



Birds of Tropical and Subtropical Queensland

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ABSTRACTS

This year the Australian Bird Study Association joined forces with Birdlife Southern Queensland in presenting a conference highlighting some recent studies on tropical and sub-tropical birds. The abstracts of those presentations are published below.

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What do birds do for rainforest decline or recovery, and vice versa?

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Rainforests are the habitat of a high diversity of bird species, and in Australia these include a significant number of regional endemics. It has consequently been widely recognised that the extensive clearing of these forests by European colonisers during the past two centuries has resulted in many species' declines. These birds are indicators of human-induced environmental impacts and also of the extent of biodiversity recovery that may be achieved by reforestation in formerly-cleared rainforest regions. However, the extent to which increasing these areas of 'new forest' can rescue the diverse fauna of native rainforests from further decline is a topic of substantial current debate. Moreover, birds are more than passive recipients of human-induced impact; they are also important components of ecosystems, and thereby act as agents of both degradation and restoration. In particular, fruit-eating birds are important dispersal agents of many plant species. This is especially the case in rainforests, where most plant species bear fleshy fruits and are bird-dispersed. Consequently, frugivorous birds have been significantly impacted by past rainforest clearing. However, they also benefit from feeding on the fruits of an increasing number of invasive non-native plant species. Birds are thus of crucial importance in enabling rainforests to regenerate, in altering their regeneration pathways in disturbed landscapes, and as key agents causing invasive plants to spread. This talk will review these issues, using case studies from the Australian tropics and subtropics, and considering some of the contemporary dilemmas which they create.

Avifaunal disarray from a single despotic species

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The Noisy Miner *Manorina melanocephala* is a native bird, but it markedly depresses the abundance of almost all smaller bird species within its territory. It is a Key Threatening Process (KTP) in Victoria, with nominations currently being considered in NSW and nationally. Despite three decades of research establishing the species' impact on entire assemblages at a level unparalleled by a native species, there is no large-scale synthesis of the causes of and solutions to the problem. To address these information gaps, the Australian Centre for Ecological Analysis and Synthesis (ACEAS) supported formation of a working group. The group developed conceptual models of Noisy Miner site occupancy and impact, and pooled bird survey data from over 2,500 sites in four states to test the postulated relationships. It also tested for increases in abundance of the species across eastern Australia and compared the cost-effectiveness of alternative management approaches. This presentation will outline the findings of the working group's research. Despite the very large distribution of the Noisy Miner and apparently conflicting results from past research, a cohesive understanding of the factors leading to increased risk of negative effects from Noisy Miners was developed. The species has

increased in recent years in at least nine bioregions. Direct culling of Noisy Miners was considered to be cost-effective in some circumstances, and would be most desirable where threatened species are affected and where development of a dense woodland structure is inappropriate. Management experiments are needed to test these ideas.

Altitudinal migration around Brisbane and the problem of historical survey data

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In 1991–92 a bird survey was conducted at 20 sites along an altitudinal gradient in South D'Aguilar National Park, formerly known as Brisbane Forest Park. The aims of that survey were to determine how census duration and repetition of the Area Search Method affected the number of species recorded (Slater 1994), and to what extent habitat, vegetation characteristics and seasons explained variation in species composition and abundance (Slater 1995). Although altitude was found to have a significant effect on the abundance of most guilds, its influence on species abundance, or interaction with seasons was never examined. Twenty years later, in 2012, I began a survey that essentially replicates this study, except that the emphasis was on variation in species abundance with altitude. In the previous study, species richness and abundance were significantly higher in the second summer (1992–3) than in the first (1991–2), which followed 18 consecutive months of below-average rainfall.

A comparison of the two studies reveals some surprising differences. For instance, Slater recorded 85 species over 21 months, the present study 123 species in just 12 months. Of the 45 species that were not recorded by Slater, many are common summer migrants or locally nomadic nectarivores. One astounding absentee from the previous study was the Large-billed Scrubwren *Sericornis magnirostra*, which is currently resident at almost every site. Seven species reported by Slater have not been recorded during the present study; two are characteristic of drier regions. These disparities are discussed, and possible cases of altitudinal migration described.

Slater, P.J. (1994). Factors affecting the efficiency of the area search method of censusing birds in open forests and woodlands. *Emu* **94**: 9–16.

Slater, P.J. (1995). The interaction of bird communities with vegetation and season in Brisbane Forest Park. *Emu* **95**: 194–207.

Making the most of investment in citizen science: what makes a twitcher tick?

