

Available online at www.sciencedirect.com







Developing an evolutionary ecology of fear: how life history and natural history traits affect disturbance tolerance in birds

DANIEL T. BLUMSTEIN

Department of Ecology and Evolutionary Biology, University of California Los Angeles

(Received 5 December 2004; initial acceptance 1 April 2005; final acceptance 24 May 2005; published online 9 January 2006; MS. number: A10057R)

When approached by humans, virtually all species flee, but we lack an understanding of the factors that influence flight response among species. Understanding this variation may allow us to understand how 'fear' structures communities, as well as to predict which species are likely to coexist with humans. I used flight initiation distance (FID) as a comparative metric of wariness and examined the relative importance of life history and natural history traits in explaining variation in FID in 150 species of birds. In a series of comparative analyses, I used independent contrasts to control for phylogenetic similarity and regressed continuous life history traits against flight initiation distance. Body size had a large and significant effect in explaining variation in flightiness: larger species initiated flight at greater distances than smaller species. After controlling for variation explained by body size, there was a nonsignificant positive relation between the age of first reproduction and FID. There were no relations between FID and clutch size, number of days spent feeding young, longevity, or habitat density. I used concentrated changes tests to look for evidence of coevolution between flightiness and dichotomous traits. Flightiness evolved multiple times and some clades were flightier than others. Flightiness was more likely to evolve in omnivorous/carnivorous species and in cooperatively breeding species. These results suggest that body size and age of first reproduction are important in explaining variation in disturbance tolerance in birds, and that species that capture live prey and those that are highly social are relatively wary. The results suggest a novel mechanism of how anthropogenic disturbance may contribute to extinction.

© 2005 The Association for the Study of Animal Behaviour. Published by Elsevier Ltd. All rights reserved.

While it is generally accepted that individuals may vary predictably along a 'shy-bold continuum' (Wilson et al. 1994), or have specific behavioural phenotypes (Gosling 2001; Sih et al. 2004a, b), we have a limited understanding of what explains differences between species in wariness or fearfulness. Despite an extensive literature on intraspecific variation in predation and antipredator behaviour (Lima & Dill 1990), relatively few studies have addressed the question of the evolution of interspecific differences (Greenberg 1983, 1990; Lima 1990, 1993; Beauchamp 1998, 2004; Swaddle & Lockwood 1998; Blumstein 2003; Blumstein et al. 2004a, 2005). Yet it is these interspecific differences that ultimately influence a species' distribution and abundance, as well as its vulnerability to environmental change. Identifying the factors or traits responsible for species-specific differences is the first step towards developing predictive models of fear in animals that will allow

Correspondence: D. T. Blumstein, Department of Ecology and Evolutionary Biology, University of California, 621 Young Drive South, Los Angeles, CA 90095-1606, U.S.A. (email: marmots@ucla.edu).

us to understand how animals respond to anthropogenic disturbance (Blumstein & Fernández-Juricic 2004).

Several lines of evidence suggest that life history theory (Stearns 1977; Sibley 2002) may provide some explanatory value (Lima 1993). For example, it is well known that variation in reproductive value may influence defensive behaviour (Montgomerie & Weatherhead 1988) and the degree of risk that animals are willing to accept (Koops & Abrahams 1998). Additionally, fecundity and survival influence parental risk taking (Ghalambor & Martin 2001), and the timing of life history events may influence risk-taking behaviour directly or indirectly (Grand 1999). Thus, differences between species in wariness or risk tolerance might be explained by specific life history traits or where they fall along a life history continuum.

Natural history variation influences morphological antipredator adaptations (e.g. Lima 1993), and could also influence wariness. For instance, in those species where cover is obstructive, individuals in obstructive cover are warier than those in open areas (e.g. Blumstein & Daniel 2002). Thus, differences between species in wariness or risk tolerance could be associated with the

relative density of cover in which the species is found. Animals that must subdue their foods might be more attentive than those who rely on vegetation, because predators must detect movement of their prey and be able to track moving prey; thus, carnivores and omnivores could conceivably be more wary.

I used a comparative empirical approach (Blumstein & Fernández-Juricic 2004) and examined relations between flight initiation distance, and several life history and natural history traits. I used birds as a model system because they have a wide range of life history traits and are found in a variety of habitat types (Bennett & Owens 2002). I used flight initiation distance as a comparative metric of wariness. Flight initiation distance (FID) is the distance that an individual approached by a predator initiates flight (Blumstein 2003), and this trait, while variable, reflects species-specific differences (Blumstein et al. 2003). Animals respond to approaching humans as they would predators (Frid & Dill 2002); thus, humans can be used as a standardized fearful stimulus. By walking towards focal subjects in a standardized way, I could estimate FID for many species. The decision to flee is one of several components of escape (Morse 1980; Ydenberg & Dill 1986; Lima & Dill 1990), and an individual's response may be subjected to trade-offs (Dill 1987; Blumstein & Bouskila 1996). Recent analyses suggest that FID is correlated with other aspects of escape (alert distance: Blumstein et al. 2005; scanning rate: Fernández-Juricic & Schroeder 2003), and thus FID promises to be a reasonable comparative metric of overall wariness. In the present study, I developed predictions of how several life history and natural history traits may influence FID.

Body size influences vulnerability (Werner 1984) as well as a species' extinction risk (Gaston & Blackburn 1995; Cardillo & Bromham 2001; Cardillo 2003; but see Crooks et al. 2001; Johnson 2002). Larger-bodied species should be less vulnerable to contemporary predation risk. However, body size is a correlate of endangerment (Gaston & Blackburn 1995) and a predictor of extinction in some taxa (Bennett & Owens 2002; Cardillo 2003). The mechanisms of increased vulnerability are generally unknown (Gaston & Blackburn 1995; but see Van Valkenburgh et al. 2004).

Previous work has identified significant positive relations between body size and both flight initiation distance (Blumstein et al. 2004a) and alert distance (Blumstein et al. 2005). However, body size may be correlated with another factor that is ultimately responsible for wariness. For instance, large-bodied species might be better able to detect approaching threats because they have larger eyes. A previous analysis rejected this suggestion and found that, after explaining significant variation in alert distance accounted for by body size, eye size had no effect on alert distance (Blumstein et al. 2004a). Because alert distance and FID are highly correlated, and based on this previous analyses with a smaller data set, I expected a positive and significant relation between body size and FID. Analyses of other life history and natural history traits would control for body size variation statistically when trying to identify other possible correlates of flightiness.

In birds (Newton 1998; Bennett & Owens 2002) and mammals (Wootton 1987), there is a positive relation between body size and age of first reproduction. Species that initiate reproduction later in life might be expected to be more cautious to ensure that they survive to reproduce. I thus predicted a positive relation between age at first reproduction and FID.

Parents that invest relatively more in a few offspring might tolerate less risk than those who invest little in many offspring because their direct fitness is associated with offspring survival. This can be tested in two ways, by focusing on clutch size and by examining how the duration that young are fed explained variation in FID. I predicted that greater FIDs would be found in species with small clutches and in species that fed their young longer.

Longevity should be associated with risk taking and thus overall wariness. Species that live longer might be expected to be more cautious to ensure that they realize this potential. Natural data on longevity are difficult to collect and are often unreliable (Gaillard et al. 1994; Promislow 1994). Nevertheless, in cases where some estimate of life span was available, I predicted a positive relation between longevity and FID.

Individuals in locations with compromised visibility increase their vigilance (Leger et al. 1983; Arnez & Leger 1997; Boinski et al. 2003; Blumstein et al. 2004b). It is likely that species also differ based on their habitats. Dense vegetation makes it difficult for individuals to detect predators. Thus, I predicted that species typically found in dense habitats would be warier than those found in more open habitats so as not to be surprised at a close distance by an unseen predator.

Motion detection is essential to feed on fast-moving prey (Fleishman et al. 1995), and visual systems vary in their velocity detection thresholds (Hodos 1993). Species that must capture moving prey have more acute visual systems (Garamszegi et al. 2002), and raptors and some *Anolis* lizards have evolved bifoveal vision to help them detect small prey (Fite & Lister 1981). Assuming that food detection abilities can be used in other contexts (e.g. predator detection), I expected that diet should be associated with flightiness. Specifically, I expected that carnivores and omnivores (i.e. species that eat moving prey) would have greater detection abilities and therefore would be more flighty than herbivores.

Sociality involves many traits (Cahan et al. 2002). Among them is allocating time to monitor conspecifics (Roberts 1988). Thus, more social species may be generally more vigilant because they must monitor both conspecifics and predators, and this wariness might make species more responsive to approaching humans. I therefore expected that social system should influence wariness. In birds, I examined this hypothesis by comparing cooperative breeders (Cockburn 1998) with noncooperative breeders, because I thought that the social relationships and bonds seen in cooperatively breeding species would select for vigilance to monitor conspecifics.

METHODS

Estimating FID

Methods follow those reported in Blumstein (2003) and Blumstein et al. (2004a, 2005). Assistants and I focused on birds (from Australia, Europe and North America) that were foraging or engaged in 'relaxed behaviours', such as preening or roosting. Highly vigilant and obviously alarmed birds were not approached, nor were nesting individuals or endangered species. To estimate FID, a subject was identified and then approached at a steady pace of \sim 0.5 m/s. Observers noted the distance that they started walking towards birds (starting distance), and the distance at which the focal bird moved away (FIDhorizontal), either on foot or by flight in response to the approach. This distance typically was obvious, with the exception of some species that actively move while foraging (practically, this was mostly a problem with shorebirds). When birds were already moving, observers focused on obvious departures from the focal subject's typical movement (e.g. a double-step or movement in another direction) to score flight initiation. This problem applied only to the relatively rare situation in which the bird walked away instead of flying away. Finally, observers noted the height the bird was off the ground (if it was off the ground). Distances were measured in paces and converted to metres. From the horizontal FID measurement and the perching height in the tree measurement, we calculated the 'direct'

$$\begin{split} & FID \left(FID_{direct}^2 = \sqrt{\left(FID_{horizontal}^2 + perching \ height^2 \right)} \right), \ and \\ & used \ this \ FID_{direct} \ measurement \ in \ subsequent \ analyses. \\ & I \ paid \ particular \ attention \ to \ ensure \ that \ all \ observers \\ & collected \ data \ consistently. \ New \ observers \ were \ trained \ until their \ observations \ were \ identical \ to \ those \ of \ a \ trained \ observers \end{split}$$

server. All observers were also trained to discard an experimental approach if there was any doubt about any

of the variables collected.

Subjects were not marked; however, observers attempted to avoid resampling individuals by flushing on birds in different geographical locations and not resampling the same location repeatedly. A modest degree of resampling subjects has been shown to not influence the results of studies like this (Runyan & Blumstein 2004). Birds were studied in both 'pristine' environments, with few if any visitors, and in areas with human activity. Analyses excluded observations on individuals in highly visited city parks, and individuals that approached humans for handouts rather than fleeing. To my knowledge, none of the species included in our analyses were actively hunted at the locations where we studied them.

From a database of over 350 species, I selected 150 species (representing 107 genera and 40 families) for which I had at least 10 observations and calculated a species' average FID (Appendix).

Comparative Analyses

Maximum body mass was tabulated from Dunning (1993), and when a species was not reported there, I

obtained means from species accounts published in The Birds of North America and the Handbook of Australian, New Zealand, and Antarctic Birds. A few remaining masses came from Geffen & Yom-Tov (2000) and Clement (2000).

Life history and natural history traits were primarily taken from species accounts published in *The Birds of* North America and the Handbook of Australian, New Zealand, and Antarctic Birds and a review of the evolution of cooperative breeding (Cockburn 2003). Other resources were used to fill in missing species as well as for European species. All told, I was able to obtain data on habitat type, diet, clutch size, and whether a species was a cooperative breeder for 150 species, the number of days a chick was fed for 86 species, age at first reproduction for 69 species and longevity for 38 species. Habitat openness was scored as 0 = completely open habitat (beaches, open deserts), 1 = partially closed habitat (e.g. shrub lands, farmland, parks, mixed habitats, dry or open woodlands) or 2 = closed habitats (dense forest, humid forest, rainforest). Other categorical traits were made dichotomous for analysis: diet was scored as carnivorous/omnivorous (species that were described as eating living prey more than 'rarely') or not; mating system was scored as cooperative breeding or not. Continuous variables were log₁₀-transformed for analysis to normalize distributions. The distance that a human begins walking towards a bird (i.e. the starting distance) explains significant and substantial variation in FID, probably because it is highly correlated with alert distance (Blumstein et al. 2005) and because individuals that detect approaching threats at a greater distance also initiate flight at a greater distance, so that they can escape while the cost of flight is relatively low. Therefore, the starting distance must be incorporated into subsequent analyses (Blumstein 2003). This relation logically should be forced through the origin, because a person beginning to approach a bird at 0 m could only elicit a 0 m FID.

Values of related species are not phylogenetically independent (i.e. species may resemble each other because of shared ancestry), but differences between them are, so I calculated phylogenetically independent contrasts for continuous variables (Felsenstein 2004). I used the Sibley & Ahlquist (1990) phylogeny and the Sibley & Monroe (1990) taxonomy. Unresolved congeners not specifically included in the Sibley & Ahlquist phylogeny were initially scored as polytomies. Polytomies were later resolved randomly using MacClade 4.03 (Maddison & Maddison 2001). I assumed a punctuational model of evolution, calculated contrasts using Compare 4.5 (Martins 2003) and, as required by the method, forced the regression of contrasts through the origin (Felsenstein 2004).

To study the effect of body size on FID, I regressed contrasts of log body size and contrasts of log starting distance against contrasts of log FID_{direct} . The data included species with a range of mean FID_{direct} ($\overline{X} \pm SD$: 16.8 \pm 12.7 m; range 3.4–65.5 m), masses $(30 \pm 1053 \text{ g}; \text{ range})$ 5–8700 g) and starting distances (33.0 \pm 22.4 m; range 8.0–103.8 m).

To study the effect of age at first reproduction, the duration that young were fed, longevity, clutch size and habitat openness, I fitted linear models of these contrasts and interpreted the effect of each variable after explaining variation accounted for by contrasts of log body mass and contrasts of log starting distance.

For categorical traits, I used the concentrated changes test (Maddison 1990). To transform FID into a categorical variable, I regressed log body mass and starting distance against log FID and saved these residuals. Species with positive residuals were then categorized as 'flighty' and those with negative residuals were categorized as 'not flighty'. I also defined 'very flighty' species as those with standardized residuals of at least 0.5. The concentrated changes tests determined whether the evolutionary gain of flightiness (or 'very flightiness') was more likely to occur in species that were carnivorous or omnivorous or that were cooperative breeders.

I used MacClade 4.03 (Maddison & Maddison 2001) to calculate the concentrated changes test and reconstructed character evolution in three ways: (1) assuming strict parsimony; (2) using an ACCTRAN algorithm, which accelerates changes; and (3) using a DELTRAN algorithm, which delays changes. This resulted in three analyses for each independent variable. In all cases I used 10 000 simulations to calculate the reported P values. (The analyses of 'very flighty' species involved more independent origins than those for 'flighty' species, and MacClade required much longer to run those simulations. Thus, for the analyses of very flighty species, P values are estimated from 1000 simulations.) I also set 'either character' as ancestral (because in some cases it was not possible to hypothesize the ancestral condition). P values were calculated for the likelihood that there were at least the observed number of evolutionary gains and losses of sociality.

Analyses were conducted using SPSS 11 for the Macintosh, and linear models were fitted using the GLM univariate method. I interpret two-sided *P* values of less than 0.05 as significant. Residuals from general linear models were visually scrutinized and did not deviate substantially from normal. I report partial eta-squared value as a measure of effect size (Cohen 1988) and interpret variables with very small effect sizes as unimportant in explaining variation in FID.

RESULTS

In general, larger species flushed at significantly greater distances than smaller ones (Fig. 1a). After explaining variation in FID accounted for by log starting distance (partial eta-squared = 0.530, B = 0.765, P < 0.001), log body mass explained significant variation in FID (partial eta-squared = 0.044, B = 0.063, P = 0.010).

Species that first reproduced at greater ages tended to be more flighty (Fig. 1b). After accounting for significant variation explained by log starting distance (partial etasquared = 0.534, B = 0.601, P < 0.001) and log body mass (partial eta-squared = 0.061, B = 0.061, P = 0.044), there was a modest, but nonsignificant effect of age at first reproduction in explaining variation in flight initiation distance (partial eta-squared = 0.043, B = 0.038, P = 0.091).

There was no effect of clutch size on flightiness, although the coefficient was negative (Fig. 1c). After accounting for significant variation explained by log starting

distance (partial eta-squared = 0.534, B = 0.766, P < 0.001) and log body mass (partial eta-squared = 0.046, B = 0.064, P = 0.009), there was no effect of log clutch size in explaining variation in flight initiation distance (partial eta-squared = 0.012, B = -0.053, P = 0.194).

There was no effect of the number of days that young were fed on flightiness (Fig. 1d). After accounting for significant variation explained by log starting distance (partial eta-squared = 0.365, B = 0.612, P < 0.001) and log body mass (partial eta-squared = 0.073, B = 0.081, P = 0.013), there was no effect of the log number of days that young were fed in explaining variation in flight initiation distance (partial eta-squared = 0.004, B = 0.014, P = 0.547).

There was no effect of longevity on flightiness (Fig. 1e). After accounting for significant variation explained by log starting distance (partial eta-squared = 0.365, B = 0.578, P < 0.001) and nonsignificant variation explained by log body mass (partial eta-squared = 0.040, B = 0.073, P = 0.239), there was no effect of log longevity in explaining variation in flight initiation distance (partial eta-squared = 0.004, B = 0.050, P = 0.703).

There was no effect of habitat openness on flightiness (Fig. 1f). After accounting for significant variation explained by log starting distance (partial eta-squared = 0.476, B = 0.594, P < 0.001) and log body mass (partial eta-squared = 0.060, B = 0.073, P = 0.003), there was no effect of habitat openness in explaining variation in flight initiation distance (partial eta-squared = 0.001, B = 0.088, P = 0.671).

Flightiness evolved multiple times, and some clades were flightier than others (see Supplementary Information, Fig. S1). The concentrated changes tests found strong evidence that flightiness and diet, and flightiness and sociality did not evolve independently. ACCTRAN (P < 0.0001), DELTRAN (P < 0.0001) and parsimonious trait reconstructions (P < 0.0001) suggested that carnivorous or omnivorous species were more likely to be flighty. Similarly, ACCTRAN (P < 0.0001), DELTRAN (P < 0.0001) and parsimonious trait reconstructions (P < 0.0001) suggested that cooperative breeding species were more likely to be flighty. When I focused on the 49 very flighty species, I found identical results (i.e. all P values < 0.0001).

