapping, of similar size (males: mean 0.32 ha, females: mean 0.26 ha) and did not differ significantly in vegetational composition. Breeding adults and their juvenile offspring also had similar-sized, highly overlapping home ranges. For one juvenile the degree of overlap decreased markedly as the bird matured. Non-breeding adults tended to occupy different vegetation communities to those inhabited by breeding adults. Male breeding adults spent significantly more time in the canopy stratum than females, who were observed more frequently in the lower strata. Both juveniles and non-breeding adults spent less time in the canopy than breeding adults. Analysis of activity budgets did not reveal specialised foraging behaviour according to height in the vegetation, or seasonal change from autumn to winter. Male and female helmeted HE showed similar levels of aggression when present in the canopy region. The distribution of manna points was random at one site, but occurred in areas with little tea-tree understory at another site.)

Mating system of the co-operatively breeding noisy miner *Manorina melanocephala,* as revealed by DNA profiling. Poldmaa, T., Montgomerie, R. and Boag, P. (1995) *Behavioral Ecology and Sociobiology* **37:** 137–143.

Relatedness, polyandry and extra-pair paternity in the co-operatively-breeding white-browed scrubwren *(Sericornis frontalis).* Whittingham, L. A., Dunn, P. O. and Magrath, R. D. (1997) *Behavioral Ecology and Sociobiology* **40:** 261–270. (DNA fingerprinting was used to examine the genetic parentage and mating system of the co-operatively breeding WBSW. Analyses revealed a remarkable variety of mating tactics and social organization. Scrubwrens bred in pairs or multi-male groups that consisted of a female and two or more males. Females were always unrelated to the pair male or alpha (dominant) male. Overall, when group members were related closely, the dominant male monopolized reproductive success, whereas when the members were not related closely the two males shared paternity equally. This positive association between monopolization of reproduction and relatedness is predicted by models of reproductive skew, but has not been reported previously within a single population of birds. Other co-operatively breeding birds with both closely related and unrelated helpers may show a similar variety of mating tactics. Extra-group paternity was more common in pairs (24% of young) than in multi-male groups (6%). The interpretation of this pattern will depend on whether females or males are ultimately shown to be responsible for paternity, but three possibilities are suggested. Estimates of genetic benefits suggest that males gain greater reproductive success breeding in a pair than remaining on their natal territory as a beta male. Constraints on successful male dispersal and breeding in a pair may exist, or there are other benefits of philopatry or helping. Constraints may include the difficulties of finding a mate in a population with a male-biased sex ratio, while benefits may include increased survival. Adult male survival was high (88% annual survival for pair and alpha males) so queuing strategies may also be important.)

RAPTORS

Initial assessment of the impact of rabbit calicivirus disease on Australian birds of prey — 1996–98. Steele, W. K. (1998) Birds Australia: Hawthorn East, Victoria. Pp. 27. (The effect of a widescale reduction in rabbit numbers following the introduction of RCD has apparently been detrimental to some of Australia's larger Falconiformes although effects vary between species and geographical areas. The relative abundance of all raptor species combined declined in rabbit-infested areas after the introduction of RCD during 1996 and declined further during 1997. A notable exception was SW Western Australia but rabbits are not over-abundant there and so raptors are not as dependent upon them as prey than in other areas. Brown Falcon populations have been severely affected by the introduction of RCD, with declines of up to 50% in their relative abundance recorded ober large areeas of temperate Australia. Little eagle populations declined in affected areas during summer and/or spring following the introduction of RCD and concommitant reduction in rabbit numbers. The birds breed at this time of year which means that they are under the greatest pressure to find prey and it is during these same seasons that RCD is most effective at killing rabbits. There is some evidence that Brown Goshawk populations have declined in RCD affected areas. The impact on the wedge-tailed eagle is difficult to assess because, while there were apparent increases in the abundance of this bird, it was obvious that birds were being attracted to road killed carrion in greater numbers than usual numbers. Thus the methodology used to collect survey data, where birds are counted along roadsides, may have meant that increased numbers of eagles were recorded when the birds were actually under significant pressure because of a shortage of prey, forced to congregate alongside roads and actually suffering a population reduction. Analysis of raptor abundance and seasonal rainfall data indicate that the lower than usual rainfall over much of temperate Australia during 1997 cannot explain the declines in some raptor populations. Furthermore, with one exception, the nankeen kestrel (which does not prey upon rabbits) did not undergo similar population declines. There is no evidence yet of the three major rabbit-eating species recovering in 1997 from the population declines suffered during 1996 following the reduction in rabbit numbers.)