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Citizen science is on the rise. For citizens the motivation is to contribute to 'real' science and conservation. For scientists, citizen science collects information that would otherwise not be affordable. The longest-running and largest citizen science programs are broad-scale bird monitoring projects that include cross-sectional monitoring (e.g. Atlases) and longitudinal monitoring (e.g. Breeding Bird Surveys, BBS). We review recent applications of these programs, and a return-on-investment analysis indicates that compared with Atlases, BBS are more cost-effective and have higher impact in the scientific literature. This is most likely because BBS focus on measuring change, allowing management and policy impacts to be quantified. However, Atlases with a less-structured design are ideal for answering high-impact questions about the volunteers themselves, due to the untargeted nature of sampling. We demonstrate a social research application informed by data from the New Atlas of Australian Birds, investigating relationships between volunteer bird survey effort and motivations, to prioritise investment in future surveys. Using models describing volunteer behaviour, we identify areas unlikely to be surveyed. If these areas are important to achieve program objectives, we can either provide volunteer incentives or invest in professional surveying. Our approach saves up to 75 percent of the investment required for a professional surveying strategy that ignores volunteer efforts. To ensure citizen science data are used to their full potential we recommend the following: elements of BBS protocols (fixed sites, long-term monitoring) are incorporated into Atlases; communication between researchers and organisations coordinating volunteer monitoring is enhanced, with monitoring targeted to meet specific objectives; and under-explored objectives such as social research are encouraged.

Synergies between carbon farming and bird conservation in Queensland

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There is great potential in Queensland to accumulate carbon via the restoration of native vegetation. This is because large areas have been cleared, and many vegetation types will readily regrow if grazing and other threats are appropriately managed. Restoration of vegetation benefits birds by increasing the amount of habitat available, and this is particularly important for birds associated with heavily cleared vegetation types, e.g. brigalow. In addition, many management actions which will maximize the carbon in a forest are also good for birds. These include the retention of large trees, standing dead trees, litter and coarse woody debris; and the management of fire, weeds and grazing.

A new revenue stream for projects that have both carbon and biodiversity benefits has been provided by the Australian Government via the Carbon Farming Initiative. Both community groups and landholders are eligible for this funding. To support the restoration of native vegetation for carbon and wildlife, the Queensland Government is developing the Regrowth Benefits website which will include an interactive map and management guidelines for Queensland vegetation types. The interactive map will allow the user to determine the pre-clearing vegetation type at their site, and also whether the site is potential habitat

for threatened species. Links are provided to web pages on vegetation ecology, condition states, and management actions for carbon and wildlife. This talk will provide an overview of the many synergies and some conflicts between managing native vegetation for carbon and birds, and a sneak peek at the Regrowth Benefits website.

Guided by the light: what is going on with those huge urban lorikeet roosts?

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Although most species are unable to cope with the process of urbanisation, a notable few are able to take advantage of the opportunities provided by anthropogenic environments. Some species such as Rainbow Lorikeets *Trichoglossus haematodus* are now among the most abundant birds found in many cities throughout Australia, a growth in populations fuelled largely by the popularity of nectar-bearing trees. During the evening, the species forms massive communal roosts, often in remarkably disturbed locations. We explored the potential influences on roost site choice among rainbow lorikeets in suburban Brisbane. The trees found in a series of 14 roosts ranging in size from a few thousand to over 100 000 birds were investigated with respect to size, canopy condition, species, proximity to natural and urban features, as well as the level of lighting reaching each tree. Trees at the roost site were classed as either roost tree, pre-roost trees or none-roosts; in addition, a large number of sites this apparent suitable conditions but not used were measures as controls. Lorikeets were found to use a wide variety of trees as roosts, but the level of light appeared to be the most important variable. One functional explanation for this may be predator detection.

Conserving nomadic birds

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Many Queensland birds are nomadic, moving around the landscape to follow resources which are often irregular and unpredictable. The isolation and extreme conditions of many parts of Queensland mean we still know very little about the way that most birds move around the landscape. I used BirdLife Australia Atlas data to map the changing distribution of outback birds over different seasons. I'll discuss critical issues in the conservation of nomadic birds and outline new ways to measure threats for nomadic and dispersive species.

Effect of observers on calling behaviour of birds during surveys.

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Observer bias in bird surveys is well documented, particularly when making estimates of abundance, however the

effect of observers on the calling behaviour of birds is less well understood. Many species are known to modify their calling behaviour in response to the presence of threats either increasing or decreasing calling behaviour. This has not been accurately quantified in terms of bird surveys however. Given that bird detections based on calls can constitute over 50 percent of observations, either change can lead to under or overestimations.

We conducted simultaneous dawn, noon and dusk point count and acoustic sensor surveys at four sites over a five day period in the Samford Valley to determine if there was a change in bird calling behaviour during surveys. Recordings corresponding to the 20-minute periods prior to the arrival of surveyors on site, while the surveyors were on site, and after surveyors departed were analysed. In total, 16 253 calls were annotated, and 83 unique species identified in the one-minute segments analysed. The difference in mean calling frequency for each species, for the before, during and after periods were compared using a one-way ANOVA. None of the 83 species compared showed a significant difference in mean calling rates for the 20-minute periods corresponding to before, during and after periods. This result warrants further investigation in different habitat types to determine if these findings are consistent across different species assemblages, and to identify what factors influence calling behaviour during bird surveys.