DISCUSSION

Taken together, fearfulness coevolved with some life history traits, but others had no effect. Body size and age of first reproduction are positively although not significantly associated with flightiness in birds. Species that eat live food, and those that are highly social, are more flighty than herbivores or noncooperative breeders. I found no effect of the number of days that young were fed, longevity, clutch size or habitat openness on flightiness in a series of analyses that controlled for variation that might be explained by body size. Body size consistently explained 4–7% of the variation in FID. While a modest effect, the effect size of other life history traits was typically much smaller. Body size, thus, seems to

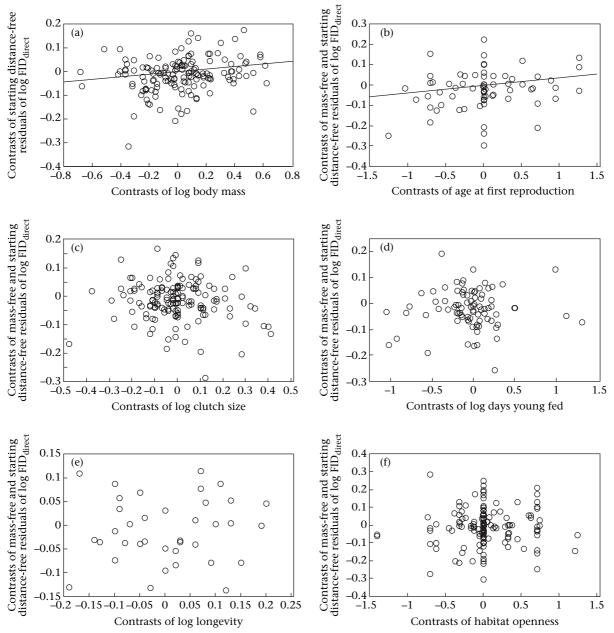


Figure 1. Effects of life history and natural history variation on flightiness in birds. Regressions of phylogenetically independent contrasts of life history traits and habitat openness on the phylogenetically independent contrasts of (a) starting distance-free residuals or (b–f) mass-free and starting distance-free residuals of log flight initiation distance (direct). Regression lines illustrate relations where P < 0.01.

be one of the major measured determinants of flightiness in birds.

There are a variety of reasons why body size might affect disturbance tolerance. Large size may be associated with greater vulnerability if predators are able to detect larger species at a distance. If large-bodied species are less agile than smaller-bodied species (Marden 1987; Witter et al. 1994), the benefit of escape might be greater in large-bodied species. Thus, for any given risk, large-bodied species may flush earlier. If large-bodied species have a lower cost of flight than small-bodied species, then we might expect that they would flush at greater distances (e.g. Ydenberg & Dill 1986). It is conceivable that small-bodied

species must allocate proportionally more time to foraging than larger species because of their relatively greater energy requirements (Bennett & Harvey 1987). If so, then the small species, even though disturbed, would tolerate a greater risk before flight.

Life history traits are expected to be correlated with each other, and finding any significant life history trait suggests that life history variation, in general, may affect fearfulness. The expected relation between age at first reproduction and flightiness was based on 69 species, but estimates of longevity were based on only 30 species. Age at maturity is perhaps a better metric of longevity (Gaillard et al. 1994; Promislow 1994), and unless there is social

suppression of reproduction (Wasser & Barash 1983), age at first reproduction should be correlated with age at maturity. Thus, the finding that age at first reproduction has a modest effect on flightiness is consistent with the hypothesis that life history influences fearfulness. In contrast, the lack of significant relations between flightiness and other measures of parental investment (clutch size, days spent feeding) was unexpected, given Ghalambor & Martin's (2001) experimental results that illustrated a risk-taking survival trade-off. Specifically, they found that birds took greater risks to care for offspring when their own mortality rates were higher (and thus residual reproductive value was lower). Perhaps my findings highlight the relatively small effect of life history traits on species-typical behaviour.

The finding that both diet and sociality coevolved with flightiness suggests that these traits affect the evolutionary origin of wariness. I suspect they do so via 'carry-over effects' from selection on other traits. Animals that eat living prey should be more attentive to movement, and social species should be more attentive to detecting conspecifics. Thus, selection on these traits may alone be a sufficient explanation for why these species are flightier.

Of course there are other factors that may also influence flightiness. For instance, the remarkably versatile corvids (Fig. S1) are relatively flighty. Corvids also have relatively large brains and have high rates of feeding innovations, characteristics associated with species richness (Nicolakakis et al. 2003). Costs of lost foraging opportunities brought about by wariness might be counterbalanced by rapidly habituating to nonthreatening situations.

These results demonstrate that we can predict speciesspecific variation in antipredator behaviour with knowledge of life history and natural history traits. Body size, age at first reproduction, diet and sociality greatly influence how species will respond to approaching threats. These results also allow us to predict which species will be vulnerable to human disturbance and offer the intriguing suggestion that there might be another mechanism underlying anthropogenic extinctions.

As previously discussed, body size is often correlated with extinction probability. Previous hypotheses have focused on the observation that larger species are the target of human hunters (Owens & Bennett 2000; but see Wroe et al. 2004) and the inevitable metabolic cost and smaller population sizes associated with large body size (e.g. Van Valkenburgh et al. 2004). I suggest that another mechanism might be associated with vulnerability, and that this mechanism might explain some of the extinctions associated with Pleistocene human range expansions (Barnosky et al. 2004).

If large-bodied species are more easily disturbed, then they will spend more time escaping possible threats. A simulation model examining the cost of human disturbance found large reductions in the number of food items captured following disturbance (Blumstein et al. 2005). Animals typically select foraging locations to reduce encounters with potentially disturbing humans (Sibbald et al. 2001; also see Gill et al. 1996), and increased human disturbance may lead to a loss of species (Fernández-Juricic 2002; Rodríguez-Prieto & Fernández-Juricic 2005). In

stressful conditions, this increased energy expenditure associated with escaping humans might prove fatal in two ways. First, by avoiding risky areas that contain disturbances, individuals may forage in suboptimal or insufficient areas and simply starve. Second, repeated disturbance could erode individual condition. The large literature on state-dependent foraging (Clark 1994) provides ample evidence that species in poor condition often take greater risks (e.g. Bachman 1993; Krause et al. 1998). Taking greater risks around a novel predator (humans) might ultimately lead to greater mortality.

These scenarios assume that individuals do not habituate to ongoing disturbance. However, habituation is not ubiquitous. Studies of chaparral birds in coastal southern California (unpublished data) suggest that some species habituated to increased disturbance while others sensitized. More research is required to explain species differences in the propensity to habituate or sensitize. However, studies of individually identified yellow-bellied marmots, Marmota flaviventris, in Colorado, have demonstrated that some individuals habituated to repeated human exposure, while others either had no response or sensitized (Runyan & Blumstein 2004). Thus, some species, unable to habituate, could be forced from preferred foraging areas and might suffer greater condition-related mortality than undisturbed species. Large-bodied species, because they need absolutely more food, might be particularly vulnerable to disturbance while foraging.

Acknowledgments

I am extremely grateful to Esteban Fernández-Juricic for many fruitful discussions about the evolution of fearfulness, disturbance tolerance, the importance of body size, as well as for sharing some raw data with me. I also thank P. Zollner for ongoing discussions of these topics and J. Daniel, K. Pollard, John Mitani and two anonymous referees for very constructive comments on previous drafts of the manuscript. I thank L. Anthony, L. Antolin, Y. Attia, Y. Cárdenas, J. Craanen, J. Daniel, M. Edgerton, R. Fernandez, C. Geist, K. Gilmour, L. Ikuta, C. Konig, E. Larsen, O. LeDee, J. Liao, S. Libby, C. Madrileo, T. Morgan, N. Murillo, B. Shen, S. Robertson, I. Rodriguez-Prieto, C. Zugmeyer, L. Zung and especially S. Garity for help collecting and processing data. Research protocols were approved by the Macquarie University Animal Research Committee (99021), the Rocky Mountain Biological Laboratory (RMBL), and the University of California, Los Angeles (UCLA) Animal Research Committee (2000-147-01). Field research permits were issued by Booderee National Park (BDR03/00012), the California Department of Fish and Game, the New South Wales National Parks and Wildlife Service (A2712), Orange County Harbor Beaches and Parks, the U.S. Fish and Wildlife Service (32154), the Parks and Wildlife Service of Tasmania (FA 00060), Seal Beach National Wildlife Refuge, the U.S. National Parks Service (SAMO-2001-SCI-0004), the University of California Natural Reserve System, the Queensland Parks and Wildlife Service (FA/000379/00/SA). Support for this project came from Macquarie University (2001 Research Discovery Scheme grant with R. Harcourt), the UCLA Division of Life Sciences, The Lida Scott Brown Ornithology Trust, the UCLA Office of Instructional Development, the UCLA Council on Research and the National Science Foundation (NSF-DBI-9987953 to RMBL).

SUPPLEMENTARY INFORMATION

Supplementary information associated with this article can be found, in the online version, at doi:10.1016/ j.anbehav.2005.05.010.

References

- Arnez, C. L. & Leger, D. W. 1997. Artificial visual obstruction, antipredator vigilance, and predator detection in the thirteen-lined ground squirrel (Spermophilus tridecemlineatus). Behaviour, 134, 1101–1114.
- Bachman, G. C. 1993. The effect of body condition on the trade-off between vigilance and foraging in Belding's ground squirrels. Animal Behaviour, 46, 233-244.
- Barnosky, A. D., Koch, P. L., Feranec, R. S., Wing, S. L. & Shabel, A. B. 2004. Assessing the causes of late Pleistocene extinctions on the continents. Science, 306, 70-75.
- Beauchamp, G. 1998. The effect of group size on mean food intake rate in birds. Biological Reviews, 73, 449-472.
- Beauchamp, G. 2004. Reduced flocking by birds on islands with relaxed predation. Proceedings of the Royal Society of London, Series B, **271**, 1039-1042.
- Bennett, A. F. & Owens, I. P. F. 2002. Evolutionary Ecology of Birds: Life Histories, Mating Systems and Extinction. Oxford: Oxford University Press.
- Bennett, P. M. & Harvey, P. M. 1987. Active and resting metabolism in birds: allometry, phylogeny and ecology. Journal of Zoology, **213**, 327-363.
- Blumstein, D. T. 2003. Flight initiation distance in birds is dependent on intruder starting distance. Journal of Wildlife Management, **67**, 852-857.
- Blumstein, D. T. & Bouskila, A. 1996. Assessment and decision making in animals: a mechanistic model underlying behavioral flexibility can prevent ambiguity. Oikos, 77, 569-576.
- Blumstein, D. T. & Daniel, J. C. 2002. Isolation from mammalian predators differentially affects two congeners. Behavioral Ecology, **13**, 657–663.
- Blumstein, D. T. & Fernández-Juricic, E. 2004. The emergence of conservation behavior. Conservation Biology, 18, 1175-1177.
- Blumstein, D. T., Anthony, L. L., Harcourt, R. G. & Ross, G. 2003. Testing a key assumption of wildlife buffer zones: is flight initiation distance a species-specific trait? Biological Conservation, 110, 97-100.
- Blumstein, D. T., Fernández-Juricic, E., LeDee, O., Larsen, E., Rodriguez-Prieto, I. & Zugmeyer, C. 2004a. Avian risk assessment: effects of perching height and detectability. Ethology, 110, 273-285.
- Blumstein, D. T., Runyan, A., Seymour, M., Nicodemus, A., Ozgul, A., Ransler, F., Im, S., Stark, T., Zugmeyer, C. & Daniel, J. C. 2004b. Locomotor ability and wariness in yellow-bellied marmots. Ethology, 110, 615-634.
- Blumstein, D. T., Fernández-Juricic, E., Zollner, P. A. & Garity, S. C. 2005. Interspecific variation in anti-predator behaviour and

- human-wildlife coexistence. Journal of Applied Ecology, 42, 943-953.
- Boinski, S., Kauffman, L., Westoll, A., Stickler, C. M., Cropp, S. & Ehmke, E. 2003. Are vigilance, risk from avian predators and group size consequences of habitat structure? A comparison of three species of squirrel monkey (Saimiri oerstedii, S. boliviensis, and S. sciureus). Behaviour, 140, 1421-1467.
- Cahan, S. H., Blumstein, D. T., Sundström, L., Liebig, J. & Griffin, A. 2002. Social trajectories and the evolution of social behavior. Oikos, 96, 206-216.
- Cardillo, M. 2003. Biological determinants of extinction risk: why are smaller species less vulnerable? Animal Conservation, 6,
- Cardillo, M. & Bromham, L. 2001. Body size and risk of extinction in Australian mammals. Conservation Biology, 15, 1435-1440.
- Clark, C. W. 1994. Antipredator behavior and the asset-protection principle. Behavioral Ecology, 5, 159-170.
- Clement, P. 2000. Thrushes. Princeton, New Jersey: Princeton University Press.
- Cockburn, A. 1998. Evolution of helping behavior in cooperatively breeding birds. Annual Review of Ecology and Systematics, 29, 141-177.
- Cockburn, A. 2003. Cooperative breeding in oscine passerines: does sociality inhibit speciation? Proceedings of the Royal Society of London, Series B, 270, 2207-2214.
- Cohen, J. 1988. Statistical Power Analysis for the Behavioral Sciences. 2nd edn. Hillsdale, New Jersey: L. Erlbaum.
- Crooks, K. R., Suarez, A. V., Bolger, D. T. & Soulé, M. E. 2001. Extinction and colonization of birds on habitat islands. Conservation Biology, 15, 159–172.
- Dill, L. M. 1987. Animal decision making and its ecological consequences: the future of aquatic ecology and behavior. Canadian Journal of Zoology, 65, 803-811.
- Dunning, J. B. 1993. CRC Handbook of Avian Body Masses. Boca Raton, Florida: CRC Press.
- Felsenstein, J. 2004. Inferring Phylogenies. Sunderland, Massachusetts: Sinauer.
- Fernández-Juricic, E. 2002. Can human disturbance promote nestedness? A case study with birds in an urban fragmented landscape. Oecologia, 131, 269-278.
- Fernández-Juricic, E. & Schroeder, N. 2003. Do variations in scanning behavior affect tolerance to human disturbance? Applied Animal Behaviour Science, 84, 219–234.
- Fite, K. V. & Lister, B. C. 1981. Bifoveal vision in Anolis lizards. Brain Behavior and Evolution, 19, 144-154.
- Fleishman, L. J., Marshall, C. J. & Hertz, P. E. 1995. Comparative study of temporal response properties of the visual system of three species of anoline lizards. Copeia, 1995, 422-431.
- Frid. A. & Dill. L. M. 2002. Human-caused disturbance stimuli as a form of predation risk. Conservation Ecology, 6, 11. [online] http://www.consecol.org/vol6/iss1/art11.
- Gaillard, J.-M., Allainé, D., Pontier, D., Yoccoz, N. G. & Promislow, D. E. L. 1994. Senescence in natural populations of mammals: a reanalysis. Evolution, 48, 509-516.
- Garamszegi, L. Z., Møller, A. P. & Erritzøe, J. 2002. Coevolving eye size and brain size in relation to prey capture and nocturnality. Proceedings of the Royal Society of London, Series B, **269**. 961–967.
- Gaston, K. J. & Blackburn, T. M. 1995. Birds, body size and the threat of extinction. Philosophical Transactions of the Royal Society of London, Series B, 347, 205-212.
- Geffen, E. & Yom-Tov, Y. 2000. Old endemics and new invaders: alternative strategies of passerines for living in the Australian environment. Behavioral Ecology and Sociobiology, 47, 250-257.

- Ghalambor, C. K. & Martin, T. E. 2001. Fecundity-survival tradeoffs and parental risk-taking in birds. Science, 292, 494–497.
- Gill, J. A., Sutherland, W. J. & Watkinson, A. R. 1996. A method to quantify the effects of human disturbance on animal populations. *Journal of Applied Ecology*, **33**, 786–792.
- Gosling, S. D. 2001. From mice to men: what can we learn about personality from animal research? *Psychological Bulletin*, **127**, 45–86
- Grand, T. C. 1999. Risk-taking behaviour and the timing of life history events: consequences of body size and season. Oikos, 85, 467–480.
- **Greenberg**, **R**. 1983. The role of neophobia in determining the degree of foraging specialization in some migrant warblers. *American Naturalist*, **122**, 444–453.
- **Greenberg, R.** 1990. Ecological plasticity, neophobia, and resource use in birds. *Studies in Avian Biology*, **13**, 431–437.
- Hodos, W. 1993. The visual capabilities of birds. In: Vision, Brain and Behaviour in Birds (Ed. by H. P. Zeigler & H. J. Bischof), pp. 63–76. Cambridge, Massachusetts: MIT Press.
- Johnson, C. N. 2002. Determinants of loss of mammal species during the Late Quaternary 'megafauna' extinctions: life history and ecology, but not body size. Proceedings of the Royal Society of London, Series B, 269, 2221–2227.
- Koops, M. A. & Abrahams, M. V. 1998. Life history and the fitness consequences of imperfect information. *Evolutionary Ecology*, 12, 601–613.
- Krause, J., Loader, S. P., McDermott, J. & Ruxton, G. D. 1998. Refuge use by fish as a function of body length-related metabolic expenditure and predation risks. *Proceedings of the Royal Society of London, Series B*, **265**, 2373–2379.
- Leger, D. W., Owings, D. H. & Coss, R. G. 1983. Behavioral ecology of time allocation in California ground squirrels (*Spermophilus bee-cheyi*): microhabitat effects. *Journal of Comparative Psychology*, 97, 283–291.
- **Lima, S. L.** 1990. Protective cover and the use of space: different strategies in finches. *Oikos*, **58**, 151–158.
- **Lima, S. L.** 1993. Ecological and evolutionary perspectives on escape from predatory attack: a survey of North American birds. *Wilson Bulletin*, **105**, 1–47.
- Lima, S. L. & Dill, L. M. 1990. Behavioral decisions made under the risk of predation: a review and prospectus. *Canadian Journal of Zoology*, 68, 619–640.
- **Maddison, W. P.** 1990. A method for testing the correlated evolution of two binary characters: are gains or losses concentrated on certain branches of a phylogenetic tree? *Evolution*, **44**, 539–557.
- Maddison, W. P. & Maddison, D. R. 2001. *MacClade: Analysis of Phylogeny and Character Evolution*. Version 4.03. Sunderland, Massachusetts: Sinauer.
- **Marden, J. H.** 1987. Maximum lift production during take-off in flying animals. *Journal of Experimental Biology*, **130**, 235–258.
- Martins, E. P. 2003. COMPARE. Version 4.5. Bloomington: Department of Biology, Indiana University.
- Montgomerie, R. D. & Weatherhead, P. J. 1988. Risks and rewards of nest defence by parent birds. *Quarterly Review of Biology*, **63**, 167–187.
- Morse, D. H. 1980. *Behavioral Mechanisms in Ecology*. Cambridge, Massachusetts: Harvard University Press.
- Newton, I. 1998. *Population Limitation in Birds*. San Diego: Academic Press.
- Nicolakakis, N., Sol, D. & Lefebvre, L. 2003. Behavioural flexibility predicts species richness in birds, but not extinction risk. *Animal Behaviour*, **65**, 445–452.
- Owens, I. P. F. & Bennett, P. M. 2000. Ecological basis of extinction risk in birds: habitat loss versus human persecution and introduced

- predators. Proceedings of the National Academy of Sciences, U.S.A., **97**, 12144–12148.
- **Promislow, D. E. L.** 1994. On size and life: progress and pitfalls in the allometry of life span. *Journal of Gerontology*, **48**, B115–B123.
- **Roberts, S. C.** 1988. Social influences on vigilance in rabbits. *Animal Behaviour*, **36**, 905–913.
- Rodríguez-Prieto, I. & Fernández-Juricic, E. 2005. Effects of direct human disturbance on the endemic Iberian frog *Rana iberica* at individual and population levels. *Biological Conservation*, **123**, 1–9.
- Runyan, A. M. & Blumstein, D. T. 2004. Do individual differences influence flight initiation distance? *Journal of Wildlife Management*, 68, 1124–1129.
- Sibbald, A. M., Hooper, R. J., Gordon, I. J. & Cumming, S. 2001. Using GPS to study the effect of human disturbance on the behaviour of red deer stags on a highland estate in Scotland. In: *Proceedings of the Conference Tracking Animals with GPS* (Ed. by A. M. Sibbald & I. J. Gordon), pp. 39–43. Aberdeen: MaCaulay Land Use Research Institute.
- Sibley, C. G. & Ahlquist, J. E. 1990. Phylogeny and Classification of Birds: a Study in Molecular Evolution. New Haven, Connecticut: Yale University Press.
- Sibley, C. G. & Monroe, B. L., Jr. 1990. Distribution and Taxonomy of Birds of the World. New Haven, Connecticut: Yale University Press.
- Sibley, R. M. 2002. Life history theory: an overview. In: Encyclopedia of Evolution (Ed. by M. Pagel), pp. 623–627. Oxford: Oxford University Press.
- Sih, A., Bell, A. M. & Johnson, J. C. 2004a. Behavioral syndromes: an ecological and evolutionary overview. *Trends in Ecology and Evolution*, 19, 372–378.
- Sih, A., Bell, A. M., Johnson, J. C. & Ziemba, R. E. 2004b. Behavioral syndromes: an integrative overview. *Quarterly Review of Biology*, 79, 241–277.
- **Stearns, S. C.** 1977. The evolution of life history traits: a critique of the theory and a review of the data. *Annual Review of Ecology and Systematics*, **8**, 145–171.
- Swaddle, J. P. & Lockwood, R. 1998. Morphological adaptations to predation risk in passerines. *Journal of Avian Biology*, **29**, 172–176.
- Van Valkenburgh, B., Wang, X. & Damuth, J. 2004. Cope's rule, hypercarnivory, and extinction in North American canids. *Science*, 306, 101–104.
- Wasser, S. K. & Barash, D. P. 1983. Reproductive suppression among female mammals: implications for biomedicine and sexual selection theory. *Quarterly Review of Biology*, 58, 513–538.
- Werner, E. E. 1984. The mechanisms of species interactions and community organization in fish. In: *Ecological Communities: Conceptual Issues and the Evidence* (Ed. by D. R. Strong, Jr, A. B. Thistle & D. Simberloff), pp. 360–382. Princeton, New Jersey: Princeton University Press.
- Wilson, D. S., Clark, A. B., Coleman, K. & Dearstyne, T. 1994. Shyness and boldness in humans and other animals. *Trends in Ecology and Evolution*, **9**, 442–446.
- Witter, M. S., Cuthill, I. C. & Bonser, R. H. C. 1994. Experimental investigation of mass-dependent predation risk in the European starling, *Sturnus vulgaris*. *Animal Behaviour*, **48**, 201–222.
- **Wootton, J. T.** 1987. The effects of body mass, phylogeny, habitat, and trophic level on mammalian age at first reproduction. *Evolution*, **41**, 732–749.
- Wroe, S., Field, J., Fullagar, R. & Jermiin, L. S. 2004. Megafaunal extinction in the Late Quaternary and the global overkill hypothesis. *Alcheringa*, **28**, 291–331.
- Ydenberg, R. C. & Dill, L. M. 1986. The economics of fleeing from predators. Advances in the Study of Behavior, 16, 229–249.

Appendix

Table A1. Mean \pm SD distance (in metres) that experimental approaches were initiated (starting distance), the mean \pm SD direct distance between the observer and the bird when it initiated flight (FID_{direct}), and sample sizes from which these estimates were derived