Do Black-faced Cormorants *Phalacrocorax fuscescens* play favourites? An experimental test of the parent-offspring conflict in a brood reducing seabird

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This paper describes the parent-offspring interactions that occur in three-nestling clutches of Black-faced Cormorants *Phalacrocorax fuscescens*, an Australian brood reducing seabird. Studies of parent-offspring conflict show that parents 'play favourites' by preferentially feeding larger dominant nestlings over marginalized nestlings, thereby maximizing their inclusive fitness. We tested this hypothesis by experimentally manipulating brood size in Black-faced Cormorants and measuring (a) levels of parental provisioning, (b) nestling begging dynamics, and (c) aggression between nestlings. We found that: (a) nestlings engage in a random begging strategy to parents without demonstrating a begging preference to a particular sex; (b) nestlings use aggression and begging as a competitive strategy to out-compete other nest mates; and (c) parents share the food delivery workload but have subtle differences in their feeding strategy. Males control the distribution of food between nestlings by selectively responding to nestling begging behaviour, while females do not show a preference towards nestling begging behaviours and equally distribute food between nestlings. This study suggests that differences in the feeding behaviour of adult male and female Black-faced Cormorants influences competitive begging interactions between nestlings.

Movement and home range of the Black-throated Finch southern subspecies *Poephila cincta cincta* – preliminary results

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The Black-throated Finch southern subspecies *Poephila cincta cincta*, previously found in woodlands from NSW to northern Queensland, has contracted in range by 80 percent since the 1970s. However, little is known about habitat use and movement of this species. Here, we present preliminary results of our study of black-throated finch southern subspecies' (BTF) movement and home range.

This study, focused mainly on the Townsville coastal plain, involves observing known BTF flocks, searching for new populations, and targeted mist netting. Captured BTFs were metal and colour-banded and selected birds were fitted with a 0.3 gram radio transmitter. Location data were analysed using a variety of spatial analysis methods.

To date, 63 BTFs have been colour banded (5 sites) and one has been radio tracked. Thirty-three re-sightings have been recorded to date, most within a few metres of the banding site but one bird was re-sighted six kilometres away after three months. Site-fidelity is strong, with three birds re-sighted in the same locale 238 days after banding. Over 11 days, the tagged BTF had regular daily activities, travelling 700 metres from a specific roosting site to a particular foraging area. Kernel density analyses indicated a foraging range of 3.55 hectares (D50%), while the overall home range was 3.78 hectares.

BTFs have been found to move farther than previously thought over seasonal time-scales, but over shorter scales, they maintain small home ranges. Further results will yield valuable information on habitat and landscape use at a variety of spatial and temporal scales, thus assisting management and conservation efforts.

Foraging behaviour of the Peaceful Dove *Geopelia striata* in relation to predation risk: group size and predator cues in a natural environment*

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Foraging behaviour is directly influenced by the risk of predation, which is in turn influenced by distance to cover, height of vegetation and, predator cues. In this study, we used giving-up density (GUD) to investigate the foraging behaviour of the Peaceful Dove *Geopelia striata* in relation to predation risk. We simulated predation risk by placing feeding patches in grass of various heights, and visual and auditory predator cues were also simulated. GUD was higher near tall grass and minimum GUD of individuals remained similar among different group sizes. Both visual cues and the combination of visual and acoustic cues altered the patterns of GUD significantly, but the effects of the two treatments did not differ from each other. We conclude that changes in vegetation structure and visual predator cues can strongly increase the assessment of predation risk by ground-feeding birds. Grouping behaviour in this species was not entirely a result of clumped food resources in their natural environment but was influenced by anti-predator strategies and birds could maintain higher food intake in more dangerous places when in groups. Our study used a rare, but important, field experimental approach to determine factors that affect foraging behaviour in a bird.

The full paper will be published in Emu:

Tang, L., and Schwarzkopf, L. (in press). Foraging behaviour of the Peaceful Dove (*Geopelia striata*) in relation to predation risk: group size and predator cues in a natural environment. *Emu: Austral Ornithology*. **113**: 1-7. Available at: <http://dx.doi.org/10.1071/MU12023>

The social dimensions of feeding birds in Australia and the United Kingdom

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Bird feeding is very common and widespread throughout the world. Despite this fact there has been very little research into this phenomenon. The feeding of birds has raised many negative assumptions for both the birds and people involved. Studies have concentrated on the impacts of dependency, malnutrition, behavioural changes and disease for the species involved. Initial research has shown that the feeding public is conscious of these negative assumptions and the opposition to the practice and despite this still desire to engage in the activity. A survey has been distributed to investigate the attitudes and motivation behind bird feeding in Australia and the United Kingdom and what it means for those involved. This research will also examine the implications of this interaction for an individual's personal connection with nature and the subsequent environmental values that may be associated with it. An international comparison is made with the United Kingdom as there is an extensive history of bird feeding (it is encouraged particularly during winter) and an opposing view to the practice when compared to Australia.