Anatidae	atidae Cygnus atratus Black swam 99.9+47.3 50.4+35.8 19 stidae Chenonetto jubata Australian wood duck 39.7+31.8 25.5±24.9 44 atidae Anas superciliosa Pacific black duck 57.1+36.6 38.9±29.0 50 atidae Anas gracilis Chestnut teal 63.4±30.6 46.5±21.4 52 dae Flour syntamus orientalis Dollarbird 2.7+61.1 8.6+4.1 24 vonidae Dacelo noveguineae 2.6,4+19.3 2.9+22.5 32 vonidae Carcomonist flabelliformis Laughing kookburn 2.6,4+19.3 2.9+22.5 32 tacidae Tichoglosus hementodus Fanas Falled Cuckoo 18.4±8.3 10.6±5.7 11 tatuidae Cacatua galerita Galah 29.6±17.0 8.9±5.6 6 tatuidae Cacatua galerita Galah 29.6±17.3 13.3±14.9 41 tataidae Alextropelia chinensis Spotted turtle-dove 24.9±13.7 12.9±9.0 5 tumbidae	Family	Latin name	Common name	Starting distance	FID_{direct}	Ν
Analidae	titidae Cyprus artatus Black swan 95,947,3 50,413.8,8 19 19 titidae Chenonetta jubata Australian wood duck 37,1136.6 38,9429,0 50 attidae Anas superciliosa Pacific black duck 57,1136.6 38,9429,0 50 attidae Anas gracilis Crey teal 62,4130.6 45,121.4 55 dae Picus wirdis Crey teal 62,4130.6 46,512.1 4 55 dae Picus wirdis Chestrut teal 62,4130.6 46,512.1 4 55 dae Picus wirdis Eurasian green woodpecker 27,72.61 8,641.1 24 acuidae Eurystomus orientalis Dalabrird 41,9133.1 25,942.5 23 attidae Eurystomus orientalis Laughing Bookaburra 26,4417.4 13,8412.2 5 days and the Cocomanis Inbelliformis Sacred kingfisher 41,9138.3 10,615.7 19 lacked Frierboglosus haematodus Ranbow Ionkeet 29,911.7 0 gaptien Cocomanis Inbelliformis Cacatua galeria Europea Cocomanis Inbelliformis Cacatua galeria Europea Cocomanis Guerra Cocomanis G	Megapodiidae	Alectura lathami	Australian brush turkev	26.6+20.3	12.0+13.0	11
Anatidae	atidae Chenonetto jubata Australian wood duck 39,4±31.8 25,5±24.9 4 atidae Anas superciliosa Cery teal 64,3±35.2 416,6±22.8 2 5 atidae Anas costanea Chestrut teal 64,3±35.2 416,6±22.8 2 5 dae Picus virdis Eurastan green woodpecker 27,7±6.1 8,6±4.1 2 dae Eurystomus orientalis Eurastan green woodpecker 27,7±6.1 8,6±4.1 2 cyonidae Daceh onvoeguineae Laughing kookaburra 26,4±17.4 3 22,9±2.5 23 cyonidae Todronglosus hoematodus Sacred kingthiser 41,9±3.4 20,9±8.5 16 catuidae Cacatur oseigelila Salphur-crested cockatoo 28,0±17.3 13,3±14.9 11 catuidae Cacatur oseigelila Sulphur-crested cockatoo 28,0±17.3 13,3±8.8 11 catuidae Pictycercus edimus Eastern rosella 24,8±17.3 13,9±8.8 11 tacidae Platycercus edimus Eastern rosella <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
Anatidae Anos supercilioso Pacífic black duck 57.1±36.6 38.9±29.0 5 Anatidae Anos castanea Chestrut teal 64.±35.2 41.6±22.8 5 Anatidae Anos castanea Chestrut teal 62.4±30.6 46.5±21.4 5 Coracidae Eurystomus orientalis Ladyonidae Docelo novaeguineae Laughing kookaburra 26.4±17.4 13.8±12.3 29.9±6.8 1 Aleyonidae Todiramphus sonctus Facelinamphus Face	atidae Anos superciliosa Pacific black duck 57.1±36.6 38.9±29.0 50.2 22.0 46.3±35.2 41.6±22.8 23.2 23.2 24.1±10.6 46.3±35.2 41.6±22.8 23.2 23.2 24.1±10.6 46.3±35.2 41.6±22.8 23.2 23.2 24.1±10.6 46.3±35.2 41.6±22.8 23.2 23.2 24.2 24.2 24.2 24.2 24.2 24.2 24.2 24.2 24.2 25.2						
Anatidae Anos gracilis Grey teal 64.3±35.2 41.6±22.8 e1/cidae Picus viridis Caractidae Picus viridis Dollarbird 14.9±31. 25.9±22.5 c1/cidae Docelo novoeguineae Laughing kookaburra 26.4±17.4 13.8±12.3 c1/cidae Cacomantis flabelliformis Sarcet Kinfigfisher 14.9±38.3 c1/cidae Cacomantis flabelliformis Sarcet Kinfigfisher 14.9±38.3 c1/cidae Cacotiu a roseicapilla Calabira Cacotiu a golerita Sulphru-crested cockatoo 18.4±8.3 c1/cidae Picus exemius Sarcet Kinfigfisher 27.9±11.4 c1/cidae Picus exemius Sarcet Kinfigfisher 27.9±11.2 c1/cidae Picus exemius Picu	stidae Anos gracilis Crey teal 64.3±35.2 41.6±22.8 25 dae Anos caratorae Chestrut teal 62.4±30.6 46.5±21.4 53 dae Picus viridis Eurastano green woodpecker 27.7±6.1 8.6±4.1 25 dae Eurystomus orientalis Dollarbirio 41.9±33.1 25.9±22.5 23 developed Dacelo novoeguineae Laughing kookaburra 26.4±17.4 13.8±12.3 54 developed 27.7±6.1 8.6±4.1 24.9±2.5 25 developed 27.7±6.1 8.6±4.1 13.8±12.3 50.9±6.8 16 Gardia Galaria Cacatua golerita Caratua foresceptila Galah 29.6±17.0 8.9±5.6 developed 27.8±17.0 14.9±5.6 developed 27.8±17.0 14.9±5.6 developed 27.8±17.1 15.9±5.6 developed 27.9±17.0 14.9±5.6 developed 27.9±17.0 14.9±17.1 developed 27.9±17.0						
Anatidae	atidae Anos costonea Chestnut teal 62,4±30,6 46,5±21,4 24 dade Picus viridia Eurasian green woodpecker 27,7±6.1 8,6±4,1 24 vonidae Dacelo noveaguineae 21,7±6.1 8,6±4,1 24 cyonidae Dacelo noveaguineae 14,9±33,1 25,9±22,5 23 cyonidae Todicamphus sonctus 5acred kingfisher 41,9±38,3 20,9±6,8 16 cyonidae Cacratur osciepalila 6acratur osciepalila 6acratur osciepalila 21,8±11,4 10,0±8,1 11 catuidae Cacatur osciepalila 6alah 29,6±17,3 15,3±14,9 41 catuidae Cacatur osciepalina 5ulphur-crested cockatoo 28,0±17,3 15,3±14,9 41 tacidae Platyererus elegans Crimson rosella 24,8±17,3 13,9±8,8 31 tacidae Platyererus elegans Crimson rosella 24,8±17,3 12,9±9,0 52 umbidae Leucosarcia melonoleuz Cosphanical 24,9±13,1 12,9±16,1 43,2±2,2 31<						
Ticidae Picus viridis Coraciidae Picus viridis Dollatbird alughing dookabura (1943). 1 25,942.5 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Agracidae Picus viridis Eurstomus orientalis Dollatiria 41,9±31, 25,9±2.5 23						
Dolarbird	racidae Eurystomus orientalis Dollarbird 41,9±33,1 25,9±22.5 25 yeynoidae Docelo novequineae Laughing kookaburra 26,4±17.4 13,8±12.3 54 yeynoidae Todiramphus sanctus Sacred kingfisher 41,9±38,3 20,9±6.8 16 factidae Trichoglossus haematodus Raihovo lorikeet 21,8±11.4 10,0±8.1 11 10,						
taletyonidae Dacelo novaeguineae Laughing kookaburra 26.4±17.4 13.8±12.3 59.9±6.8 Luculidae Todiramphus sanctus Sacret kingfisher 41.9±38.3 20.9±6.8 10.6±5.7 1 Luculidae Cacotuna foseicapilla Cactuidae Cacotuda roseicapilla 21.8±11.4 10.6±5.7 1 Lacatuidae Cacatuo ageiria Sulphur-crested cockatoo 28.0±17.3 15.3±14.9 8 9±5.6 6 Lacatuidae Platycercus estimius Calan 29.6±17.0 8.9±5.6 6 Sittacidae Platycercus estimius Eastern orsella 24.8±17.3 11.9±8.8 3 Joilumbiidae Macropagia amboinensis Spotted turtle-dove 20.9±10.0 3 12.9±9.0 5 Joilumbiidae Geopela humeralis Bar-shouldered dove 66.3±35.8 22.1±14.8 2 12.7±9.2 3 3 12.2±14.1 12.7±9.2 3 3 12.2±14.1 12.2±14.1 12.2±14.1 12.2±14.1 12.2±14.1 12.2±14.1 12.2±14.1 12.2±14.1 12.2±14.1 <td>cyonidale Docelo novaeguineae Laughing kookaburra 26,4±17.4 13.8±12.3 54 cyonidae Todramphus sanctus Sacred kingfisher 41,9±38.3 20,9±6.8 16 culidae Caccomonts flabeliformis Fan-tailed cuckoo 18.4±8.3 10.6±5.7 19 tacidae Trichoglosus haematodus Calah 29,6±17.0 8,9±5.6 64 catuidae Cacatua orseicapilla Calah 29,6±17.0 8,9±5.6 64 tacidae Platycerus elegans Crimson rosella 24,8±17.3 13,9±8.8 31 tacidae Platycerus esimius Eastern rosella 24,8±17.3 13,9±8.8 31 umbidae Macroppiga amboinensis Brown cuckoo-dove 20,9±10.0 8,1±4.8 11 umbidae Geopelia humeralis Bran-shouldered dove 66,3±3.8 22,1±14.8 31 umbidae Leucosarcia melanoleuca Wonga pigeon 28,4±16.7 18,5±10.9 22 umbidae Pophyrio porphyrio Purple swamphen 52,8±31.0 34,5±21.8 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<></td>	cyonidale Docelo novaeguineae Laughing kookaburra 26,4±17.4 13.8±12.3 54 cyonidae Todramphus sanctus Sacred kingfisher 41,9±38.3 20,9±6.8 16 culidae Caccomonts flabeliformis Fan-tailed cuckoo 18.4±8.3 10.6±5.7 19 tacidae Trichoglosus haematodus Calah 29,6±17.0 8,9±5.6 64 catuidae Cacatua orseicapilla Calah 29,6±17.0 8,9±5.6 64 tacidae Platycerus elegans Crimson rosella 24,8±17.3 13,9±8.8 31 tacidae Platycerus esimius Eastern rosella 24,8±17.3 13,9±8.8 31 umbidae Macroppiga amboinensis Brown cuckoo-dove 20,9±10.0 8,1±4.8 11 umbidae Geopelia humeralis Bran-shouldered dove 66,3±3.8 22,1±14.8 31 umbidae Leucosarcia melanoleuca Wonga pigeon 28,4±16.7 18,5±10.9 22 umbidae Pophyrio porphyrio Purple swamphen 52,8±31.0 34,5±21.8 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
Alacyonidae	Cyonidae Todiramphus sanctus Sacred kingfisher 41,9438.3 20,9±6.8 16 cuilidae Cacomus flobelliformis Fan-taided cuckoo 18,4±8.3 10,6±5.7 19 tactidae Trichoglossus haematodus Rainbow lorikeet 21,8±11.4 10,0±8.1 11 catuidae Cacatua galeria Sulphur-crested cockatoo 28,0±17.3 15,3±14.9 41 tacidae Platyrezrus eigams Crimson rosella 19,7±12.3 9,1±6.4 83 tacidae Platyrezrus eigams Spotted turtle-dove 24,9±13.7 12,9±9.0 52 umbidae Macropygia amboinensis Spotted turtle-dove 20,9±10.0 8.1±4.8 11 umbidae Coopelia humeralis Brown cuckoo-dove 20,9±10.0 8.1±4.8 11 umbidae Leucosarcia melanoleux Wonga pigeon 24,4±16.7 18,5±10.9 22 umbidae Leucosarcia melanoleux Wonga pigeon 23,3±13.9 15,2±12.1 15 idae Gallinula tenebrosa Dusky moorhen 23,1±1.6 14,4±2						
Statacidae Cacomantis flabelliformis Fan-tailed cuckoo 18.4±8.3 10.6±5.7 15.8tatacidae Trichopolisus haematodus Sanbow lorikeet 21.8±11.4 10.0±8.1 26.2tatuidae Cacotua roseicapilla Calah 29.6±17.0 8.9±5.6 6.2tatuidae Cacotua roseicapilla Sulphur-crested cockatoo 28.0±17.3 13.3±14.9 15.8taticidae Platycercus esimius Santern ossella 19.7±12.3 9.1±6.4 8.5tatacidae Platycercus esimius Santern ossella 24.8±17.3 12.9±9.0 5.0tumbidae Macropyogia amboinensis Spotted turtle-dove 24.9±13.7 12.9±9.0 5.0tumbidae Macropyogia amboinensis Grested pigeon 27.4±13.4 12.7±9.2 5.0tumbidae Ceopela humeralis Sanshouldered dove 66.3±3.8 22.1±14.8 6.0tumbidae Ceopela humeralis	culidae Cacomantis flabelillormis Fan-tailed Cuckoo 18.4±8.3 10.6±5.7 19 tatuidae Cacatua roseicapilla Calah 29.6±17.0 8.9±5.6 64 tatuidae Cacatua roseicapilla Sulphur-crested cockatoo 28.0±17.3 15.3±14.9 41 tataidae Platycerus elegans Crimson rosella 24.8±17.3 13.9±8.8 31 tatcidae Platycerus escimius Eastern rosella 24.8±17.3 13.9±8.8 31 umbidae Sterptopelia chinensis Spotted turtle-dove 24.9±13.7 12.9±9.0 52 umbidae Ocyphaps lophotes Crested pigeon 27.4±13.4 12.7±9.2 31 umbidae Leucosarcia melanoleuca Wonga pigeon 28.4±16.7 18.5±10.9 22 umbidae Leucosarcia melanoleuca Wonga pigeon 28.4±16.7 18.5±10.9 22 ilidae Porphyrio porphyrio Purple swamphen 52.8±31.0 34.5±21.8 68 ilopacidae Limas fedoa Marbide archive 18.2±2.5 17.1±6.6						
Saltacidae	tacidae Trichoglossus heematodus Rainbow lonikeet 21,8±11,4 10,0±8,1 11 atuidae Cacatua galeria Sulphur-crested cockatoo 28,0±17,3 15,3±14,9 41 atacidae Platycercus esigams Crimson rosella 19,7±12,3 9,1±6,4 83 atacidae Platycercus esimius Eastern rosella 24,8±17,3 13,9±8,8 31 umbidae Macropygia amboinensis Spotted turtle-dove 24,9±13,7 12,9±9,0 52 umbidae Macropygia amboinensis Spotted turtle-dove 20,9±10,0 8,1±4,8 11 umbidae Ceopelia humeralis Barshouldered dove 66,3±35,8 22,1±14,8 93 umbidae Leucosarcia melanoleux Wonga pigeon 28,4±16,7 18,5±10,9 22 lidae Golfinula tenebrosa Dusky moorhen 23,3±13,9 15,2±12,8 68 lidae Fulika autra Eurasian coot 24,9±17,6 19,2±15,8 10 lopacidae Numenius macricarus Numenius macricarus 10,0±26,11 14,3±23						
acatuidae Cacatui on seicopilla Galah 29,6+17,0 8.9±5,6 acatuidae Cacatuidae Gracutu galerita Sulphur-crested cockatoo 28,0+17,3 15,3±14,9 4 26,2+17,3 15,3±14,9 4 26,2+17,3 15,3±14,9 4 26,2+17,3 15,3±14,9 4 26,2+17,3 15,3±14,9 4 26,2+17,3 15,3±14,9 4 26,2+17,3 15,3±14,9 4 26,2+17,3 15,3±14,9 4 26,2+12,0 26,2+12,0 26,2+12,0 26,2+12,0 26,2+12,0 26,2+12,0 26,2+12,1 3 1,9±8,8 3 26,2+12,1 3 1,9±8,2 3 2,1+12,9 20,2 20,2 20,2 20,2 20,2 20,2 20,2 20,2 20,2 21,1+14,8 3 20,2 21,1+14,8 3 21,1+14,8 3 22,1+14,8 4 22,2 21,1+14,8 10,2 22,1+14,8 4 22,2,1+14,8 21,1-14,8 20,2 21,1-14,8 20,2 21,1-14,8 20,2 21,1-14,8 20,2 21,1-14,8 20,2 21,1-14,8	catuidae Cacatiua polerita Galah 29.6±17.0 8.9±5.6 64 tacidae Paltycercus elegans Crimson rosella 19.7±12.3 9.1±6.4 83 tacidae Paltycercus elegans Crimson rosella 19.7±12.3 9.1±6.4 83 tumbidae Streptopelia chinerals Spotted turtle-dove 24.9±13.7 12.9±9.0 52 tumbidae Macropygig amboinensis Brown cuckoo-dove 20.9±10.0 84 14.8 tumbidae Geopelin chumeralis Bar-shouldered dove 66.3±35.8 12.2±14.4 89 tumbidae Leucosarcia melanoleuca Wonga pigeon 28.4±16.7 18.5±10.9 22 tumbidae Leucosarcia melanoleuca Monga pigeon 28.4±16.7 18.5±10.9 22 tumbidae Leucosarcia melanoleuca Monga pigeon 28.4±16.7 18.5±10.9 22 tidae Forphyrio porphyrio Purple swamphen 52.8±31.0 34.5±21.8 68 tidae Fulka tara Furasian coot 24.9±17.6 19.2±15.8 10						
Septendidae Cacatua galerita Sulphur-crested cockatoo 28,0±17.3 15,3±14.9 9,1±6.4 8 19,7±12.3 13,9±18.8 19,7±12.3 13,9±18.8 19,7±12.3 13,9±18.8 19,7±12.3 13,9±18.8 19,7±12.3 13,9±18.8 19,7±12.3 13,9±18.8 19,7±12.3 13,9±18.8 19,7±12.3 13,9±18.8 19,7±12.3 13,9±18.8 19,7±12.3 13,9±18.8 19,7±12.3 13,9±18.8 12,9±0.0 19,00 12,9±0.0 12	zatuidae Cacatua galerita Sulphur-crested cockatoo 28,0±17.3 15,3±14.9 41 tacidae Platycercus elegans Crimson rosella 19,7±12.3 9,1±6.4 83 tacidae Platycercus eximius Eastern rosella 24,8±17.3 13,9±8.8 31 umbidae Macropygia amboinensis Spotted turtle-dove 24,9±13.7 12,9±9.0 52 umbidae Ocyphaps lophotes Crested pigeon 27,4±13.4 12,7±9.2 31 umbidae Leucosarcia melanoleuca Wong pigeon 28,4±16.7 18,5±10.9 22 umbidae Leucosarcia melanoleuca Wong pigeon 28,4±16.7 18,5±10.9 22 umbidae Leucosarcia melanoleuca Wouning dove 23,3±13.9 15,2±12.1 15 idae Fulkica otra Luncosarcia Dusky moorhen 22,9±11.6 14,8±10.7 37 idae Fulkica otra Luncosarcia Marbied godwit 44,3±23.5 17,7±8.6 36 idopacidae Numenius americanus Long-billed curlew 4						
Sistacidae Platycerus elegans 19,7±1,23 9,1±6,4 185taticidae Platycerus esimius Eastern rosella 24,8±17,3 13,9±8,8 5 5 5 5 5 5 5 5 5	tacidae Platycercus selgans Crimson rosella 19.7±12.3 9.1±6.4 83 umbidae Streptopelia chimensis Spotted turtle-dove 24.9±13.7 12.9±9.0 52 umbidae Macroptopiga amboinensis Brown cuckoo-dove 20.9±10.0 81.44.8 81 umbidae Geopelia humeralis Bar-shouldered dove 66.3±35.8 22.1±14.8 93 umbidae Leucosarcia melanoleuca Monga pigeon 28.4±16.7 18.5±10.9 22 umbidae Leucosarcia melanoleuca Mourning dove 23.3±13.9 15.2±12.1 15 idae Gallinula tenebrosa Dusky moorhen 23.9±11.6 14.8±10.7 37 idae Gallinula tenebrosa Dusky moorhen 23.9±11.6 14.8±10.7 37 idae Jumerius pheeopus Mimbirel 77.1±6.6 36 18 19.2±15.8 30 idopacidae Numenius menecarus Marbield godwit 44.3±23.5 17.7±8.6 36 idopacidae Fringa (Heteroscelus) brevipes 18.0±10.2 18.9±25						
Patricidade Platycercus eximius Eastern rosella 24,8±17.3 13,9±8.8	tacidae Plafycercus exfimius Eastern rosella 24.8±17.3 31.9±8.8 31 umbidae Macropygia amboinensis Spotted turtle-dove 24.9±13.7 71.2±9.2 31 umbidae Macropygia amboinensis Brown cuckoo-dove 20.9±10.0 8.1±4.8 11 umbidae Geopelia humeralis Bar-shouldered dove 66.3±35.8 22.1±14.8 93 umbidae Leucosarcia melanolaua Wonga pigeon 28.4±16.7 18.5±10.9 22 umbidae Zenaida macroura Mourning dove 23.3±13.9 15.2±12.1 15 idae Gallinula tenebrosa Dusky moorhen 23.9±11.6 14.8±10.7 37 idae Fulkca atra Eurasian coot 24.9±17.6 19.2±15.8 10 idae Fulkca atra Mumenius medagoscariensis 10.0±10.0 44.9±13.2 17.7±8.6 36 idopacidae Numenius medagoscariensis Longacidae 17.7±8.6 17.7±8.6 36 idopacidae Valenterosculas brevisa 17.9±16.2 17.1±8.6 45 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
Columbidae Streptopelia chinensis Spotted turtle-dove 24,9±13,7 12,9±9,0 8,1±4,8 5 Columbidae Macropygia amboinensis Frown cuckoo-dove 20,9±10,0 8,1±4,8 1 Columbidae Copyhaps lophotes Crested pigeon 27,4±13,4 12,7±9,2 2 Columbidae Leucosarcia melanoleuca Wonga pigeon 28,4±16,7 18,5±10,9 2 Columbidae Leucosarcia melanoleuca Mourning dove 23,3±13,9 15,5±12,1 1 Columbidae Porphyrio porphyrio Purple swamphen 23,9±11,6 14,8±10,7 3 15,5±12,1 1 4 15,2±12,1 1 4 1,5±12,1 1 1 1,5±12,1 1 1 1,5±12,1 1 1 1,5±12,1 1 1 1 1,5±12,1 1 1 1 1,5±12,1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	umbidale umbidae Umbidae Macropejia amboinensis Brown cuckoo-dove 24.9±13.7 12.9±9.0 52.0 umbidae Ocyphaps lophotes Crested pigeon 27.4±13.4 12.7±9.2 31.0 umbidae Lecosarcia melanoleuca Wonga pigeon 28.4±16.7 18.5±10.9 22.2 umbidae Lecosarcia melanoleuca Wonga pigeon 28.4±16.7 18.5±10.9 22.2 umbidae Callinula tenebrosa Mourning dove 23.3±13.9 15.2±12.1 15.0 lidae Gallinula tenebrosa Dusky moorhen 23.9±11.6 148.5±10.7 37.0 lidae Gullinula tenebrosa Dusky moorhen 23.9±11.6 148.5±10.7 37.0 lopacidae Limosa fedoa Numenius phaeopus Mimbrel 77.1±66.1 37.7±30.4 28.0 lopacidae Numenius americanus Marbided godwit 44.3±23.5 17.7±8.6 36.5±41.6 42.0 lopacidae Numenius americanus Very Tripophorus semipalmatus 10.0 10.0 38.2±53.7 17.3±8.6 45.0 lopacidae Calidris munitillo Cery-tailed cattler 38.9±25.7 17.3±8.6 45.0 lopacidae Calid						
Columbida	umbidale umbidae Macropyagia amboinensis Brown cuckoo-dove 20.9±10.0 8.1±4.8 11 umbidae Geopelia humeralis Bar-shouldered dove 66.3±35.8 22.1±14.8 93 umbidae Leucosarcia melanoleuca Wonga pigeon 28.4±16.7 18.5±10.9 22 umbidae Zenoida macroura Mourning dove 23.3±13.9 15.2±12.1 15 idae Pophyrio porphyrio Purple swamphen 52.8±31.0 34.5±21.8 68 idae Fulica atra Lumos fedoa Marbled godwit 44.3±23.5 17.7±18.6 36 olopacidae Numenius parejous Whimbrel 77.1±66.1 19.2±15.8 10 olopacidae Numenius americanus Long-billed curlew 48.4±26.8 25.7±9.7 18 olopacidae Vilinger (Heteroscelus) brevipes Eastern curlew 103.8±53.1 65.5±41.6 42 olopacidae Catoptrophorus semipalmatus Wellet 44.8±21.7 20.8±10.2 93 olopacidae Limnodromus griseus Short-billed dowitcher	Psittacidae		Eastern rosella			
Columbidae Cocyphops tophotes Crested pigeon 27,4±13.4 12,7±9.2 Columbidae Geopelia humeralis Bars-shouldered dove 66,3±35.8 22,1±14.8 50,000mbidae Leucosarcia melanoleuca Wonga pigeon 28,4±16.7 18,5±10.9 12,2±12.1 14,2±12.1	umbidale Umbidae Ocyphings lophotes Crested pigeon 27.4±13.4 12.7±9.2 31 umbidae Leucosarcia melanoleuca Wonga pigeon 28.4±16.7 18.5±10.9 22 umbidae Leucosarcia melanoleuca Wonga pigeon 28.4±16.7 18.5±10.9 22 lidae Porphyrio porphyrio Purple swamphen 52.8±31.0 34.5±21.8 68 lidae Gallinula tenebrosa Dusky moorhen 23.9±11.6 148.5±10.7 37 lidae Fulkca atra Eurasian coot 24.9±17.6 148.5±10.7 37 lopacidae Numenius phaeopus Marbled godwit 44.3±23.5 17.7±8.6 36 lopacidae Numenius madagascariensis Long-billed curlew 48.4±26.8 25.7±9.7 18 lopacidae Numenius madagascariensis Eastern curlew 103.8±53.1 37 20 80 80 25.7±9.7 18 80 80 80 80 80 80 80 80 80 80 80 80 80 80<	Columbidae		Spotted turtle-dove	24.9 ± 13.7	12.9 ± 9.0	52
Columbida	umbidabe Ceópelía humeralis Bar-shouldered dove 66.3±35.8 22.1±4.8 93 umbidae Leucosarcía melanoleuca Monga pigeon 28.4±16.7 18.5±10.9 22 umbidae Zenoida macroura Mourning dove 23.3±13.9 15.2±12.1 15 idae Porphyrio porphyrio Purple swamphen 52.8±31.0 34.5±21.8 68 idae Fullica atra Eurasian coot 24.9±17.6 19.2±15.8 10 lopacidae Numenius phaeopus Whimbrel 77.1±66.1 37.7±30.4 28 lopacidae Numenius madagascariensis Jong-billed curlew 48.4±26.8 52.7±9.7 18 lopacidae Vumenius madagascariensis Jong-billed curlew 48.4±26.8 52.7±9.7 18 lopacidae Catoptrophorus semipalmatus Willet 44.8±21.7 20.8±10.2 93 lopacidae Calidris muri Western sandpiper 31.7±18.7 56.5±41.6 42 lopacidae Calidris minutilla Least sandpiper 31.7±18.7 56.±25.7 <t< td=""><td>Columbidae</td><td>Macropygia amboinensis</td><td>Brown cuckoo-dove</td><td>20.9 ± 10.0</td><td>8.1 ± 4.8</td><td>11</td></t<>	Columbidae	Macropygia amboinensis	Brown cuckoo-dove	20.9 ± 10.0	8.1 ± 4.8	11
Columbidae Leucosarcia melanoleuca Monga pigeon 28.4±16.7 18.5±10.9 2.0	umbidae Geòpelia humeralis Bar-shouldreed dove 66,3+35.8 22,1±14.8 93 umbidae Leucosarcia melanoleuca Monga pigeon 28,4±16.7 18,5±10.9 22 umbidae Zenaida macroura Mourning dove 23,3±13.9 15,2±12.1 15 lidae Purphyino porphyrio Purple swamphen 23,9±11.6 14,8±10.7 37 lidae Fulkica atra Eurasian coot 24,9±17.6 19,2±15.8 10 lopacidae Numenius pracepus Whimbrel 77,1±66.1 37,7±30.4 28 lopacidae Numenius madagascariensis Jong-billed curlew 48,4±26.5 32,7±9.7 18 lopacidae Vumenius madagascariensis Jong-cidae 10,8±51.1 65,5±41.6 42 lopacidae Catoptrophorus semipalmatus Willet 44,8±21.7 20,8±10.2 93 lopacidae Calidris muri Western sandpiper 29,8±15.0 12,7±6.2 11 lopacidae Calidris muri Western sandpiper 23,2±17.1 9,2±5.7 33	Columbidae	Ocyphaps lophotes	Crested pigeon	27.4 ± 13.4	12.7 ± 9.2	31
Doumbide Zenaida macroura	lumbidae Zenaida macroura Mourning dove 23.3±13.9 15.2±12.1 15 lidae Porphyrio porphyrio Purple swamphen 52.8±31.0 34.5±21.8 68 lidae Fulica atra Eurasian coot 24.9±17.6 19.2±15.8 10 lopacidae Limosa fedoa Marbide godwit 44.3±23.5 17.7±8.6 36 lopacidae Numenius melogauscariensis Limosa dagascariensis 17.1±66.1 37.7±30.4 28 lopacidae Numenius madagascariensis Lopacidae Minmerius madagascariensis 13.8±63.1 65.5±41.6 42 lopacidae Arenaria interpres Ruddy turnstone 28.6±10.0 13.8±6.4 51 lopacidae Calidris muirulila Western sandpiper 31.7±18.7 15.6±9.3 22 lopacidae Calidris mitrulila Least sandpiper 31.7±18.7 15.6±9.3 22 lopacidae Calidris minutilla Least sandpiper 31.7±18.7 15.6±9.3 22 lopacidae Calidris minutilla Least sandpiper 23.2±17.1	Columbidae		Bar-shouldered dove	66.3 ± 35.8	22.1 ± 14.8	93
Dourning dove 23.3±13.9 15.2±12.1 18.1 18.1 18.1 18.2±18.8 18.1 18.2±18.8 18.1 18.2±18.8 18.1 18.2±18.8 18.1 18.2±18.8 18.1	lumbidae Zenaida macroura Mourning dove 23.3±13.9 15.2±12.1 15 lidae Porphyrio porphyrio Purple swamphen 52.8±31.0 34.5±21.8 68 lidae Fulica atra Eurasian coot 24.9±17.6 19.2±15.8 10 lopacidae Limosa fedoa Marbide godwit 44.3±23.5 17.7±8.6 36 lopacidae Numenius melogauscariensis Limosa dagascariensis 17.1±66.1 37.7±30.4 28 lopacidae Numenius madagascariensis Lopacidae Minmerius madagascariensis 13.8±63.1 65.5±41.6 42 lopacidae Arenaria interpres Ruddy turnstone 28.6±10.0 13.8±6.4 51 lopacidae Calidris muirulila Western sandpiper 31.7±18.7 15.6±9.3 22 lopacidae Calidris mitrulila Least sandpiper 31.7±18.7 15.6±9.3 22 lopacidae Calidris minutilla Least sandpiper 31.7±18.7 15.6±9.3 22 lopacidae Calidris minutilla Least sandpiper 23.2±17.1	Columbidae			28.4±16.7	18.5±10.9	22
ballidae Porphyrio porphyrio Purple swamphen 52.8±31.0 34.5±21.8 6 ballidae Gallimule tenebrosa Dusky moorhen 23.9±11.6 14.8±10.7 3 ballidae Fulica atra Eurasian coot 24.9±17.6 19.2±15.8 1 ballidae Fulica atra Eurasian coot 24.9±17.6 19.2±15.8 1 ballidae Limosa fedoa Marbiel dodwit 44.3±23.5 17.7±8.6 3 ballidae Numenius madagascariensis Whimbrel 77.1±66.1 37.7±30.4 2 ballidae Numenius madagascariensis Long-billed curlew 48.8±26.8 25.7±9.7 1 ballidae Arenaria interpres Ballidae Long-billed curlew 48.8±10.2 2 3.9±10.2 25.9±17.7 17.3±8.6 4 3.9±25.7 17.3±8.6 4	lidae Porphyrio porphyrio Purple swamphen 52.8±31.0 34.5±21.8 68 lidae Gallinula tenebrosa Dusky moorhen 23.9±11.6 14.8±10.7 37 lidae Fulica atra Eurasian coot 24.9±17.6 19.2±15.8 10 lopacidae Numenius phaeopus Nimbrel 77.1±66.1 37.7±30.4 28 lopacidae Numenius medagoscariensis Long-billed curlew 48.4±26.8 25.7±9.7 18 lopacidae Catoptrophorus semipalmatus Estern curlew 103.8±33.1 65.5±41.6 42 lopacidae Catoptrophorus semipalmatus Willet 44.8±21.7 20.8±10.2 93 lopacidae Calidris mari Western Sandpiper 31.7±18.7 15.6±9.3 22 lopacidae Calidris muri Western Sandpiper 31.7±18.7 15.6±9.3 22 lopacidae Calidris muri Least sandpiper 31.7±18.7 15.6±9.3 22 lopacidae Calidris muri Least sandpiper 31.7±18.7 15.6±9.3 22 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
Iallidae Gallinula tenebrosa Dusky moorhen 23,9±11.6 14,8±10.7 32,8±11.6 14,8±10.7 32,8±17.6 19,2±15.8 32,8±17.6 19,2±15.8 17,7±8.6 32,8±17.6 19,2±15.8 17,7±8.6 32,8±17.6 19,2±15.8 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 17,7±8.6 32,7±30.4 18,1±20.7 13,1±30.4 18,1±20.7 13,1±30.4 18,1±20.7 13,1±30.4 18,1±20.7 13,1±30.4 18,1±20.7 13,1±30.4 18,1±20.7 13,1±30.4 18,1±20.7 13,1±30.4 18,1±20.7 13,1±30.4 18,1±20.7 13,1±30.4 18,1±20.7 13,1±30.4 18,1±20.7 13,1±30.4 18,1±20.7 13,1±30.4 18,1±20.7 13,1±30.2 18,1±20.7 13	lidae Gallinula tenebrosa Dusky moorhen 23.9±11.6 14.8±10.7 37 lidae Fulica atra Eurasian coot 24.9±1.76 19.2±15.8 10 lopacidae Numenius pheopus Marbled godwit 44.3±23.5 17.7±8.6 36 lopacidae Numenius mericanus Minericanus 48.4±26.8 25.7±9.7 18 lopacidae Numenius madagascariensis Incop-billed curlew 13.8±53.1 65.5±41.6 42 slopacidae Catoptrophorus semipalmatus Grey-tailed tattler 18.9±25.7 17.3±8.6 42 slopacidae Limnodromus griseus Willet 44.8±21.7 20.8±10.2 93 slopacidae Calidris murillo Least sandpiper 31.7±18.7 15.6±9.3 22 slopacidae Calidris minutilla Least sandpiper 31.2±10.1 16.4±8.7 61 slopacidae Calidris minutilla Least sandpiper 23.2±17.1 9.2±5.7 33 slopacidae Calidris minutilla Least sandpiper 23.2±17.1 9.2±5.7 <						
Rallidae Fulica otra Eurasían coot 24,9±17.6 19,2±15.8 12,2±15.9 12,2±15.8 12,2±15.8 12,2±15.8 12,2±15.8 12,2±15.8 12,2±15.8 12,2±15.8 12,2±15.8 12,2±15.8 12,2±15.8 12,2±15.9 22,2±17.7 12,2±15.8	ikidae Fulica atra Eurasian coot 24.9±17.6 19.2±15.8 10. olopacidae Limosa fedoa Marbled godwit 44.3±2.5 17.7±8.6 36. olopacidae Numenius phaeopus Whimbrel 77.1±66.1 37.7±30.4 28. olopacidae Numenius madagascariensis Long-billed curlew 48.4±26.8 25.7±9.7 18. olopacidae Tringa (Heteroscelus) brevipes olopacidae Catoptrophorus semiplumatus Willet 48.8±21.7 20.8±10.2 29. olopacidae Catoptrophorus semiplumatus Willet 44.8±21.7 20.8±10.2 38. olopacidae Limnodromus griseus Short-billed dowitcher 29.8±15.0 13.8±6.4 51. olopacidae Calidris mauri Western sandpiper 31.7±18.7 15.6±9.3 22. olopacidae Calidris minutilla Least sandpiper 23.2±17.1 9.2±5.7 33. olopacidae Calidris acuminata Sharp-tailed sandpiper 23.2±17.1 9.2±5.7 33. olopacidae Calidris acuminata Sharp-tailed sandpiper 23.2±17.1 9.2±5.7 33. olopacidae Burhinus grallarius Bush stone-curlew 41.6±9.3 25.9±20.7 13. olopacidae Haematopus longirostris Pied oystercatcher 95.9±54.8 38.5±18.0 23. olopacidae Haematopus lunginosus Sooty oystercatcher 95.9±54.8 38.5±18.0 23. olopacidae Haematopus lunginosus Sooty oystercatcher 95.9±54.8 38.5±18.0 23. olopacidae Haematopus lunginosus Sooty oystercatcher 95.9±2.2 38.3±21.1 63. olopacidae Haematopus lunginosus Black-ecked stilt 47.6±26.7 22.3±12.9 52. olopacidae Pluvialis squatarola Black-bellied plover 63.9±29.8 30.5±15.8 59. olopacidae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 21.0±1						
icolopacidae Limosa fedoa Marbled godwit 44,3±23.5 17,7±8.6 2 icolopacidae Numenius phaeopus Whimbrel 77,1±66.1 37,7±30.4 2 icolopacidae Numenius madagoscariensis Long-billed curlew 48,4±26.8 25,7±9.7 1 icolopacidae Tringa (Hetroscelus) brevipes Eastern curlew 103,8±53.1 65,5±41.6 4 icolopacidae Catoptrophorus semipalmatus Willet 44,8±21.7 20,8±10.2 9 icolopacidae Calidris miterpres Ruddy turnstone 28,66±10.0 13,8±6.4 2 icolopacidae Calidris muri Western sandpiper 31,7±18.7 15,6±9.3 2 icolopacidae Calidris murilla Least sandpiper 23,2±17.1 9,2±5.7 3 icolopacidae Calidris acuminata Sharp-tailed sandpiper 23,2±17.1 9,2±5.7 3 icolopacidae Calidris minutilla Least sandpiper 23,2±17.1 9,2±5.7 3 icolopacidae Calidris acuminata Sharp-tailed sandpiper 26,5±12.				,			
Numenius phaeopus Numenius maericanus Long-billed curlew 48.4±26.8 25.7±9.7 1.566.1 37.7±30.4 2.500pacidae Numenius maericanus Long-billed curlew 48.4±26.8 25.7±9.7 1.500pacidae Numenius maericanus Long-billed curlew 48.4±26.8 25.7±9.7 1.500pacidae Numenius maericanus Long-billed curlew 48.4±26.8 25.7±9.7 1.500pacidae Caloptrophorus semipalmatus Caloptrophorus Caloptropho	Namenius phaeopus Whimbref 77.1±66.1 37.7±30.4 28 Numenius marcicanus Long-billed curlew 48.4±26.8 25.7±9.7 18 18 18 18 18 18 18 1						
icolopacidae Numenius americanus Long-billed curlew 148.4±26.8 25.7±9.7 cicolopacidae Numenius madagascarienis Eastern curlew 103.8±53.1 65.5±41.6 2 miles (Colopacidae Tringa (Heteroscelus) brevipes Cicolopacidae Catoptrophorus semipalmatus Villet 44.8±21.7 20.8±10.2 20.8±10.2 cicolopacidae Arenaria interpres Ruddy turnstone 28.6±10.0 13.8±6.4 5 cicolopacidae Limnodromus griseus Short-billed dowitcher 29.8±15.0 12.7±6.2 cicolopacidae Calidris murii Western sandpiper 31.7±18.7 15.6±9.3 2 cicolopacidae Calidris ruficollis Red-necked stint 31.2±11.0 16.4±8.7 6 cicolopacidae Calidris ruficollis Red-necked stint 31.2±11.0 16.4±8.7 6 cicolopacidae Calidris ruficollis Red-necked stint 31.2±11.0 16.4±8.7 6 cicolopacidae Calidris curimiata Sharp-tailed sandpiper 23.2±17.1 9.2±5.7 5 cicolopacidae Calidris curimiata Sharp-tailed sandpiper 26.5±12.9 14.8±8.7 2 surhinidae Humantopus princistris Pied oystercatcher 95.9±54.8 38.5±18.0 2 cicolopacidae Haematopus longirostris Pied oystercatcher 95.9±54.8 38.5±18.0 2 cicolopacidae Haematopus Inliginosus Sooty oystercatcher 95.9±54.8 38.5±18.0 2 cicolopacidae Himantopus Revicanus Black-winged stilt 56.9±22.2 38.3±21.1 ticolopacidae Himantopus Revicanus Black-necked stilt 56.9±22.2 38.3±21.1 ticolopacidae Himantopus Revicanus Black-necked stilt 56.9±22.2 38.3±21.1 ticolopacidae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 cicolaradriidae Pluvialis squatarola Black-bellied plover 36.9±29.8 36.0±18.7 2 cicolaradrius unificapillus Red-capped plover 36.9±29.8 36.0±18.7 2 cicolaradrius unificapillus Red-capped plover 36.9±29.8 36.0±18.7 2 cicolaradrius vulcianus Kelp gull 54.9±22.4 2 cicolaria. 1 cicolaradrius vulcianus Kelp gull 54.9±22.4 2 cicolaria. 2 cicolaradrius Vanellus miles Masked lapwing 92.2±48.4 4 6.8±30.5 3 cicolaradrius Alaridae Larus occidentalis Western gull 54.9±22.4 2 cicolaria. 2 cicolaradrius Phalacrocorax varius Pied cormorant 56.5±32.6 19.8±14.3 5 cicolaradrius Phalacrocorax varius Pied cormorant 7 cicolaradrius Phalacrocorax varius Phalacrocorax vari							
icolopacidae Numenius madagascariensis Eastern curlew 103.8±5.3.1 65.5±41.6 4 icolopacidae Tringa (Heteroscelus) brevipes Grey-tailed tattler 38.9±25.7 17.3±8.6 4 icolopacidae Arenaria interpres Willet 44.8±21.7 20.8±10.2 20.8±10.0 13.8±6.4 5 icolopacidae Calidris mauri Western Sandpiper 31.7±18.7 15.6±9.3 2 icolopacidae Calidris multila Least sandpiper 23.2±17.1 9.2±5.7 6 icolopacidae Calidris multilla Least sandpiper 23.2±17.1 9.2±5.7 6 icolopacidae Calidris multilla Least sandpiper 23.2±17.1 9.2±5.7 6 icolopacidae Calidris acuminata Sharp-tailed sandpiper 26.5±12.9 14.8±8.7 2 icolopacidae Calidris multilla Least sandpiper 23.2±17.1 9.2±5.7 3 2 2 25.9±20.7 1 4 8 2 2 2 2 2 2 2 2	Alpacidae Numenius madagascariensis Eastern curlew 103.8±53.1 65.5±41.6 42 Alpacidae Tringa (Heteroscelus) brevipes Grey-tailed tattler 38.9±25.7 17.3±8.6 45 Alpacidae Catoptrophorus semipalmatus Willet 44.8±21.7 20.8±10.2 93 Alpacidae Limnodromus griseus Short-billed dowitcher 29.8±15.0 12.7±6.2 11 Alpacidae Calidris mauri Western sandpiper 31.7±18.7 15.6±9.3 22 Alpacidae Calidris michilla Least sandpiper 31.7±18.7 15.6±9.3 22 Alpacidae Calidris michilla Least sandpiper 23.2±17.1 9.2±5.7 33 Alpacidae Calidris acuminata Sharp-tailed sandpiper 26.5±12.9 14.8±8.7 28 Alpacidae Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 13 Ematopodidae Haematopus longirostris Pied oystercatcher 95.9±54.8 38.5±18.0 23 Ematopodidae Haematopus fuliginosus Sooty oystercatcher 58.2±25.8 30.5±15.8 59 Eurovirostridae Himantopus mexicanus Black-micked still 47.6±26.7 22.3±12.9 52 aradriidae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 21 aradriidae Elsyornis melanops Black-fronted dotterel 36.9±29.8 36.0±18.7 41 aradriidae Larus dominicanus Ring-billed gull 54.9±22.4 22.0±7.7 16 aradriidae Larus odminicanus Ring-billed gull 54.9±22.4 22.0±13.1 15 didae Larus odminicanus Kelp gull 63.1±36.0 16.8±12.1 136 didae Larus novaehollandiae Silver gull 37.2±25.9 17.4±10.8 26 didae Sterna abifrons Little tern 48.2±6.6 21.5±7.9 18 alacrocoracidae Phalacrocorax varius Pied cormorant 56.5±32.6 19.8±14.3 38 alacrocoracidae Phalacrocorax varius Pied cormorant 56.4±24.8 32.3±20.1 33 bleidae Egretta anvaehollandiae Creat blue heron 73.9±46.3 36.6±23.1 46 bleidae Egretta anvaehollandiae Creat blue heron 73.9±46.3 36.6±23.1 47 deidae Egretta anvaehollandiae Creat blue heron 73.9±46.3 36.6±23.1 47 dei						
icolopacidae Tringa (Heteroscelus) brevipes Grey-tailed tattler 38.9±25.7 17.3±8.6 4 icolopacidae Catoptrophorus semipalmatus Willet 44.8±21.7 20.8±10.2 5 icolopacidae Limnodromus griseus Short-billed dowitcher 28.6±10.0 13.8±6.4 5 icolopacidae Calidris muri Western sandpiper 29.8±15.0 12.7±6.2 1 icolopacidae Calidris ruficollis Red-necked stint 31.2±11.0 16.4±8.7 6 icolopacidae Calidris minutilla Least sandpiper 23.2±17.1 9.2±5.7 3 decolopacidae Calidris minutilla Least sandpiper 23.2	Allopacidae Tringa (Heteroscelus) brevipes Grey-tailed tattler 38.9±25.7 17.3±8.6 45 Allopacidae Catoptrophorus semipalmatus Willet 44.8±21.7 20.8±10.2 93 Allopacidae Arenaria interpres Ruddy turnstone 28.6±10.0 13.8±6.4 51 Allopacidae Calidris mauri Western sandpiper 31.7±18.7 15.6±9.3 22 Allopacidae Calidris multilla Least sandpiper 31.7±18.7 15.6±9.3 22 Allopacidae Calidris minutilla Least sandpiper 23.2±17.1 9.2±5.7 33 Allopacidae Calidris acuminata Sharp-tailed sandpiper 23.2±17.1 9.2±5.7 33 Allopacidae Calidris acuminata Sharp-tailed sandpiper 26.5±12.9 14.8±8.7 28 Allopacidae Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 13 Bernatopodidae Haematopus longirostris Pied oystercatcher 95.9±54.8 38.5±18.0 23 Bernatopodidae Haematopus longirostris Pied oystercatcher 95.9±54.8 38.5±18.0 23 Bernatopodidae Himantopus mixicanus Black-winged stilt 56.9±22.2 38.3±21.1 63 Baruviriostridae Himantopus mixicanus Black-winged stilt 47.6±26.7 22.3±12.9 52 Barderidade Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 21 Barderidade Pluvialis squatrola Black-bellied plover 33.9±29.8 36.0±18.7 41 Barderidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 37 Barderidae Vanellus miles						
Colopacidae Arenaria interpres Ruddy turnstone 28.6±10.0 13.8±6.4 5.000 pacidae Limnodromus griseus Short-billed dowitcher 29.8±15.0 12.7±6.2 15.000 pacidae Limnodromus griseus Short-billed dowitcher 29.8±15.0 12.7±6.2 15.000 pacidae Calidris mauri Western sandpiper 31.7±18.7 15.6±9.3 20.000 pacidae Calidris minutilla Least sandpiper 31.2±11.0 16.4±8.7 6.000 pacidae Calidris minutilla Least sandpiper 23.2±17.1 9.2±5.7 15.000 pacidae Calidris acuminata Sharp-tailed sandpiper 26.5±12.9 14.8±8.7 20.000 pacidae Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 14.8±8.7 20.000 pacidae Haematopus longirostris Pied oystercatcher 95.9±54.8 38.5±18.0 20.000 pacidae Haematopus luliginosus Sooty oystercatcher 95.9±54.8 38.5±18.0 20.000 pacidae Haematopus luliginosus Sooty oystercatcher 95.9±54.8 38.5±18.0 20.000 pacidae Himantopus himantopus Black-winged still 56.9±22.2 38.3±21.1 20.000 pacidae Himantopus mexicanus Black-necked still 47.6±26.7 22.3±12.9 9.000 pacidae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 20.000 pacidae Pluvialis supatarola Black-bellied plover 35.4±21.6 21.9±12.1 20.000 pacidae Pluvialis supatarola Black-bellied plover 36.9±29.8 36.0±18.7 40.000 pacidae Pluvialis supatarola Black-bellied plover 36.9±16.6 22.0±7.7 15.000 pacidae Pluvialis supatarola Black-bellied plover 36.9±16.6 22.0±7.7 15.000 pacidae Pluvialis supatarola Black-bellied plover 36.9±16.6 22.0±7.7 15.000 pacidae Pluvialis supatarola Black-bellied pluvialis supatarola Black-bellied plu							
icolopacidae Arenaria interpres Short-billed dowitcher 29.8±15.0 12.7±6.2 11.00 13.8±6.4 55.00 pacidae Limnodromus griseus Short-billed dowitcher 29.8±15.0 12.7±6.2 11.00 12.00 12.00 12.00 12.00 12.00 12.00 12.7±6.2 11.00 12.00	Diopacidae						
icolopacidae Limnodromus griseus Short-billed dowitcher 29.8±15.0 12.7±6.2 15.cclopacidae Calidris mauri Western sandpiper 31.7±18.7 15.6±9.3 25.cclopacidae Calidris minutilla Least sandpiper 23.2±17.1 9.2±5.7 25.cclopacidae Calidris minutilla Least sandpiper 23.2±17.1 9.2±5.7 25.cclopacidae Calidris acuminata Sharp-tailed sandpiper 24.5±12.9 14.8±8.7 25.cclopacidae Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 15.cclopacidae Haematopous longirostris Pied oystercatcher 95.9±54.8 38.5±18.0 24.aematopodidae Haematopus luliginosus Sooty oystercatcher 58.2±25.8 30.5±15.8 25.cclopacidae Himantopus bilinginosus Sooty oystercatcher 58.2±25.8 30.5±15.8 25.cclopacidae Himantopus bilinginosus Sooty oystercatcher 58.2±25.8 30.5±15.8 25.cclopacidae Himantopus himantopus Black-winged stilt 56.9±22.2 38.3±21.1 66.cclopacidae Himantopus mexicanus Black-necked stilt 47.6±26.7 22.3±12.9 9.cclopacidae Pluvialis fullva Pacific golden plover 35.4±21.6 21.9±12.1 22.cclopacidae Pluvialis squatarola Black-bellied plover 63.9±29.8 36.0±18.7 4.cclopacidae Pluvialis squatarola Black-fronted dotterel 38.6±14.2 22.7±9.3 4.cclopacidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 36.cclopacidae Larus doelmacensis Ring-billed gull 54.9±22.4 22.0±13.1 4.caridae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 11.caridae Larus dominicanus Kelp gull 63.1±36.0 16.8±12.1 13.caridae Larus oxcidentalis Western gull 37.2±25.9 17.4±10.8 2.caridae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12.caridae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12.caridae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12.caridae Phalacrocoracidae Phalacrocor	Diopacidae Limnodromus griseus Short-billed dowitcher 29.8±15.0 12.7±6.2 11		Catoptrophorus semipalmatus				
Scolopacidae Calidris mauri Western sandpiper 31.7±18.7 15.6±9.3 25 (scolopacidae Calidris ruficollis Red-necked stint 31.2±11.0 16.4±8.7 31.2±17.1 19.2±5.7 31 (scolopacidae Calidris ruficollis Least sandpiper 23.2±17.1 9.2±5.7 31 (scolopacidae Calidris acuminata Sharp-tailed sandpiper 26.5±12.9 14.8±8.7 32.9±20.7 18 (surhinidae Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 18 (alematopodidae Haematopus longirostris Pied oystercatcher 95.9±54.8 38.5±18.0 29 (alematopodidae Haematopus fuliginosus Sooty oystercatcher 95.9±54.8 30.5±15.9 30.5±15.9 30.	Dispacidae Calidris mauri						
colopacidae Calidris ruficollis Red-necked stint 31.2±11.0 16.4±8.7 60 colopacidae Calidris minutilla Least sandpiper 23.2±17.1 9.2±5.7 colopacidae Calidris minutilla Least sandpiper 26.5±12.9 14.8±8.7 26 colopacidae Calidris cauminata Sharp-tailed sandpiper 26.5±12.9 14.8±8.7 26 colopacidae Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 17 colopacidae Haematopus longirostris Pied oystercatcher 95.9±54.8 38.5±18.0 18-matematopodidae Haematopus fuliginosus Sooty oystercatcher 95.9±54.8 38.5±18.0 30.5±15.8 25 colopacidae Himantopus fuliginosus Sooty oystercatcher 95.9±54.8 38.5±18.0 18-matematopodidae Himantopus fuliginosus Sooty oystercatcher 95.9±54.8 30.5±15.8 25 colopacidae Himantopus fuliginosus Sooty oystercatcher 95.9±22.5 38.3±21.1 26 colopacidae Himantopus fuliginosus Black-winged stilt 56.9±22.2 38.3±21.1 26 colopacidae Pluvialis squatarola Black-necked stilt 47.6±26.7 22.3±12.9 12.0 colopacidae Pluvialis squatarola Black-bellied plover 35.4±21.6 21.9±12.1 20.0 colopacidae Pluvialis squatarola Black-bellied plover 63.9±29.8 36.0±18.7 40.0 colopacidae Pluvialis squatarola Black-fronted dotterel 38.6±14.2 22.7±9.3 40.0 colopacidae Elseyornis melanops Black-fronted Elseyornis melanops Elseyornis Elseyor	Diopacidae Calidris ruficollis Red-necked stint 31.2±11.0 16.4±8.7 61 Diopacidae Calidris minutilla Least sandpiper 23.2±17.1 9.2±5.7 33 Diopacidae Calidris acuminata Sharp-talied sandpiper 23.2±17.1 9.2±5.7 33 Diopacidae Calidris acuminata Sharp-talied sandpiper 23.2±17.1 9.2±5.7 33 Diopacidae Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 13 Pematopodidae Haematopus longirostris Pied oystercatcher 95.9±54.8 38.5±18.0 23 Pied oystercatcher 95.9±54.8 31.2±20.7 34 Pied oystercatcher 95.9±54.8 31.2±20.7 34 Pied oystercatcher 95.9±54.8 31.2±20.1 34 Pied oystercatcher 95.9±54.8 31						
colopacidae Calidris minutilla Least sandpiper 23.2±17.1 9.2±5.7 25 25 26 26 27 24 24 25.7 25 26 26 27 26 27 26 27 27 27 27 28 27 27 28 28 28 28 28 28 28 28 28 28 28 28 28	Diopacidae Calidris minutilla Least sandpiper 23.2±17.1 9.2±5.7 33 Diopacidae Calidris acuminata Sharp-tailed sandpiper 26.5±12.9 14.8±8.7 28 Thinking and minutilla Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 13 25.9±20.7 13 25.9±20.7 13 25.9±20.7 13 25.9±20.7 27 25.9±20.7 28	Scolopacidae	Calidris mauri	Western sandpiper	31.7±18.7	15.6 ± 9.3	22
Scolopacidae Calidris acuminata Sharp-tailed sandpiper 26.5±12.9 14.8±8.7 25.9 surhinidae Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Nopacidae Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 13 ematopodidae Haematopus longinostris Pied oystercatcher 95.9±54.8 38.5±18.0 23 sematopodidae Haematopus fuliginosus Sooty oystercatcher 95.9±22.2 38.3±21.1 63 utuvirostridae Himantopus himantopus Black-mecked still 47.6±26.7 22.3±12.9 52 eradriidae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 21 aradriidae Pluvialis squatarola Black-bellied plover 35.4±21.6 21.9±12.1 21 aradriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 46 eradriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 46 eradriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 37 idae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 14 idae Larus socidentalis Western gull 37.2±25.9 17.4±10.8 26 idae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 136 idae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12 idae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 37 idae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 10 idae Carpora melanopas Black-shouldered kite 73.2±35.2 23.1±14.9 10 idae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 10 idae Carpora melanopas Elacrocoracidae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 25 idae Egretta novaehollandiae Winterfaced heron 78.9±46.5 31.2±20.1 33 idae Carpora melanoleucos Little pied cormorant 72.5±27.9 31.3±18.0 25 idae Egretta novaehollandiae Winterfaced heron 78.9±46.5 31.2±20.1 33 idae Egretta novaehollandiae Winterfaced heron 78.9±46.5 31.2±20.1 33 idae Egretta novaehollandiae Winterfaced heron 78.9±46.3 36.6±23.1 46 idae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 idae Eladae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 idae Eladae Egretta thula Snowy egret 47.9±34.0 18.6±23.1 46 idae Egretta thula Snowy egret 47.9±34.0 18.6±23.1 46 idae Egretta thula Snowy egret 47.9±34.0 18.6±23.1 47 idae Eladae Egretta thula Snowy egret 47.9±34.0 18.6±23.1 47 idae Eladae Egretta thula Snowy egret 47.9±34.0 18.6±23.1 47 idae Eladae Egretta thula S	Scolopacidae	Calidris ruficollis	Red-necked stint	31.2 ± 11.0	16.4 ± 8.7	61
Burhinidae Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 1 Alaematopodidae Haematopus fuliginosus Sooty oystercatcher 95.9±54.8 38.5±18.0 2 Alaematopodidae Haematopus fuliginosus Sooty oystercatcher 58.2±25.8 30.5±15.8 5 Alaematopodidae Haematopus fuliginosus Sooty oystercatcher 58.2±25.8 30.5±15.8 5 Alaematopodidae Himantopus himantopus Black-winged stilt 56.9±22.2 38.3±21.1 6 Alaematopus fuliginosus Sooty oystercatcher 58.2±25.8 30.5±15.8 5 Alaematopus fuliginosus Sooty oystercatcher 58.2±25.8 30.5±10.4 5 Alaematopus fuliginosus Sooty oystercatcher 58.2±25.8 30.5±10.4 2 Alaematopus fuliginosus Black-necked stilt 56.9±22.2 38.3±20.7 3 Alaematopus fuliginosus Black-necked stilt 47.6±26.7 22.3±12.9 3 Alaematopus fuliginosus Black-necked stilt 47.6±26.7 22.2±12.1 3 Alaematopus fuliginosus Black-necked stilt 47.6±26.7 22.2±12.1 3 Alaematopus fuliginosus Black-necked stilt 47.6±2	thinidae Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 2 25 20.7 13 25 20.7 13 2 25 20.7 13 2 25 20.7 13 25 20.7 13 25 20.7 13 25 20.7 13 25 20.7 13 25 20.7 13 25 20.7 13 25 20.7 13 25 20.7 13 25 25 20.7 13 25 20.7 1	Scolopacidae	Calidris minutilla	Least sandpiper	23.2 ± 17.1	9.2 ± 5.7	33
Burhinidae Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 1 Jahamatopodidae Haematopus fuliginosus Sooty oystercatcher 95.9±54.8 38.5±15.8 30.5±	hinidae Burhinus grallarius Bush stone-curlew 41.6±29.3 25.9±20.7 13 ematopodidae Haematopus longirostris Pied oystercatcher 58.2±25.8 38.5±18.0 23 ematopodidae Himantopus fuliginosus Sooty oystercatcher 58.2±25.8 30.5±15.8 59 eturvirostridae Himantopus himantopus Black-winged stilt 56.9±22.2 38.3±21.1 63 eturvirostridae Himantopus mexicanus Black-necked stilt 47.6±26.7 22.3±12.9 52 erardriidae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 21 erardriidae Pluvialis squatarola Black-bellied plover 63.9±29.8 36.0±18.7 41 erardriidae Charadrius ruficapillus Red-capped plover 36.9±16.6 22.0±7.7 16 erardriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 46 erardriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 37 elidae Larus dominicanus Kelp gull 54.9±22.4 22.0±13.1 15 elidae Larus cocidentalis Western gull 54.9±22.4 22.0±13.1 15 elidae Larus novaehollandiae Silver gull 62.8±34.7 24.4±11.4 14 elidae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 136 elidae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12 elidae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 37 elidae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 37 elidae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 37 elidae Sterna deliforos Little tern 8.2±26.6 21.5±7.9 18 elicipedidae Tachybaptus novaehollandiae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 20 elidae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 25 elidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 33 eleidae Egretta fulua Snowy egret 47.9±34.0 18.6±15.7 47 eleidae Egretta fulua Snowy egret 47.9±34.0 18.6±15.7 47 eleidae Eretta thula Snowy egret 47.9±34.0 18.6±15.7 47 eleidae Ardea herodias Great blue heron 73.9±46.3 36.6±23.1 46	Scolopacidae	Calidris acuminata	Sharp-tailed sandpiper	26.5 ± 12.9	14.8 ± 8.7	28
Haematopodidae Haematopus longirostris Pied oystercatcher 95.9±54.8 38.5±18.0 24 daematopodidae Haematopus fuliginosus Sooty oystercatcher 58.2±25.8 30.5±15.8 25.2±25.9 25.2±25.9 25.2±12.1 25.2±25.9 25.2±12.1 25.2±25.9 25.2±12.1 25.2±25.9 25.2±12.1 25.2±25.9 25.2±12.1 25.2±25.9 25.2±15.1 25.2±25.9 25.2±25	ematopodidae Haematopus Inliginosus Sooty oystercatcher 58.2±25.8 38.5±18.0 23 turvirostridae Himantopus himantopus Black-winged stilt 56.9±22.2 38.3±21.1 63 turvirostridae Himantopus mexicanus Black-necked stilt 47.6±26.7 22.3±12.9 52 aradriidae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 21 aradriidae Pluvialis squatarola Black-bellied plover 63.9±29.8 36.0±18.7 41 aradriidae Charadrius ruficapillus Red-capped plover 36.9±16.6 22.0±7.7 16 aradriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 46 aradriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 46 aradriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 37 aradidae Larus dominicanus Kelp gull 54.9±22.4 22.0±13.1 15 aradidae Larus occidentalis Western gull 54.9±22.4 22.0±13.1 15 aradidae Larus oxedentalis Western gull 37.2±25.9 17.4±10.8 26 aradidae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12 aradidae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 37 aradidae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 18 aradidae Tachybaptus novaehollandiae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 20 aradicae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 25 aradicae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 33 aradicae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 ardea herodias Great blue heron 73.9±46.3 36.6±23.1 46		Burhinus grallarius		41.6 ± 29.3	25.9 ± 20.7	13
Haematopodidae Haematopus fuliginosus Sooty oystercatcher 58.2±25.8 30.5±15.8 52.6 decurvirostridae Himantopus himantopus Black-winged stilt 56.9±22.2 38.3±21.1 68.6 decurvirostridae Himantopus mexicanus Black-necked stilt 47.6±26.7 22.3±12.9 52.6 decurvirostridae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 22.6 decurvirostridae Pluvialis squatarola Black-bellied plover 35.4±21.6 21.9±12.1 22.6 decurvirostridae Pluvialis squatarola Black-bellied plover 36.9±29.8 36.0±18.7 42.6 decurvirostridae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 42.6 decurvirostridae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 42.6 decurvirostridae Usanus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 13.2 decurvirostridae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 decurvirostridae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 decurvirostridae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 13.2 decurvirostridae Sterna despii Crested tern 71.0±36.2 17.3±10.7 32.2 decurvirostridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 decurvirostridae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 decurvirostridae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 decurvirostridae Elanus axilcrostris Little black cormorant 56.4±24.8 32.3±20.6 34.2 decidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 32.4 decidae Egretta novaehollandiae Great blue heron 73.9±46.3 36.6±23.1 decidae Ardeidae Ardeidae Egretta thula Snowy egret 47.9±34.0 86.6±23.1 decidae Ardeidae Ardeidae Ardeidae Ardeidae Ardeidae Ardea herodias Great blue heron 73.9±46.3 36.6±23.1 decidae Ardeidae Ardei	ematopodidae Haematopus fuliginosus Sooty oystercatcher 58.2±25.8 30.5±15.8 59 turvirostridae Himantopus himantopus Black-winged stilt 56.9±22.2 38.3±21.1 63 aturvirostridae Himantopus mexicanus Black-necked stilt 47.6±26.7 22.3±12.9 52 aradriidae Pluvialis fulva Pacific golden plover 33.4±21.6 21.9±12.1 21 aradriidae Pluvialis squatarola Black-bellied plover 63.9±29.8 36.0±18.7 41 aradriidae Elseyornis melanops Black-fronted dotterel 38.6±16.6 22.0±7.7 16 aradriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 46 aradriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 37 diae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 15 diae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 14 diae Larus occidentalis Western gull 37.2±25.9 17.4±10.8 26 diae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 136 diae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12 diae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 37 diae Sterna dibifrons Little tern 48.2±26.6 21.5±7.9 18 licipedidae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±41.1 19 diacrocorax melanoleucos Phalacrocorax warius Pied cormorant 56.5±32.6 19.8±14.3 58 diacrocoracidae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 25 diacrocoracidae Phalacrocorax varius Phalacrocorax carbo Great cormorant 56.4±24.8 32.3±20.6 34 diedae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 33 leidae Egretta fulua Snowy egret 47.9±34.0 18.6±15.7 47 dredae herodias Great blue heron 73.9±46.3 36.6±23.1 46						
Recurvirostridae Himantopus himantopus Black-winged stilt 56.9±22.2 38.3±21.1 66.6 decurvirostridae Himantopus mexicanus Black-necked stilt 47.6±26.7 22.3±12.9 56.1 decurvirostridae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 27.1 decurvirostridae Pluvialis squatarola Black-bellied plover 35.4±21.6 21.9±12.1 27.1 decurvirostridae Pluvialis squatarola Black-bellied plover 36.9±29.8 36.0±18.7 4.1 decurvirostridae Charadrius ruficapillus Red-capped plover 36.9±16.6 22.0±7.7 18.1 decurvirostridae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 4.2 decurvirostridae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 36.2 decurvirostridae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 18.2 decurvirostridae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 19.2 decurvirostridae Larus novaehollandiae Silver gull 37.2±25.9 17.4±10.8 29.2 decurvirostridae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 13.2 decurvirostridae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 13.2 decurvirostridae Sterna delbifrons Little tern 48.2±26.6 21.5±7.9 19.2 decurvirostridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 19.2 decurvirostridae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.1 19.2 decurvirostridae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 29.2 decurvirostridae Elanus axilicirostris Little black cormorant 72.5±27.9 31.3±18.0 29.2 decircidae Phalacrocorax carbo Great cormorant 56.4±24.8 32.3±20.6 31.2±20.1 32.4 decidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 32.4 decidae Egretta novaehollandiae White-faced heron 78.9±46.3 36.6±23.1 44.2 decidae Egretta decidae Great blue heron 73.9±46.3 36.6±23.1 44.2 decidae Ardeidae Egretta decidae Great blue heron 73.9±46.3 36.6±23.1 44.2 decidae Ardeidae Ardeidae Egretta hula Snowy egret 47.9±34.0 18.6±15.7 44.2 decidae Ardeidae Ardeidae Ardeidae Great blue heron 73.9±46.3 36.6±23.1 44.2 decidae Ardeidae Ardeidae Ardeidae Ardeidae Ardeidae Ardeidae Ardeidae Ardeidae Ardeidae Arde	turvirostridae Himantopus himantopus Black-winged stilt 47.6±26.7 22.3±12.9 52 aradriidae Himantopus mexicanus Black-necked stilt 47.6±26.7 22.3±12.9 52 aradriidae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 21 aradriidae Pluvialis squatarola Black-bellied plover 63.9±29.8 36.0±18.7 41 aradriidae Charadrius ruficapillus Red-capped plover 36.9±16.6 22.0±7.7 16 aradriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 46 aradriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 37 aradriidae Larus dominicanus Kelp gull 54.9±22.4 22.0±13.1 15 aradriidae Larus occidentalis Western gull 54.9±22.4 22.0±13.1 15 arade Larus occidentalis Western gull 63.1±36.0 16.8±12.1 136 arade Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12 arade Sterna albifrons Little tern 48.2±26.6 21.5±7.9 18 arade Black-shouldered kite 73.2±35.2 23.1±1.9 10 arachybaptus novaehollandiae Australasian grebe Darter 45.3±21.1 24.0±14.9 20 arachybaptus novaehollandiae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 25 arachybaptus novaehollandiae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 25 arachybaptus novaehollandiae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±23.0 10 leidae Egretta thula Snowy egret 47.9±34.0 18.6±23.1 46 leidae Egretta thula Great blue heron 73.9±46.3 36.6±23.1 46						
Recurvirostridae Himantopus mexicanus Black-necked stilt 47.6±26.7 22.3±12.9 55. Charadriidae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 26. Charadriidae Pluvialis squatarola Black-bellied plover 36.9±29.8 36.0±18.7 45. Charadriidae Charadrius ruficapillus Red-capped plover 36.9±16.6 22.0±7.7 16. Charadriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 45. Charadriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 36. charadriidae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 17. charadriade Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 18. charadriade Larus novaehollandiae Silver gull 37.2±25.9 17.4±10.8 27. charadriade Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 13. charidae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 17. charidae Sterna delafirons Little tern 48.2±26.6 21.5±7.9 17. charidae Sterna dibifrons Little tern 48.2±26.6 21.5±7.9 18. charadriade Anhingidae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 18. chalacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 59. chalacrocoracidae Phalacrocorax sulcirostriis Little black cormorant 56.4±24.8 32.3±20.6 20. chalacrocoracidae Phalacrocorax sulcirostriis Little egret 88.9±35.8 52.4±23.0 18. chalacrocoracidae Egretta novaehollandiae White-faced heron 78.9±46.3 36.6±23.1 24. chalacrocoracidae Egretta fulua Snowy egret 47.9±46.3 36.6±23.1 24. characrocoracidae Parade herodias Great blue heron 73.9±46.3 36.6±23.1 24. characrocoracidae Parade herodias Great blue heron 73.9±46.3 36.6±23.1	turvirostridae Himantopus mexicanus Black-necked stilt 47.6±26.7 22.3±12.9 52 aradriidae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 21 aradriidae Pluvialis squatarola Black-bellied plover 36.9±29.8 36.0±18.7 41 aradriidae Charadrius ruficapillus Red-capped plover 36.9±16.6 22.0±7.7 16 aradriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 46 aradriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 37 idae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 15 idae Larus occidentalis Western gull 54.9±22.4 22.0±13.1 15 idae Larus novaehollandiae Silver gull 62.8±34.7 24.4±11.4 14 idae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 136 idae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12 idae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 18 ipitridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 10 idicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 19 inigidae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 20 alacrocoracidae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 25 alacrocoracidae Phalacrocorax varius Pied cormorant 56.5±32.6 19.8±14.3 58 alacrocoracidae Phalacrocorax varius Pied cormorant 56.5±27.9 31.3±18.0 25 alacrocoracidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 33 leidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 33 leidae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 leidae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 leidae Egretta herodias Great blue heron 73.9±34.0 36.6±23.1 46						
Charadriidae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 22. Charadriidae Pluvialis squatarola Black-bellied plover 63.9±29.8 36.0±18.7 4 2. Charadriidae Charadriis ruficapillus Red-capped plover 36.9±16.6 22.0±7.7 12. Charadriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 4 2. Charadriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 32. aridae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 13. aridae Larus occidentalis Western gull 62.8±34.7 24.4±11.4 14. aridae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 13. aridae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 13. aridae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 13. aridae Sterna desgii Crested tern 71.0±36.2 17.3±10.7 33. aridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 13. aridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 13. aridae Podicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 13. aridae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 53. aridae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 29. aridae Phalacrocorax sulcirostris Little black cormorant 56.4±24.8 32.3±20.6 32. aridae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 34. arideidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 34. arideidae Egretta thula Snowy egret 47.9±40.3 36.6±23.1	aradriidae Pluvialis fulva Pacific golden plover 35.4±21.6 21.9±12.1 21 aradriidae Pluvialis squatarola Black-bellied plover 63.9±29.8 36.0±18.7 41 aradriidae Charadrius ruficapillus Red-capped plover 36.9±16.6 22.0±7.7 16 aradriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 46 aradriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 37 idae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 15 idae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 14 idae Larus occidentalis Western gull 37.2±25.9 17.4±10.8 26 idae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 136 idae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12 idae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 37 idae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 18 ipitridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 10 idacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 58 idacrocoracidae Phalacrocorax varius Pied cormorant 58.3±31.0 24.0±15.3 38 idacrocoracidae Phalacrocorax varius Pied cormorant 56.4±24.8 32.3±20.6 34 idae Egretta auxiliaria Little egret 88.9±35.8 52.4±23.0 10 leidae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 ideidae Egretta thula Great blue heron 73.9±46.3 36.6±23.1 46						
Charadriidae Pluvialis squatarola Black-bellied plover 33.9±29.8 36.0±18.7 42. Charadrius ruficapillus Red-capped plover 36.9±16.6 22.0±7.7 17. Charadriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 24. Charadriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 23. aridae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 17. aridae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 17. aridae Larus occidentalis Western gull 37.2±25.9 17.4±10.8 27. aridae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 13. aridae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 13. aridae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 13. aridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 13. aridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 14. aridae Sterna dergii Crested tern 71.0±36.2 17.3±10.7 13. aridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 14. aridae Sterna dergii Crested tern 71.0±36.2 17.3±10.7 13. aridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 14. aridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 15. aridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 15. aridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 15. aridae Sterna delarocorax varilars Black-shouldered kite 73.2±35.2 23.1±14.9 15. aridae Phalacrocorax welanoleucos Little pied cormorant 72.5±27.9 31.3±18.0 26. aridae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 26. aridae Phalacrocorax carbo Great cormorant 56.4±24.8 32.3±20.6 31. aridae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 36. arideidae Egretta funula Snowy egret 47.9±34.0 18.6±15.7 46. arideidae Egretta funula Snowy egret 47.9±34.0 18.6±15.7 46. arideidae Ardeidae Ardeidae Egretta funula Snowy egret 47.9±34.0 18.6±23.1 47. arideidae Ardeidae Ardeidae Ardeidae Great blue heron 73.9±46.3 36.6±23.1	aradriidae Pluvialis squatarola Black-bellied plover 63.9±29.8 36.0±18.7 41 aradriidae Charadrius ruficapillus Red-capped plover 36.9±16.6 22.0±7.7 16 aradriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 46 aradriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 37 idae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 15 idae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 14 idae Larus occidentalis Western gull 37.2±25.9 17.4±10.8 26 idae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 136 idae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12 idae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 37 idae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 18 icipitridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 10 idicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 19 iningidae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 20 idicipedidae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 58 idiacrocoracidae Phalacrocorax varius Pied cormorant 56.5±27.9 31.3±18.0 25 idiacrocoracidae Phalacrocorax carbo Great cormorant 56.4±24.8 32.3±20.6 34 idicipedidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 33 leidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 36 idicipedidae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 ididae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 ididae Ardea herodias Great blue heron 73.9±46.3 36.6±23.1 46		•				
Charadriidae Charadrius ruficapillus Red-capped plover 36.9±16.6 22.0±7.7 1 Charadriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 4 Charadriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 3 Charadriidae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 1 Caridae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 1 Caridae Larus occidentalis Western gull 37.2±25.9 17.4±10.8 2 Caridae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 13 Caridae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 13 Caridae Sterna albifrons Little tern 71.0±36.2 17.3±10.7 3 Cacipitridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 13 Chalacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 5 Chalacrocoracidae Phalacrocorax varius Pied cormorant 56.4±24.8 32.3±20.6 3 Chalacrocoracidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 3 Cardeidae Egretta formalia Snowy egret 47.9±34.0 18.6±15.7 4 Cardeidae Egretta thula Snowy egret 47.9±34.0 36.6±23.1 44.0±15.7 4 Cardeidae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 4 Cardeidae Egretta thula Snowy egret 47.9±34.0 36.6±23.1	rardriidae Charadrius ruficapillus Red-capped plover 36.9±16.6 22.0±7.7 16 aradriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 46 aradriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 37 idae Larus deminicanus Kelp gull 54.9±22.4 22.0±13.1 15 idae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 14 idae Larus novaehollandiae Silver gull 37.2±25.9 17.4±10.8 26 idae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 136 idae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12 idae Sterna abbifrons Little tern 71.0±36.2 17.3±10.7 37 idae Sterna abbifrons Little tern 48.2±26.6 21.5±7.9 18 ipitridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 10 idicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 19 iniqidae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 20 idiacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 58 idiacrocoracidae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 25 idiacrocoracidae Phalacrocorax carbo Great cormorant 56.4±24.8 32.3±20.6 34 idiacrocoracidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 33 leidae Egretta novaehollandiae Kittle egret 88.9±35.8 52.4±23.0 10 leidae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 leidae Ardea herodias Great blue heron 73.9±46.3 36.6±23.1 46						
Charadriidae Elseyornis melanops Black-fronted dotterel 38.6±14.2 22.7±9.3 24. Charadriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 35. Aridae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 15. Aridae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 15. Aridae Larus occidentalis Western gull 37.2±25.9 17.4±10.8 15. Aridae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 15. Aridae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 15. Aridae Sterna delbifrons Little tern 71.0±36.2 17.3±10.7 15. Aridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 15. Aridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 15. Aridae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 15. Aridae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 15. Aridae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 15. Aridae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 15. Ardeidae Egretta funua Snowy egret 47.9±34.0 18.6±15.7 24. Ardeidae Egretta thula Snowy egret 47.9±34.0 18.6±23.1 44. Ardeidae Ardeidae Egretta thula Snowy egret 47.9±34.0 18.6±23.1 44. Ardeidae Ardeidae Ardeidae Great blue heron 73.9±46.3 36.6±23.1	Black-fronted dotterel 38.6±14.2 22.7±9.3 46 aradriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 37 idae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 15 idae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 14 idae Larus novaehollandiae Silver gull 37.2±25.9 17.4±10.8 26 idae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 136 idae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12 idae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 18 idicipedidae Tachybaptus novaehollandiae Black-shouldered kite 73.2±35.2 23.1±14.9 10 idicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 19 idicipedidae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 58 idicrocoracidae Phalacrocorax varius Pied cormorant 56.5±32.6 19.8±14.3 58 idicae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 33 idicidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 34 ididae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 ididae Egretta thula Snowy egret 47.9±34.0 36.6±23.1 46						
Charadriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 33 aridae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 11 aridae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 11 aridae Larus occidentalis Western gull 37.2±25.9 17.4±10.8 12 aridae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 13 aridae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 11 aridae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 13 aridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 11 aridae Sterna albifrons Little pied cormorant 56.5±32.1 23.1±14.9 11 aridae Sterna albifrons Sterna albifrons Little pied cormorant 56.5±32.6 19.8±14.3 25 aridae Sterna albifrons Sterna albifrons Little bied cormorant 56.5±32.6 19.8±14.3 25 aridae Sterna albifrons Sterna albifr	rardriidae Vanellus miles Masked lapwing 92.2±48.4 46.8±30.5 37 idae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 15 idae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 14 idae Larus occidentalis Western gull 37.2±25.9 17.4±10.8 26 idae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 136 idae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12 idae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 37 idae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 18 idicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 19 iningidae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 10 idaerocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 58 idacrocoracidae Phalacrocorax varius Pied cormorant 56.5±27.9 31.3±18.0 25 idaerocoracidae Phalacrocorax carbo Great cormorant 58.3±33.0 24.0±15.3 38 idacrocoracidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 33 leidae Egretta novaehollandiae Carbon Fieldae Egretta thula Snowy egret 47.9±34.0 18.6±23.1 46 leidae Egretta thula Snowy egret 47.9±34.0 18.6±23.1 46		•				
Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 1 Laridae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 1 Laridae Larus occidentalis Western gull 37.2±25.9 17.4±10.8 2 Laridae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 13 Laridae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 1 Laridae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 3 Laridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 1 Locipitridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 1 Lodicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 1 Locipitridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 1 Lodicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 1 Locipitridae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 5 Locipitridae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 2 Locipitridae Phalacrocorax varius Pied cormorant 56.5±32.6 19.8±14.3 5 Locipitridae Phalacrocorax varius Pied cormorant 56.4±24.8 32.3±20.6 3 Locipitridae Phalacrocorax carbo Great cormorant 56.4±24.8 32.3±20.6 3 Locipitridae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 3 Locipitridae Egretta blula Snowy egret 47.9±34.0 18.6±15.7 4 Locipitridae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 4 Locipitridae Egretta blue heron 73.9±46.3 36.6±23.1	idae Larus delawarensis Ring-billed gull 54.9±22.4 22.0±13.1 15 idae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 14 idae Larus occidentalis Western gull 37.2±25.9 17.4±10.8 26 idae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 136 idae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12 idae Sterna delbifrons Little tern 71.0±36.2 17.3±10.7 37 idae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 18 ipiptridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 10 idicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 19 inigidae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 20 inigidae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 58 inlacrocoracidae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 25 inlacrocoracidae Phalacrocorax sulcirostris Little black cormorant 56.4±24.8 32.3±20.6 34 inlacrocoracidae Phalacrocorax carbo Great cormorant 56.4±24.8 32.3±20.6 34 inlacrocoracidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 33 inleidae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 inlaced heron 73.9±46.3 36.6±23.1 46 indae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 indae Indae Ardea herodias Great blue heron 73.9±46.3 36.6±23.1 46		, ,				
Laridae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 1 Laridae Larus occidentalis Western gull 37.2±25.9 17.4±10.8 2 Laridae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 13 Laridae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 1 Laridae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 3 Laridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 1 Accipitridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 1 Anhingidae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 2 Phalacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 5 Phalacrocoracidae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 2 Phalacrocoracidae Phalacrocorax sulcirostris Little black cormorant 56.4±24.8 32.3±20.6 3 Ardeidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 3 Ardeidae Egretta fulla Snowy egret 47.9±34.0 18.6±15.7 4 Ardeidae Ardea herodias Great blue heron 73.9±46.3 36.6±23.1	idae Larus dominicanus Kelp gull 62.8±34.7 24.4±11.4 14 idae Larus occidentalis Western gull 37.2±25.9 17.4±10.8 26 idae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 136 idae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 12 idae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 37 idae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 18 ipitridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 10 idicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 19 iningidae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 20 iningidae Anhinga melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 58 iningidae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 25 iningidae Phalacrocorax sulcirostris Little black cormorant 58.3±33.0 24.0±15.3 38 iningidae Phalacrocorax carbo Great cormorant 56.4±24.8 32.3±20.6 34 iningidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 33 iningidae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 iningidae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 iningidae Egretta thula Great blue heron 73.9±46.3 36.6±23.1 46						
Larus occidentalis Western gull 37.2±25.9 17.4±10.8 28 aridae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 13 aridae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 15 aridae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 35 aridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 17 aridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 17 archybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 17 archybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 18 aridae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 59 aridae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 29 aridae Phalacrocorax carbo Great cormorant 56.4±24.8 32.3±20.6 31 ardeidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 31 ardeidae Egretta fuula Snowy egret 47.9±34.0 18.6±15.7 48 ardeidae Ardea herodias Great blue heron 73.9±46.3 36.6±23.1	idae Larus occidentalis Western gull 37.2 ± 25.9 17.4 ± 10.8 26 idae Larus novaehollandiae Silver gull 63.1 ± 36.0 16.8 ± 12.1 136 idae Sterna caspia Caspian tern 54.5 ± 15.4 35.0 ± 10.4 12 idae Sterna albifrons Little tern 71.0 ± 36.2 17.3 ± 10.7 37 idae Sterna albifrons Little tern 48.2 ± 26.6 21.5 ± 7.9 18 cipitridae Elanus axillaris Black-shouldered kite 73.2 ± 35.2 23.1 ± 14.9 10 dicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3 ± 15.7 23.4 ± 14.1 19 alacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5 ± 32.6 19.8 ± 14.3 58 alacrocoracidae Phalacrocorax varius Pied cormorant 56.5 ± 32.6 19.8 ± 14.3 58 alacrocoracidae Phalacrocorax sulcirostris Little black cormorant 56.5 ± 32.6 19.8 ± 14.3 38 alacrocoracidae Phalacrocorax sulcirostris Little black cormorant 56.4 ± 24.8 32.3 ± 20.6 34 alacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.1 33 leidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 33 leidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 47 leidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1						
Laridae Larus novaehollandiae Silver gull 63.1±36.0 16.8±12.1 13 Laridae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 13 Laridae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 35 Laridae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 13 Laridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 13 Laridae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 13 Laridae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 20 Laridae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 50 Laridae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 20 Laridae Phalacrocorax carbo Great cormorant 56.4±24.8 32.3±20.6 30 Laridae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 32 Laridae Egretta fulla Snowy egret 47.9±34.0 18.6±15.7 44 Laridae Ardeeidae Ardee herodias Great blue heron 73.9±46.3 36.6±23.1 44	idae Larus novaehollandiae Silver gull 63.1 \pm 36.0 16.8 \pm 12.1 136 idae Sterna caspia Caspian tern 54.5 \pm 15.4 35.0 \pm 10.4 12 idae Sterna bergii Crested tern 71.0 \pm 36.2 17.3 \pm 10.7 37 idae Sterna albifrons Little tern 48.2 \pm 26.6 21.5 \pm 7.9 18 cipitridae Elanus axillaris Black-shouldered kite 73.2 \pm 35.2 23.1 \pm 14.9 10 dicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3 \pm 15.7 23.4 \pm 14.1 19 ingidae Anhinga melanogaster Darter 45.3 \pm 21.1 24.0 \pm 14.9 20 alacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5 \pm 32.6 19.8 \pm 14.3 58 alacrocoracidae Phalacrocorax varius Pied cormorant 58.3 \pm 33.0 24.0 \pm 15.3 38 alacrocoracidae Phalacrocorax carbo Great cormorant 56.4 \pm 24.8 32.3 \pm 20.6 34 eleidae Egretta novaehollandiae White-faced heron 78.9 \pm 46.5 31.2 \pm 20.1 33 eleidae Egretta thula Snowy egret 47.9 \pm 34.0 18.6 \pm 15.7 47 eleidae Ardea herodias Great blue heron 73.9 \pm 46.3 36.6 \pm 23.1 46						
Ardeidae Sterna caspia Caspian tern 54.5±15.4 35.0±10.4 15.4 aridae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 35.4 35.0±10.4 17.3±10.7 35.4 35.0±10.4 35.0±10.4 35.0±10.4 35.0±10.4 35.0±10.4 35.0±10.4 35.0±10.4 35.0±10.4 35.0±10.4 35.0±10.4 35.0±10.4 35.0±10.7 35.0±10.4 35.0±10.7 35.0±10.4 35.0±10.7 35.0±10.7 35.0±10.4 35.0±10.7 3	idae Sterna caspia Caspian tern 54.5 ± 15.4 35.0 ± 10.4 12 idae Sterna bergii Crested tern 71.0 ± 36.2 17.3 ± 10.7 37 idae Sterna albifrons Little tern 48.2 ± 26.6 21.5 ± 7.9 18 cipitridae Elanus axillaris Black-shouldered kite 73.2 ± 35.2 23.1 ± 14.9 10 dicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3 ± 15.7 23.4 ± 14.1 19 ningidae Anhinga melanogaster Darter 45.3 ± 21.1 24.0 ± 14.9 20 halacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5 ± 32.6 19.8 ± 14.3 58 halacrocoracidae Phalacrocorax varius Pied cormorant 72.5 ± 27.9 31.3 ± 18.0 25 halacrocoracidae Phalacrocorax sulcirostris Little black cormorant 58.3 ± 33.0 24.0 ± 15.3 38 halacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.6 34 helicidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 33 leidae Egretta fulla Snowy egret 47.9 ± 34.0 18.6 ± 15.7 47 leidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1						
Ardeidae Sterna bergii Crested tern 71.0±36.2 17.3±10.7 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 6 5 6 5 6	idae Sterna bergii Crested tern 71.0 \pm 36.2 17.3 \pm 10.7 37 idae Sterna albifrons Little tern 48.2 \pm 26.6 21.5 \pm 7.9 18 cipitridae Elanus axillaris Black-shouldered kite 73.2 \pm 35.2 23.1 \pm 14.9 10 dicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3 \pm 15.7 23.4 \pm 14.1 19 ningidae Anhinga melanogaster Darter 45.3 \pm 21.1 24.0 \pm 14.9 20 alacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5 \pm 32.6 19.8 \pm 14.3 58 alacrocoracidae Phalacrocorax varius Pied cormorant 72.5 \pm 27.9 31.3 \pm 18.0 25 alacrocoracidae Phalacrocorax sulcinostris Little black cormorant 58.3 \pm 33.0 24.0 \pm 15.3 38 alacrocoracidae Phalacrocorax carbo Great cormorant 56.4 \pm 24.8 32.3 \pm 20.6 34 leidae Egretta novaehollandiae White-faced heron 78.9 \pm 46.5 31.2 \pm 20.1 33 leidae Egretta fulla Snowy egret 47.9 \pm 34.0 18.6 \pm 15.7 47 leidae Ardea herodias Great blue heron 73.9 \pm 46.3 36.6 \pm 23.1 46						
Ardeidae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 1 Accipitridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 1 Accipitridae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 1 Anhingidae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 2 Phalacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 5 Phalacrocoracidae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 2 Phalacrocoracidae Phalacrocorax varius Dialacrocoracidae Phalacrocorax carbo Great cormorant 58.3±33.0 24.0±15.3 32 Phalacrocoracidae Phalacrocorax carbo Great cormorant 56.4±24.8 32.3±20.6 32 Ardeidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 32 Ardeidae Egretta garzetta Little egret 88.9±35.8 52.4±23.0 1 Ardeidae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 42 Ardeidae Ardea herodias Great blue heron 73.9±46.3 36.6±23.1	idae Sterna albifrons Little tern 48.2±26.6 21.5±7.9 18 cipitridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 10 dicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 19 ningidae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 20 alacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 58 alacrocoracidae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 25 alacrocoracidae Phalacrocorax sulcirostris Little black cormorant 58.3±33.0 24.0±15.3 38 alacrocoracidae Phalacrocorax carbo Great cormorant 56.4±24.8 32.3±20.6 34 leidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 33 leidae Egretta garzetta Little egret 88.9±35.8 52.4±23.0 10 leidae Egretta thula Snowy egret 47.9±34.0 18.6±15.7 47 leidae Ardea herodias Great blue heron 73.9±46.3 36.6±23.1 46						
Recipitridae Elanus axillaris Black-shouldered kite 73.2±35.2 23.1±14.9 10 20 20 20 20 20 20 20 20 20 20 20 20 20	tipitridae Elanus axillaris Black-shouldered kite 73.2 ± 35.2 23.1 ± 14.9 10 dicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3 ± 15.7 23.4 ± 14.1 19 ningidae Anhinga melanogaster Darter 45.3 ± 21.1 24.0 ± 14.9 20 alacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5 ± 32.6 19.8 ± 14.3 58 alacrocoracidae Phalacrocorax varius Pied cormorant 72.5 ± 27.9 31.3 ± 18.0 25 alacrocoracidae Phalacrocorax sulcirostris Little black cormorant 58.3 ± 33.0 24.0 ± 15.3 38 alacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.6 34 eleidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 33 leidae Egretta garzetta Little egret 88.9 ± 35.8 52.4 ± 23.0 10 leidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 47 leidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1						
Podicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3±15.7 23.4±14.1 1 Anhingidae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 2 Phalacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5±32.6 19.8±14.3 5 Phalacrocoracidae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 2 Phalacrocoracidae Phalacrocorax sulcirostris Little black cormorant 58.3±33.0 24.0±15.3 3 Phalacrocoracidae Phalacrocorax carbo Great cormorant 56.4±24.8 32.3±20.6 33 Phalacrocoracidae Egretta novaehollandiae White-faced heron 78.9±46.5 31.2±20.1 33 Phalacrocoracidae Egretta garzetta Little egret 88.9±35.8 52.4±23.0 13 Phalacrocoracidae Fagretta thula Snowy egret 47.9±34.0 18.6±15.7 43 Phalacrocoracidae Fagretta thula Snowy egret 47.9±34.0 18.6±15.7 44 Phalacrocoracidae Phalacrocorax sulcirostris Little egret 47.9±34.0 18.6±15.7 44 Phalacrocoracidae Phalacrocorax sulcirostris Little pied cormorant 73.9±46.3 36.6±23.1 44	dicipedidae Tachybaptus novaehollandiae Australasian grebe 30.3 ± 15.7 23.4 ± 14.1 19 ningidae Anhinga melanogaster Darter 45.3 ± 21.1 24.0 ± 14.9 20 alacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5 ± 32.6 19.8 ± 14.3 58 alacrocoracidae Phalacrocorax varius Pied cormorant 72.5 ± 27.9 31.3 ± 18.0 25 alacrocoracidae Phalacrocorax sulcirostris Little black cormorant 58.3 ± 33.0 24.0 ± 15.3 38 alacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.6 34 leidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 33 leidae Egretta garzetta Little egret 88.9 ± 35.8 52.4 ± 23.0 10 leidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 47 leidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1						
Anhingidae Anhinga melanogaster Darter 45.3±21.1 24.0±14.9 22.0±14.9 25.0±14.3 25.0±14	ningidae Anhinga melanogaster Darter 45.3 ± 21.1 24.0 ± 14.9 20 alacrocoracidae Phalacrocorax melanoleucos Little pied cormorant 56.5 ± 32.6 19.8 ± 14.3 58 alacrocoracidae Phalacrocorax varius Pied cormorant 72.5 ± 27.9 31.3 ± 18.0 25 alacrocoracidae Phalacrocorax sulcirostris Little black cormorant 58.3 ± 33.0 24.0 ± 15.3 38 alacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.6 34 leidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 33 leidae Egretta garzetta Little egret 88.9 ± 35.8 52.4 ± 23.0 10 leidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 47 leidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1	Accipitridae			73.2 ± 35.2	23.1 ± 14.9	
Phalacrocoracidae Phalacrocorax melanoleucos Phalacrocorax melanoleucos Phalacrocoracidae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 20 20 20 21.3±18.0 20 21.3±18.0 20 20 21.3±18.0 20 21.3±18.0 20 20 21.3±18.0 20 21.3±18.0 20 20 21.3±18.0	Alacrocoracidae Phalacrocorax melanoleucos Pied cormorant 56.5 ± 32.6 19.8 ± 14.3 58 Alacrocoracidae Phalacrocorax varius Pied cormorant 72.5 ± 27.9 31.3 ± 18.0 25 Alacrocoracidae Phalacrocorax sulcirostris Little black cormorant 58.3 ± 33.0 24.0 ± 15.3 38 Alacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.6 34 Alacrocoracidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 33 leidae Egretta garzetta Little egret 88.9 ± 35.8 52.4 ± 23.0 10 leidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 47 leidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1 46	Podicipedidae		Australasian grebe			
Phalacrocoracidae Phalacrocorax melanoleucos Phalacrocorax melanoleucos Phalacrocoracidae Phalacrocorax varius Pied cormorant 72.5±27.9 31.3±18.0 20 20 20 21.3±18.0 20 21.3±18.0 20 20 21.3±18.0 20 21.3±18.0 20 20 21.3±18.0 20 21.3±18.0 20 20 21.3±18.0	Alacrocoracidae Phalacrocorax melanoleucos Pied cormorant 56.5 ± 32.6 19.8 ± 14.3 58 Alacrocoracidae Phalacrocorax varius Pied cormorant 72.5 ± 27.9 31.3 ± 18.0 25 Alacrocoracidae Phalacrocorax sulcirostris Little black cormorant 58.3 ± 33.0 24.0 ± 15.3 38 Alacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.6 34 Alacrocoracidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 33 leidae Egretta garzetta Little egret 88.9 ± 35.8 52.4 ± 23.0 10 leidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 47 leidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1 46	Anhingidae	Anhinga melanogaster	Darter	45.3 ± 21.1	24.0 ± 14.9	
Phalacrocoracidae Phalacrocorax varius Pied cormorant 72.5 ± 27.9 31.3 ± 18.0 24.0 ± 15.3 31.3 ± 18.0 Phalacrocoracidae Phalacrocorax sulcirostris Little black cormorant 58.3 ± 33.0 24.0 ± 15.3 31.3 ± 18.0 Phalacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.6 31.2 ± 20.1 31.3 ± 18.0 Phalacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.6 31.2 ± 20.1 31.3 ± 18.0 Phalacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.6 31.2 ± 20.1 31.3 ± 18.0 Phalacrocoracidae Phalacrocorax carbo Great heron 78.9 ± 46.5 31.2 ± 20.1 31.3 ± 18.0 31.3 ± 18.0 31.3 ± 18.0 31.3 ± 18.0 Phalacrocoracidae Phalacrocorax carbo Great cormorant 78.9 ± 46.5	Alacrocoracidae Phalacrocorax varius Pied cormorant 72.5 ± 27.9 31.3 ± 18.0 25 Alacrocoracidae Phalacrocorax sulcirostris Little black cormorant 58.3 ± 33.0 24.0 ± 15.3 38 Alacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.6 34 Aleidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 33 Aleidae Egretta garzetta Little egret 88.9 ± 35.8 52.4 ± 23.0 10 Aleidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 47 Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1						58
Phalacrocorax sulcirostris Little black cormorant 58.3 ± 33.0 24.0 ± 15.3 3.0 Phalacrocorax sulcirostris Little black cormorant 56.4 ± 24.8 32.3 ± 20.6 30.0 Ardeidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 30.0 Ardeidae Egretta garzetta Little egret 88.9 ± 35.8 52.4 ± 23.0 10.0 Ardeidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 Ardeidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1	Alacrocoracidae Phalacrocorax sulcirostris Little black cormorant 58.3 ± 33.0 24.0 ± 15.3 38 Alacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.6 34 Alacrocoracidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 33 Aleidae Egretta garzetta Little egret 88.9 ± 35.8 52.4 ± 23.0 10 Aleidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 47 Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1 46						25
Phalacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.6 34.4 Ardeidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 34.4 Ardeidae Egretta garzetta Little egret 88.9 ± 35.8 52.4 ± 23.0 14.4 Ardeidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 Ardeidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1	Alacrocoracidae Phalacrocorax carbo Great cormorant 56.4 ± 24.8 32.3 ± 20.6 34 leidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 33 leidae Egretta garzetta Little egret 88.9 ± 35.8 52.4 ± 23.0 10 leidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 47 leidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1 46						
Ardeidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 3	leidae Egretta novaehollandiae White-faced heron 78.9 ± 46.5 31.2 ± 20.1 33 leidae Egretta garzetta Little egret 88.9 ± 35.8 52.4 ± 23.0 10 leidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 47 leidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1 46						
Ardeidae Egretta garzetta Little egret 88.9 ± 35.8 52.4 ± 23.0 1 Ardeidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 4 Ardeidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1 4	leidae Egretta garzetta Little egret 88.9 ± 35.8 52.4 ± 23.0 10 leidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 47 leidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1 46						
Ardeidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 4 Ardeidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1 4	leidae Egretta thula Snowy egret 47.9 ± 34.0 18.6 ± 15.7 47 leidae Ardea herodias Great blue heron 73.9 ± 46.3 36.6 ± 23.1 46						
Ardeidae $ ilde{Ardea}$ $ ilde{Ardea}$ $ ilde{Ardea}$ Great blue heron $ ilde{73.9\pm46.3}$ $ ilde{36.6\pm23.1}$ $ ilde{4}$	leidae $ ilde{Ardea}$						
				Creat blue boron			
	(continua	n ueiuae	Arueu rieroulus	Great blue heron	/ 3.9±46.3	30.0±23.1	

Table A1. (continued)

Family	Latin name	Common name	Starting distance	FID_{direct}	N
Ardeidae	Ardea alba	Great egret	73.4±45.6	39.9±24.8	79
Threskiornithidae	Threskiornis molucca	Australian white ibis	83.6±50.1	32.8 ± 20.4	48
Threskiornithidae	Threskiornis spinicollis	Straw-necked ibis	61.7±32.5	42.4±25.2	10
Threskiornithidae	Platalea regia	Royal spoonbill	85.7±39.9	44.4±24.9	24
Pelecanidae	Pelecanus conspicillatus	Australian pelican	77.4±54.5	32.6±25.4	39
Climacteridae	Cormobates leucophaeus	White-throated treecreeper	12.1±4.5	5.8±2.9	17
		•	11.1±5.3	5.1±3.1	13
Climacteridae	Climacteris picumnus	Brown treecreeper			
Menuridae	Menura novaehollandiae	Superb lyrebird	19.4±15.1	10.5±8.6	26
Ptilonorhynchidae	Ailuroedus crassirostris	Green catbird	15.3±5.0	9.7±4.1	16
Ptilonorhynchidae	Ptilonorhynchus violaceus	Satin bowerbird	16.4 ± 6.8	9.5±5.1	22
Maluridae	Malurus cyaneus	Superb fairy-wren	13.0 ± 5.9	6.5 ± 3.4	93
Maluridae	Malurus lamberti	Variegated fairy-wren	$9.2{\pm}6.0$	4.5 ± 3.4	38
Maluridae	Stipiturus malachurus	Southern emu-wren	$9.9{\pm}3.8$	7.0 ± 3.3	13
Meliphagidae	Lichmera indistincta	Brown honeyeater	18.1 ± 8.9	$9.8{\pm}5.6$	16
Meliphagidae	Meliphaga lewinii	Lewin's honeyeater	16.0 ± 12.7	8.2 ± 6.0	32
Meliphagidae	Lichenostomus chrysops	Yellow-faced honeyeater	9.5±5.1	5.8 ± 3.6	29
Meliphagidae	Lichenostomus penicillatus	White-plumed honeyeater	16.1±7.8	$9.8{\pm}5.6$	23
Meliphagidae	Philemon corniculatus	Noisy friarbird	20.5±8.4	11.1±5.3	55
Meliphagidae	Phylidonyris novaehollandidae	New Holland honeyeater	13.4±9.0	7.9±6.0	47
Meliphagidae	Phylidonyris melanops	Tawny-crowned honeyeater	19.5±10.4	9.8±6.7	11
Meliphagidae	Acanthorhynchus tenuirostris	Eastern spinebill	9.7±4.3	5.8±2.6	39
Meliphagidae Meliphagidae	Manorina melanophrys	Bell miner	9.7±4.3 9.6±6.6	5.0±3.0	39 44
					37
Meliphagidae	Manorina melanocephala	Noisy miner	21.1±23.7	7.5±14.9	
Meliphagidae	Anthochaera chrysoptera	Little wattlebird	15.8±10.2	7.3±3.0	40
Meliphagidae	Anthochaera carunculata	Red wattlebird	14.3±8.6	8.7±6.4	15
Meliphagidae	Epthianura albifrons	White-fronted chat	35.5 ± 14.7	22.6±7.8	23
Pardalotidae	Sericornis citreogularis	Yellow-throated scrubwren	11.7 ± 6.6	5.6 ± 4.3	51
Pardalotidae	Sericornis frontalis	White-browed scrubwren	9.1 ± 4.6	4.2 ± 2.5	41
Pardalotidae	Sericornis magnirostris	Large-billed scrubwren	8.0 ± 2.1	$4.4 {\pm} 4.4$	17
Pardalotidae	Acanthiza pusilla	Brown thornbill	$9.5{\pm}4.4$	6.7 ± 9.9	28
Pardalotidae	Acanthiza reguloides	Buff-rumped thornbill	$9.5{\pm}4.1$	4.3 ± 1.8	14
Pardalotidae	Acanthiza nana	Yellow thornbill	11.3 ± 6.4	6.3 ± 2.4	17
Pardalotidae	Gerygone mouki	Brown gerygone	8.6 ± 3.7	4.2 ± 1.9	32
Petroicidae	Eopsaltria australis	Eastern yellow robin	16.2±8.3	9.9±5.6	77
Cinclosomatidae	Psophodes olivaceus	Eastern whipbird	11.3±5.1	5.9±3.3	50
Corcoracidae	Corcorax melanorhamphos	White-winged chough	23.7±10.6	16.2±7.3	14
Pachycephalidae	Pachycephala pectoralis	Golden whistler	14.7±6.4	7.9±3.9	18
Pachycephalidae	Colluricincla harmonica	Grey shrike-thrush	21.4±13.8	12.8±11.4	15
Corvidae	Aphelocoma californica	Western scrub-jay	23.9±13.0	15.0±8.9	27
Corvidae	•		42.6 ± 8.3	24.6±14.3	14
	Corvus monedula	Eurasian jackdaw			
Corvidae	Corvus coronoides	Australian raven	42.0±27.7	25.8±22.2	63
Artamidae	Cracticus torquatus	Grey butcherbird	33.4±21.1	19.3±13.3	10
Dicruridae	Gymnorhina tibicen	Australian magpie	24.4 ± 13.0	10.9 ± 8.7	91
Artamidae	Strepera graculina	Pied currawong	26.0 ± 17.9	15.1±11.6	26
Oriolidae	Oriolus sagittatus	Olive-backed oriole	17.0 ± 10.7	11.3±5.9	33
Campephagidae	Coracina novaehollandiae	Black-faced cuckoo-shrike	36.9 ± 22.3	21.1 ± 13.2	20
Dicruridae	Rhipidura leucophrys	Willie wagtail	20.4 ± 13.9	11.8 ± 9.7	46
Dicruridae	Rhipidura fuliginosa	Grey fantail	12.8 ± 6.5	$6.8 {\pm} 4.3$	37
Dicruridae	Rhipidura rufifrons	Rufous fantail	12.5±4.0	$6.4 {\pm} 2.0$	11
Artamidae	Grallina cyanoleuca	Magpie-lark	35.7±17.7	19.0±10.5	97
Muscicapidae	Zoothera lunulata	Bassian thrush	15.4±6.6	8.9±3.1	31
Turdidae	Turdus migratorius	American robin	22.6±12.3	11.2±7.4	13
Muscicapidae	Erithacus rubecula	European robin	29.2±5.5	11.1±4.3	16
Sturnidae	Sturnus vulgaris	Common starling	26.4±13.7	13.6±9.0	32
Sturnidae	Sturnus vuigaris Sturnus unicolor		29.8±6.7	13.0±9.0 13.2±6.2	14
	Acridotheres tristis	Spotless starling			
Sturnidae		Common myna	22.8±13.6	11.6±9.4	40
Certhiidae	Certhia brachydactyla	Short-toed treecreeper	22.3±2.6	7.2±2.4	15
Paridae	Parus ater	Coal tit	10.2±1.8	3.4±1.0	14
Paridae	Parus major _.	Great tit	18.5±5.1	6.3±2.1	15
Paridae	Parus caeruleus	European blue tit	18.3 ± 6.1	6.9 ± 1.9	14
Aegithalidae	Psaltriparus minimus	Bushtit	12.9 ± 8.6	6.9 ± 4.2	26
Hirundinidae	Hirundo neoxena	Welcome swallow	25.4±18.2	11.0±5.6	32
Regulidae	Regulus calendula	Ruby-crowned kinglet	10.2 ± 4.0	4.7 ± 2.1	10
Pycnonotidae	Pycnonotus jocosus	Red-whiskered bulbul	23.8±16.8	18.4±13.2	25
Sylviidae	Cisticola exilis	Golden-headed cisticola	9.0±4.7	5.4±3.0	41
Zosteropidae	Zosterops lateralis	Silvereye	11.0±6.2	6.1±3.8	34
Sylviidae	Acrocephalus stentoreus	Clamorous reed-warbler	15.5±9.4	11.5±9.4	20
Sylviidae Sylviidae	Phylloscopus collybita	Eurasian chiffchaff	13.3±9.4 24.7±5.3	6.0±1.5	15

Table A1. (continued)

Family	Latin name	Common name	Starting distance	FID_{direct}	N
Timaliidae	Chamaea fasciata	Wrentit	9.0±4.7	5.0±3.4	10
Fringillidae	Passer domesticus	House sparrow	21.6±11.6	13.2 ± 8.6	18
Fringillidae	Passer montanus	Eurasian tree-sparrow	20.3±7.6	8.0 ± 3.0	15
Passeridae	Motacilla alba	White wagtail	28.9 ± 3.6	7.7 ± 1.8	16
Motacillidae	Anthus novaeseelandiae	Richard's pipit	23.0±11.7	12.4 ± 5.2	63
Passeridae-Estrildinae	Neochmia temporalis	Red-browed finch	13.8 ± 8.7	7.5 ± 5.1	51
Passeridae	Lonchura punctulata	Nutmeg mannikin	19.6 ± 9.1	11.0 ± 6.3	43
Passeridae	Lonchura castaneothorax	Chestnut-breasted mannikin	21.2 ± 5.5	14.4 ± 4.5	10
Fringillidae	Fringilla coelebs	Chaffinch	28.3 ± 6.2	7.7 ± 2.1	15
Fringillidae	Carduelis chloris	European greenfinch	$22.7{\pm}2.2$	6.9 ± 1.6	15
Fringillidae	Carduelis carduelis	European goldfinch	25.7 ± 4.9	9.2 ± 2.5	18
Emberizidae	Melospiza melodia	Song sparrow	12.9 ± 5.5	8.2 ± 3.9	17
Emberizidae	Zonotrichia leucophrys	White-crowned sparrow	16.1 ± 8.2	$8.6 {\pm} 5.3$	43
Emberizidae	Junco hyemalis	Dark-eyed junco	15.1 ± 6.6	8.9 ± 3.8	17
Emberizidae	Pipilo crissalis	California towhee	19.8 ± 10.9	11.9±7.9	46
Emberizidae	Pipilo maculatus	Spotted towhee	15.8 ± 10.5	$9.8 {\pm} 6.4$	32
Parulidae	Dendroica coronata	Yellow-rumped warbler	14.8 ± 5.7	9.4 ± 4.1	28